Water Recycling Funding Program Facilities Planning Study

FINAL

NOVEMBER 2025

LOS OSOS COMMUNITY SERVICES DISTRICT

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Prepared by Water Systems Consulting, Inc

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ACRONYMS & ABBREVIATIONS

AF	Acre-feet
AFY	Acre-feet per year
AOP	Advanced Oxidation Process
AWPF	Advanced Water Purification Facility
BAC	Biologically Activated Carbon
BOD5	Biochemical Oxygen Demand (5-day)
BPS	Booster Pump Station
CCF	Hundred cubic feet
CCWA	Central Coast Water Authority
CEQA	California Environmental Quality Act
CHG	Cleath-Harris Geologists, Inc.
County	San Luis Obispo County
CWSRF	Clean Water State Revolving Fund
DDW	(State Water Board) Division of Drinking Water
DPR	Direct Potable Reuse
DWR	California Department of Water Resources
DWSRF	Drinking Water State Revolving Fund
EA	Each
Flood Control District	Flood Control and Water Conservation District
GPM	Gallons per minute
GRRP	Groundwater Replenishment Reuse Project
GSWC	Golden State Water Company
GW	Groundwater
HP	Horsepower
IPR	Indirect Potable Reuse
ISJ	Interlocutory Stipulated Judgment

KWH	Kilowatt hour
LF	Linear feet
LOBMC	Los Osos Basin Management Committee
LOBP	Los Osos Basin Plan
LOCSD	Los Osos Community Services District
LOWRF	Los Osos Water Recycling Facility
LS	Lump sum
MB	Morro Bay
MCL	Maximum Contaminant Level
MF	Microfiltration
MG/L	Milligrams per liter
MGD	Million gallons per day
MPN	Most Probable Number
NPDES	National Pollutant Discharge Elimination System
NPR	Non-Potable Reuse
NTU	Nephelometric Turbidity Unit(s)
O&M	Operations and Maintenance
O3	Ozone
PFAS	Per- and Polyfluoroalkyl Substances
PS	Pump Station
RO	Reverse Osmosis
RW	Recycled Water
RWC	Recycled Water Contribution
RWPS	Recycled Water Pump Station
RWQCB	Regional Water Quality Control Board
S&T	S&T Mutual Water Company
SAT	Soil Aquifer Treatment
SDWIS	State Drinking Water Information System
SF	Square feet
SGMA	Sustainable Groundwater Management Act

SLO	San Luis Obispo
SSLOCSD	South San Luis Obispo County Sanitation District
SWP	State Water Project
SWRCB	State Water Resources Control Board
TOC	Total Organic Carbon
URL	Urban Reserve Line
USACE	U.S. Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UV	Ultraviolet
UV/AOP	Ultraviolet Advanced Oxidation Process
WDR	Waste Discharge Requirements
WIFIA	Water Infrastructure Finance and Innovation Act
WRDA	Water Resource Development Act
WRFP	Water Recycling Funding Program (Facilities Planning Study)
WTF	Water Treatment Facility

1.0 Introduction

The Los Osos Community Services District (LOCSD), as a member of the Los Osos Basin Management Committee, contracted for services to develop a Transient Groundwater Model (Transient Model) and prepare a Water Recycling Funding Program Facilities Planning Study (WRFP Study) for the community of Los Osos. The purpose of the Transient Model and WRFP Study is to develop an accurate groundwater model for the Los Osos Groundwater Basin and to evaluate recycled water and supplemental supply alternatives to improve groundwater sustainability. The Transient Model and WRFP Study is funded in part by a grant from the California State Water Resources Control Board (SWRCB) Water Recycling Funding Program.

1.1 Study Organization

The WRFP Study is organized as follows:

Chapter 1: Introduction

This chapter provides background information, describes the study area, and stakeholder participation throughout the project.

Chapter 2: Water Supply Characteristics and Facilities

This chapter describes the existing water purveyors, water costs, demand, and quality within the study area.

Chapter 3: Wastewater Characteristics and Facilities

This chapter describes the wastewater service area, major facilities, effluent requirements, and existing and projected reuse.

Chapter 4: Treatment Objectives for Discharge and Reuse

This chapter describes the recycled water use types and regulations for reuse alternatives evaluated in this Study.

Chapter 5: Supply Alternatives

This chapter includes the planning assumptions, recycled water market assessment, the recycled water and water supply alternatives considered in this Study, and an alternatives comparison summary.

Chapter 6: Recommendations

This chapter describes the recommended supply alternatives, project implementation, funding and financing needs, and next steps.

Appendix A provides a crosswalk of this WRFP Study to the WRFP Guidelines recommended outline.

1.2 Background

The Los Osos Groundwater Basin (Basin) is the sole source of water for the community of Los Osos, an unincorporated community located in the County of San Luis Obispo (County) (Figure 1-1). The Basin is adjudicated; and, in 2015, the parties to the adjudication agreed to a Stipulated Judgement and Basin Plan for the management of the Basin. The Stipulated Judgement called for the formation of the Los Osos Basin Management Committee (LOBMC), which consists of representatives from the LOCSD, Golden State Water Company (GSWC), S&T Mutual Water Company (S&T Mutual), and San Luis Obispo County (County).

The Basin Plan identified numerous programs and projects to increase the sustainable yield of the Basin, protecting against degradation from seawater intrusion and nitrates and providing water for future growth within the community. As part of this WRFP Study, the groundwater model was updated from a steady-state model to a Transient Model and used to evaluate reuse and new water supply alternatives with the purpose to protect the Basin against degradation and support sustainable water management for the community.

Figure 1-1. Vicinity Map

Source: Los Osos Wastewater Project development Water Recycling Facility Engineering Report, Figure 1 (SLO County, 2018)

1.3 Study Area

The study area for the WRFP Study is the Los Osos Groundwater Basin, shown in Figure 1-3, which underlies the unincorporated communities of Los Osos, Baywood Park, and Cuesta-by-the Sea. The study area characteristics are described below.

1.3.1 Topography

The topography of Los Osos is shown in Figure 1-2. In general, the topography of the study area is sea level at Morro Bay northwest of the community and rises up to 200 feet along the south side of the urban reserve area.

1.3.2 Hydrogeologic Features

The onshore portion of the Los Osos Groundwater Basin (Figure 1-3) covers approximately 10 square miles, of which approximately 3.3 square miles underlie Morro Bay and the Morro Bay State and National Estuary, and 6.7 square miles underlie Los Osos, Baywood Park, Cuesta-by-the-Sea, and the Los Osos Creek Valley. The Basin is underlain and bounded by relatively impermeable rocks on the north, east, and south. To the west, the Basin is effectively bounded by the seawater/freshwater interface, although the basin extends westward under Morro Bay an estimated three miles beneath the Pacific Ocean. Figure 1-4 shows the surface water features in the Basin. Unconsolidated sediments forming the Basin include alluvial deposits, dune sands, the Paso Robles Formation, and the Careaga Formation (LOBMC, 2015).

The Basin is a synclinal trough with a northwest-southeast orientation lying between two parallel ridges of hills to the north and south. Dips along stratigraphic horizons on the limbs of the syncline reach approximately 4 degrees, although dips of up to 8 degrees are present near the Los Osos fault zone at the southeast end of the Basin. The contact between Basin sediments and bedrock is an unconformity, and the synclinal nature of the Basin sediments is only partially developed on the surface. Faulting along the south Basin boundary has encroached into the Basin and offset bedrock along at least three planes. The United States Geological Survey (USGS) proposed two parallel faults trending north-northeast and extending into the Basin from previously mapped faults in basement rocks south of Bayview Heights. These parallel faults uplift Basin sediments on the east and create a groundwater barrier between upper Los Osos Creek and downtown Los Osos (LOBMC, 2015).

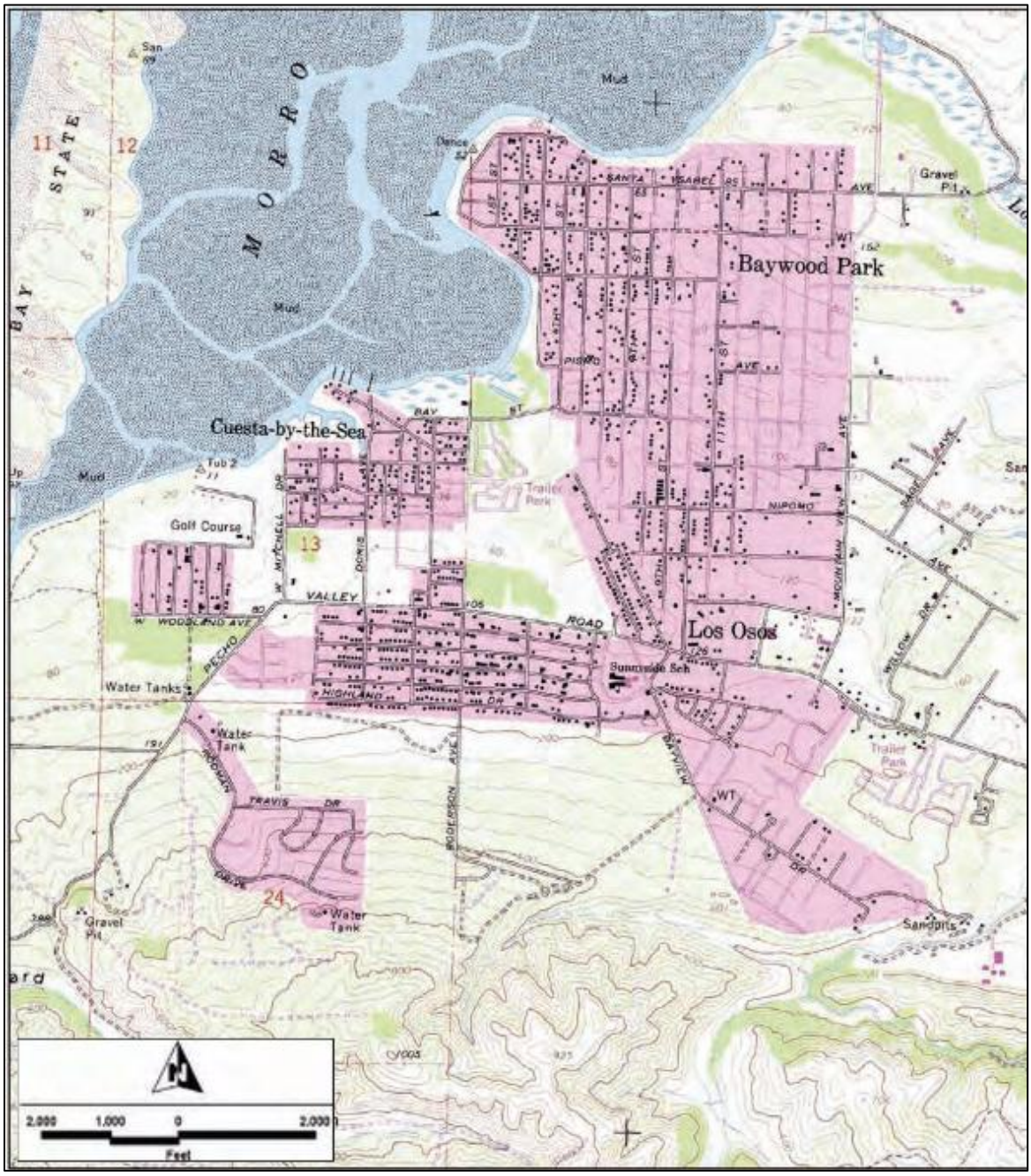
The hydrogeology of the Basin has been subject to several technical studies, leading to a progressively better understanding over time. Regarding the vertical differentiation of aquifer zones, the current model began in 1989 when the Morro Group prepared a series of geologic cross-sections interpreting Basin structure. This was based on correlating three discrete horizons separating four zones across the Basin in a series of cross-sections. The three horizons correlated in the cross-sections were selected for their significance with respect to the movement of groundwater within the Basin. The three horizons (i.e., aquitards), designated AT2 through AT4, separated four zones (i.e., aquifers), designated AF1 through AF4.

In 2001, Weber, Hayes and Associates subdivided AF1 into three units, Zones A, B, and C, as a part of a service station site investigation report in downtown Los Osos (SLO County, 2011).

In 2003, Cleath and Associates adapted this nomenclature for the Basin and expanded it to include Zones D and E, which were previously designated AF2 and AF3 in the Morro Group terminology. A sixth aquifer zone, also identified by Cleath and Associates, is the alluvial aquifer, which lies along Los Osos Creek Valley. With this terminology, the “Upper Aquifer” is Zone C, the “Lower Aquifer” is Zones D and E, and they are separated by the “regional aquitard” which is AT2 (SLO County, 2011).

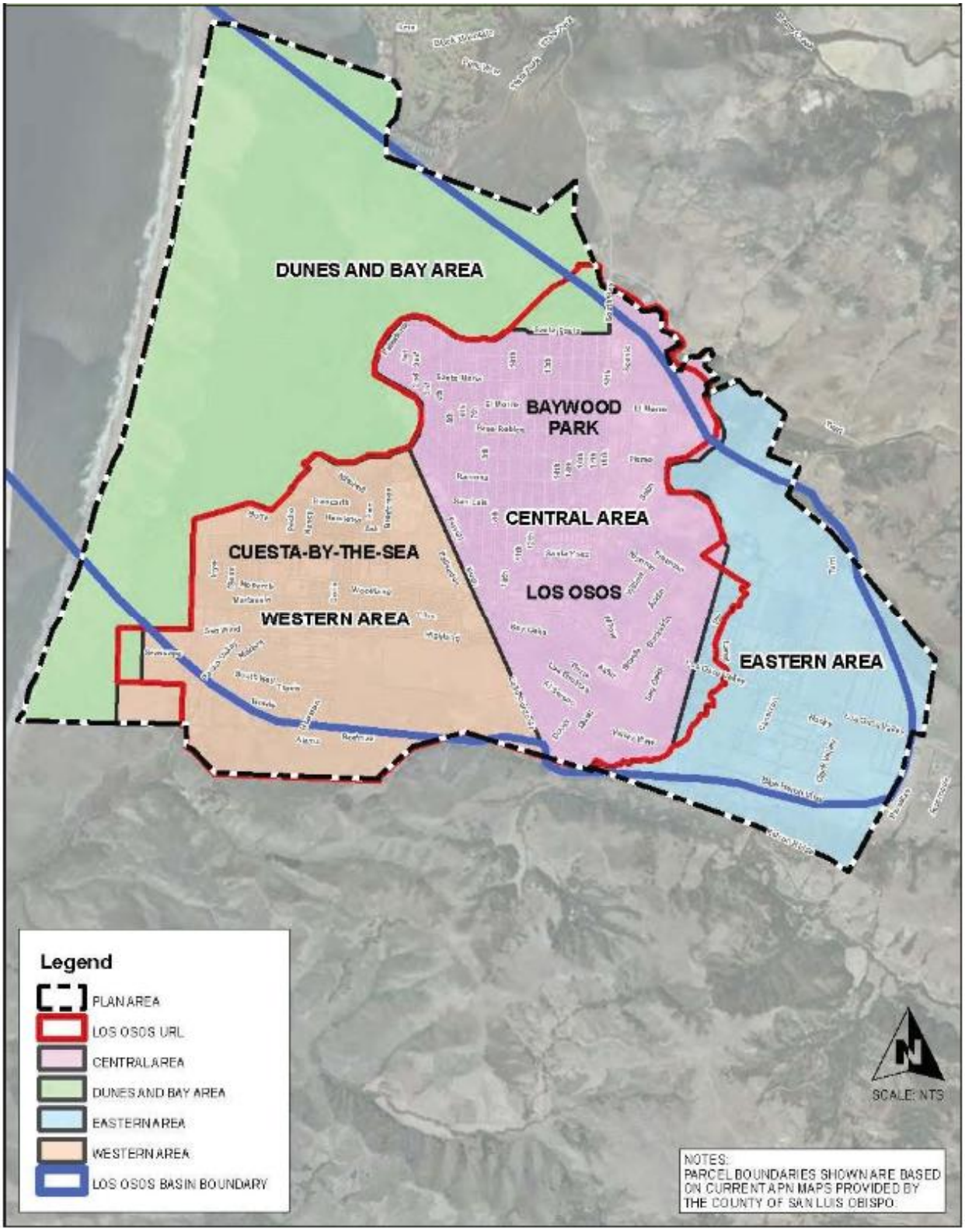
In August 2008, the Superior Court of the State of California for the County of San Luis Obispo (Court) approved an Interlocutory Stipulated Judgment (ISJ) between LOCSD, GSWC, S&T Mutual, and the County. Under the ISJ, these Parties formed a working group, undertaking technical studies and management discussions that produced the Los Osos Basin Plan (LOBP) in January 2015. The LOBP presents a comprehensive groundwater management strategy and serves as the cornerstone of a physical solution to address significant problems facing the Basin. This includes seawater intrusion and elevated nitrate concentrations. The LOBP addresses restoration of Basin water resources while respecting existing water rights (CHG, 2024). Cleath-Harris Geologists, Inc. (CHG) has prepared the annual basin monitoring reports since 2015 following the LOBP.

Figure 1-2. Topographic Map



Source: Los Osos Wastewater Project development Water Recycling Facilities Plan, Figure 3 (SLO County, 2011)

Figure 1-3. Los Osos Groundwater Basin



Source: Updated Basin Plan for the Los Osos Groundwater Basin, Figure 1 (LOBMC, 2015)

Figure 1-4. Surface Water Resources of the Basin

Source: Updated Basin Plan for the Los Osos Groundwater Basin, Figure 21 (LOBMC, 2015)

1.3.3 Groundwater Production

Combined groundwater production of all types, i.e., purveyor, private domestic, community, and agricultural, is shown in Table 1-1 for the period from 2018 through 2024. Purveyor production data was derived from metered well production and is considered the most accurate and reliable. Production from non-metered wells used for irrigation (Community, Agriculture) is estimated using a daily soil moisture budget with local land use/crop data, daily rainfall, and evapotranspiration data. The domestic production is also estimated and was updated in 2023 in the Water Offset Study (SLO County, 2023).

Table 1-1. Groundwater Production 2018-2024

Year	Purveyor Pumping	Domestic Wells[1]	Community Facilities	Agricultural Wells	Total (rounded)
2018	1,018	220	120	670	**1,900**
2019	991	220	60	630	**1,900**
2020	1,063	220	80	650	**2,010**
2021	1,026	220	130	620	**2,000**
2022	1,016	220	90	680	**2,010**
2023	984	110	60	500	**1,650**
2024	1,022	110	50	510	**1,690**

Source: Los Osos Basin Plan Groundwater Monitoring Program Annual Monitoring Reports, 2020-2024, Table ES-1 (CHG, 2021; 2022; 2023; 2024; 2025)
Note 1: Domestic production use was updated in 2023 from the 2023 Water Offset Study (SLO County, 2023).

The majority of recharge to the Basin consists of the following elements:

- Direct percolation of precipitation;
- Return flow from irrigation and septic system discharges;
- Stream seepage from Los Osos Creek; and
- Subsurface inflow across Basin boundaries, including seawater intrusion.

Within the Basin, individual aquifer zones may receive recharge directly from the above sources or indirectly through inflow (leakage) from an overlying or underlying aquifer zone. Movement of groundwater within alluvial, perched, and upper aquifer zones can be inferred from groundwater elevation contour maps.

The Basin went through an adjudication process; and, in 2015, the parties agreed to a Stipulated Judgement to create allocation pools, allocate the sustainable yield, and establish the LOBMC to manage the Basin. The Stipulated Judgement also defined the groundwater pool allocation for the Basin sustainable yield of 2,400 acre-feet per year (AFY), shown in Table 1-2. When compared to the historic pumping shown in Table 1-1, the purveyor pool and total Basin production have been consistently below the allowance defined in the Stipulated Judgement.

Table 1-2. Stipulated Judgement Pool Allocation

User	Pool Share	Pool Allowance (AFY)
Purveyor Pool	59.58	1,430
Private Domestic Pool	6.25	150
Community Pool	2.92	70
Agricultural Pool	31.25	750
Total	**100.0**	**2,400**

Source: Los Osos Basin Stipulated Judgment Table 3, 2015

The LOBMC approved a sustainable yield estimate for calendar year 2025 of 2,380 acre-feet (AF), which has been unchanged since 2021, at the October 16, 2024 Board of Directors meeting. An update to the Basin sustainable yield is expected in Fall 2025 based on the results of the Transient Model (CHG, 2025).

1.3.4 Water Quality

Historically, the Los Osos groundwater basin has been impacted by nitrates from septic systems and saltwater intrusion in the lower aquifer.

A sewer system and the Los Osos Water Recycling Facility (LOWRF) were constructed to serve Los Osos and began operating in 2016 to reduce the impact of septic systems on the Basin. Since the startup of the LOWRF, the nitrate concentration in the Basin has been steadily declining. The Basin Nitrate Metric, defined as the average concentration of nitrate in five key wells located in areas of the Basin that have been impacted by elevated nitrate concentrations, was 14.2 mg/L in winter 2023, which is above the maximum contaminant level of 10 mg/L. This was a decrease from previous years, and the lowest point recorded in the last 20 years, largely due to the LOBP actions and the construction of the LOWRF to stop nitrate loading in the Basin from septic disposal. Nitrate concentrations are predicted to continue to decline in the Basin and reach the LOBP objective of 10 mg/L by mid-century (CHG, 2024).

Another key metric is the Basin Chloride Metric, which is used to monitor seawater intrusion in the Lower Aquifer; it is the weighted average concentration of chlorides in four key wells. Reduction in pumping from the Lower Aquifer should result in measurable declines in chloride concentrations. In the 2024 Los Osos Groundwater Basin Annual Report, the Chloride Metric was 188 mg/L in Spring 2024 and 249 mg/L in Fall 2024, respectively (CHG, 2025). Seawater intrusion is typically most active in the fall when water levels are lowest. The 2024 Basin Annual Report projects several years of continued rise in the Chloride Metric (deterioration in Basin conditions) before the metric trend reverses, followed by many years of gradual decline in the metric before reaching the LOBP objective of 100 mg/L.

Additionally, Chromium-6 has been a concern in several upper and lower aquifer wells as described in the 2015 Annual Groundwater Monitoring Report. Per- and polyfluoroalkyl substances (PFAS) have also been detected in portions of the Basin (CHG, 2016).

1.3.5 Land Use

The study area includes approximately 6,000 land acres, primarily comprised of residential areas, limited commercial development to serve the community, agricultural land, and conserved open space.

Residential and commercial development within Los Osos is generally bounded by the Urban Reserve Line (URL), as established in the Los Osos Community Plan. The URL is clearly defined by a greenbelt, including productive agricultural lands and open space that are managed to protect the Morro Bay estuary (SLO County, 2024). This includes scenic and natural resources, shown in Figure 1-5.

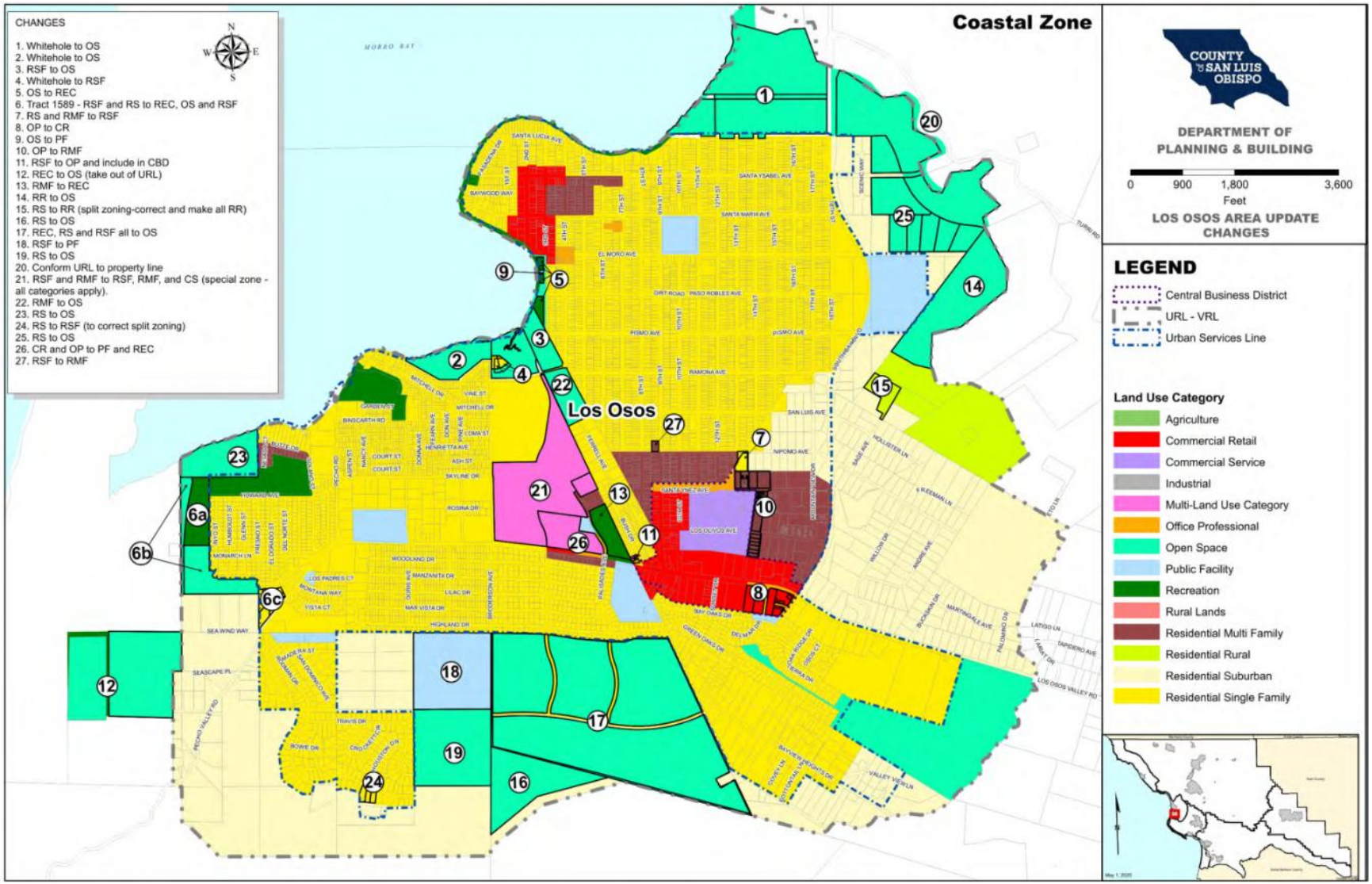
Table 1-3 provides a land use summary for the URL as defined in the 2024 Los Osos Community Plan. The URL includes approximately 3,472 acres.

1.3.6 Population

The community of Los Osos is a census-designated place (Figure 1-6) with a population of 14,465 as of the 2020 US Census—189 higher than the 14,276 counted during the 2010 Census. The areas included in the census-designated place but not the WRFP study area include Morro Bay State Park and the Morro Bay Estuary, which do not significantly contribute to the population estimate.

Table 1-4 includes population projections for the community of Los Osos that were developed for the Los Osos Community Plan and were adopted by the County Board of Supervisors in October 2024. The URL defined in the Los Osos Community Plan is slightly smaller than the Census Designated Place boundaries, which results in a slightly lower 2010 population reported in the Community Plan compared to the 2010 Census. The projected 2035 population reported in the Community Plan is 18,607.

Figure 1-5. Land Use of the Unincorporated Community of Los Osos



Source: Los Osos Community Plan (SLO County, 2024)

Table 1-3. Land Use Summary

Land Use Category	Acreage	Land Use Distribution (%)	Dwellings at Buildout	Population at Buildout[1]	Maximum Non-Residential Square Feet at Buildout[2]
Residential Multi-Family	106	3	1,430	3,146	-
Residential Single Family	1442	42	5,806	12,773	-
Residential Suburban	789	23	279	614	-
Residential Rural	68	2	10	22	
Commercial Retail	92	3	244	420	668,100
Commercial Service	27	0.77	23	51	186,600
Office and Professional	9	0.26	10	22	61,600
Open Space	705	20	0	0	-
Recreation	49	1.6	10	22	10,000
Public Facilities	115	3.3	0	0	-
Morro Shores Mixed Use (RMF, RSF, CS[3])	56	1.8	370	814	98,000
Midtown Mixed Use (PF, REC)	12	0.34	0	0	-
TOTAL	**2,851(net) 3,472 (gross)[4]**	**100%**	**8,182**	**18,001**	**1,024,300**

Notes:

(1) Population estimates are based on 2.2 persons per occupied dwelling unit and 0% vacancy.

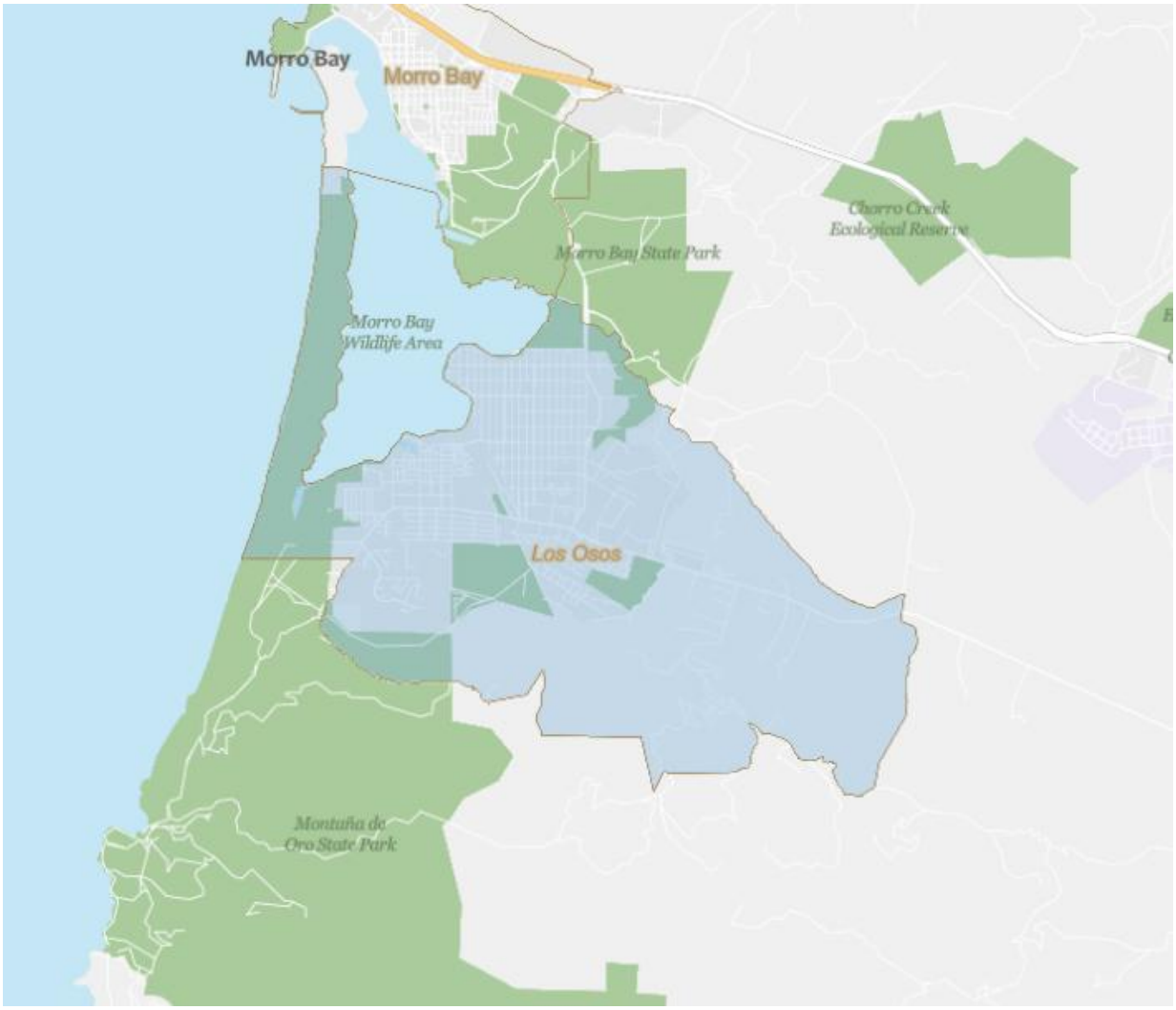
(2) The maximum non-residential floor area is based on floor area averages for each land use category; does not include potential lodging units.

(3) Morro Shores Mixed Use categories: RMF,RSF,CS: 56 acres

(4) Gross acreage includes road rights-of-way

Source: 2024 Los Osos Community Plan, Table 3-1 (SLO County, 2024)

Figure 1-6. Los Osos, Census-Designated Place



Source: US Census, 2024

Table 1-4. Los Osos Population Projections

Year	Total Population	Percent Increase from 2010	Annual Growth Rate
2010	13,908	--	--
2015	13,988	0.58%	0.11%
2035	18,607	33.7%	1.35%
Buildout	18,750	34.8%	--

Source: 2024 Los Osos Community Plan, Table C-3 (SLO County, 2024)

1.4 Stakeholder Participation

The Transient Model and WRFP Study included opportunities for stakeholder and public involvement, listed in Table 1-5. The Technical Advisory Committee (TAC) meetings included staff level representatives from each of the LOBMC member agencies and a Peer Review Hydrogeologic consultant. The LOBMC meetings provide opportunity for public comments.

Additionally, there's been a brief update on the WRFP Study/Transient Model included in the Los Osos Basin Update Report (formerly known as the Executive Director's Report) since December 2019 and there have been numerous BMC staff meetings to discuss the WRFP Study and Transient Model.

Table 1-5 Stakeholder Participation

Date	Stakeholder Opportunity	Topic for Discussion
October 27, 2021	BMC Meeting	The Board authorized use of Grant Pursuit Contingency funding for Staff to prepare the Water Recycling Funding Program (WRFP) grant application and to submit request to the County to access the $150,000 in County funding budgeted for the development of a Transient Groundwater Model.
April 20, 2022	BMC Meeting	The Board approved the WRFP Study and Transient Model RFP with modifications to the schedule and approved release of RFP contingent on award of funding from the State Water Resource Control Board.
May 17, 2023	BMC Meeting	The Board approved of Staff's recommendation of the selection of Cleath-Harris Geologists to complete the WRFP Study for the BMC.
June 21, 2023	BMC Meeting	The Board approved Staff's recommendation of the selection of GSI Water Solutions to provide Peer Review consulting services for the WRFP Study.
October 6, 2023	TAC Meeting	Project Kickoff - Review Hydrogeologic Conceptual Site Model and Modeling Approach
December 21, 2023	TAC Meeting	Review Project Alternatives
March 14, 2025	TAC Meeting	Review Transient Model Construction, Calibration, and Baseline Scenario results
March 20, 2025	TAC Meeting	Review Preliminary Water Supply Alternatives
April 9, 2025	TAC Meeting	Review Preliminary Alternatives Analysis
May 20, 2025	TAC Meeting	Review Updated Alternatives Analysis
May 21, 2025	BMC Meeting	The Board received a presentation from Staff on the Public Draft 2024 Annual Monitoring Report (AMR), which includes discussion on the Transient Model.

Date	Stakeholder Opportunity	Topic for Discussion
June 12, 2025	TAC Meeting	Review Transient Model peer reviews, updated Baseline Scenario
June 18, 2025	BMC Meeting	The Board received and filed the Transient Model Construction and Calibration and Baseline Scenario Technical Memorandums.
July 8, 2025	TAC Meeting	Review and discuss WRFP Study Draft Supply Alternatives Comments
July 16, 2025	BMC Meeting	The Boad received an update on the Los Osos Water Recycling Funding Program (WRFP) Study Engineering Report.
August 20, 2025	BMC Meeting	The Board received the presentation on the Transient Model Construction and Calibration and Baseline Scenario Technical Memorandums. The Board provided Staff direction to prepare responses to the technical questions asked in public comment and circulate the responses to the public.
October 2, 2025	BMC Meeting	The Board received information on a potential Transient Model Sustainable Yield Adaptive Method approach methodology. The Board received and filed the written responses to the public comments/questions on the Draft Transient Model Construction and Calibration Technical Memorandum received at the August 20, 2025 BMC Meeting.
October 15, 2025	BMC Meeting	The Board received information on updated Sustainable Yield calculations and approved of the proposed Sustainable Yield estimate for Calendar Year 2026, which was calculated utilizing the Transient Model.
November 12, 2025	BMC Meeting	The Board commented on and authorized submittal of the Final Draft Los Osos Water Recycling Funding Program (WRFP) Study to the State Water Resources Control Board (SWRCB) with changes to address comments received from SWRCB and BMC.

2.0 Water Supply Characteristics and Facilities

Groundwater is the only source of potable water in the planning area. Most of the groundwater is produced by three purveyors: LOCSD, GSWC, and S&T Mutual. Other groundwater is produced using private wells for domestic and irrigation purposes. This Chapter describes the water suppliers, water sources, facilities, and water use trends.

2.1 Water Purveyors

Three entities purvey potable water to the community of Los Osos: LOCSD, GSWC, and S&T Mutual. Figure 2-1 shows the service area for each purveyor. Outside of the purveyor service areas include private domestic parcels, agricultural parcels, community facilities (parks and golf course), and open space. The sole source of potable water for the study area is groundwater from the Basin. None of the purveyors purchase water from a wholesale water purveyor.

Additionally, the County provides recycled water within the Study area for landscape and agricultural irrigation.

2.1.1 LOCSD

LOCSD formed pursuant to California Government Code Sections 61000 et seq. and provides water, drainage, parks and recreation, solid waste, street lighting, fire emergency, and rescue response services to a portion of the community of Los Osos.

2.1.2 GSWC

GSWC is a California corporation and a public utility, as defined in California Public Utilities Code Section 216, and owns and operates a municipal water utility system in Los Osos since 1976.

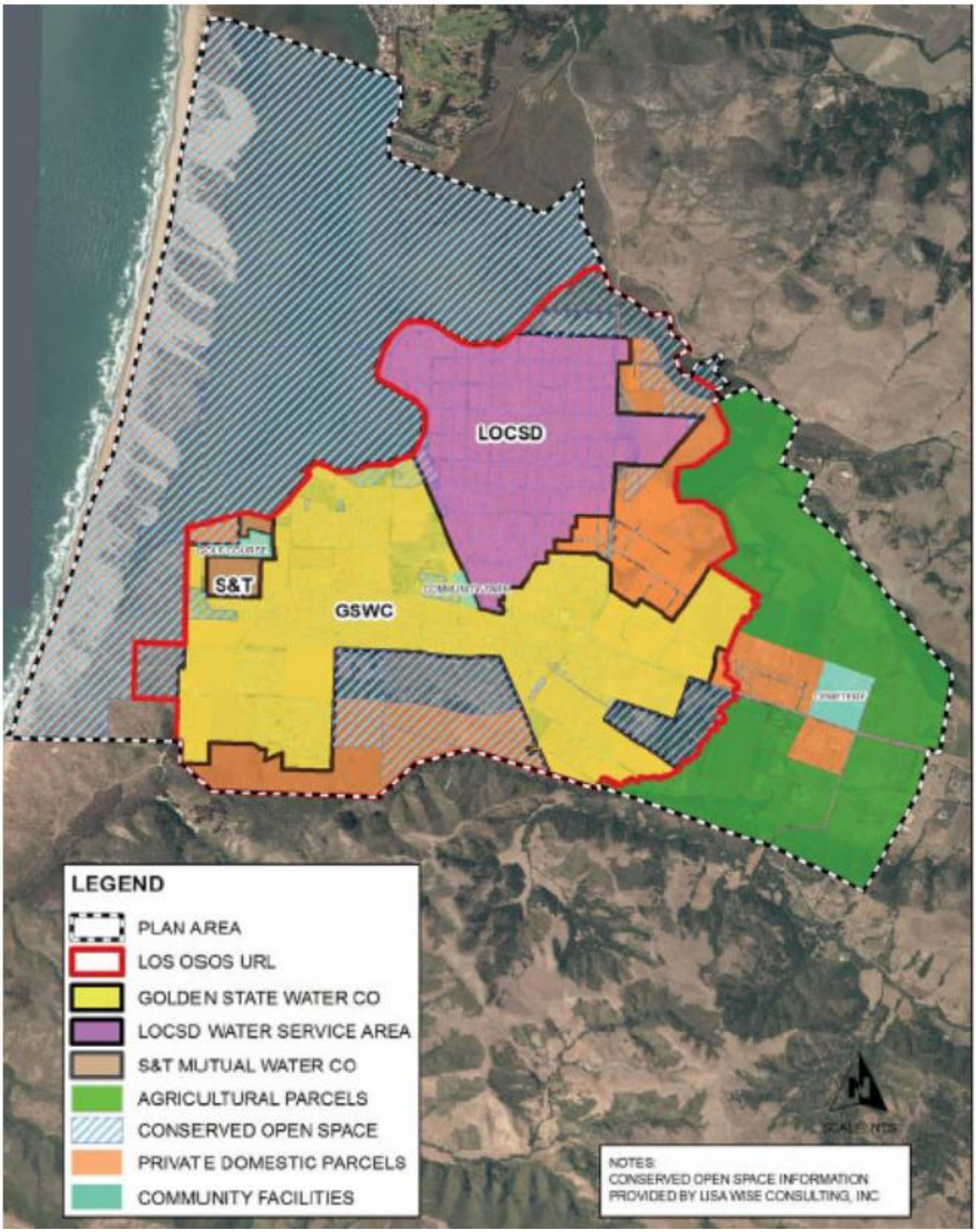
2.1.3 S&T Mutual

S&T Mutual is a California corporation and a mutual water company, as defined in California Public Utilities Code Section 2705, and owns and operates a municipal water utility system in Los Osos through which it delivers water exclusively to its shareholders at cost.

2.1.4 San Luis Obispo County

San Luis Obispo County owns and operates the recycled water system and provides disinfected tertiary treated recycled water for agricultural and landscape irrigation in the Basin.

Figure 2-1. Water Service Areas



Source: Updated Basin Plan for the Los Osos Groundwater Basin, Figure 4 (LOBMC, 2015)

2.2 Water Supply Infrastructure

The major assets for each of the three purveyors includes:

- LOCSD's water supply is 100% groundwater from 7 wells. The LOCSD also has 3 tanks and water mains.
- GSWC's water supply is 100% groundwater from 7 wells. GSWC also has 5 tanks and water mains.
- S&T Mutual's water supply is 100% groundwater from 1 well. S&T Mutual has 1 additional inactive well. S&T Mutual also has 2 tanks and water mains.

2.3 Water Supply Operating Costs

Water supply operating costs were only available from one purveyor, LOCSD. LOCSD's Water Fund operating (expenditure) budget for fiscal year 2025-2026 is $4.8 million (LOCSD, 2025). The primary expense is capital outlay for infrastructure capital improvements (approximately $2.1 million), which will vary year to year based on planned projects.

2.4 Water Supply Customer Rates

Current (2025) customer rate information for each purveyor is summarized below. Future prices are not yet established.

LOCSD

LOSCD uses a tiered rate schedule based on usage to determine monthly charges for customers. A base rate of $77 per month is charged to all customers. Additionally, for every hundred cubic feet (CCF) consumed, customers are charged between $7.21 to $13.52 per CCF with the first tier ranging from 1 to 5 CCF and the highest tier for 21 CCF or greater.

GSWC

GSWC uses a non-residential and a residential schedule for determining the customer monthly charge. Non-residential customers are charged $11.473 per CCF plus a monthly meter service charge tied to meter size. Residential customers have tiered rates. The rate is $11.473 per CCF for the first 8 CCF (Tier 1), $13.194 per CCF for the next 10 CCF (Tier 2), and $15.173 per CCF for all usage above 18 CCF. Additionally, residential customers are charged a monthly meter service fee tied to meter size.

S&T Mutual

S&T Mutual uses a four-tiered water rate schedule. The base water charge is $110 with a rate of $11 per CCF for the first 6 CCF (Tier 1), $15 per CCF for 7 to 12 CCF (Tier 2), $40 per CCF for 13 to 30 CCF (Tier 3), $54 per CCF for 31 CCF and greater (Tier 4).

San Luis Obispo County

The County charges approximately 90% of the drinking water rate for recycled water to incentivize users to connect to the system.

2.5 Water Supply Capacity

The only water source for the community of Los Osos is groundwater. Per the 2024 Los Osos Basin Groundwater Annual Monitoring Report, the Basin's adopted Sustainable Yield for 2025 is 2,380 AFY, with an update to the Basin sustainable yield expected in Fall 2025 (CHG, 2025). The Basin Monitoring Program provides a continuously updated hydrologic assessment of the Basin, its water resources, and sustainable yield as documented in annual Basin Reports. The 2024 Basin Report notes that an update to the Basin sustainable yield is expected in the fall of 2025 based on the findings of the Transient Model (CHG, 2025).

2.6 Groundwater Management

The LOBMC was established by the Stipulated Judgement as the governing body responsible for implementing the Basin Plan. Both the Stipulated Judgment and incorporated Updated Basin Plan for the Los Osos Groundwater Basin (dated January 2015) were approved by the San Luis Obispo Superior Court in October of 2015.

The Updated Basin Plan aims to address the twin challenges of nitrate degradation and seawater intrusion through the recommendation and implementation of certain programs. The Basin Plan recommendations are listed below, with the first five recommended for immediate implementation and the last two recommended for implementation if the County and Coastal Commission allow for future development:

1. Implement a Groundwater Monitoring Program to collect, organize, and report data regarding the health of the Basin.
2. Implement an Urban Water Use Efficiency Program to reduce urban water demand from the Basin.
3. Implement an Urban Water Reinvestment Program to reinvest all water produced back to the Basin through direct percolation to the aquifer or reuse of treated wastewater effluent.
4. Implement Basin Infrastructure Programs A and C:
    - Program A includes a water system interconnection between LOCSD and GSWC, a new LOCSD upper aquifer well, nitrate removal of LOCSD's existing South Bay Well, modifications of LOCSD's existing Palisades Well, a well Blending Project within GSWC's system, and metering within S&T Mutal's system.
    - Program C includes three new expansion wells, two of which for GSWC and one for LOCSD, a water system interconnection between GSWC and S&T Mutual, and a water main upgrade in GSWC's system.
5. Implement a Wellhead Protection Program which includes Purveyors conducting Drinking Water Source Assessment and Protection surveys for each of their wells.
6. Implement Basin Infrastructure Program B, which includes new LOCSD and GSWC wells and a Community Nitrate Removal Facility.
7. Implement Either Basin Infrastructure Program D or the Agricultural Water Reinvestment Program:

- Program D includes three new expansion wells to serve the LOCSD and/or GSWC systems.
- The Agricultural Water Reinvestment Program to deliver additional recycled water to agricultural users to offset Basin production.

Pursuant to the Stipulated Judgment, the LOBMC meets publicly, typically on a monthly or quarterly basis. It also retains consultants and technical advisors to support hydrologic modeling, legal compliance, and project engineering. With specific relation to the above recommended programs, the Basin Plan sets forth an Adaptive Management Plan under which the LOBMC annually evaluates the Basin and the effectiveness of the Basin Plan and can modify the above recommended programs to better meet the overall Basin objectives.

2.7 Water Demand

The purveyor water demands for the study area, presented in Table 2-1, are based on existing water use plus potential water use at buildout.

Table 2-1. Current and Projected Purveyor Water Use (AFY)

Current Demand[1]	Projected Growth[2]	Buildout Conditions
1,016	295	1,309

1. 2019 to 2023 average water demand.
2. Based on Potential Future Water Demand for the Los Osos Basin Plan Area (County of San Luis Obispo Department of Planning and Building, 2024). Refer to Table 2-2.

Projected demands are based on an estimate prepared by the County, *Potential Future Water Demand for the Los Osos Basin Plan Area*, included as Appendix C. The estimate supports LOBMC planning efforts, including this study. Estimated future additional water demand at buildout is presented in Table 2-2.

Table 2-2. Estimated Increase in Development and Water Demand at Buildout (from Current Baseline) for Purveyors in the Los Osos Basin Plan Area

Development Type	Potential New Development	Potential New Water Demand (AFY)
Single-Family Residences	1,020 units	146
Multi-Family Residences	795 units	89
Commercial Service	49,574 sf	19
Retail	228,900 sf	34
Office	49,536 sf	4
Public Facilities & Recreation	Sea Pines	2
Total Increase in Water Demand		**295**

Note: Units = dwelling units. One Single-Family unit typically allowed per parcel.

2.7.1 Water Conservation

As reflected in the existing and future water demand estimates, water users within the Los Osos Basin Plan Area have implemented and plan to implement a high level of conservation. The County prepared the Los Osos Water Offset Study (Maddaus, 2023) to evaluate the retrofit-to-build program for the community of Los Osos and inform water resource planning efforts in Los Osos. The report stated that:

> *To avoid increasing groundwater production from the Los Osos Groundwater Basin, the retrofit-to-build program requires new development to offset twice its estimated water demand (2:1) for all new development that uses groundwater from the Basin (including from private wells). Offsets are currently achieved via water savings projects at existing developments including credits for toilet and showerhead retrofits outside of the sewer service area, and for clothes washing machine and hot water recirculation retrofits basin wide. Annual groundwater production by Los Osos water purveyors has decreased almost 50% from 2008 to 2022, which can be partially attributed to the implementation of community-wide water conservation programs, including the County programs discussed in this study.*

Future demands included in the County's *Potential Future Water Demand for the Los Osos Basin Plan Area (*Appendix C) used the average residential water demand factors from the Los Osos Water Offset Study and commercial water demand factors from City of Santa Barbara, which has high water conservation.

2.8 Water Quality

Table 2-3 presents the water quality data for each purveyor as reported on the State Water Board Division of Drinking Water's State Drinking Water Information System (SDWIS). The water quality is also discussed in Section 1.3.4, since all water supplies are from the Bain.

Table 2-3. Purveyor Drinking Water Quality

Constituent (mg/L)	LOCSD		GSWC		S&T Mutual		MCL
	Range	Average	Range	Average	Range	Average	
Nitrate (N)	0.98-13	5	0.4-20	7	6.6-8.4	7.1	10
Total Dissolved Solids	140-490	277	220-360	314	270-310	293	1,000[1]
Chloride	29-98	52	34-120	73	56-83	72	500[1]
Sodium	20-59	35	27-57	39	38-48	42	—
Sulfate	3.2-48	18	8.6-27	17	5.4-14	10	500[1]
Boron	0.03-0.19	0.07	—	—	—	—	—
Carbonate	< 1	< 1	< 2	< 2	< 3	< 3	—
Bicarbonate	47-230	107	49-240	112	48-63	56	—
Calcium	10-59	31	15-39	26	18-19	18	—
Potassium	1.1-3.4	1.7	—	—	—	—	—
Magnesium	9.1-50	22	12-36	24	14-16	15	—

Source: 2024 Recycled Water Annual Report, Attachment 1, Section B.1, sources from the State Water Board Division of Drinking Water's State Drinking Water Information System (SLO County, 2025) and S&T Mutal 2024 Consumer Confidence Report (S&T Mutual Water Company, 2025)
Notes:
1. Secondary Maximum Contaminant Level (MCL)

2.9 Future Water Facilities

The LOBP outlines multiple infrastructure programs to bring the Basin into sustainability. Several infrastructure programs have been completed, and others are in progress or on hold pending further evaluation consistent with the Adaptive Management Plan. This study uses the Transient Model to evaluate infrastructure programs, including many either beyond those identified in the Basin Plan or not recommended for implementation, including expansion of the recycled water system, a creek discharge and recovery program, a seawater intrusion barrier, direct potable reuse, a community nitrate removal facility, and a new water resiliency intertie pipeline to bring new supplies into the Basin.

3.0 Wastewater Characteristics and Facilities

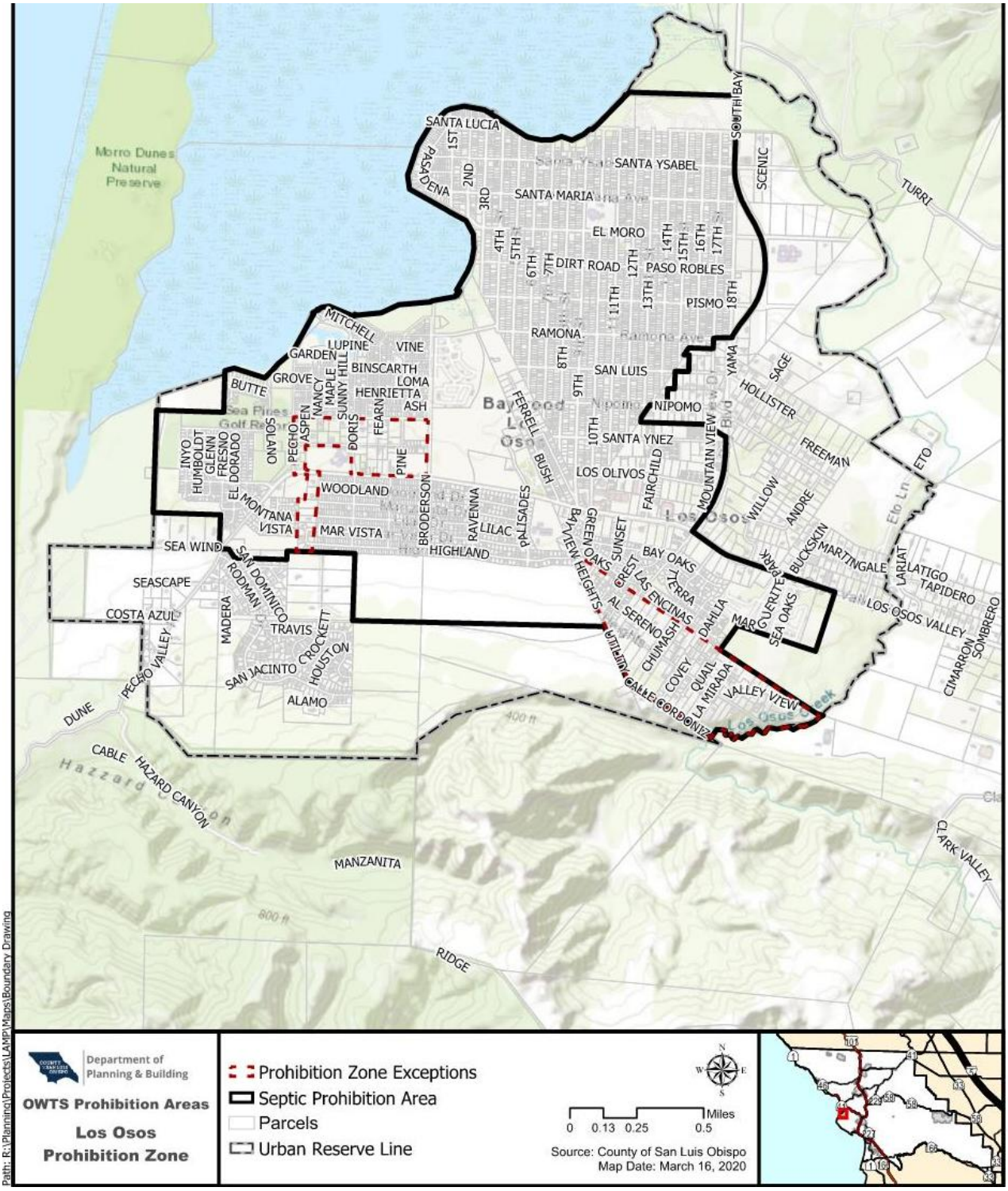
Most wastewater generated in Los Osos is treated at the Los Osos Water Recycling Facility and reused or disposed to leach fields. This Chapter describes the wastewater service area, treatment facility, and recycled water system and users.

3.1 Wastewater Service Area

Wastewater from most of the community is collected and conveyed to the LOWRF. The Los Osos Wastewater Project was managed by the County and included the planning, design, and construction of a collection system and the LOWRF to convert the community from septic treatment to a sewer system with a centralized treatment facility. The Los Osos Wastewater Project was constructed from 2012 to 2016, with the collection system largely completed by 2015 and the LOWRF operational by mid-2016.

The wastewater service area is shown in Figure 3-1 as the Septic Prohibition Area. Septic systems are still used outside the area from which wastewater is collected.

Figure 3-1. Wastewater Collection Area (Septic Prohibition Area)



Source: County of San Luis Obispo Department of Planning and Building, 2020

3.2 Major Facilities

3.2.1 Collection System

The Los Osos collection system was constructed from 2012 to 2015 and includes:

- Approximately 45 miles of pipelines, plus service laterals.
- Nine major duplex and triplex pump stations, all with stand-by power.
- Thirteen “pocket” pump stations.
- A 2.5-mile force main to convey raw wastewater from the service area to the LOWRF (SLO County, 2011).

The collection system serves a majority of residential users and some commercial users. There are no known sources of industrial or problem constituents (SLO County, 2018).

3.2.2 Los Osos Water Recycling Facility

The LOWRF is located on a parcel of approximately 30 acres about two miles east of the community core and north of the Los Osos Cemetery. The treatment facility is permitted for an annual average flow of 1.2 million gallons per day (MGD) but currently operates at about half its capacity, receiving about 0.5 MGD. A substantial contribution to reduced flows at the LOWRF is water conservation, which has contributed to almost a 50% reduction in indoor water use since 2010 (SLO County, 2025).

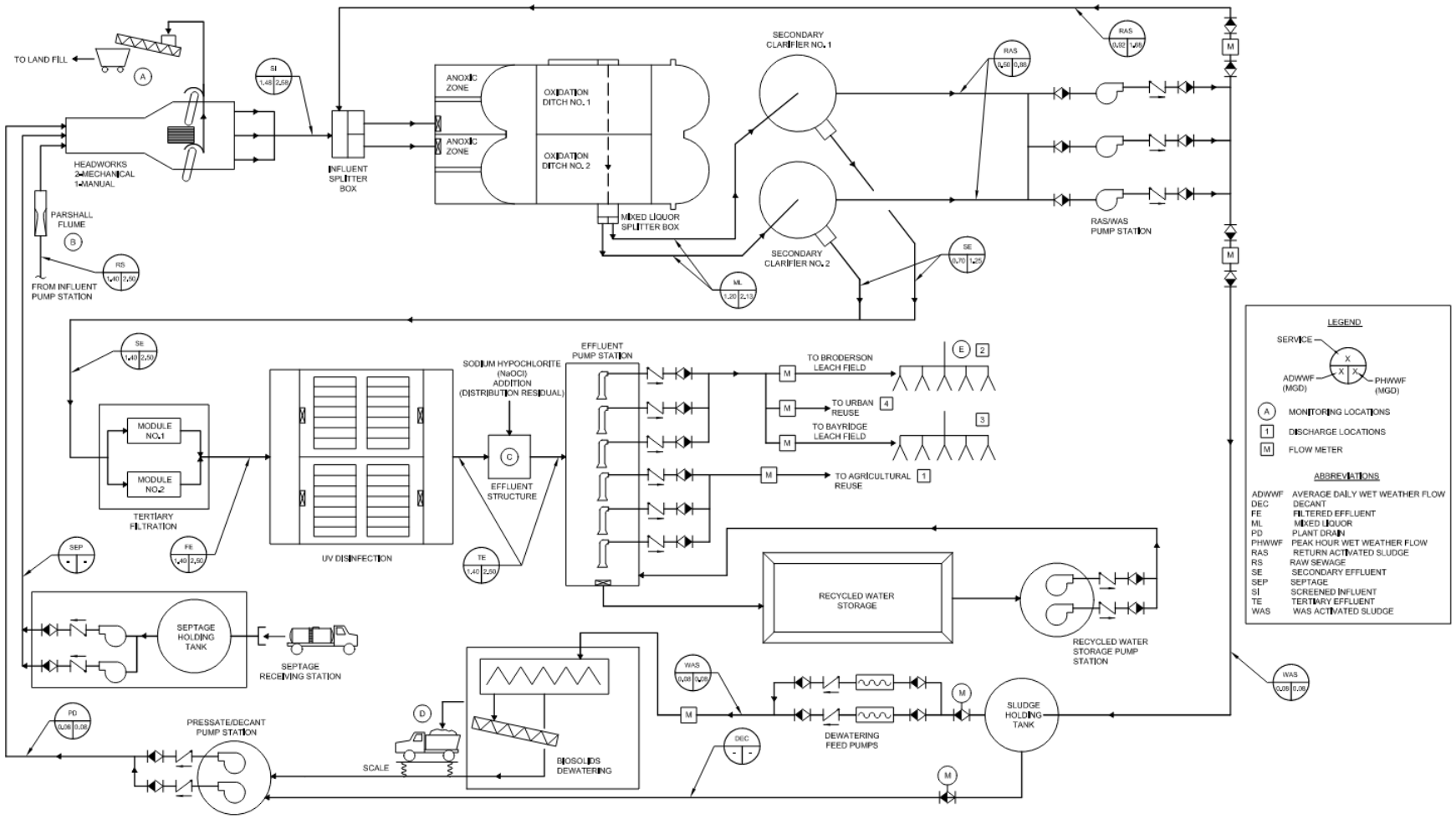
Figure 3-2 includes a site plan of the LOWRF, and Figure 3-3 includes a schematic of the treatment process. The LOWRF treatment process includes the following:

- Headworks and mechanical bar screens.
- Oxidation ditches (aeration secondary treatment process) and secondary clarification to meet a monthly average total nitrogen limit of 7 mg/L.
- Tertiary filter process with ultraviolet disinfection designed to meet California Title 22 standards for tertiary recycled water.
- Mechanical sludge dewatering (belt filter press or screw press) enclosed in a building for odor control.

Figure 3-2. Los Osos Water Recycling Facility Site Map

Source: 2024 Annual Report for Recycled Water Use (SLO County, 2025)

Figure 3-3. LOWRF Process Flow Diagram



Source: Waste Discharge/ Recycled Water Requirements Order No. R3-2011-0001, Attachment C

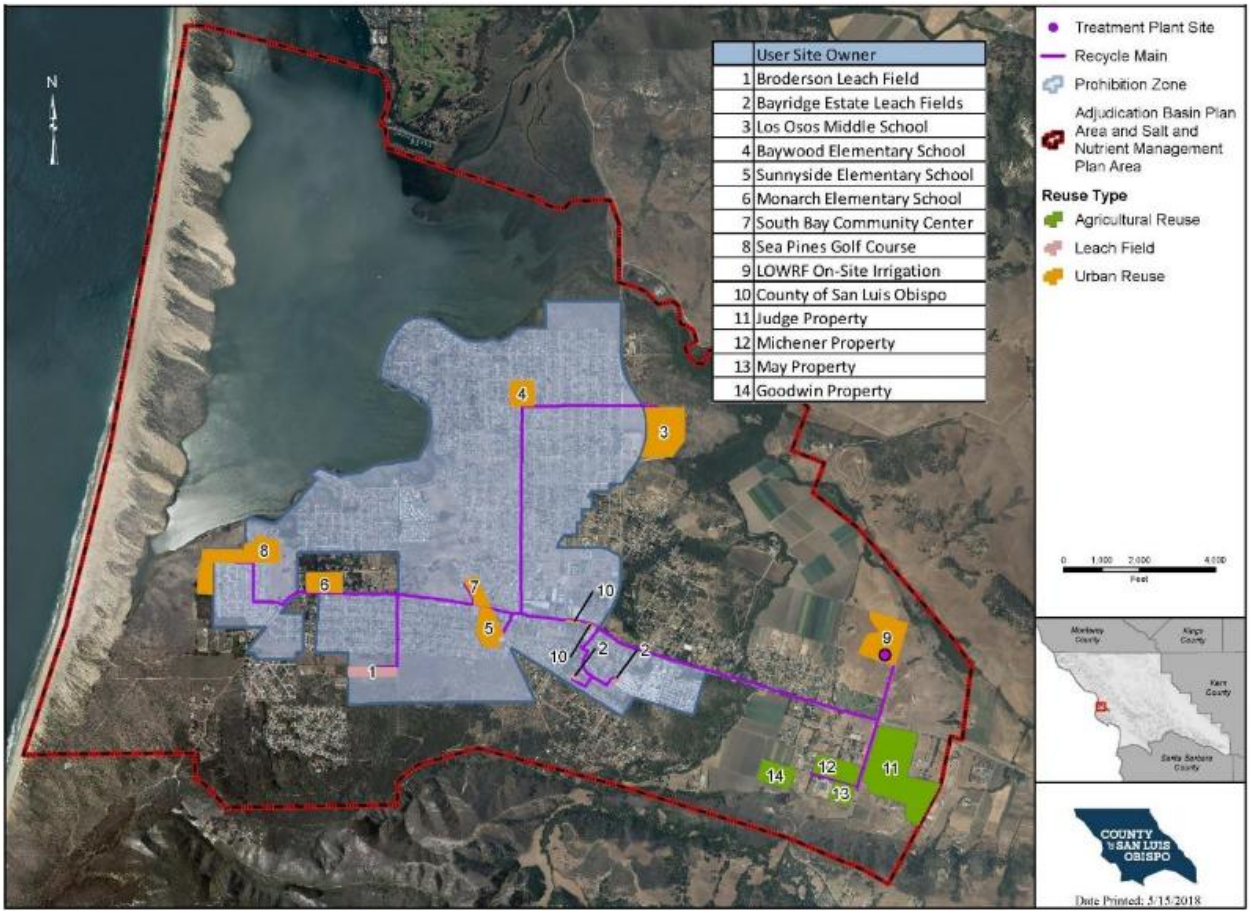
3.2.3 Disposal Facilities

Treated effluent is currently disposed to leach fields or delivered as recycled water for irrigation and agricultural reuse. There are two leach fields available for disposal: Broderson and Bayridge Estates. Broderson leach field has a permitted disposal capacity of 448 AFY per the Los Osos Wastewater Project Coastal Development Permit. The Bayridge Estates leach field does not have a permitting capacity limit, but the Coastal Development Permit does specify delivery of 33 AFY or the amount necessary to maintain Willow Creek and downstream resource in their pre-project state of better.

The recycled water system was designed to serve the golf course, schools, medians, and agricultural users in Los Osos. The estimated recycled water usage is up to 182 AFY for the currently approved recycled water users, while the actual use is less because not all users have connected (SLO County, 2025).

The approved disposal and reuse sites and recycled water distribution system are shown in Figure 3-4.

Figure 3-4. Approved Disposal and Reuse Sites



Source: 2024 Recycled Water Annual Report, Figure 1 (SLO County, 2025)

3.3 Effluent Quality

The LOWRF is permitted under the Regional Water Quality Control Board (RWQCB) Waste Discharge/ Recycled Water Requirements Order No. R3-2011-001. The LOWRF effluent requirements are summarized in Table 3-1.

Since effluent will flow from the treatment plant to both reuse and disposal sites in the same pipeline, the more stringent requirements must be met, including a total nitrogen limit of 7 mg/L and California Title 22 standards for tertiary recycled water. The LOWRF is programmed to divert effluent flows to the headworks if turbidity levels exceed Waste Discharge Requirements (WDR) limits, as a protective measure.

Table 3-1. LOWRF Effluent and Recycled Water Limitations

Constituent	Units	Effluent Limitations		Recycled Water Limitations	
		30-day Average	Daily Maximum	Monthly Mean	Maximum
BOD, 5-day	mg/L	60	100	30	90
Suspended Solids	mg/L	60	100	30	90
Settable Solids	mL/L	0.1	0.5	n/a	n/a
Total Nitrogen (as N)	mg/L	7	10	n/a	n/a
pH		n/a	n/a	6.5 – 8.4	
Total Coliform	MPN/ 100 mL	n/a	n/a	Shall not exceed median of 2.2 per last 7 days; 23 in more than one sample in any 30-day period; and shall not exceed 240 in any single sample	
Turbidity	NTU	n/a	n/a	Shall not exceed 0.2 NTU more than 5% of time within a 24-hour period and 0.5 NTU at any time	

Source: Waste Discharge/ Recycled Water Requirements Order No. R3-2011-0001

3.4 Future Facilities

There are no additional facilities needed to comply with the waste discharge or recycled water requirements.

3.5 Sources of Industrial of Other Problem Constituents

There are no known sources of industrial or problem constituents.

3.6 Existing and Projected Reuse

The County provides disinfected tertiary recycled water from the LOWRF for landscape and agricultural irrigation. Prior to 2019, deliveries only included the Broderson and Bayridge Estates Leach Fields and construction water use. In 2018, the County received a Notice of Applicability for General Waste Discharge Requirements, Order WQ 2016-0068-DDW for the delivery of recycled water. Deliveries to Sea Pines Golf Course began in June 2019. Two agricultural users (Goodwin and May properties) were connected to the recycled water system in 2021. Deliveries to the Los Osos Valley Road medians began in 2024, and Monarch Grove, Los Osos Middle School and Los Osos Community Park/South Bay Community Center will be connected to recycled water in the summer of 2025 (SLO County, 2025).

Recycled water users who connect to the recycled water system must apply for recycled water service and execute a Recycled Water Use Agreement with the County. As part of the agreement, the users must adhere to the County's Rules and Regulations Governing the Distribution and Use of Recycled Water, provided in Appendix D, which include user responsibilities, requirements for recycled water facilities, inspections, site supervisor designation, signage, prohibitions (like cross-connections), system maintenance, and emergency reporting obligations. Recycled water customer requirements are discussed in Section 4.2.1.3. The cost of recycled water is set to 90% of the local drinking water rates described in Section 2.4.

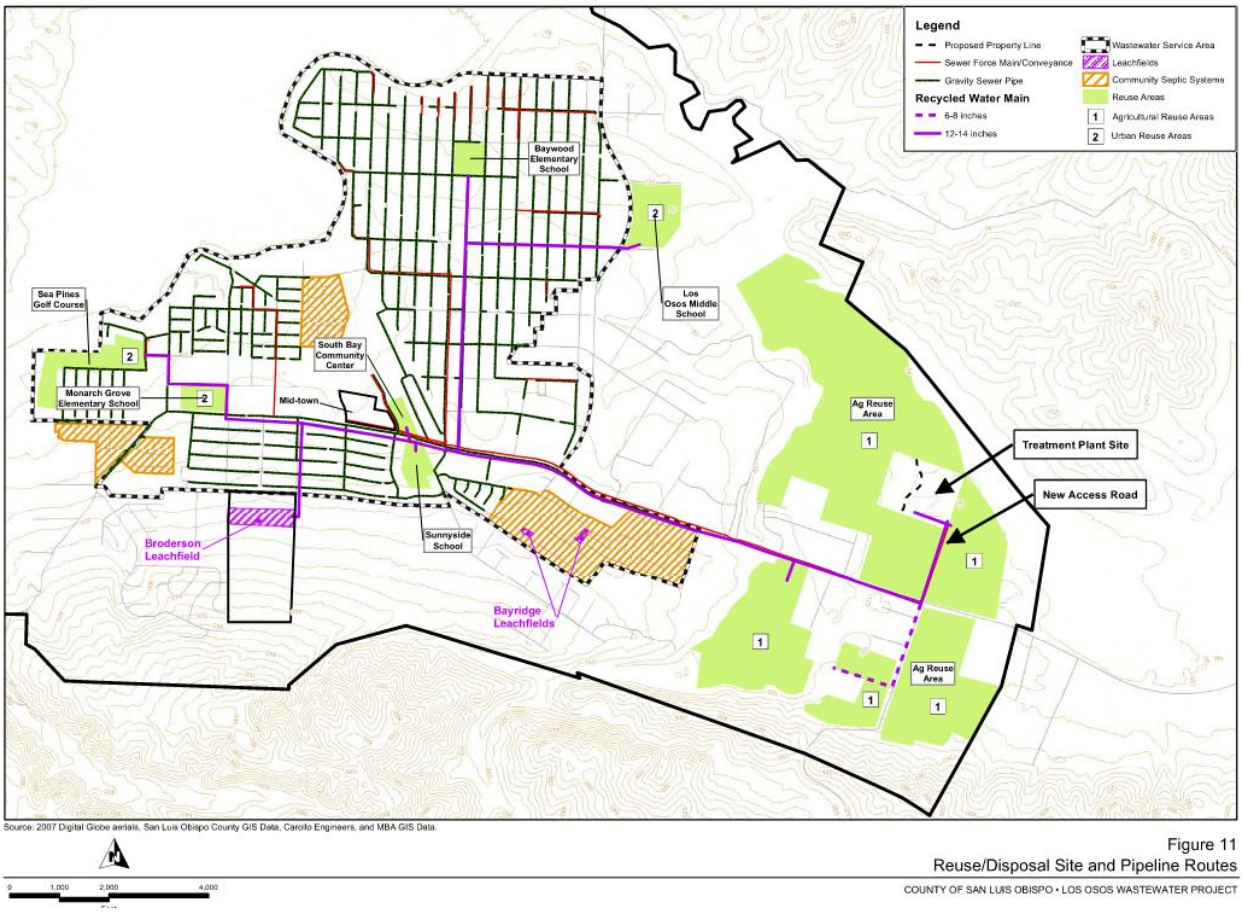
The LOBP identified potential disposal/reuse opportunities for the LOWRF, shown in Table 3-2 and Figure 3-5. Table 3-2 compares the 2015 LOBP projected buildout disposal/reuse volume to the current average reuse volume. As shown, the current reuse and disposal of 542 AFY is lower than the 2015 LOBP projection of 780 AFY.

Table 3-2. Existing Disposal / Reuse (AFY)

Reuse/ Disposal Location	2015 LOBP Projection[1]	2019-2023 Average[2]
Broderson Leach Field	448	483
Bayridge Estates Leach Field	33	
Sea Pines Golf Course	40	57
Los Osos Valley Memorial Park	50	--
Other Urban Reuse	63	~0~
Agricultural Reuse	146	1.4
Construction Water	--	0.2
Total	**780**	**542**

1. Updated Basin Plan for the Los Osos Groundwater Basin (2015), Table 2. (LOBMC, 2015)
2. 2019 to 2023 Annual Reports for Recycled Water Use.

Figure 3-5. Potential Reuse and Disposal Sites



Source: LOWRF Water Recycling Facility Plan (2011), Figure 11 (SLO County, 2011)

For the study “baseline” conditions, the planned reuse totals 105 AFY (see Table 3-3) and includes recent (2022 to 2024) reuse plus 36 AFY estimated demand for customers that connected in 2024 and 2025: Los Osos Valley Road medians (1 AFY), Monarch Grove Elementary School (5 AFY), Los Osos Middle School (25 AFY), and Los Osos Community Park (5 AFY). The recent (2022-2024) annual recycled water deliveries were used as a starting point for the baseline reuse conditions to include the most recent connections to the recycled water system rather than averaging recycled water deliveries over a longer period.

Table 3-3. Study Baseline Reuse (AFY)

Reuse/ Disposal Location	2022-24 Average	Study Baseline
Los Osos Middle School	--	25[a]
Los Osos Valley Road Medians	0.1	1[a]
Monarch Grove Elementary School	--	5[a]
Sea Pines Golf Course	66	66[b]
South Bay Community Center	--	5[a]
Construction Water	0.3	~~
May Property	0.8	1[b]
Goodwin Property	2.2	2[b]
Total	**69**	**105**

Notes:
a. 2024 Annual Report for Recycled Water Use, Table 1 (SLO County, 2025)
b. 2022 to 2024 average recycled water use.

Projected wastewater flows to the LOWRF at buildout is estimated from projected community growth and water demand, discussed in Section 2.7. Table 3-4 presents the current and projected water demand and wastewater flows. Based on the historic water to wastewater generation factor of 53% in Los Osos, the estimated 295 AFY in water demand growth equates to approximately 157 AFY of additional wastewater flows to the LOWRF at buildout that could be available for additional reuse.

Table 3-4. Current and Projected Water Use / Wastewater Flows (AFY)

	Study Baseline[1]	Projected Growth	Buildout Conditions
Purveyor Water Use	1,016	295[2]	1,309
Estimated Wastewater Generation for Disposal / Reuse	542	157[3]	699

1. Based on 2019 to 2023 average.
2. Refer to Section 2.7.
3. Estimated as 53% of new water demand based on the 2019-2023 purveyor pumping and wastewater generation.

Table 3-5 presents the estimated current and projected recycled water supply that could be available for reuse alternatives evaluated in Chapter 5. These projections assume that:

- Current and planned urban and agricultural reuse will continue.

- Flows can be diverted from Broderson and Bayridge Estates Leach Fields for new reuse opportunities while maintaining a minimum of 15 AFY to Bayridge leach fields[1] (based on 2020-2024 average deliveries).
- For future reuse alternatives with reverse osmosis (RO), RO treatment will have an 80% recovery rate and 20% RO concentrate production.

Table 3-5. Current and Projected Flow for New Reuse Alternatives (AFY)

	Study Baseline	Buildout Conditions
Estimated Wastewater Generation for Disposal / Reuse[1]	542	699
Planned Reuse[2]	105	105
Minimum Leach Field Deliveries[3]	15	15
Potential Supply for New Reuse Alternatives	**422**	**579**
Potential Supply for New Reuse Alternatives with 100% RO[4]	**338**	**463**

Notes:
1. See Table 3-4.
2. See Table 3-3.
3. Based on average of 2020 to 2024 Bayridge leach field deliveries.
4. Assumes RO treatment will have an 80% recovery rate and 20% RO concentrate production.

As flows to the LOWRF increase with growth in water use, the capacity of existing disposal options will be reached. Assuming maximum discharge to Broderson Leach Field (448 AFY), Bayridge Leach Fields (33 AFY), and planned reuse (105 AFY), there is 586 AFY of disposal capacity. Based on the 2019 to 2023 average, 53% of purveyor water use becomes wastewater for disposal. Applying this factor means that disposal capacity would be reached once purveyor potable water use reaches approximately 1,100 AFY.

[1] The LOWRF coastal development permit specifies the minimum annual discharge to the Bayridge Estates Leach Fields is approximately 33 AFY or the amount shown to be necessary for maintaining Willow Creek and downstream resources in their pre-project state or better (California Coastal Commission, 2010). Historically the County has discharged about 15 AFY to the Bayridge Leach Field and this study assumes that a minimum of 15 AFY continues to be discharged. Approval from Coastal Commission and amendments to the Stipulated Judgment or LOBMP may be required to lower flows further or eliminate discharges to the Bayridge Leach Field.

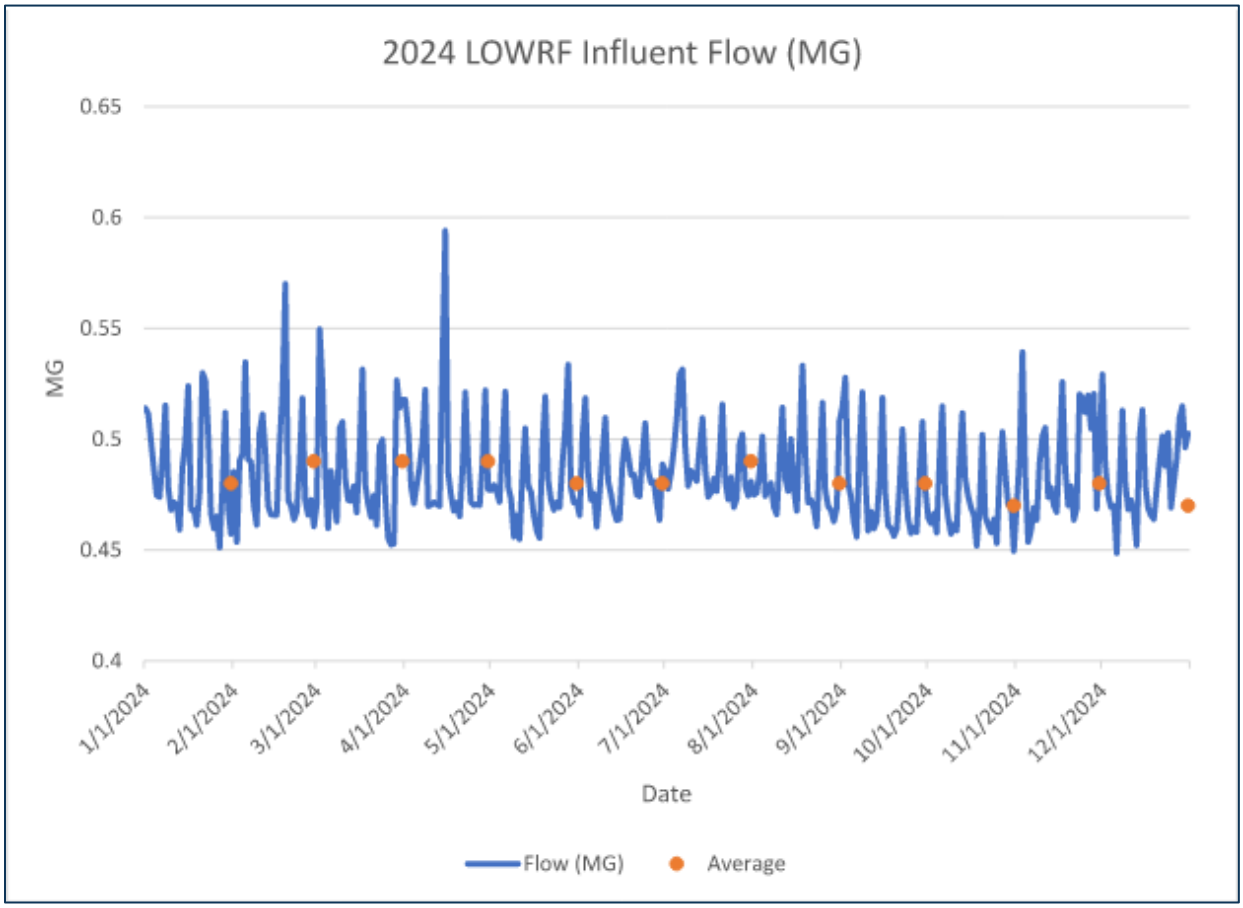
3.7 Existing Rights to Use of Treated Effluent

In addressing recycled water use, the Stipulated Judgment provides that all water produced from the LOWRF shall be used for recharge at the Broderson or Bayridge Estates sites, or for beneficial use within the Basin, pursuant to the distribution and use set forth in Condition No. 97 of the Coastal Development Permit for the LOWRF and the Water Reinvestment Program of the LOBMP. In addition, with respect to agricultural users, the Stipulated Judgment permits such usage on such terms as the County shall determine from time to time subject to review and comment by the LOBMC.

3.8 Wastewater Flow Variations

Figure 3-6 presents the daily influent flow to the LOWRF in 2024. As shown in the monthly average, the LOWRF does not experience significant seasonal variations in the influent flow. Hourly flow data was not available.

Figure 3-6. 2020 LOWRF Influent Flow



Source: 2024 Recycled Water Annual Report, Attachment 1, Section B.2 (SLO County, 2025)

4.0 Treatment Objectives for Discharge and Reuse

This chapter describes the potential recycled water use types and regulations and requirements for each use. It also describes the existing waste discharge/ recycled water requirements for current uses.

4.1 Recycled Water Use Types

There are a range of recycled water use types that could be implemented to increase beneficial use of recycled water in Los Osos. The Uniform Statewide Water Recycling Criteria are contained in the California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22). The Water Recycling Criteria address each type of recycled water use where the use involves the protection of public health. In addition, cross-connection control regulations address the protection of public water supplies from cross-connection with non-potable systems and are contained in California Code of Regulations, Title 17, Subchapter 1, Group 4. The types and definitions of recycled water use and the corresponding level of treatment required by the applicable regulations are summarized in Table 4-1.

The Water Recycling Criteria also identifies another type of recycled water use known as Indirect Potable Reuse: Surface Water Augmentation. This project involves the planned placement of recycled municipal wastewater into a surface water reservoir that is used as a source of domestic drinking water. The purpose is to supplement the source of domestic drinking water supply. Purveyors in Los Osos do not use a surface water reservoir as a source of supply, so this recycled water use type is not considered in this Study.

The County currently serves recycled water for non-potable reuse and utilizes land disposal via two leach fields for excess recycled water.

Table 4-1. Recycled Water Use Types

Use Type		Definition	Required Level of Treatment
	Surface Water Discharge or Land Disposal	Disposal of treated municipal wastewater to a surface water body (permitted through the National Pollutant Discharge Elimination System [NPDES]) or land (permitted through waste discharge requirements).	Depends on the water quality objectives of the surface water body or underlying groundwater basin.
	Non-Potable Reuse: Landscape or Industrial	Use of recycled municipal wastewater for various uses other than human consumption. The full list of allowable uses is described in Article 3 of the Water Recycling Criteria.	Undisinfected Secondary, Disinfected Secondary, or Disinfected Tertiary (depends on type of use).
	Indirect Potable Reuse: Groundwater Recharge by Surface Spreading	A project involving the planned use of recycled wastewater that is operated for the purpose of replenishing a groundwater basin for use as a source of municipal and domestic water supply. This type is via surface application, where the recharge water is applied to a spreading area.	Total recharge volume can include up to 20% tertiary recycled water initially, blended with other high-quality sources. Advanced Treated recycled water (see below) can be used without dilution.
	Indirect Potable Reuse: Groundwater Recharge by Subsurface Injection	A project involving the planned use of recycled wastewater that is operated for the purpose of replenishing a groundwater basin for use as a source of municipal and domestic water supply. This type is via subsurface application, where the recharge water is applied by injection wells.	Advanced Treated recycled water, which includes tertiary, reverse osmosis (RO), and ultraviolet advanced oxidation process (UV/AOP).
	Direct Potable Reuse	A project involving the planned introduction of recycled water that goes beyond indirect potable reuse; where recycled wastewater either goes directly into a public water system or into a raw water supply immediately upstream of a water treatment plant.	Advanced Treated recycled water and Ozone followed immediately by Biologically Activated Carbon (Ozone/BAC).

4.2 Recycled Water Regulations

This section describes the regulatory setting that governs various types of recycled water uses considered in this study, including:

- Non-potable reuse regulations.
- Indirect potable reuse (groundwater replenishment) regulations.
- Direct potable reuse regulations.

4.2.1 Non-Potable Reuse

4.2.1.1 Title 22

Title 22 requires that wastewater be treated using designated processes to achieve a specified level of quality for different recycled water use designations. Title 22 requires that wastewater be oxygenated, which means that its organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen. Secondary treatment is necessary to produce oxidized and stabilized wastewater. Beyond secondary treatment is tertiary treatment involving coagulation, and media or membrane filtration is required to meet Title 22 turbidity criteria measured in nephlometric turbidity units (NTU) for many types of reuse. Following tertiary treatment, disinfection ensures that the recycled water is safe for non-potable reuse (NPR) with unrestricted public contact.

LOWRF meets Title 22 requirements for unrestricted non-potable reuse.

4.2.1.2 Existing Waste Discharge Requirements

The LOWRF is permitted under RWQCB Waste Discharge/ Recycled Water Requirements Order No. R3-2011-001. The permit includes four discharge points for both land disposal to the leach fields and for NPR:

- Discharge Point 1: Broderson leach field.
- Discharge Point 2: Bayridge Estates leach field at 2 locations.
- Discharge Point 3: Agricultural reuse irrigation at 25 different locations.
- Discharge Point 4: Urban reuse irrigation at 10 different locations.

The LOWRF must meet the requirements for both land disposal and NPR described in Table 3-1.

4.2.1.3 Customer Requirements

The *Rules and Regulations Governing the Distribution and Use of Recycled Water for the Los Osos Recycled Water System,* included in Appendix D*,* establish operational and on-site requirements to ensure the safe and effective use of recycled water. These requirements address critical elements, such as backflow prevention, pipeline separation, buffer zone standards, equipment specifications, and the operational, maintenance, and training responsibilities necessary to protect public health and maintain system integrity.

The recycled water system strictly prohibits cross-connections between potable and recycled water systems to protect public health. All sites must install backflow prevention devices, with the device placed as close as possible to the potable water meter, tested annually, and maintained in accordance with purveyor requirements. Temporary potable water connections used for cross-connection testing are permitted but must be removed once the system passes inspection.

All recycled water pipelines must maintain a minimum separation requirement of four feet horizontally and one foot vertically from potable pipelines, with potable pipelines located above recycled lines. To ensure clear identification, all recycled water piping and appurtenances must be colored purple (Pantone 512) and prominently labeled with “RECYCLED WATER – DO NOT DRINK” in both English and Spanish. Valve boxes, quick-couplers, meters, controllers, and all above-grade pipes require permanent purple identification tags or signage. Public areas with recycled water use must feature clear signage at site entrances and at intervals not exceeding 1,000 feet.

Recycled water irrigation systems must maintain a 50-foot horizontal buffer from any domestic water supply well unless a site-specific exemption is granted based on verified geological and structural protections. Impoundments containing recycled water must be located at least 100 feet from any domestic water supply well. Drinking fountains located within or near recycled water use areas must be protected from overspray by physical shielding, relocation, or modifications to irrigation design and operation. These buffer and layout requirements are intended to safeguard potable water supplies and prevent direct public contact with recycled water.

Overall, all recycled system elements must be designed and operated to minimize the risk of public exposure to recycled water. This includes the prohibition of hose bibs connected to recycled water systems in publicly accessible areas, and all valves must be lockable or operable only with special tools to prevent unauthorized access. Irrigation sprinklers should provide uniform precipitation rates and be adjusted to minimize overspray, runoff, and ponding. Automatic irrigation controllers are required to allow multiple start/stop cycles within a 24-hour period; and, while optional, flow-control devices are strongly recommended to automatically shut down the system in the event of a break or pressure loss.

Recycled water users are responsible for ensuring the on-site recycled water system operates in full compliance with County requirements at all times. Each recycled water use site must designate a Use Area Supervisor who is responsible for the system operation, compliance, and communication with the County. This supervisor must complete a California Department of Public Health and County-approved certification workshop and be trained on the recycled water use rules and regulations. The Use Area Supervisor must perform an annual self-inspection, and the County conducts an annual inspection for each use site, or twice yearly for schools. Operators must continuously monitor the system to prevent and correct overspray, runoff, and ponding, and must ensure that all signage, labels, and purple identification markings are intact and legible. Any system failure, violation, or emergency must be reported immediately to the County and, when applicable, regulatory agencies. Mechanical components such as backflow

devices, pumps, and filters must be inspected quarterly, with strainers and screens cleaned routinely to ensure reliable performance and prevent system malfunctions.

4.2.2 Indirect Potable Reuse / Groundwater Recharge

Groundwater recharge of recycled water, which is termed "indirect potable reuse" (IPR), entails discharging recycled water into recharge basins or injection wells for replenishment of the groundwater basin and eventual pumping for incorporation into the potable water system. IPR is characterized by an environmental buffer – either groundwater basin or surface reservoir with minimum underground retention time (discussed further below) – between discharge of the purified recycled water and potable use of the water. Recharging with recycled water is practiced across California and has regulations in place to protect public health. This section describes regulations for groundwater replenishment reuse projects (GRRPs).

In 2014, requirements for GRRPs were added to Title 22 Water Recycling Criteria. The requirements are classified according to the method of recharge:

- Surface application (spreading)
- Subsurface application (injection wells)

Surface application projects (described in Title 22, Article 5.1) are allowed to use disinfected tertiary recycled water with limitations on the amount of recycled water that can be applied compared to diluent water. The recycled water contribution (RWC) may initially be limited to 20% but can be increased if soil aquifer treatment is demonstrated to remove total organic carbon (TOC) from the recycled water. Further, recycled water with additional treatment to lower TOC may use higher RWCs, potentially not requiring any diluent water

Subsurface application projects (Title 22, Article 5.2) require that the full volume of recycled water injected must receive advanced treatment, which consists of RO and an advanced oxidation process that meets certain performance criteria. Subsurface application projects may have up to 100% RWCs.

All GRRP's must comply with various requirements for water quality, pathogenic microorganism control, underground retention, response retention time, and monitoring wells. Beyond the minimum treatment requirements, both surface and subsurface applications must meet minimum underground retention time from discharge to the closest potable well to provide minimum response time and minimum virus removal. This requirement can be problematic if wells are located close to surface recharge locations or injection wells and would require additional treatment or replacement of the potable well to a new location.

To implement a GRRP project, the County would need to acquire a new WDR permit that demonstrates compliance with Title 22 and the LOBP. Obtaining a GRRP permit requires significant effort to prepare studies, monitor and report, and correct issues.

4.2.3 Direct Potable Reuse

Direct potable reuse (DPR) differs from IPR in that it has no environmental buffer between the discharge of purified recycled water and the potable end use and, as such, requires intensive

treatment, monitoring, and staffing. DPR is the planned introduction of recycled water either directly into a public water system (referred to in the regulations as “treated water augmentation”) or into a raw water supply immediately upstream of a water treatment plant (referred to in the regulations as “raw water augmentation”). Since Los Osos does not have a surface water treatment plant, the only option available for the community to implement DPR is via treated water augmentation, where an advanced water treatment facility meets the requirements for generating purified water that is blended directly into the potable distribution systems.

Regulations for DPR in California were adopted by the State Water Resources Control Board in December of 2023 and took effect on October 1, 2024. Implementation of DPR is highly complex and the regulations require extensive treatment, operator training, and strict implementation requirements for monitoring and reporting. The new regulations include several provisions that are much stricter than the existing GRRP regulations for subsurface application, including:

- Additional treatment steps for chemical control – ozone and biologically activated carbon.
- Redundant treatment steps for pathogen control.
- Higher operator certification levels with 24/7 staffing.
- Enhanced source control, including for constituents of emerging concern.
- Higher levels of treatment monitoring and controls.

An overview of the key elements of the DPR regulation is provided in the following section.

4.2.3.1 Wastewater Source Control

Wastewater source control programs are intended to prevent the introduction of pollutants into a treatment system that could interfere with its operation or that may pass through into the discharge and prevent the effluent from meeting the discharge permit requirements. Source control programs establish prohibitions and discharge limits for pollutants, and agencies maintain compliance with these limits through education and outreach, permits, reporting, inspections, and enforcement activities. The wastewater source control requirements for DPR include provisions established in the National Pretreatment Program (published in 40 CFR Part 403) as well as additional, more stringent requirements (like enhanced source control and early warning program).

4.2.3.2 Pathogenic and Chemical Control

DPR requirements ensure rigorous pathogen control through a combination of advanced treatment processes, continuous monitoring, validation requirements, and contingency measures to safeguard public health.

Pathogen Treatment Requirements: DPR regulations require that the treatment train achieve minimum log reduction values for various pathogens. To achieve the required pathogen reduction, the treatment processes must include membrane physical separation, chemical

inactivation, and ultraviolet (UV) inactivation and must meet specific requirements for treatment of the pathogens. Additionally, minimum dosages for UV disinfection are defined.

Chemical Treatment Requirements: In addition to tertiary treatment, the treatment train for DPR projects consists of three key processes in sequence:

1. Ozone followed immediately by Biologically Activated Carbon (Ozone/BAC).
2. RO Membrane.
3. UV Advanced Oxidation Process (UV/AOP).

Operational Requirements: Early warning systems for DPR projects must be equipped with a system that detects process failures and automatically stops water distribution if targets are not achieved. Continuous monitoring for certain constituents and TOC is required at 15-minute intervals. Chemical control points and monitoring locations must be established to manage any exceedances. In addition to continuous monitoring, monthly compliance reporting is required as well as an optimization plan to minimize treatment byproducts.

4.3 Regulatory Coordination

This WRFP Study evaluates non-potable recycled water use, groundwater replenishment, and DPR alternatives. Coordination with the Central Coast RWQCB and the Division of Drinking Water (DDW) has informed the regulatory pathways and permitting requirements for these alternatives, as summarized below:

Recycled Water Use Alternatives

The Study includes expanded urban and agricultural reuse alternatives. All proposed use sites are currently authorized under the County's existing permits and comply with the County's Recycled Water Rules and Regulations. These alternatives build on established frameworks to ensure consistency with state and local requirements.

Groundwater Replenishment Alternatives

In 2016, LOCSD initiated outreach to RWQCB and DDW for the Los Osos Creek Discharge Study to clarify permitting pathways for creek discharge of treated effluent. Regulators indicated that such projects could be classified either as a new point of discharge or as a GRRP, with determination based on the travel time from the point of discharge to the extraction location (MKN, 2016). The GRRP alternatives in this Study align with regulatory requirements developed through coordination with RWQCB and DDW.

DPR Alternative

The DPR alternative in this Study was conceptualized to meet the newly adopted DPR regulations, ensuring compliance with all applicable treatment, monitoring, and operational requirements.

5.0 Supply Alternatives

This chapter evaluates seven recycled water and new potable water supply alternatives for the community of Los Osos, including:

Non-Potable Reuse, Irrigation

A. Urban Reuse: Conversion of existing schools, parks, and cemetery irrigation systems to be served by the existing non-potable recycled water distribution system and offset potable water deliveries.

B. Agriculture Reuse: Distribution of recycled water to agriculture users to offset groundwater pumping.

Indirect Potable Reuse, Groundwater Replenishment

C. IPR, Creek Discharge: Discharge to Los Osos Creek to enhance groundwater recharge.

D. IPR, Injection for Seawater Barrier: Injection of advanced purified water into the lower aquifer of the Los Osos Basin to increase recharge and create a seawater intrusion barrier.

New Potable Supplies

E. Direct Potable Reuse (DPR): Delivery of advanced purified water to the drinking water distribution system to offset groundwater pumping.

F. Upper Aquifer Nitrate Treatment: Regional Nitrate Treatment Facility to allow for enhanced use of nitrate-contaminated upper aquifer supplies.

G. Water Resiliency Intertie Pipeline: Interconnection with the regional surface water conveyance system to provide access to State Water or other supplies to enable conjunctive use.

A “no project” alternative was not evaluated but is captured by the Current Conditions Baseline scenario described in Section 5.1.3.

5.1 Planning Assumptions

5.1.1 Planning and Design Criteria

Table 5-1 lists planning and design criteria that apply to all supply alternatives. The current and projected recycled water for recycled water supply alternatives is described in Section 3.6. Additional criteria that are specific to individual alternatives, such as treatment requirements, are addressed in the subsequent sections.

Table 5-1. Planning and Design Criteria

Category	Planning Criteria / Assumption
Pipelines	Pipelines are sized to maintain a head loss of less than 4 feet per 1,000 feet of pipe length and a velocity of less than 5 feet per second. All new pipelines are assumed to be constructed via open trench in the public right-of-way unless otherwise noted.
Wells	New wells developed in Creek Valley are assumed to have a 100 GPM production capacity similar to existing wells in area. For each new production well that is not replacing an existing well, 0.5 acres of land is required. For each new monitoring well site, 0.25 acres of land is required.
Pump Stations	Pump efficiency is assumed to be 75% efficient for power requirement calculations.

5.1.2 Cost Basis

The cost estimates presented in this study are preliminary and follow industry standards for planning-level[2] accuracy with adequate contingency to account for uncertainties. These estimates will evolve as project designs and details become clearer during future planning and feasibility stages. Detailed project cost estimates are included in Appendix B. Since the recycled water projects are driven by a need to increase local supply rather than to avoid wastewater disposal costs, no costs are assumed to be allocated toward wastewater disposal.

Table 5-2 and Table 5-3 list the common capital and operation and maintenance (O&M) unit costs and assumptions, respectively, used to develop the cost estimates. The unit costs are generally based on previous reports and studies, recent bids, understanding of regulatory requirements, and similar projects. Capital costs are annualized over 30 years at a 2.1% loan rate, which is the long-term average rate for Clean Water State Revolving Fund loans.

[2] Cost estimates are Class 5 Conceptual Report Classification of Opinion of Probable Construction Costs as developed by Association for the Advancement of Cost Engineering, International. The purpose of a Class 5 Estimate is to provide a conceptual level of effort that is expected to range in accuracy from -30% to +50%.

Table 5-2. Capital Cost Estimate Unit Costs

Item	Description	Unit	Unit Cost
1	4-in Pipeline	LF	$250
2	6-in Pipeline	LF	$282
3	8-in Pipeline	LF	$315
4	12-in Pipeline	LF	$404
5	Trenchless Crossing, 24-in Casing	LF	$600
6	Storage Tank	GAL	$2.50
7	Pump Station	HP	$19,000
8	Production Well – Creek Valley	EA	$1,300,000
9	Injection Well	EA	$2,200,000
10	Monitoring Wells		
	Monitoring Well – Creek Valley	EA	$153,000
	Monitoring Well – Lower Aquifer	EA	$357,000
11	Treatment Facility		
	Treatment Facility – Ozone / BAC	MGD	$8,240,000
	Treatment Facility – MF/RO	MGD	$43,300,000
	Treatment Facility – MF/RO/AOP	MGD	$48,100,000
	Treatment Facility – O3/BAC/MF/RO/AOP	MGD	$62,000,000
	Treatment Facility – Rosina Nitrate Treatment Facility Buy-In (Placeholder)	EA	$2,200,000
12	Recycled Water Conversion	EA	$350,000
13	Creek Discharge Structure	EA	$200,000

BAC- Biological Activated Carbon
MF- Microfiltration
RO- Reverse Osmosis
AOP- Advanced Oxidation Process
O3- Ozone

Table 5-3. Operation and Maintenance Unit Cost Assumptions

Item	Description	Unit	Unit Cost	Basis
1	Pipeline Annual O&M	LS	0.5%	of pipeline construction costs
2	Storage Tank Annual O&M	GAL	$0.04	per gallon
3	BPS Annual O&M	LS	4.0%	of pump station construction costs
4	Well Annual O&M	LS	2.0%	of well construction costs
5	Pumping, RWPS			
	Existing RWPS	AF	$0	No net increase in existing costs, offsets existing pumping to Broderson Leach Field
	New RWPS, to Creek Discharge	AF	$0	
	New RWPS, to Injection Wells	AF	$0	
	Brine PS, Pumping to MB Outfall	AF	$110	
6	Well Pumping			
	GW Pumping, Creek Valley	AF	$150	
	GW Pumping, Upper Aquifer	AF	$150	
	GW Pumping, Deep Aquifer	AF	$200	
7	Treatment			
	Treatment Facility - Ozone / BAC	AF	$1,000	
	Treatment Facility - MF/RO	AF	$3,000	
	Treatment Facility - MF/RO/AOP	AF	$3,700	
	Treatment Facility - O3/BAC/MF/RO/AOP	AF	$4,700	
	Treatment Facility - Nitrate	AF	$810	
8	Imported Water Purchase Price	AF	$900-$2,400	Basis is described in Section 8.0.
9	Electrical Cost	kWh	$0.30	
10	Brine Fee	AF	$1,000	Placeholder; Has not been verified
11	RO Recovery		80%	
12	RW Site Annual Inspection	EA	$5,000	

5.1.3 Basin Yield Basis

A representative subset of supply alternatives, covering a range of different supply types, was evaluated with the Transient Model to estimate their benefit to enhancing sustainable groundwater production from the Basin. The results of the Transient Model scenarios compare the alternative's supply yield to the change in total purveyor pumping from the Study Baseline to characterize the alternative's benefit to the Basin. The model evaluates an alternative's impact on the Basin's sustainable yield, considering the new water supply generated by a project, its use, and any reduction in effluent discharged to Broderson Leach Field. To isolate benefits to the Basin from an alternative's supply, wastewater flows above flows in the baseline scenario were assumed to be diverted to new agricultural spray fields for disposal.

Seven scenarios were modeled:

- **Current Conditions Baseline:** Represents current groundwater production based on average pumping from 2019 to 2023, which is 1,830 AFY of groundwater pumping.
- **Baseline Sustainable Yield:** The scenario uses 2025 infrastructure and optimizes the pumping distribution between purveyor wells to maximize purveyor production while maintaining the seawater intrusion front west of the 2021 threshold lines. Based on the optimized distribution of pumping, a time-weighted-average Sustainable Yield of 2,000 AFY over the 50-year planning horizon.
- **Broderson 50% Scenario:** Simulates diverting half (224 AFY) of effluent that is discharged to the Broderson Leach Fields in the Baseline Scenario and diverting to agricultural irrigation for disposal with no groundwater pumping offset. This scenario was used to evaluate the Basin impact of reducing discharges to the Broderson Leach Field.
- **Creek Discharge Scenario:** Maximizes discharges to Los Osos Creek under Alternative C1 (160 AFY) by diverting a similar amount from Broderson Leach Fields.
- **Upper Aquifer Pumping Scenario:** Simulates Upper Aquifer Nitrate Treatment alternative with increased groundwater pumping from the upper aquifer.
- **Seawater Barrier Scenario:** Simulates Seawater Barrier scenario of injection of 340 AFY of advanced purified water into the lower aquifer of the Los Osos Basin by diverting 425 AFY of effluent from Broderson Leach Fields.
- **Intertie Scenario:** Simulates Water Resiliency Intertie Pipeline alternative, which imports 300 AFY of surface water, on average, to purveyors.

Basin benefits from the five model scenarios for comparison with the Baseline Sustainable Yield scenarios are summarized in Table 5-4 and include:

- **Broderson 50% Scenario:** Model results show that reducing Broderson discharges by 224 AF results in a 55 AF reduction in the sustainable yield, or a 25% (55 / 224 = 25%) decrease in Basin benefit. This suggests that each AF discharged to Broderson provides about 0.25 AF Basin benefit, or roughly 25% Basin benefit. Accordingly, new alternatives that divert treated effluent from Broderson to directly offset lower aquifer pumping would achieve an approximately 75% Basin benefit.
- **Creek Discharge Scenario:** Model results show a 75% (120 / 160 = 44%) Basin benefit. The benefits are less than 100% due to losses in the creek during basin recharge,

impacts to lower aquifer pumping with increased production in the Creek Valley, and reduced effluent disposal to the Broderson Leach Field.

- **Upper Aquifer Pumping Scenario:** Model results show a 84% (400 / 475 = 84%) Basin benefit. The benefits are less than 100% due to impacts to reduction in sustainable production from the lower aquifer as a result of increased upper aquifer pumping.
- **Seawater Barrier Scenario:** Model results show a 106% (360 / 340 = 106%) Basin benefit. The benefits are greater than 100% because the barrier helps retain some streamflow and inflow from the Upper Aquifer that would normally flow out of the Basin.
- **Intertie Scenario:** This alternative provides a 100% Basin benefit because new water is imported to the Basin and does not impact discharges to Broderson Leach Field.

For more information on the Transient Model results, see Appendix E.

Table 5-4. Transient Model Scenario Results

	Model Scenario:	Baseline Current Condition	Baseline Sustainable Yield	Broderson 50%	Creek Discharge	Upper Aquifer Pumping	Seawater Barrier	Intertie
Alternative Yield	Leach Fields & Reuse	528	637	575	702	853	829	797
	New Spray Fields (No Offset)	--	70	227	3	281	3	230
	Project Yield	**N/A**	**--**	**-224**	**160**	**475**	**340**	**300**
Purveyor Pumping	Lower West/ Central	718	703	576	684	614	995	703
	Upper West/ Central	298	502	524	481	997	570	502
	Creek Valley	--	0	0	160	0	0	0
	Total Purveyor Pumping	**1,016**	**1,204**	**1,150**	**1,325**	**1,610**	**1,565**	**1,204**
Basin Benefit	Basin Benefit (Change in Purveyor Pumping)	N/A	--	(54)	120	400	360	300
	% Basin Benefit vs. Project Yield	N/A	--	24%	75%	84%	106%	100%

The Transient Model results were used to develop Basin Benefit factors for all supply alternatives based on the project type, listed in Table 5-5. All evaluated project types were modeled except those designed to offset groundwater pumping in the Creek Valley. For these projects, the Basin Benefit was estimated at 75%, and similar to the benefit of offsetting

pumping in the Central/Western Area (75%) and the benefit from creek discharge and recovery (75%). The unit cost for each supply alternative is developed using the increased Basin yield to compare alternatives.

Table 5-5. Basin Benefit Factors

Project Type	Alternative	Basin Benefit as a Percentage of Supply Yield
Offset Groundwater Pumping in the Central/Western Area	A1, E	75%
Offset Groundwater Pumping in the Creek Valley	A2, B	75%
Creek Discharge and Recovery	C1, C2, C3, C4	75%
Seawater Intrusion Barrier	D	106%
Upper Aquifer Pumping	F	84%
Imported Supply to the Basin	G	100%

5.2 Recycled Water Market Assessment

A comprehensive recycled water market assessment was conducted for the LOBP, which identified up to 1,300 AFY of potential recycled water demand, including the leach field disposal sites, summarized in Table 5-6. The market assessment considered major public and commercial urban and agricultural irrigation areas in the Basin. The LOBP acknowledges that while recycled water could be widely used for agriculture, this use is less effective at preventing seawater intrusion than urban reuse within the purveyor area. Furthermore, the potential demand for recycled water is greater than the supply, so it should be allocated to places where it provides the most benefit to the Basin. Not every agricultural user in the Basin wants to use recycled water either. As a result, the LOBP Water Reinvestment Program set expected recycled water demand at 780 AFY and limited agricultural use of the recycled water system to select agricultural users (LOBMC, 2015).

Table 5-6. Los Osos Basin Plan Recycled Water Market Assessment

Potential Use	Potential Recycled Water Demand (AFY)	Anticipated Recycled Water Demand (AFY)
Broderson Leach Field	448	448
Bayridge Leach Field	33	33
Urban Reuse	63	63
Sea Pines Golf Course	40	40
Los Osos Memorial Park	50	50
Agricultural Resue	666	146
Total	**1,300**	**780**

Source: LOBP, Table 2 and Table 31 (LOBMC, 2015)

The recycled water market assessment completed for the LOBP was refined during the LOWRF permitting process. Table 5-7 lists the permitted recycled water users, which includes the urban reuse sites and a portion of the agricultural reuse sites identified in the LOBP market assessment. Presently, approximately 105 AFY of recycled water is being reused, excluding disposal to leach fields, with an additional potential of 140 AFY. Alternatives A and B address the delivery of recycled water to prospective future users.

Table 5-7. Current and Potential Recycled Water Users, Excluding Leach Fields

User	Type of User	Current and Planned Use[1] (AFY)	Approved Future Users[2] (AFY)	Total Potential Average Annual Use (AFY)
Los Osos Memorial Park	Urban		50	50
Los Osos Middle School	Urban	25		25
Baywood Elementary School	Urban		7	7
Sunnyside Elementary School	Urban		5	5
Monarch Elementary School	Urban	5		5
South Bay Community Center	Urban	5		5
Sea Pines Golf Course	Urban	66		66
LOVR Medians	Urban	1		1
Judge Property	Agricultural		50	50
Michener Property	Agricultural		16	16
May Property	Agricultural	1	4	5
Goodwin Property	Agricultural	2	8	10
Construction Water	Other	~~		~~
Total		**105**	**140**	**245**

Notes:
1. Current and planned reuse historical reuse plus estimated demand for customers that connected in 2024 and 2025. See Table 3-3 for more information.
2. Estimated usage of approved recycled water users from 2024 RW Annual Report, Table 1 (SLO County, 2025).

Estimated peak season demands for the total potential recycled water use (excluding leach fields) shown in Table 5-7 are presented in Table 5-8.

Table 5-8. Peak Demands for Current and Potential Recycled Water Users, Excluding Leach Fields

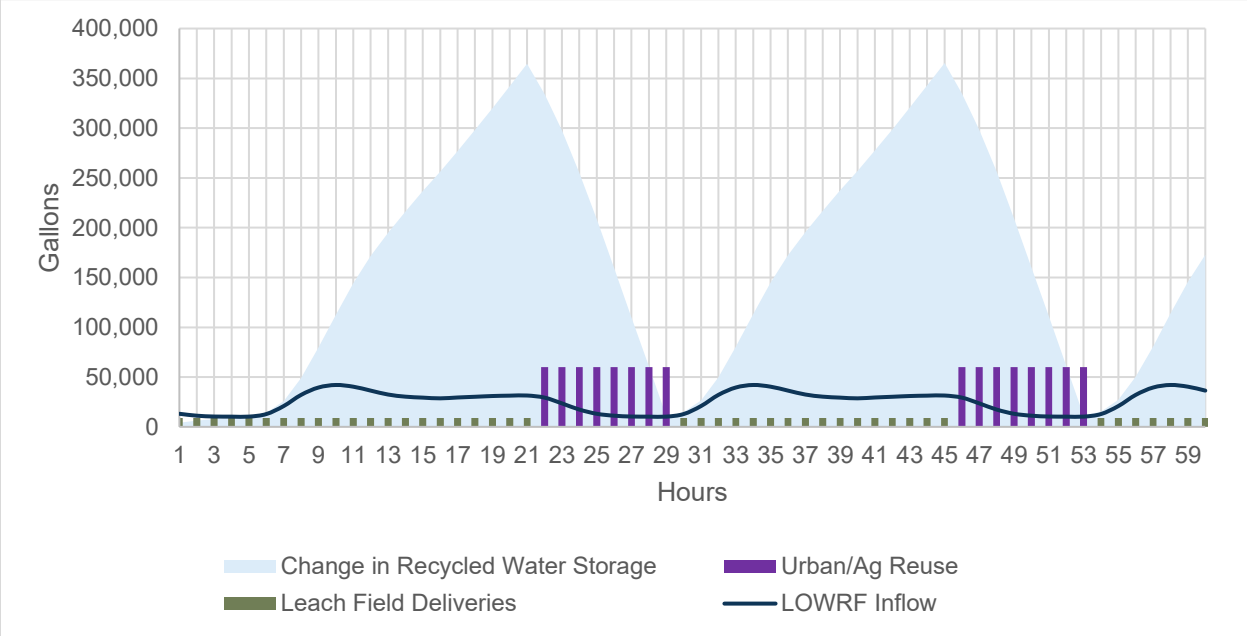
Demand Type	Peaking Factor	Total Potential Average Annual Use (AFY)
Annual Average Demand (AAD)	See Table 5-7	179 AFY (0.22 MGD)
Peak Day Demand (PDD)	3.0 x AAD	0.66 MGD (450 GPM)
Peak Hour Demand (PHD)	3.0 x PDD (8 hours over 24 hours)	1,3500 GPM

5.2.1 Recycled Water Storage Assessment

The LOWRF includes two onsite recycled water storage ponds, shown in Figure 3-3, with a total storage capacity of approximately 11.1 MG. The current storage is more than sufficient for current and potential recycled water users described in Table 5-7, and is primarily used to manage flows in the wet weather season when there is no reuse beyond deliveries to the leach fields (SLO County, 2018).

Figure 5-1 shows the estimated diurnal inflows[3] to the LOWRF, recycled water deliveries (based on Table 5-8), and the recycled water storage needed to manage reuse. The deliveries to the leach fields can be made at any time and are only limited by the leach field capacity. Urban and agricultural reuse is assumed to occur overnight during an 8-hour period and typically corresponds with low inflows to the LOWRF. As shown, about 350,000 gallons of storage is needed to manage the recycled water deliveries, which is significantly less than the 11.1 MG available storage at the LOWRF. Alternatives evaluated in this study include the potential reuse included in the storage evaluation below, or include reuse alternatives that can be delivered at a constant rate and would reduce the recycled water storage needed to manage the inflows and deliveries.

Figure 5-1. LOWRF Recycled Water Storage Needs



Note: See Table 5-8 for Urban/Ag Reuse demand basis.

[3] Hourly inflow data for the LOWRF was unavailable, so estimates were derived from diurnal patterns observed at other similarly sized treatment facilities along the Central Coast. This approach is considered conservative, as attenuation within the LOWRF likely moderates the diurnal peaks and troughs.

5.2.2 Water and Nutrient Balance

Guidance for the use of recycled water is provided under the statewide Recycled Water Policy, which requires the development of Salt and Nutrient Management Plans (SNMP's) for groundwater basins to help streamline the permitting of recycled water projects while ensuring compliance with Basin Plan water quality objectives. The County completed the Los Osos Groundwater Basin SNMP in January 2018 as part of permitting efforts for LOWRF.

The Los Osos Basin SNMP provides a water balance and nutrient balance that evaluates total dissolved solids, chloride, and nitrate-nitrogen mass loading under buildout conditions, along with assimilative capacity and anti-degradation analyses. The buildout conditions scenario for the SNMP included water conservation, new supply wells, upper aquifer development, and both urban and agricultural recycled water reuse. Water supply and reuse project alternatives being considered in the current WRFP study are directly or indirectly incorporated into the SNMP.

Results of the nitrogen mass loading analysis show that operation of the LOWRF and recycled water reuse provides a net gain in nitrate-nitrogen assimilative capacity in the Basin, which is an improvement in water quality. The SNMP thresholds for utilization of salt and nutrient assimilative capacity were established by the State Water Board and are not exceeded under buildout conditions in the Los Osos Basin.

The anti-degradation analysis performed for the Los Osos Basin SNMP confirms WRFP alternative supply project consistency with Title 22 standards for drinking water quality and tertiary recycled water quality, and with Basin Plan water quality objectives. For WRFP alternative supply projects with more advanced treatment processes for recycled water, the salt and nutrient mass loading to Basin aquifers and associated utilization of Basin assimilative capacity would be even less than considered in the SNMP.

5.3 Alternative A - Urban Reuse

Urban reuse includes completing recycled water connections and conversions to increase recycled water use for landscape irrigation and offset groundwater production.

Demand / Yield

Urban reuse is limited by irrigation demand. Table 5-9 and Figure 5-2 show the approved recycled water urban users in the Los Osos recycled water service area. Table 5-9 compares the projected urban reuse demand from the LOBP to the current and planned recycled water deliveries to estimate a potential 62 AFY of additional urban reuse demand from three users in Los Osos's recycled water service area.

Table 5-9. Urban Reuse Customers (AFY)

Customer	LOBP Buildout Estimate[1]	Current and Planned Deliveries[2]	Potential Future
Los Osos Valley Memorial Park	50	--	50
Los Osos Middle School	25	25	
Baywood Elementary School	7	--	7
Sunnyside Elementary School	5	--	5
Monarch Elementary School	5	5	
South Bay Community Center	5	5	
Sea Pines Golf Course	17 (portion)	66	
Los Osos Valley Road Medians	--	1	
Total	**114**	**102**	**62**

1. LOWRF Engineering Report (2018), Table 7
2. Current urban reuse demand is estimated based on recent and planned recycled water deliveries. See Table 3-3 Study Baseline.

Benefits

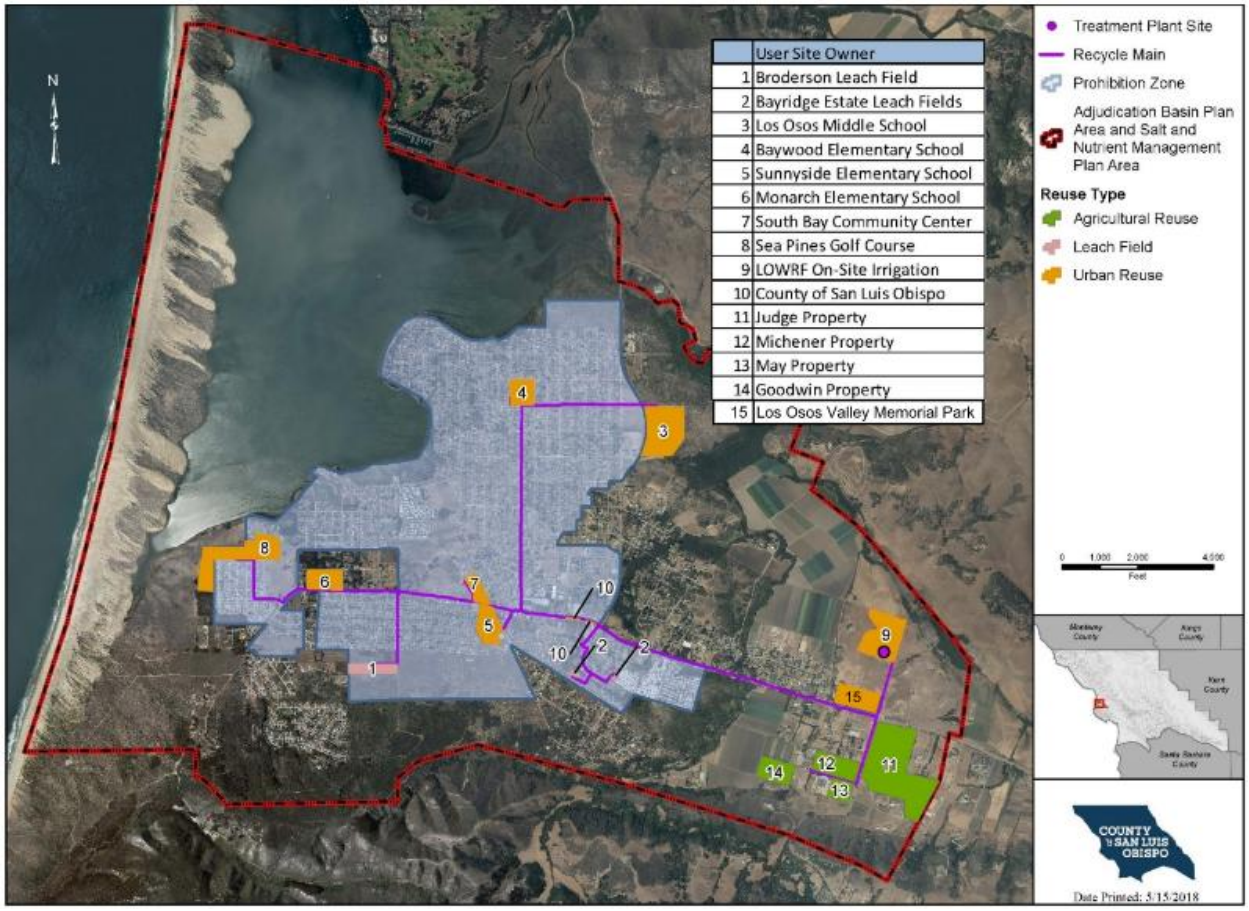
Urban reuse at Baywood and Sunnyside Elementary Schools, located in the Western and Central Areas[4] of the Basin, directly offsets purveyor pumping on a 1:1 basis. However, due to decreased disposal to Broderson Leach Field, the overall benefit to the basin is estimated at approximately 75% of the project's yield when offsetting purveyor pumping.

Los Osos Valley Memorial Park is located outside of the purveyor's service area, and reuse here offsets the lower aquifer production in the Eastern Area[3] of the Basin, also referred to as the "Creek Valley." Groundwater modeling in 2015 showed that directly offsetting purveyor pumping in the Western and Central Areas has a greater benefit to mitigating seawater intrusion than offsetting production in the Creek Valley area (LOBMC, 2015). The transient model was used to model delivery of 50 AFY to Los Osos Valley Memorial Park, offsetting groundwater production by diverting a similar amount from Broderson Leach Field. Results indicate that in this in-lieu recharge scenario there is no net benefit to the Basin or increase in sustainable yield. Additionally, the model estimates that if Broderson Leach Field is already operating at its permitted capacity and flows are not diverted from the Broderson Leach Field for Los Osos Valley Memorial Park deliveries, purveyor pumping could increase by 17 AFY, resulting in a 35% benefit to the Basin.

For reuse at Los Osos Valley Memorial Park to provide a similar yield and benefit as urban reuse at the schools, this alternative requires pumping groundwater from the Creek Valley and conveying the same amount of recycled water delivered to Los Osos Memorial Park to purveyors using a new well and pipeline system. The overall basin benefit is estimated at 75% of the project's yield (Table 5-5) due a reduction in discharges to Broderson Leach Field.

[4] Basin Plan Areas defined in the Los Osos Groundwater Basin Plan and shown in Figure 1-3.

Figure 5-2. Current and Potential Recycled Water User Sites



Source: Adapted from 2024 Annual Report for Recycled Water Use (2025), Figure 1

Facilities

The existing recycled water distribution system is located adjacent to each of the potential urban reuse sites, but all connections would need to be converted for recycled water irrigation. This includes updating existing irrigation systems to meet Title 22 requirements, connection assemblies and metering to the recycled water system, and any required backflow prevention to protect potable water systems.

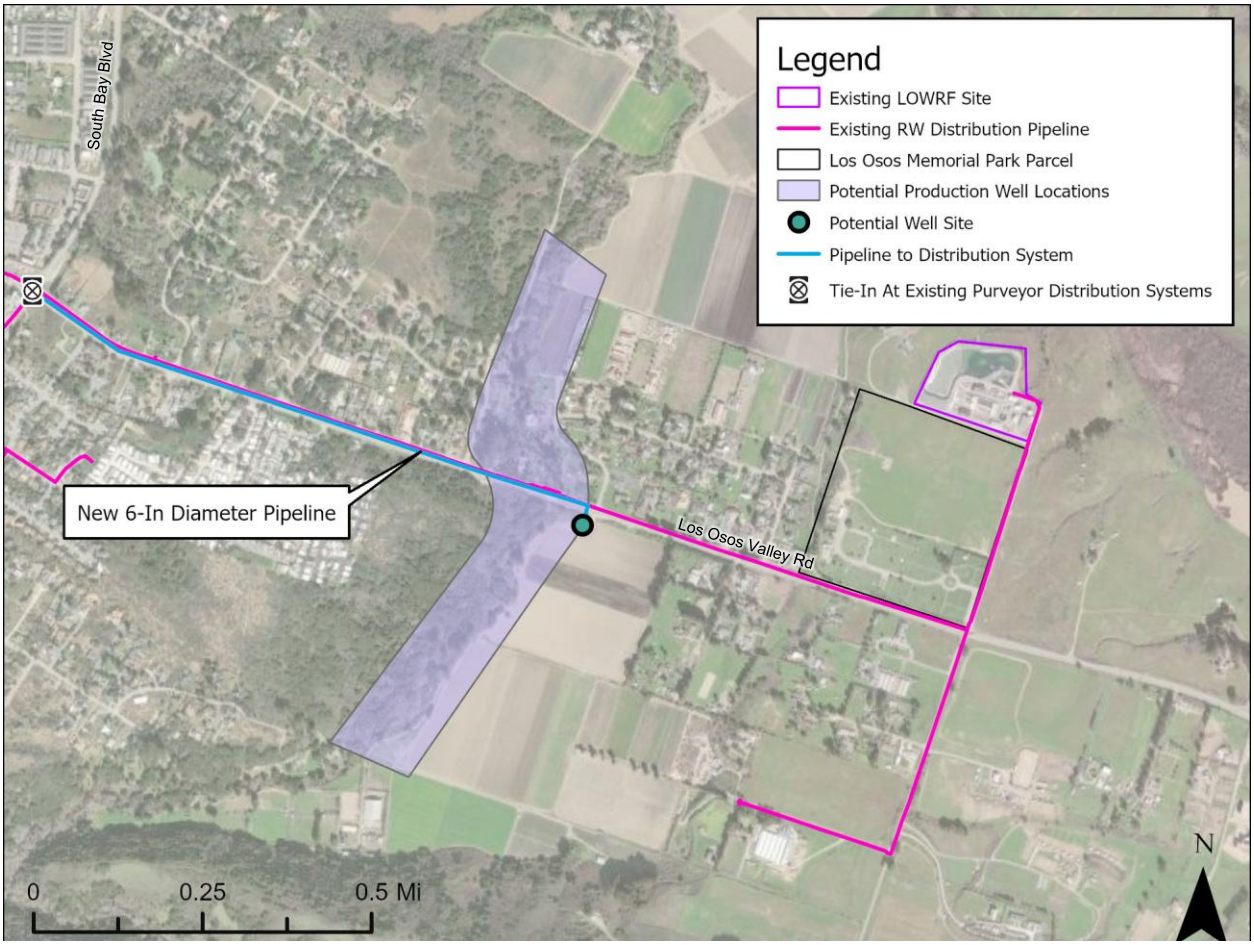
The County indicated that Baywood Elementary School is planning to incorporate recycled water requirements into planned irrigation system upgrades. For the conversion, the recycled water main will need to be extended to a new point of connection on the opposite side of campus, with a new recycled water connection meter and assembly installed, along with on-site upgrades for recycled water use.

Sunnyside Elementary School is currently for sale and new owners could incorporate recycled water into any planned irrigation updates. Recycled water conversion costs would include a new recycled water connection meter, assembly, and on-site upgrades.

In addition to site conversion at Los Osos Valley Memorial Park, new facilities are needed to pump and deliver the groundwater offset by reuse to purveyors, listed below and shown in Figure 5-3:

- 1 – 100 GPM well (approximate flowrate)
- Approximately 4,700 LF of 6-inch pipeline from the new well to tie into purveyor distribution systems near the intersection of Los Osos Valley Rd and South Bay Blvd.

Figure 5-3. Urban Reuse at Los Osos Valley Memorial Park



Note: Potential production well site was used for facility needs characterization. The specific location of the potential production well should be within the indicated shaded area.

Cost

Table 5-10 presents the capital and annual costs for urban reuse at the schools and Los Osos Valley Memorial Park. Detailed capital and O&M cost estimates are included in Appendix B. The estimated cost for converting potential future sites to recycled water is based on comparable previous conversion projects, as outlined in Table 5-2; however, a site-specific study is necessary to more accurately determine the conversion cost for each location. The unit cost for recycled water conversion at the schools is high due to low recycled water demand and the high estimated cost for recycled water conversion. The high unit costs associated with the recycled water conversion at Los Osos Memorial Park result from the need to construct a new well and

pipeline system required to deliver offset groundwater to purveyors and provide similar benefits to urban reuse at the schools.

Table 5-10. Alternative A - Urban Reuse, Cost Estimate

Items	Baywood and Sunnyside Elementary Schools	Los Osos Valley Memorial Park
Capital Cost	$1,000,000	$4,300,000
Annualized Capital Cost	$45,000	$190,000
Annual O&M	$10,000	$40,000
Annual Total	**$55,000**	**$230,000**
Annual Yield (AFY)	12	50
Basin Benefit (AFY)[1]	9	38
Unit Cost ($/AF)[2]	**$6,110**	**$6,670**

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

1. Basin benefit is estimated from scenarios evaluated in the Transient Model. See Section 5.1.3 for more information.
2. Unit costs are based on the basin benefit yield.

Risks & Uncertainties

The largest uncertainty for this alternative is the cost of recycled water conversion. The conversion costs represent almost all the cost for recycled water service to Baywood and Sunnyside Elementary schools. The conversion costs ($350,000 per site) are estimated based on bid prices from other recycled water conversions at Los Osos schools; however, conversions require site-specific evaluations.

5.4 Alternative B - Agriculture Reuse

Agricultural reuse includes completing recycled water connections and conversions to increase recycled water use for agricultural irrigation and offset groundwater production.

Demand / Yield

Like urban reuse, agricultural reuse is limited by the demand for water. Table 5-11 and Figure 5-4 show the four currently approved recycled water agricultural users in the recycled water service area. As shown in Table 5-11, there is 78 AFY of potential additional approved agricultural reuse, which includes new uses on land that is currently dry farming (66 AFY) and increased use at the existing users to offset groundwater production (12 AFY). Agricultural reuse on properties that are currently not pumping does not increase Basin groundwater yield, so this alternative only considers the 12 AFY increased deliveries to offset existing groundwater production in the Creek Valley area of the Basin.

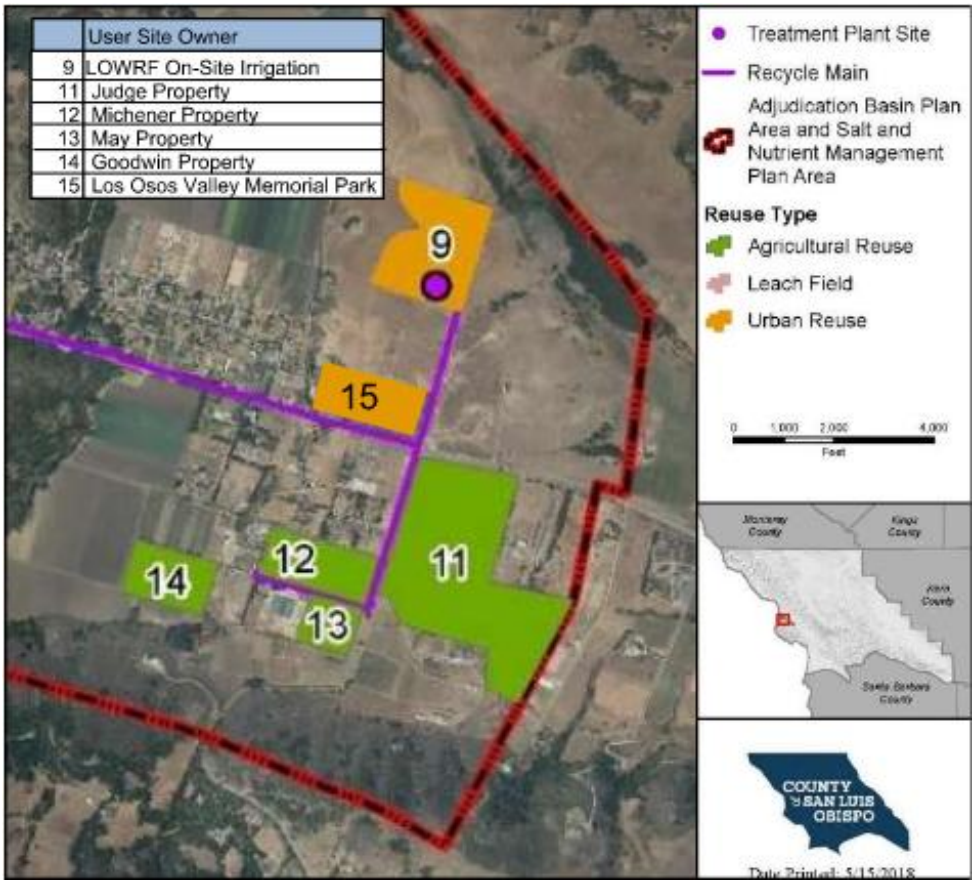
There is additional agricultural irrigation in the Creek Valley area of the Basin beyond the approved agricultural users. However, agricultural users outside of those previously approved for recycled water use have not historically been interested in or have an incentive to use recycled water instead of groundwater. For this reason, this alternative only focuses on the approved agricultural reuse sites.

Table 5-11. Approved Agricultural Reuse Sites

Agricultural User	Irrigable Acres[1]	Estimated Use (AFY)[1]	2022-2024 Average Use (AFY)	Potential Additional Approved Ag Reuse	
				New Demand	Offset Pumping
Judge Property	50	50		50	
Michener Property	10	16		16	
May Property	8	5	0.8		4
Goodwin Property	15	10	2.2		8
Total	**83**	**81**	**3.0**	**66**	**12**

Note:
1. 2024 Annual Report for Recycled Water Use (2025), Table 1

Figure 5-4. Agricultural Reuse Sites



Source: Adapted from 2024 Annual Report for Recycled Water Use (2025), Figure 1

Benefits

Like reuse at the Los Osos Valley Memorial Park, agricultural reuse offsets groundwater production in the Creek Valley, which was modeled to have no overall benefit to the Basin sustainable yield when diverting flows from Broderson Leach Field. To offset purveyor pumping, which is shown to have a greater benefit to mitigating seawater intrusion, the project includes a new well and pipeline to pump offset groundwater from the Creek Valley to purveyors. The overall basin benefit is estimated at 75% of the project's yield due to a reduction in discharges to Broderson Leach Field. Recycled water deliveries to Judge and Michener properties would not offset existing groundwater use since the properties are currently dry farming, so they were not included in this alternative.

Note that the California Coastal Commission permit conditions for the LOWRF, including Condition No. 97, indicate that total agricultural reuse shall not be less than 10% of the total treated effluent (LOBMC, 2015). Agricultural reuse is currently less than 10% of the total treated effluent. Increased agricultural deliveries will help meet this permit condition; however, most potential agricultural customers have not been interested in using recycled water to date.

Facilities

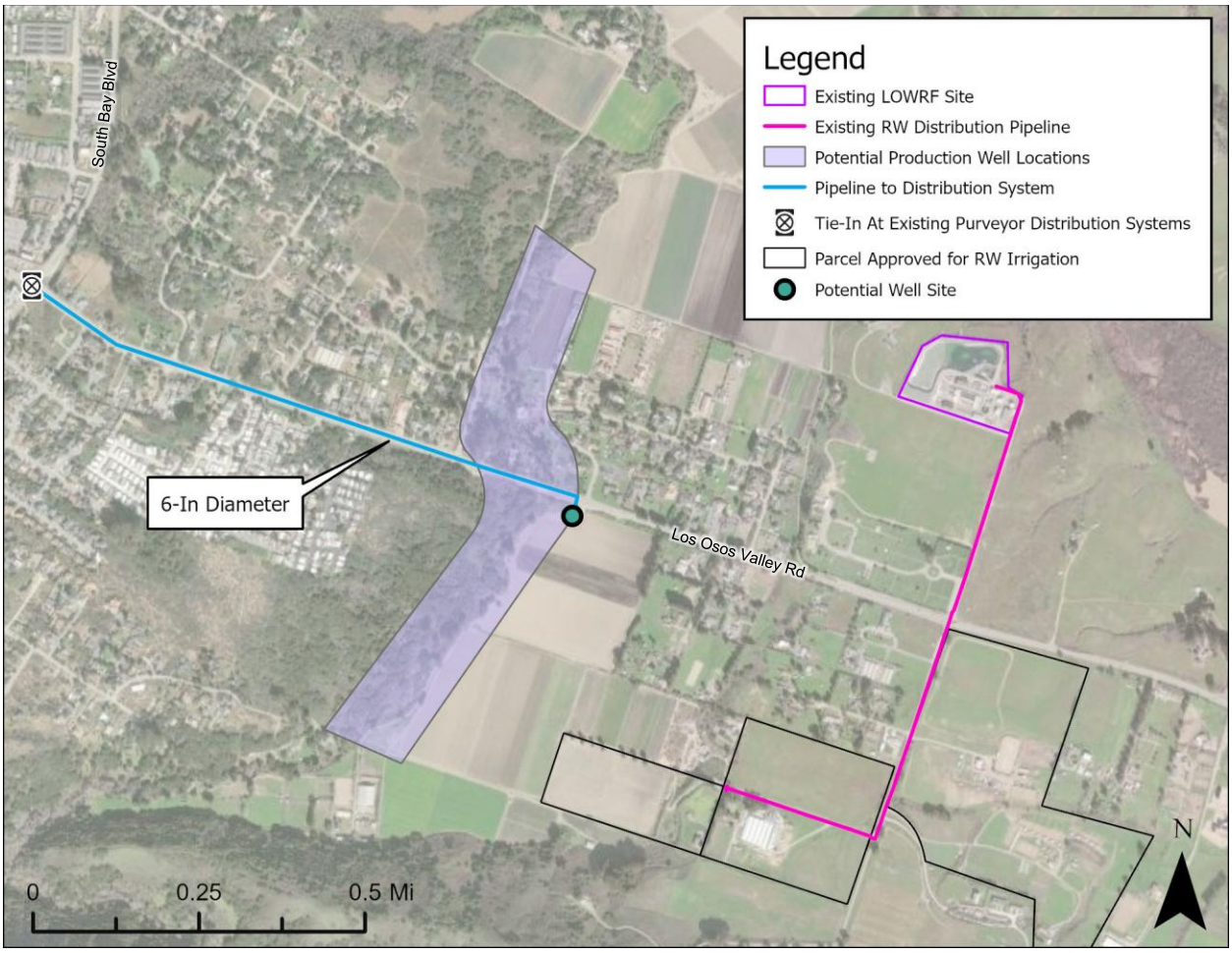
The existing recycled water distribution system is connected to and serves the May and Goodwin Properties, so new recycled water connections and conversion are not needed. Only new facilities are needed to pump and deliver the groundwater offset by agricultural reuse, which are the same facilities for urban reuse at Los Osos Memorial Park, shown in Figure 5-5, and include:

- 1 – 100 GPM well (approximate flow rate)
- 4,700 LF of 6-inch pipeline from the new well to tie into purveyor distribution systems near the intersection of Los Osos Valley Rd and South Bay Blvd.

Cost

Table 5-12 presents the capital and annual costs for agricultural reuse. Detailed capital and O&M cost estimates are included in Appendix B. The cost per AF of yield is high due to low recycled water demand and the need for a new well and pipeline to deliver offset groundwater to the purveyors.

Figure 5-5. Agricultural Reuse Recovery Facilities



Note: Potential production well site was used for facility needs characterization. The specific location of the potential production well location area should be within the indicated shaded area.

Table 5-12. Alternative B- Agricultural Reuse, Cost Estimate

Items	Cost
Capital Cost	$5,100,000
Annualized Capital Cost	$230,000
Annual O&M	$50,000
Annual Total	**$280,000**
Annual Yield (AFY)	12
Basin Benefit (AFY)[1]	9
Unit Cost ($/AF)[2]	**$31,100**

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

1. Basin benefit is estimated from scenarios evaluated in the Transient Model. See Section 5.1.3 for more information.
2. Unit costs are based on the basin benefit yield.

Risks & Uncertainties

The largest risk or uncertainty for this alternative is the willingness of agricultural customers to use recycled water, since they currently have the ability to pump more groundwater now.

5.5 Alternative C - Creek Discharge

The concept for the Creek Discharge alternative is to discharge recycled water from the LOWRF near the upper portion of Los Osos Creek to recharge the Creek Valley portion of the Basin. To maximize seawater intrusion prevention benefits, the discharged water would need to be pumped from the Creek Valley and conveyed to the purveyors to offset lower aquifer pumping in the Western and Central Areas[5] of the Basin.

The project can be defined differently depending on the type of discharge, permitting framework, and treatment requirements. There are two permitting sub-alternatives:

1) a new point of discharge for the LOWRF; or
2) a Groundwater Replenishment Reuse Project (GRRP).

Within a GRRP framework, there are several sub-alternatives depending on treatment prior to discharge:

a) no additional treatment;
b) ozone / biologically activated carbon (BAC); or
c) microfiltration / reverse osmosis (MF/RO).

LOWRF New Point of Discharge. LOWRF could implement a second point of discharge to provide operational flexibility and redundancy. The discharge could be permitted under their existing discharge permit (R3-2011-0001) with no additional treatment requirements. The discharge would likely occur at a percolation basin in the vicinity of the creek. Monitoring of the discharge will likely be required. The City of Paso Robles added a second point of discharge as part of their last permit update (Central Coast Regional Water Quality Control Board Order No. R3-2021-0001), and they have similar recycled water treatment as LOWRF.

GRRP. A new discharge to the creek that occurs as part of a GRRP would result in GRRP regulations applying to the discharge. The primary considerations for a GRRP in this setting are:

- TOC must be less than 0.5 mg/L after recycled water treatment, soil aquifer treatment (SAT), and/or blending. Practically, this requires blending with existing creek flows and/or the addition of RO to reduce TOC.
- Minimum travel time from the discharge point to proximate drinking water wells.

The Los Osos Creek Discharge Study (MKN, 2016) states:

> *Based on discussions with State Water Resources Control Board Division of Drinking Water (DDW) staff, the project may qualify as a discharge rather than a GRRP if the boundary between the discharge and any existing drinking water wells is at least two to*

[5] Basin Plan Areas defined in the Los Osos Groundwater Basin Plan and shown in Figure 1-3.

five years travel time, and an ordinance were established to restrict future potable water wells from being installed within the boundary.

Demand / Yield

The project yield is limited by the number of days that effluent can be discharged to the creek and the TOC concentration in the effluent for projects permitted as a GRRP, which varies with added treatment.

With the project permitted as a point of discharge, the yield is only limited to the number of discharge days. Recycled water discharge to Los Osos Creek was analyzed using the steady-state groundwater model in 2014. The groundwater modeling analysis found that recycled water discharges to the creek can percolate into the stream channel deposits and Creek Valley alluvium when the stream channel is dry. Year-round recycled water discharge had less efficient recovery (59% - 69% recovery) compared to recycled water recharge tied to maintaining a minimum amount of groundwater in storage (79% - 88% recovery) (CHG, 2014).

To maximize recharge and recovery of discharged water, this study assumes recycled water will only be discharged during the dry season, which is typically from April 15 to October 15, per the Los Osos Creek Discharge Study (MKN, 2016). This equates to approximately 160 AFY available for recharge over a 6-month period after all existing and planned recycled water deliveries and minimum discharges to Bayridge Leach Field. At buildout, this has the potential to increase to 240 AFY with projected future flows. The remainder of the year, LOWRF effluent will continue to discharge to the leach fields. The actual volume discharged to the creek should be based on available storage in the Creek Valley area of the Basin and may vary depending on annual rainfall and Basin inflows. The discharged water can be recovered over a longer period if the Basin is not spilling to the ocean.

For projects permitted as a GRRP, the recycled water recharge volume is further limited by meeting the TOC limit. Assuming LOWRF treated effluent TOC of 7 mg/L, 50% TOC reduction via SAT, and 600 AFY of blend water via creek underflow per the Los Osos Creek Discharge Study (MKN, 2016), a GRRP with no additional treatment would limit discharges to roughly 100 AFY. Additional treatment is considered to further reduce TOC and increase the volume discharged to the creek. Assuming ozone/BAC reduce the effluent TOC to 4 mg/L, the discharge could be increased to roughly 150 AFY. Use of MF/RO would reduce the effluent TOC to 0.5 mg/L but results in 75% to 85% yield from the influent recycled water supply to RO effluent. Assuming 80% recovery, this would yield roughly 130 AFY of potential treated effluent for creek discharge over a 6-month period (80% of 160 AFY available flows); this could expand to about 190 AFY (80% of 240 AFY) at buildout flows. The creek discharge sub-alternatives are summarized in Table 5-13 below.

Benefits

To maximize yield, similar to other alternatives in the Creek Valley area, this project assumes new wells to recover recharged water and deliver to purveyors to offset pumping.

The Transient Model was used to analyze this alternative and evaluate the increase to sustainable purveyor pumping assuming that creek discharges are recovered and delivered to

purveyors to offset purveyor pumping. As shown in Table 5-13, the Transient Model estimates the basin benefit is about 75% of the project's yield, accounting for reduced effluent disposal to the Broderson Leach Field.

Table 5-13. Creek Discharge Sub-Alternatives

Sub Alternative	Treatment	Effluent TOC (mg/L)	Recycled Water Recharge and Recovery (AFY)		Basin Benefit (AFY)[3]	
			Existing Conditions	Buildout Conditions	Existing Conditions	Buildout Conditions
C1	New Point of Discharge	N/A	160	240	120	180
C2[1]	Existing	7	100	100	75	75
C3[1]	Ozone/BAC	4	150	150	113	113
C4[2]	MF/RO	0.5	130	190	98	143

Note:
1. Existing and buildout conditions are the same because discharge is limited by TOC
2. Recycled water recharge is 80% of the available recycled water over 6-month period due to losses from RO treatment
3. Basin benefit is estimated as 75% of the project yield based on analysis using the Transient Model. See Section 5.1.3 for more information.

Facilities

Table 5-14 and Figure 5-6 through Figure 5-9 present the facilities for each creek discharge sub-alternative, which include a minimum of new recycled water pipelines to the creek discharge location, one or two recovery wells and monitoring wells in the Creek Valley, and a new pipeline to convey recovered water to the purveyors. Alternatives C3 and C4 also include new treatment facilities and a pump station, which are assumed to be located at the LOWRF.

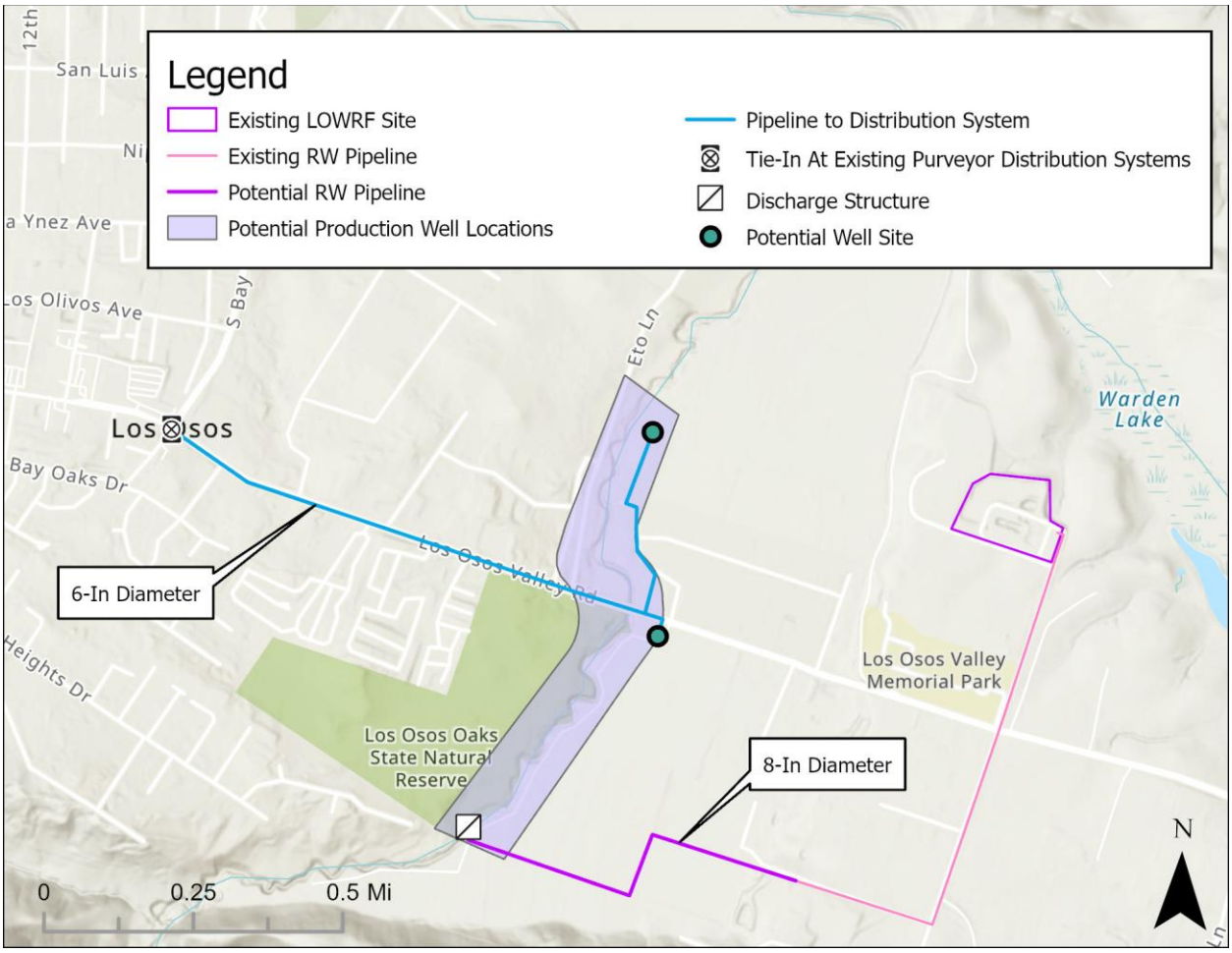
Additionally, Alternative C4-GRRP with MF/RO treatment includes RO concentrate disposal facilities, which assumes RO concentrate discharge via the nearest potential outfall connection (i.e., Morro Bay Outfall at the air relief structure) for cost comparison purposes only, shown in Figure 5-10. It is important to note that this assumption does not reflect a confirmed plan, as further analysis is required to evaluate the feasibility and implications of RO concentrate disposal options.

Table 5-14. Creek Discharge, Facilities for each Sub-Alternative

Items	C1-New Discharge[1]	C2-GRRP, No Treatment[1]	C3-GRRP, Ozone/BAC	C4-GRRP, MF/RO
Yield (Dry Weather)	**160-240 AFY**	**100 AFY**	**150 AFY**	**130-190 AFY**
Treatment				
Treatment	--	--	Ozone/BAC	MF/RO
RO Concentrate PS	--	--	--	22 HP
RO Concentrate Pipe	--	--	--	4”, 44,000 LF
WRF To Discharge				
GRRP PS	N/A	N/A	16 HP	19 HP
Pipeline to Discharge	8”, 3,400 LF	6”, 3,400 LF	6”, 9,000 LF	6”, 9,000 LF
Discharge Recovery				
Production Wells (~100 GPM)	2	1	1	2
Monitoring Wells	1	2	2	2
Pipeline from Wells to Purveyors	6”, 7,200 LF	6”, 4,700 LF	6”, 4,700 LF	6”, 7,200 LF

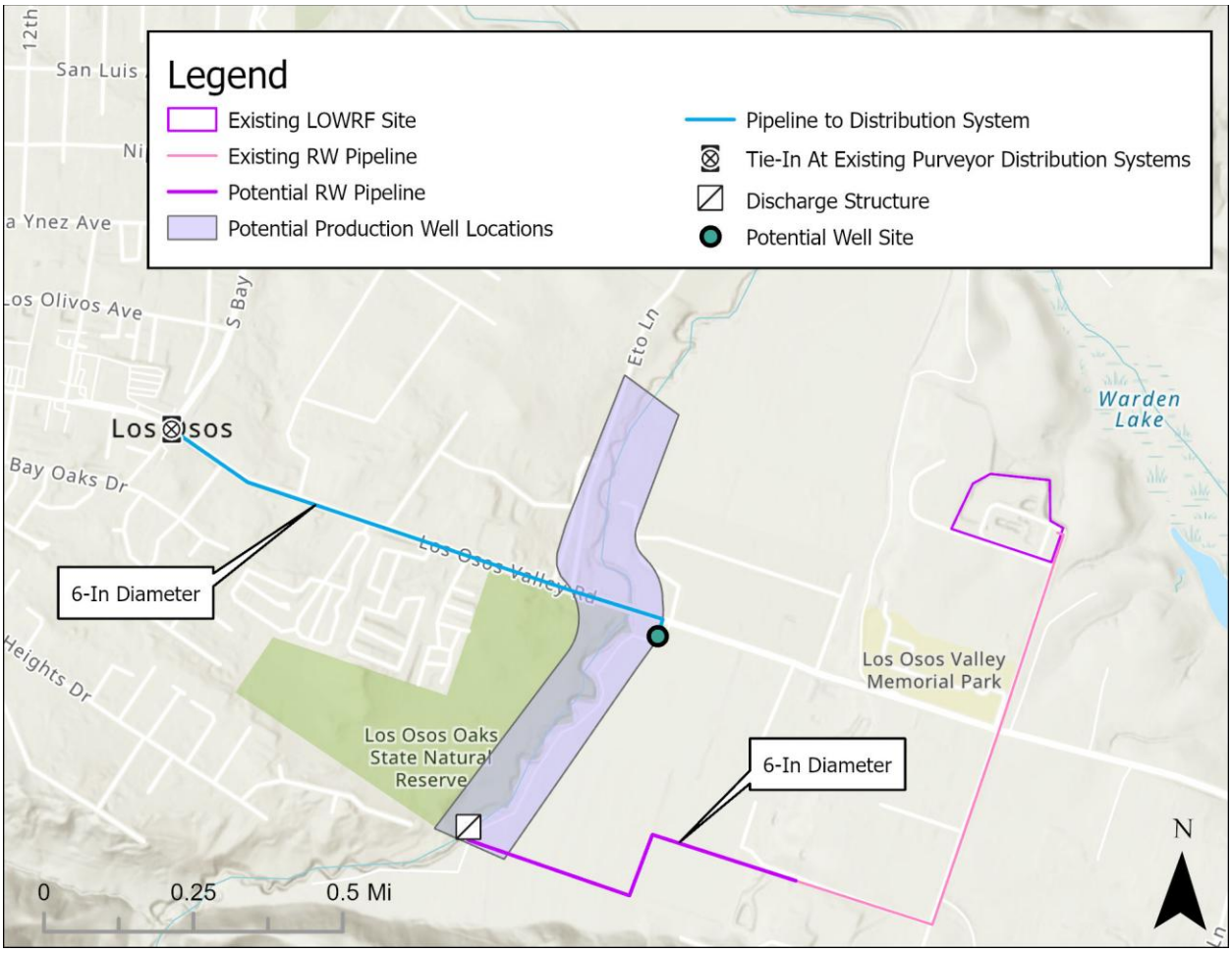
Notes:
1. Project utilizes the existing RWPS and a portion of the existing recycled water distribution system, resulting in no new GRRP Pump Station and less new pipeline to the discharge location compared to other sub-alternatives.
2. Refer to detailed cost estimates in Appendix B for additional information on facilities.

Figure 5-6. Creek Discharge – Alternative C1 New Point of Discharge



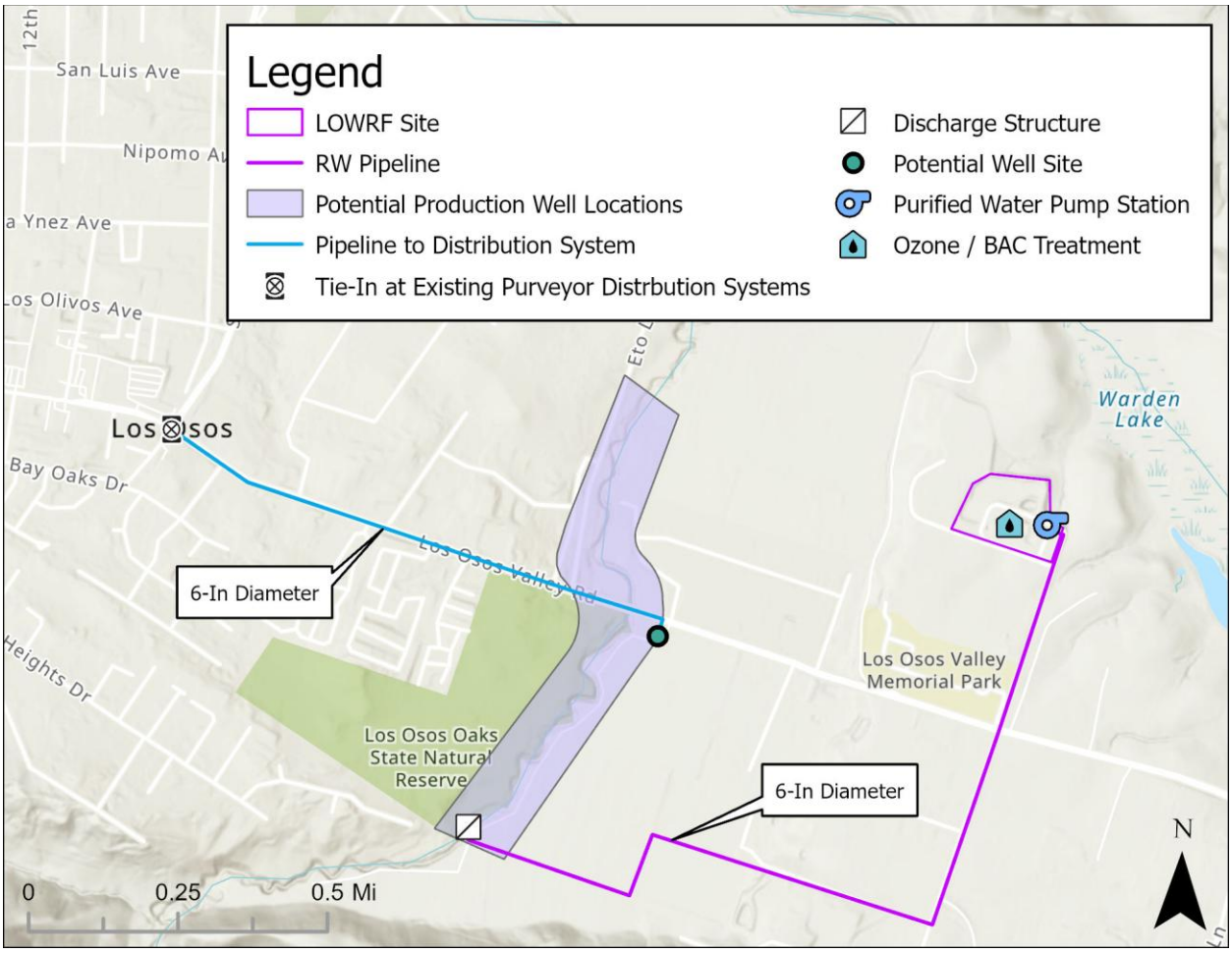
Note: Potential production well sites were used for facility needs characterization. The specific location of the potential production wells should be within the indicated shaded area.

Figure 5-7. Creek Discharge – Alternative C2 GRRP, no Treatment



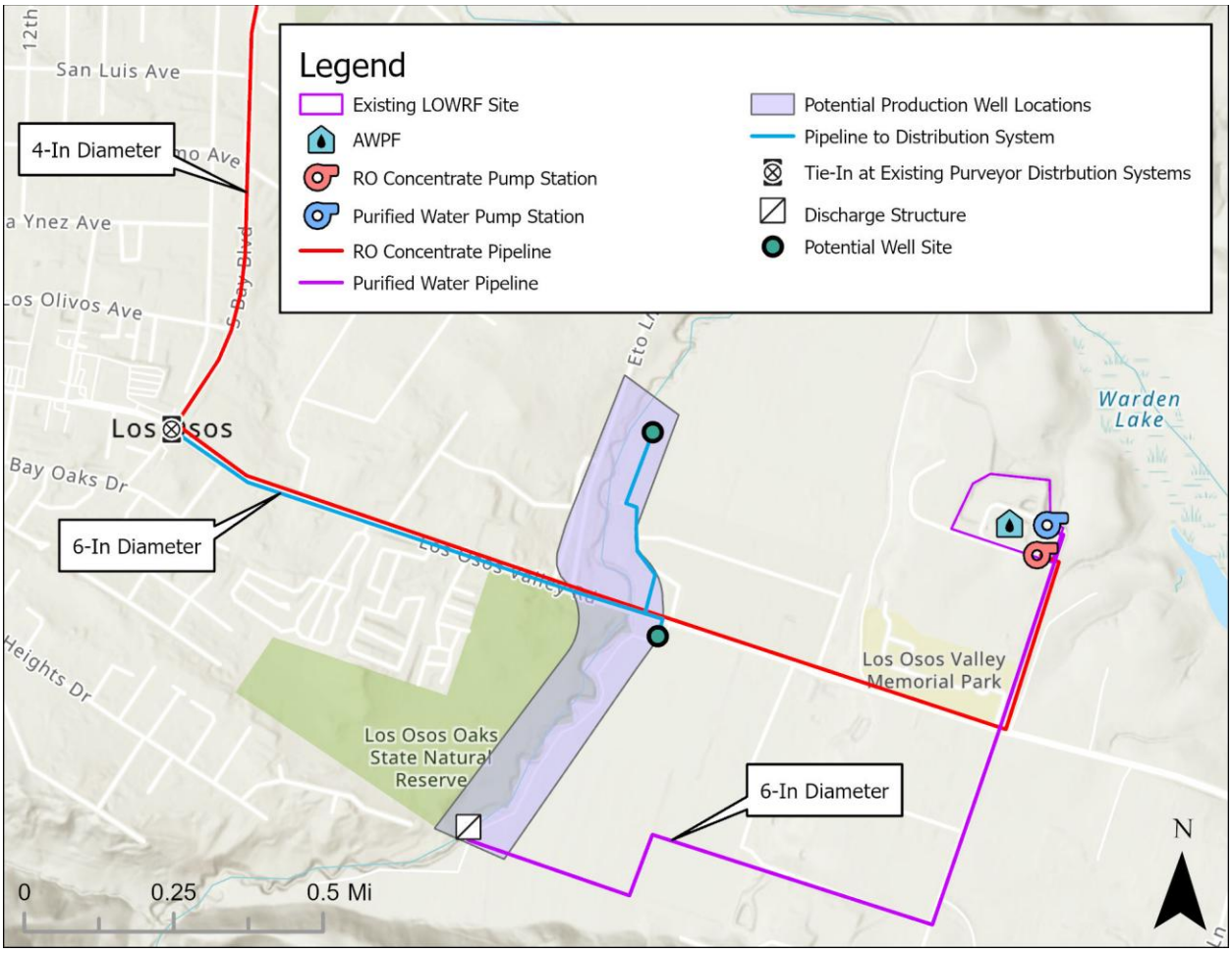
Note: Potential production well site was used for facility needs characterization. The specific location of the potential production well should be within the indicated shaded area.

Figure 5-8. Creek Discharge –Alternative C3 GRRP, Ozone/BAC



Note: Potential production well site was used for facility needs characterization. The specific location of the potential production well should be within the indicated shaded area.

Figure 5-9. Creek Discharge –Alternative C4 GRRP, MF/RO



Note: Potential production well site was used for facility needs characterization. The specific location of the potential production well should be within the indicated shaded area.

Figure 5-10. RO Concentrate Pipeline and Existing Ocean Outfall Pipeline

Note: No discussion with the City of Morro Bay has occurred. The discharge concept was developed for alternative screening. The pipeline length could potentially be reduced by connecting to the City of Morro Bay's new Water Resources Center existing "Brine Line" near the intersection of Quintana Rd. and South Bay Blvd.

Cost

Table 5-15 presents the capital and annual costs for all creek discharge alternatives at current flows and at buildout. Detailed capital and O&M cost estimates are included in Appendix B.

The high unit costs for GRRP alternatives with new treatment are compounded by the operational complexity of running the treatment facilities only six months each year. BAC treatment relies on biological activation. During non-operation, the biological film would die off and need to be redeveloped each year before startup to achieve adequate TOC removal. Both MF and RO treatment also perform best with a constant flow rate and would require restart operations each year to ensure treatment goals are met before discharging to the creek.

Table 5-15. Creek Discharge, Cost Estimate

Items	New Discharge	GRRP, No Treatment	GRRP, Ozone/BAC	GRRP, MF/RO
Existing Flows				
Capital Cost	$11,800,000	$8,100,000	$15,500,000	$54,700,000
Annualized Capital Cost	$530,000	$370,000	$700,000	$2,480,000
Annual O&M	$160,000	$180,000	$360,000	$693,000
Annual Total	**$690,000**	**$550,000**	**$1,060,000**	**$3,173,000**
Annual Yield (AFY)	160	100	150	130
Basin Benefit (AFY)[1]	120	75	113	98
Unit Cost ($/AF)[2]	**$5,750**	**$7,330**	**9,420**	**$32,540**
Buildout Flows				
Capital Cost	$11,800,000	No increase in yield at buildout since it's limited by creek underflow for blending.		$66,500,000
Annualized Capital Cost	$530,000			$3,010,000
Annual O&M	$180,000			$818,000
Annual Total	**$710,000**			**$3,828,000**
Annual Yield (AFY)	240			190
Basin Benefit (AFY)[1]	180			143
Unit Cost ($/AF)[2]	**$3,940**			**$26,860**

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

1. Basin benefit is estimated from scenarios evaluated in the Transient Model. See Section 5.1.3 for more information.
2. Unit costs are based on the basin benefit yield.

Risks & Uncertainties

The largest risk or uncertainty for this alternative is permitting uncertainty as a new point of discharge or a GRRP. GRRP permitting classification would trigger stricter regulatory standards that reduce the volume of water that can be recharged or require additional treatment. There is also a large risk with the seasonal operation of additional treatment facilities during a six-month discharge period and significant uncertainty of RO concentrate disposal with the addition of MF/RO treatment facilities.

5.6 Alternative D - Seawater Barrier

Alternative D consists of injecting advanced purified water into the lower aquifer of the Basin to increase groundwater recharge and create a seawater intrusion barrier. This would require a new advanced water purification facility (AWPF) to treat the LOWRF effluent, new purified water conveyance piping, reverse osmosis concentrate piping, and new injection and monitoring wells.

One of the key Basin metrics is the chloride metric to monitor seawater intrusion in the Lower Aquifer. Figure 5-11 shows the estimated seawater intrusion front in Lower Aquifer Zone D and E from Fall of 2023. Based on the current understanding of the seawater intrusion front and the Basin hydrogeology, preliminary injection wells are recommended to be located near the boundary of the Western and Central Area of the Basin, shown in Figure 5-11 (CHG, 2024).

Demand/Yield

Table 5-16 provides the estimated project yield and basin benefit. The project assumes that all LOWRF effluent, after current and planned reuse, will be available for advanced treatment and injection. The AWPF requires MF/RO and other treatment processes to produce advanced purified water. Typical AWPF recovery is 75%-85% of influent flow. It is assumed to be 80% for planning, which results in about 340 AFY available for groundwater injection after treatment that increases to 460 AFY at buildout (see Table 3-5).

The Transient Model was used to model the seawater barrier and estimates that 340 AFY injected in the Lower Aquifer results in approximately 360 AFY of basin yield, or a 106% Basin Benefit, shown in Table 5-16. This is because the seawater intrusion barrier helps retain some streamflow and inflow from the Upper Aquifer that would normally flow out of the Basin.

Figure 5-11. Seawater Intrusion Front and Preliminary Injection Well Locations

Source: Adapted from Los Osos Groundwater Basin 2023 Annual Report (2024), Figure 18

Table 5-16. Current and Projected Advanced Purified Water Supply

	AWPF Supply for Injection (AFY)[1]	Basin Benefit (AFY)[2]
Current	340	360
Projected Future	460	488

Notes:
1. Assumes 80% recovery of treated LOWRF effluent after accounting for existing and planned reuse.
2. Based on groundwater modeling results described in Section 5.1.3.

Benefits

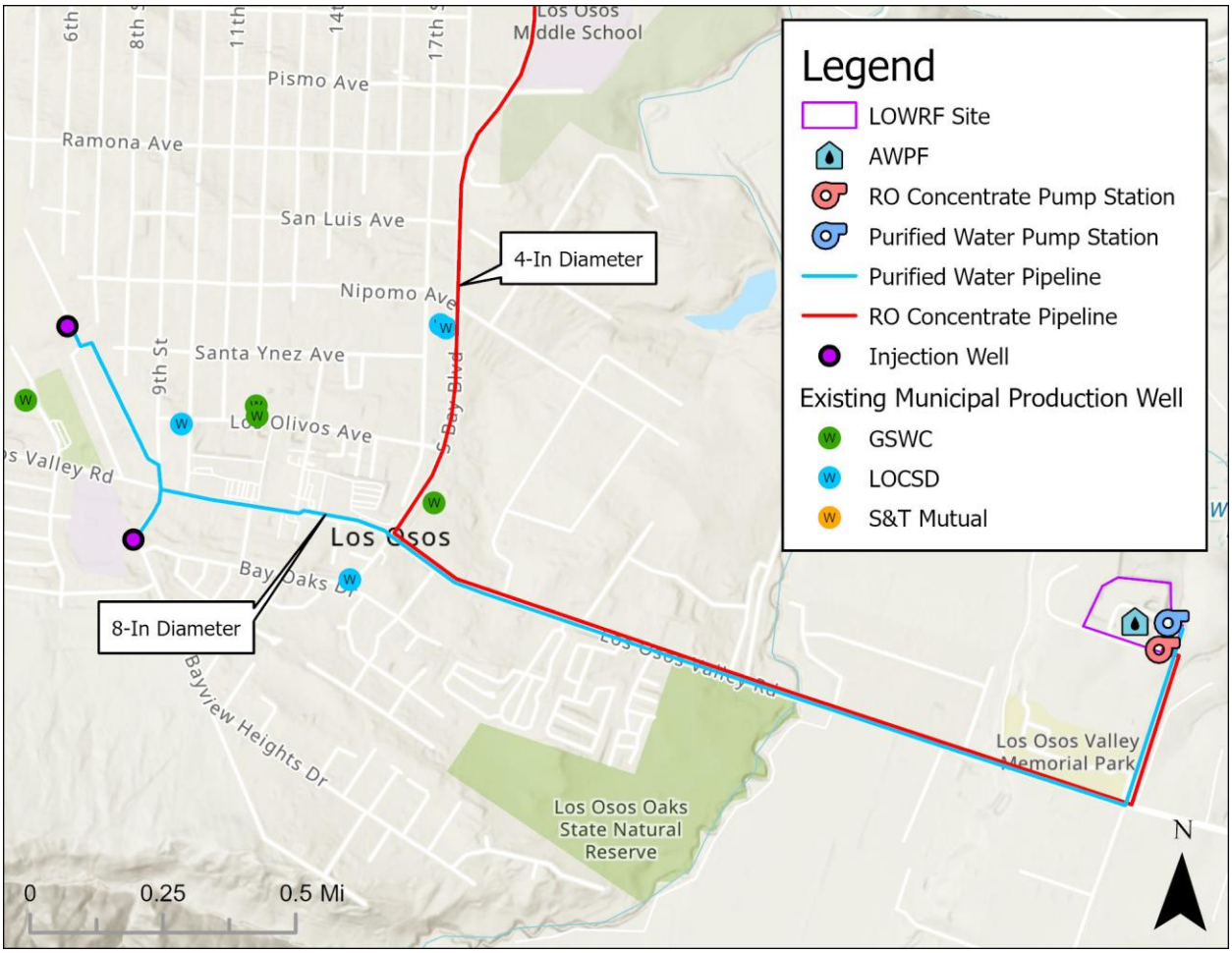
This alternative provides multiple benefits, including:

- Direct recharge of the lower aquifer increases purveyor supplies.
- Increased lower aquifer groundwater levels prevent saltwater intrusion for the Basin.

Facilities

Figure 5-12 shows the required facilities for a seawater barrier project. This alternative includes a new AWPF with MF, RO, and ultraviolet light with advanced oxidation processes (UV-AOP) to treat LOWRF effluent to the required advanced purified recycled water levels. For planning level cost estimates, the AWPF is assumed to be located at the LOWRF. A new purified water pump station and pipeline are needed to convey water to two new injection wells, with preliminary siting shown on Figure 5-12. The injection wells are assumed to inject in Zone D (north well) and Zone E (south well) of the lower aquifer. Additional groundwater monitoring with four new monitoring wells will also be needed. In this alternative, no new purveyor production wells would need to be installed.

Figure 5-12. Alternative D- IPR, Injection for Seawater Barrier



This alternative will also require RO concentrate disposal facilities and assumes RO concentrate discharge via the Morro Bay outfall (refer to Figure 5-10) for cost comparison purposes with other alternatives. However, RO concentrate disposal options require further analysis.

Cost

Table 5-17 presents the capital and annual costs for IPR and injection for a seawater barrier for current and buildout flows. Detailed capital and O&M cost estimates are included in Appendix B.

Table 5-17. Alternative D- IPR and Injection for Seawater Barrier, Cost Estimate

Items	Cost (Current Flows)	Cost (Buildout Flows)
Capital Cost	$61,100,000	$73,200,000
Annualized Capital Cost	$2,770,000	$3,310,000
Annual O&M	$1,638,000	$2,148,000
Annual Total	$4,408,000	$5,458,000
Annual Injection (AFY)	340	460
Basin Benefit (AFY)[1]	360	488
Unit Cost ($/AF)[2]	$12,110	$11,130

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

1. Basin benefit is estimated from scenarios evaluated in the Transient Model. See Section 5.1.3 for more information.
2. Unit costs are based on the basin benefit yield.

Risks & Uncertainties

There are many risks and uncertainties with this alternative. This includes regulatory and permitting risks for the project (like the feasibility of RO concentrate disposal and the advanced purified water regulatory approval). Additionally, there are technical uncertainties with the injection well siting and monitoring requirements.

5.7 Alternative E - Direct Potable Reuse

DPR will require a new AWPF with additional treatment processes compared to injection for a seawater barrier to meet regulatory requirements and deliver purified water directly to the purveyors.

Demand/Yield

Similar to Alternative D (Seawater Barrier), this project assumes that all LOWRF effluent, after existing and planned reuse, will be available for advanced treatment for DPR. Assuming an 80% recovery rate, this alternative would produce 340 AFY of new potable supply after treatment for delivery to purveyors that could increase to 460 AFY at buildout (see Table 3-5). The estimated

Basin benefit is 75% of the project yield due to reduced discharges to Broderson, which equates to about 255 AFY at current flows and 345 AFY at buildout flows.

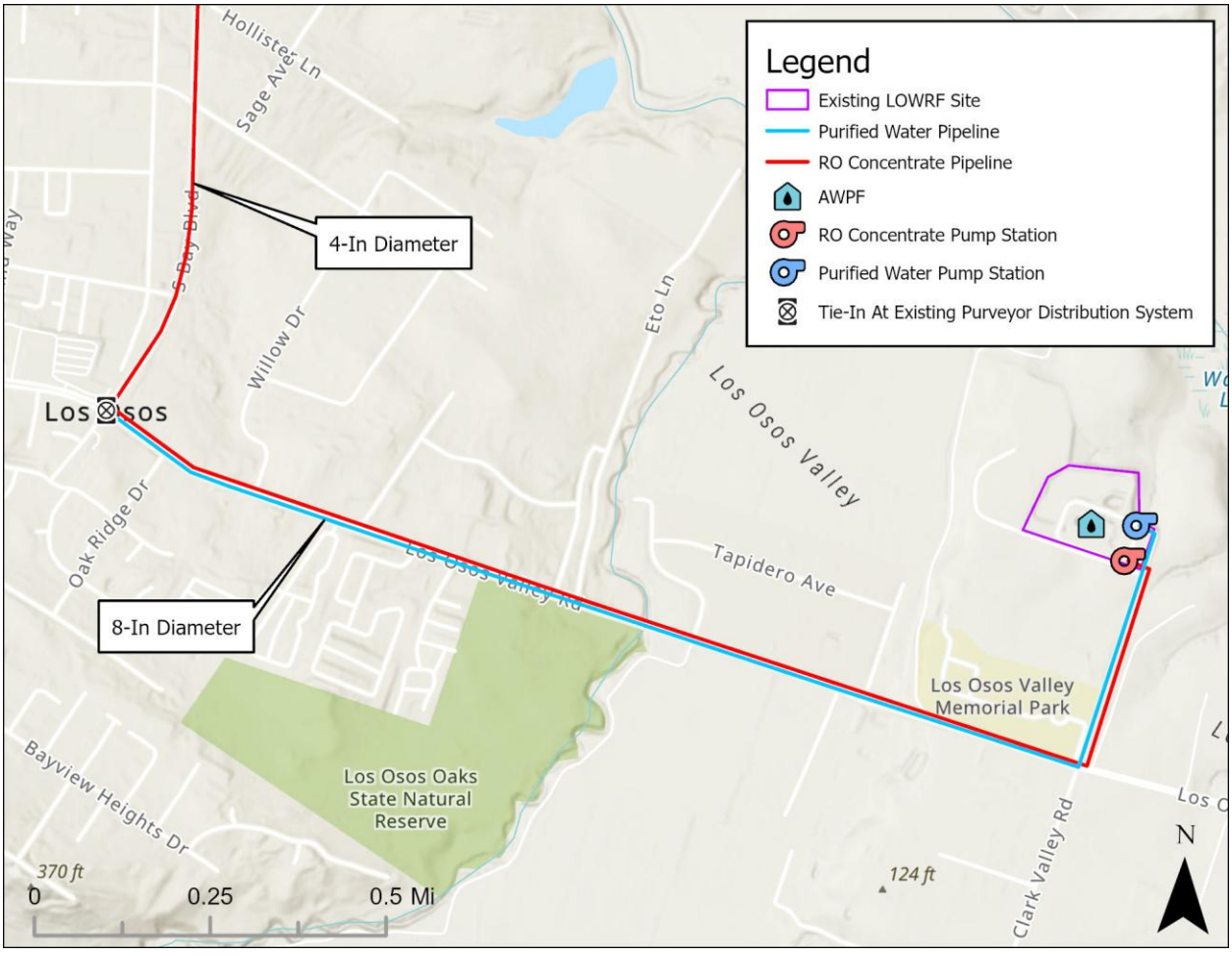
Benefits

DPR provides a new water supply directly to purveyors to offset existing groundwater pumping. It also requires less infrastructure than Alternative D (Seawater Barrier) since it does not require new wells. DPR requires increased treatment processes and continuous online monitoring compared to injection, since it does not include an environmental buffer.

Facilities

Figure 5-13 shows the required facilities for this alternative. DPR will include a new AWPF that is assumed to be located at the LOWRF. The AWPF must include at least four treatment processes with at least one log pathogen removal each and three different removal mechanism types. This includes membrane physical separation, chemical inactivation, and UV inactivation with a higher UV dose compared to the existing LOWRF UV process to achieve the required pathogen inactivation. For this alternative, the DPR AWPF treatment process includes Ozone/BAC, MF, RO, and UV-AOP treatment. A map showing the entire alignment of the RO Concentrate Pipeline and the existing Ocean Outfall Pipeline is included as Figure 5-10.

Figure 5-13. DPR Alternative Facilities



This alternative also includes new purified water conveyance piping to deliver purified water to the purveyors and RO concentrate disposal facilities. Like other alternatives, RO concentrate is assumed to be disposed to the Morro Bay outfall for cost-comparative purposes and requires further evaluation.

Cost

Table 5-18 presents the capital and annual costs for DPR at current and buildout flows. High treatment costs result in high unit costs per AF of new supply. Detailed capital and O&M cost estimates are included in Appendix B.

Table 5-18. Alternative E- DPR, Cost Estimate

Items	Cost (Current Flows)	Cost (Buildout Flows)
Capital Cost	$59,200,000	$75,300,000
Annualized Capital Cost	$2,680,000	$3,410,000
Annual O&M	$1,925,000	$2,525,000
Annual Total	**$4,605,000**	**$5,935,000**
Annual Yield (AFY)	340	460
Basin Benefit (AFY)[1]	255	345
Unit Cost ($/AF)[2]	**$18,060**	**$17,200**

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

1. Basin benefit is estimated from scenarios evaluated in the Transient Model. See Section 5.1.3 for more information.
2. Unit costs are based on the basin benefit yield.

Risks & Uncertainties

DPR is an emerging supply for California without any existing permitted or operating projects. This presents the largest risk for this alternative, and implementation would entail significant uncertainties and substantial effort.

5.8 Alternative F - Upper Aquifer Nitrate Treatment

This alternative includes increased pumping from the nitrate-contaminated upper aquifer and treatment at a Regional Nitrate Treatment Facility. The Basin Nitrate Metric, defined as the average concentration of nitrate in five key wells located in areas of the Basin that have been impacted by elevated nitrate concentrations, was 14.2 mg/L in winter 2023, which is above the maximum contaminant level of 10 mg/L. This represents a decrease from previous years, and the lowest point recorded in the last 20 years, largely due to the LOBP actions and the construction of the LOWRF to stop nitrate loading in the Basin from septic disposal. Nitrate concentrations are predicted to continue to decline in the Basin and reach the LOBP objective of 10 mg/L by mid-century (CHG, 2024).

GSWC currently owns and operates the Rosina Nitrate Treatment Facility, which treats high nitrate water produced from its Skyline Well. The Rosina Nitrate Treatment Facility is designed to treat up to 600 GPM but is currently operated at about a third of its capacity and is limited by well capacity. This alternative includes the construction of a new upper aquifer well and the construction of an additional upper aquifer well or rehabilitation of an existing well to supply groundwater for treatment at the existing Rosina Nitrate Treatment Facility. The purveyors have existing interconnections between their distribution systems than may be used to distribute the treated water regionally.

LOCSD previously operated an upper aquifer well with nitrate treatment but has since shut down the facility due to low-producing groundwater at the well site, relatively high treatment and brine disposal costs, and the presence of PFAS. This alternative does not include redeveloping this upper aquifer well or treatment facility.

A risk associated with this alternative is the possibility of other contaminants in the upper aquifer that would require additional treatment to meet drinking water standards. Chromium-6 has been a concern in several upper and lower aquifer wells as described in the 2015 Annual Groundwater Monitoring Report, and PFAS has been detected in portions of the Basin (CHG, 2016). Further water quality evaluation is required to assess the need for additional water treatment beyond nitrate treatment. Additional treatment facilities would significantly raise treatment costs.

Demand/Yield

The Transient Model was used to estimate up to 550 AFY of upper aquifer supply that could be sustainably pumped, treated, and delivered to purveyors. This includes 75 AFY that is currently produced at GSWC's Skyline Well, with 475 AFY additional production from the Basin. The model also estimates that the basin benefits from an increased 400 AFY of sustainable yield; this results in a 84% basin benefit due to impacts on the lower aquifer when pumping higher volumes from the upper aquifer.

The project could also be phased over time as needed to meet the purveyor's needs and allow for phased construction of new upper aquifer wells.

Benefits

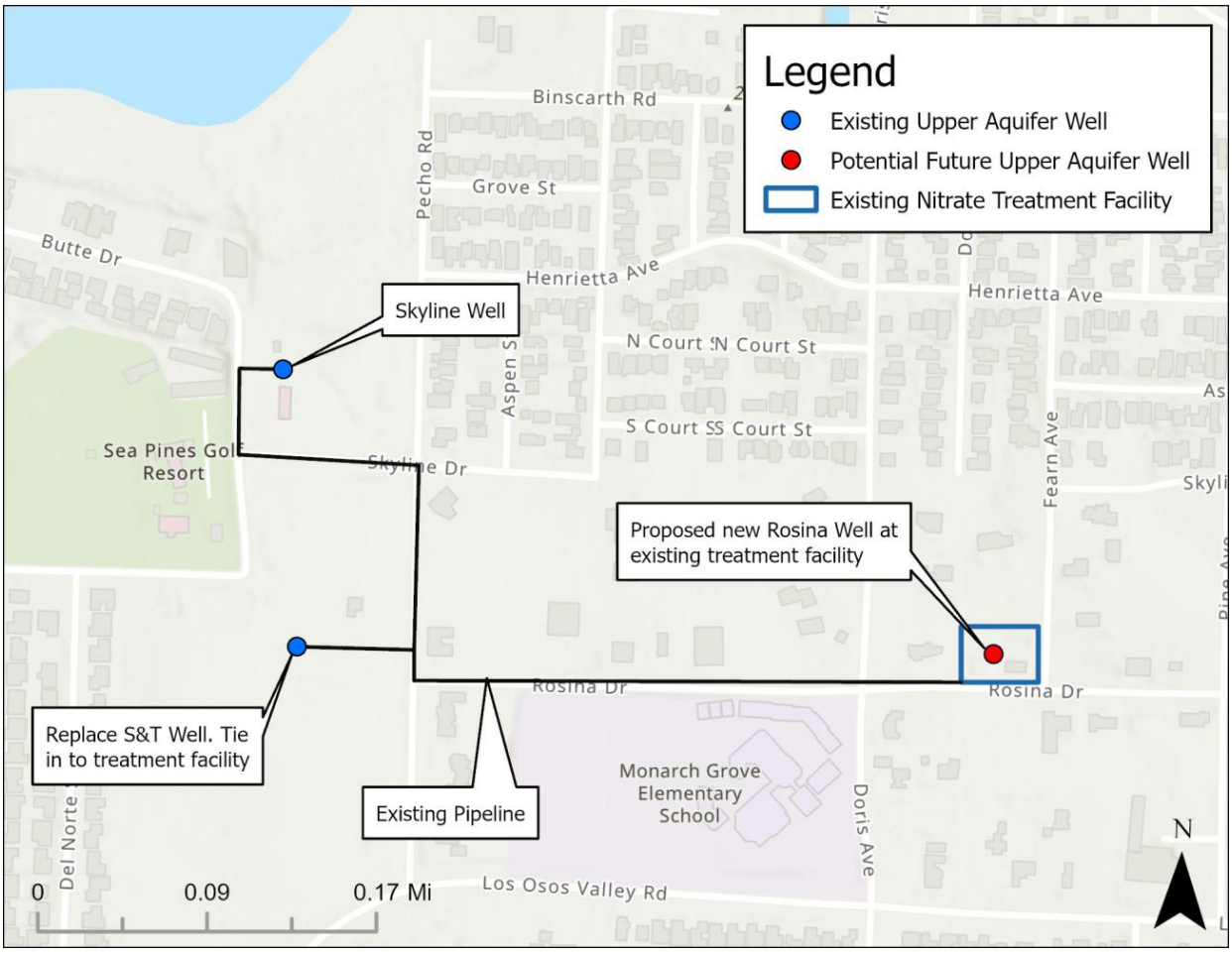
This alternative directly offsets purveyor pumping from the lower aquifer by maximizing production from the upper aquifer. The transfer of groundwater production from the lower aquifer to the upper aquifer will have a direct, beneficial impact on seawater intrusion. However, the Transient Model estimates that the transfer of water from the lower aquifer to the upper aquifer only provides a 84% basin benefit. Additionally, pumping and treating high nitrate water from the upper aquifer will also reduce contamination and support the continuing decline of nitrate concentrations toward the Basin Metric target (LOBMC, 2015).

Facilities

Figure 5-14 shows the proposed facilities for the upper aquifer nitrate treatment alternative. This alternative relies on GSWC's existing Rosina Nitrate Treatment Facility, which currently treats water from their Skyline Well. The treatment facility has capacity to treat additional water, and

GSWC has indicated that only additional brine storage would be needed to operate at its design capacity. Currently, the brine is trucked to South San Luis Obispo County Sanitation District (SSLOCSD) for disposal. When operated at its design capacity, the treatment facility will likely require brine disposal every one to two days. Further investigation is needed to confirm whether SSLOCSD can accept brine on a more frequent basis.

Figure 5-14. Upper Aquifer Nitrate Treatment Facilities



S&T Mutual has an existing upper aquifer well that can be tied into the Rosina Nitrate Treatment Facility with about 300 feet of new piping. Due to the current well condition, it will require extensive rehabilitation and may be more cost-effective to be replaced. For conservative cost estimating purposes, it is assumed this well will be replaced. Additionally, there is available space at the existing treatment facility to drill an additional upper aquifer well to serve the facility.

The purveyors have system interties that could be utilized to convey the treated water from GSWC's system to the other purveyor distribution systems.

Cost

Table 5-19 includes the upper aquifer treatment alternative costs. Detailed capital and O&M cost estimates are included in Appendix B. A key cost assumption is the cost to buy into the

existing treatment facility, which was estimated from the costs of constructing the Rosina Nitrate Treatment Facility.

Table 5-19. Alternative F- Upper Aquifer Nitrate Treatment, Cost Estimate

Items	Costs
Capital Cost	$8,900,000
Annualized Capital Cost	$400,000
Annual O&M	$422,000
Annual Total	**$822,000**
Annual Yield (AFY)	475
Basin Benefit (AFY)[1]	400
Unit Cost ($/AF)[2]	**$2,130**

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

1. Basin benefit is estimated from scenarios evaluated in the Transient Model. See Section 5.1.3 for more information.
2. Unit costs are based on the basin benefit yield.

Risks & Uncertainties

The largest risks and uncertainties for this alternative include:

- Institutional/ regulatory challenges
- Emerging contaminants
- Distribution infrastructure
- Brine Disposal

As an investor-owned utility regulated by the California Public Utilities Commission, GSWC may face potential regulatory challenges in leading a regional project and supplying water to other purveyors. They may also face challenges using an existing facility for regional benefit. These challenges could arise from restrictions within the regulatory framework, impacting interagency agreements and pricing structures. Addressing these regulatory barriers and approval by the California Public Utilities Commission will be essential to implement this alternative. If approved, the cost to buy into the existing infrastructure and invest in the necessary upgrades to the treatment facility will need to be negotiated.

Investigation of additional contaminants in the upper aquifer wells is needed to determine necessity of additional treatment. Costs could be significantly higher if additional treatment facilities are needed to treat other contaminants.

Agreements must be developed and executed, and operational details must be investigated to see if the interties will work or if additional costs will be incurred to have the system function.

The project will produce additional brine with more frequent disposal. The disposal site permitting issue needs further investigation to confirm project feasibility.

5.9 Alternative G – Water Resiliency Intertie Pipeline

LOCSD is considering the construction of a Water Resiliency Intertie Pipeline (Intertie) that would allow for delivery of potable water from the State Water Project (SWP) or other water to offset purveyor pumping from the Basin. The Intertie is envisioned to connect to the Chorro Valley Pipeline, which is owned and operated by the San Luis Obispo County Flood Control and Water Conservation District (County Flood Control District) and provides treated SWP supplies to users in the Chorro Valley and the City of Morro Bay. The Intertie includes approximately 2.5 miles of new pipeline from the Chorro Valley Pipeline to LOCSD's distribution system. On July 15, 2025, the County Flood Control District adopted an updated SWP Water Transfer Policy that establishes a framework to guide County Flood Control District staff, the Board and its SWP subcontractors in maximizing the SWP water supply and sets forth priorities and criteria for use.

Demand/Yield

If the requisite agreements can be reached with the County Flood Control District, LOCSD is considering delivering up to 600 AFY of SWP supplies through the Intertie when supplies are available. The Chorro Valley Pipeline was originally designed to deliver this volume to Los Osos and other water users (Montgomery Watson, 1995).

SWP supplies are highly variable, and climate change is increasing the variability, frequency, and magnitude of floods and droughts that contribute to the continued decline in SWP reliability (DWR, 2024). This alternative assumes LOCSD will conjunctively use surface water supplies to offset groundwater when supplies are available, and groundwater will be used in dry years when surface water supplies are limited. Using reliability estimates in the most recent SWP Delivery Capability Report, it is projected that LOCSD could receive an average of 300 AFY over a long-term period, which includes years receiving 600 AF and other years using less or no surface water supplies.

Benefits

Delivery of additional potable water would directly reduce the amount of purveyor groundwater pumping from the Basin on a 1:1 basis, resulting in a 100% basin benefit.

Facilities

Figure 5-15 presents the potential Intertie pipeline alignments from the Los Osos CSD Water Supply Resiliency Inter-Tie Memo (Wallace Group, 2022). This includes a new turnout from the Chorro Valley Pipeline and approximately 2.5 miles of 12" pipeline from Highway 1 south along South Bay Boulevard. This would tie in at the LOCSD distribution system near the intersection of South Bay Boulevard and Santa Ysabel Avenue. The Chorro Valley Pipeline turnout would include new valving and metering vault. The Intertie pipeline is expected to be 12" PVC except at bridge/creek crossings, where the pipe will either be ductile iron pipe mounted to the bridge or HDPE pipe directionally drilled (Wallace Group, 2022).

Cost

Table 5-20 lists the estimated Intertie cost for the average yield. Detailed capital and O&M cost estimates are included in Appendix B. The cost estimates are escalated from the Los Osos CSD

Water Supply Resiliency Inter-Tie Memo and include a range of estimated SWP purchase costs, presented in Table 5-21.

Table 5-20. Alternative G - Water Resiliency Intertie Pipeline, Cost Estimate

Items	Average Yield
Capital Cost	**$10,800,000**
Annualized Capital Cost	$490,000
Annual O&M	$30,000
Annual Total	**$520,000**
Annual Yield & Basin Benefit (AFY)	300
Facilities Unit Cost ($/AF)	**$1,730**
SWP Purchase Costs ($/AF)	$900 to $1,200 (see Table 5-21)
Total Unit Cost ($/AF)	**$2,600 to $2,900**

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

Figure 5-15. Possible Water Resiliency Intertie Pipeline Alignments

Source: Los Osos CSD Water Supply Resiliency Inter-Tie Memo (Wallace Group, 2022)

State Water Project Costs

The estimated SWP costs include three components:

- Water acquisition
- System/capacity buy-in
- Delivery charges

A recent report prepared for San Luis Obispo County – *State Water Project Supply Options and Costs for Paso Basin SWP Supplemental Water Supply Project* (Provost & Pritchard, 2025) – estimated the potential SWP costs for these three components.

Water Acquisition

The County report cited a recent permanent sale of SWP water at $8,500 per AF of annual Table A rights, which is an equivalent annual unit cost of roughly $800 to $900/AF when annualized and accounts for long-term average delivery volumes.

An alternative to water rights acquisition is the annual purchase of imported water. SWP spot market purchases vary significantly depending on the water year type and supply availability. The County report also estimated costs to purchase water on an annual basis would range from $200 to $500, assuming that water would only be acquired in normal to wet years. As an example, the County Flood Control District recently executed an agreement to sell SWP for $450/AF, which aligns with the values in the table for a normal water year type.

System / Capacity buy-in

The County report estimates acquisition costs could range from $0 to $2,900/AF. The report notes that there is no defined process for SWP contractors to allocate their unallocated Table A Amounts, and it's unusual to require an initial buy-in charge. This study does not include any system/capacity buy-in costs due to the uncertainty of these costs.

Delivery Charges

If Table A SWP rights are acquired, the County report estimates equivalent delivery costs (annual SWP charges divided by the average water delivered) as roughly $1,500/AF, divided between costs paid based on Table A contract amounts and variable costs based on deliveries. The analysis includes a range of assumptions with significant uncertainty and is described in Section 5 of the report (Provost & Pritchard, 2025).

If water is acquired on an annual basis, the County report notes that delivery would require wheeling agreements with the Department of Water Resources (DWR) and Central Coast Water Authority (CCWA). Costs would include variable costs from DWR and CCWA totaling roughly $700/AF.

Combined Costs

The combined costs from the different categories are presented in Table 5-21 for purchases on the open market and the purchase of Table A rights. Note that the actual costs to acquire and deliver SWP water are subject to negotiation with state water contractors. At this time, LOCSD

is interested in purchasing water on the open market and executing transfers for delivery of the water.

Table 5-21. Estimated SWP Purchase Cost

Cost Component	Open Market Cost per AF	Table A Rights Cost per AF
Water Acquisition	$200 to $500	$900
System/Capacity Buy-In	$0	$0
Delivery Charges	$700	$1,500
Total	**$900 to $1,200**	**$2,400**

Note: Actual costs to acquire and deliver SWP water are subject to negotiation with state water contractors. At this time LOCSD has indicated they are interested in purchasing water on the open market rather than Table A rights.

Risks & Uncertainties

The largest risk or uncertainty for this alternative is the price and future availability of SWP water.

5.10 Alternatives Comparison

Table 5-22 summarizes the yield, unit costs, and summary findings for each alternative designed to offset purveyor pumping from the lower aquifer. Of the evaluated options, Alternatives F and G are the most cost-effective, but each has specific uncertainties that must be addressed before implementation:

- **Upper Aquifer Nitrate Treatment (Alternative F)** uncertainties include the cost to buy into existing GSWC treatment facility and the required investment to expand reliable production capacity, including the investigation of potential emerging contaminants, brine disposal, and existing distribution infrastructure to convey the treated supply.
- **Water Resiliency Intertie Pipeline (Alternative G)** uncertainties include the cost of acquiring and conveying imported water to Los Osos.
- **Urban Reuse – Two Schools (Alternative A1)** may be cost-effective depending on on-site conversion costs. Since these are site-specific, a recommended next step is to estimate these costs and then determine whether to proceed with the alternative.

Table 5-22. Alternatives Comparison

Alternative		Project Water Use (AFY)	Basin Benefit (AFY)[1]	Unit Cost ($/AF)[2]	Findings/ Recommendations
A1	Urban Reuse – Two Schools	12	9	$6,100	High costs for recycled water conversion. Site specific cost estimates for the conversion are needed.
A2	Urban Reuse – Memorial Park	50	38	$6,700	
B	Ag Reuse + Recovery	12	9	$31,100	High cost to recover water in Creek Valley. Alternatives may be viable for backup disposal for the LOWRF.
C	Creek Discharge				
C1	No GRRP, Recovery	160	120	$5,800	
C2	GRRP, No Treatment + Recovery	100	75	$7,300	High unit cost to recover water in the Creek Valley. GRRP projects have extensive permitting efforts. Complex operation of treatment facilities for half the year.
C3	GRRP, Ozone/ BAC Treatment + Recovery	150	113	$9,400	
C4	GRRP, MF/RO Treatment + Recovery	130	98	$32,500	
D	Seawater Barrier	340	360	$12,100	High unit costs and extensive permitting. This alternative prevents seawater intrusion and provides higher yields than the water injected.
E	Direct Potable Reuse	340	255	$18,100	High unit costs and extensive permitting.
F	Upper Aquifer Nitrate Treatment	475	400	$2,100	Costs may increase depending on the cost to buy into existing infrastructure and if other contaminants must be treated. Also, there are potential institutional barriers.
G1	Water Resiliency Intertie Pipeline	300	300	$2,600 - $2,900	Uncertainty around SWP purchase and conveyance costs.

1. Basin benefit is estimated from scenarios evaluated in the Transient Model. See Section 5.1.3 for more information.
2. Unit costs are the annual costs ($/yr) divided by Basin benefit (AFY).

6.0 Recommendations

This chapter describes the recommended projects, implementation plan, construction financing plan and revenue program, and next steps.

6.1 Recommended Projects Descriptions

As discussed in Section 5.9, the top projects include Upper Aquifer Nitrate Treatment and Water Resiliency Intertie Pipeline. Considering the preliminary definition of each alternative and associated uncertainty in estimated unit costs, it is recommended to:

1. First take steps to address uncertainties in the top alternatives:
    - **Upper Aquifer Nitrate Treatment (Alternative F):** Engage with GSWC to define a potential institutional pathway for conversion of Rosina Nitrate Treatment Facility to a regional facility; define required upgrades to reliably expand production capacity, investigate potential water quality issues, and investigate brine disposal feasibility.
    - **Water Resiliency Intertie Pipeline (Alternative G):** Engage with County Flood Control District and other relevant stakeholders to better define potential imported water purchase terms.
2. Conduct a site-specific analysis and revise the cost estimate for the **Urban Reuse – Two Schools (Alternative A1)**. Based on the updated costs and site-specific factors, and if funding is available for recycled water conversion, consider implementing this project.
3. Consider the need for alternative disposal locations for future discharge capacity needs. Discharge options include reuse at **Los Osos Valley Memorial Park (Alternative A2) and agricultural reuse (Alternative B)**.

For this Study, the recommended projects discussed in detail are:

- Upper Aquifer Nitrate Treatment
- Water Resiliency Intertie Pipeline

Implementation of Urban Reuse – Schools is included in case the next step of conducting a site-specific analysis results in a determination that the project should move forward.

6.1.1 Upper Aquifer Nitrate Treatment

The facilities for the Upper Aquifer Nitrate Treatment project, shown in Figure 6-1, includes:

- Two new upper aquifer wells.
  - The S&T Mutual well could be rehabilitated instead of replaced depending on its current condition.
- Approximately 300 feet of new 6-inch pipeline to tie the S&T Mutual well into the Rosina Nitrate Treatment Facility.
- Upgrades to the existing Rosina Nitrate Treatment Facility .
  - According to GSWC, the existing treatment capacity is 600 GPM and is capable of treating the project's estimated flows. The existing treatment facility currently operates at about 170 GPM, and would increase to about 500 GPM to produce the project's 550 AFY. Additional study is needed to determine if improvements are needed to reliably increase the existing facilities' treatment capacity.
  - Additional brine waste storage.
- Potentially new brine waste disposal needs.
- Potentially new purveyor system interconnections so convey treated water to each purveyor.

Further studies are required to determine the specific improvements needed to reliably increase production capacity. The project assumes production of 550 AFY for treatment, representing an increase of 475 AFY from current capacity. As a regional project, water would be delivered to all purveyors through existing interconnections; however, additional analysis is needed to confirm whether these interconnections can accommodate the increased supply or if further off-site improvements are necessary. The project is assumed to be operated by GSWC but would be subject to discussions during project development.

Table 6-1 includes the upper aquifer treatment alternative costs. Detailed capital and O&M cost estimates are included in Appendix B. A key assumption is the cost to buy into the existing treatment facility, which was estimated from the costs of constructing the Rosina Nitrate Treatment Facility.

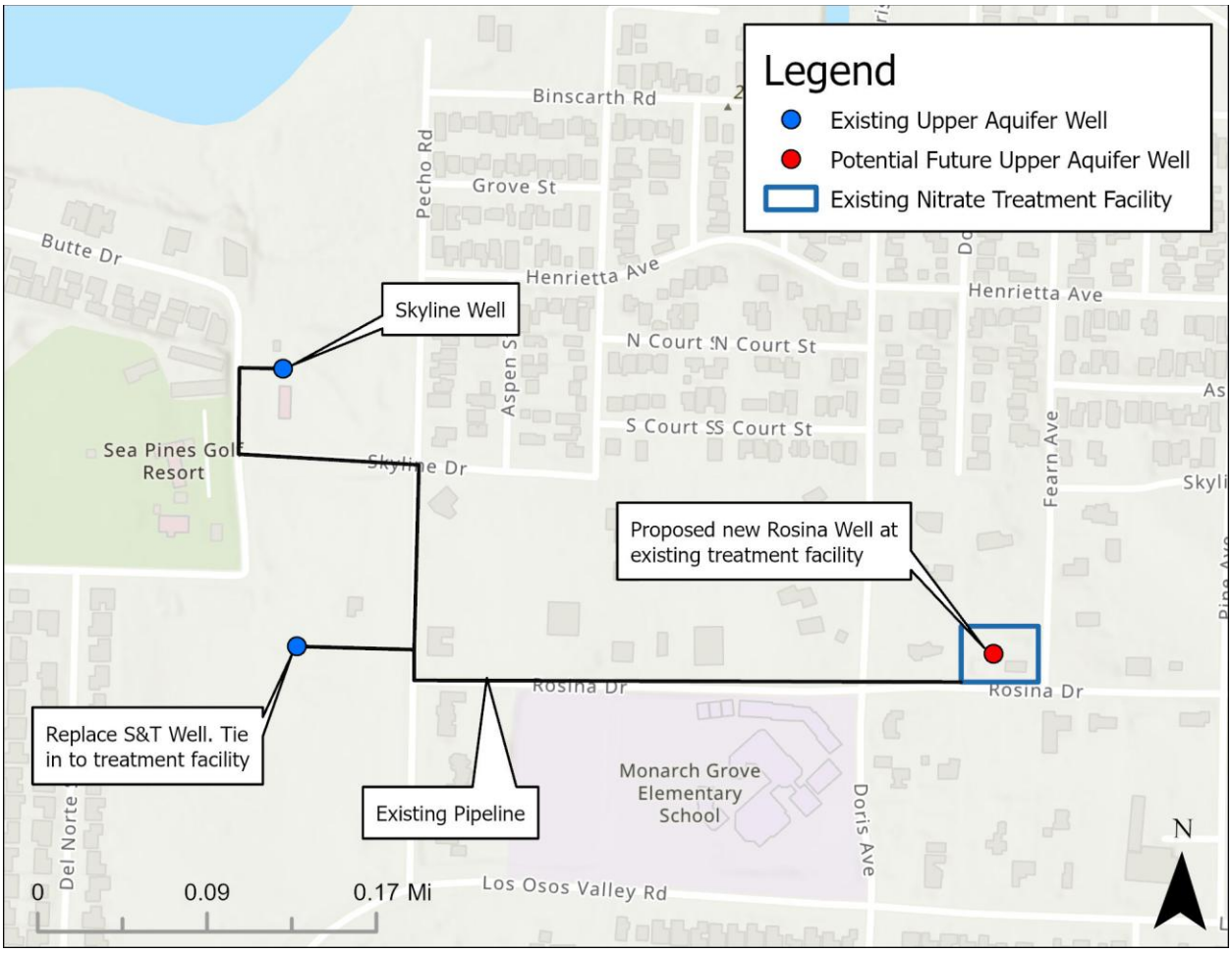
Table 6-1. Upper Aquifer Nitrate Treatment, Cost Estimate

Items	Costs
Capital Cost	$8,900,000
Annualized Capital Cost	$400,000
Annual O&M	$422,000
Annual Total	**$822,000**
Annual Yield (AFY)	475
Basin Benefit (AFY)[1]	400
Unit Cost ($/AF)[2]	**$2,130**

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

1. Basin benefit is estimated from scenarios evaluated in the Transient Model. See Section 5.1.3 for more information.
2. Unit costs are based on the basin benefit yield.

Figure 6-1. Upper Aquifer Nitrate Treatment Project Facilities



6.1.2 Water Resiliency Intertie Pipeline

The facilities Water Resiliency Intertie Pipeline alternative, shown in Figure 6-2, includes:

- A new turnout from the Chorro Valley Pipeline
- Approximately 13,000 feet of 12" pipeline to convey SWP to LOCSD / purveyors
- Acquisition of SWP water rights, opportunistic SWP water purchases, or purchase of other water rights.

The project is anticipated to deliver up to 600 AFY to LOCSD in normal to wet SWP years when SWP water is available, with an average of 300 AFY, based on delivery occurring in about half the years of operation. This supplemental water would offset LOCSD/purveyor's groundwater pumping. The pipeline is assumed to be operated by LOCSD.

Table 6-2 lists the estimated cost for the Water Resiliency Intertie Pipeline. Detailed capital and O&M cost estimates are included in Appendix B. The cost estimates are escalated from the Los Osos CSD Water Supply Resiliency Inter-Tie Memo and include a range of estimated SWP purchase costs presented in Table 5-21.

Figure 6-2. Water Resiliency Intertie Pipeline Alignments

Source: Los Osos CSD Water Supply Resiliency Inter-Tie Memo (Wallace Group, 2022)

Table 6-2. Water Resiliency Intertie Pipeline, Cost Estimate

Items	Average Yield
Capital Cost	**$10,800,000**
Annualized Capital Cost	$490,000
Annual O&M (exclude water purchase costs)	$30,000
Annual Total	**$520,000**
Annual Yield and Basin Benefit (AFY)	300
Facilities Unit Cost ($/AF)	**$1,730**
SWP Purchase Costs ($/AF)	$900 to $1,200 (see Table 5-21)
Total Unit Cost ($/AF)	**$2,600 to $2,900**

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

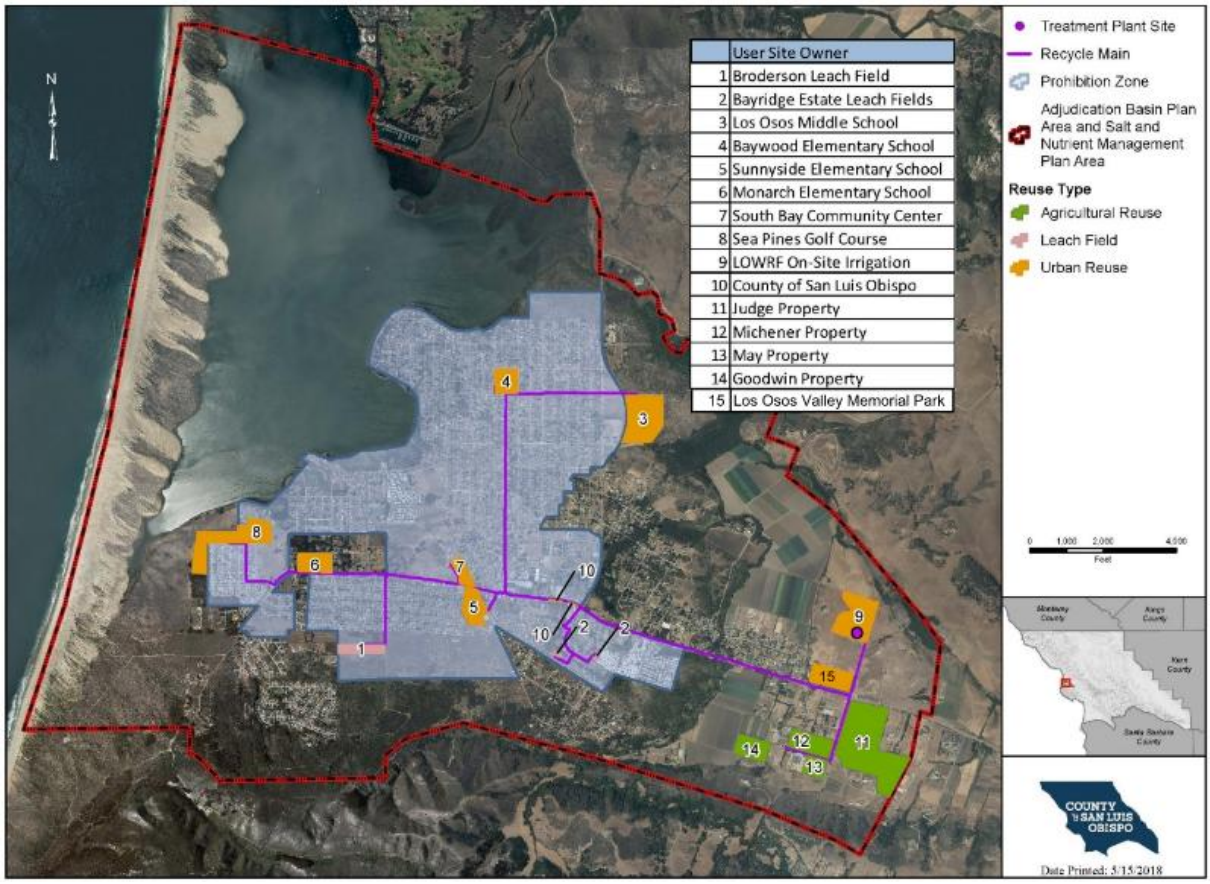
6.1.3 Urban Reuse – Two Schools

Urban reuse at Baywood Elementary School and Sunnyside Elementary School, shown as site 4 and 5, respectively, in Figure 6-3 would include the conversion of the onsite irrigation system to recycled water. Total estimated demand of 12 AFY translates to a peak hour demand of 70 GPM, which can be managed by the existing recycled water system. The existing recycled water distribution system is located adjacent to both potential urban reuse sites, but all connections would need to be converted for recycled water irrigation. This includes updating existing irrigation systems to meet Title 22 requirements, connection assemblies and metering to the recycled water system, required backflow prevention to protect potable water systems, and required signage. LOCSD is considering the acquisition of the Sunnyside Elementary School property and, if acquired, anticipates having to replace the existing irrigation system to improve reliability and efficiency. The irrigation system updates are anticipated to include the ability to irrigate with recycled water. In summary, project facilities would include:

- Turnout and pipeline to connect the existing recycled water pipeline to the school's irrigation system.
- Recycled water meter and backflow protections.
- On-site adjustments, as needed, to comply with Title 22 requirements.

The recycled water system is assumed to continue to be operated by the County and system operations can reliably meet the needs of local irrigation sites. Individual site owners would be responsible for meeting compliance requirements defined by the County and based on the existing recycled water use permit, such as on-site supervisors and reporting. Both schools are currently owned by San Luis Coastal Unified School District, but as noted previously, the Sunnyside Elementary School property will likely have a new owner prior to recycled water being implemented at the site. Both sites have previously expressed interest in use of recycled water and are permitted for use of recycled water but a 'commitment letter' will not be requested until site specific conversion cost assessments are completed.

Figure 6-3. Current and Potential Recycled Water User Sites



Source: Adapted from 2024 Annual Report for Recycled Water Use (2025), Figure 1

Table 6-3 presents the capital and annual cost for urban reuse at the two schools. Detailed capital and O&M cost estimates are included in Appendix B. The unit cost for recycled water conversion at the schools is high due to low recycled water demand and the high estimated cost for recycled water conversion ($350,000 construction costs per site based on other recycled water conversions in Los Osos). However, the costs for recycled water conversion should be updated following site-specific evaluations.

Table 6-3. Urban Reuse – Two Schools, Cost Estimate

Items	Values
Capital Cost	$1,000,000
Annualized Capital Cost	$45,000
Annual O&M	$10,000
Annual Total	**$55,000**
Annual Yield (AFY)	12
Basin Benefit (AFY)[1]	9
Unit Cost ($/AF)[2]	**$6,110**

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

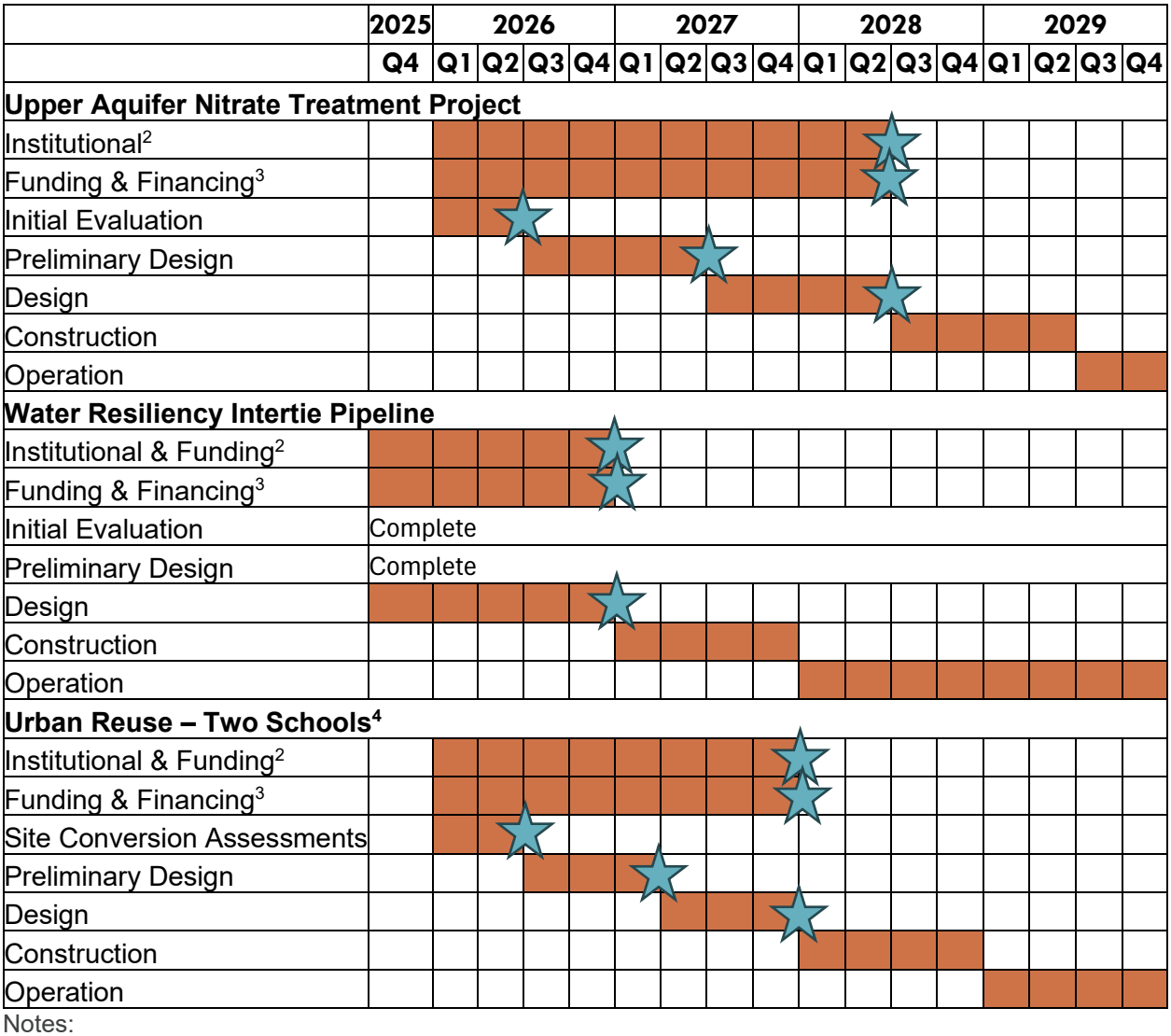
1. Basin benefit is estimated from scenarios evaluated in the Transient Model. See Section 5.1.3 for more information.
2. Unit costs are based on the basin benefit yield.

6.2 Implementation Plan

6.2.1 Project Schedule

Project schedules for each project are presented in Figure 6-4.

Figure 6-4. Project Schedules



Notes:

1. Stars indicate decision points during project implementation regarding whether to proceed, primarily based around cost effectiveness.
2. "Institutional" entails agreements, permitting, land acquisition, and other project implementation pre-construction components not included in design. These are addressed in Section 6.2.2.
3. Funding and Financing is discussed in Section 6.3.
4. Service to each school will likely proceed on different timelines since the Sunnyside Elementary School is currently for sale and would likely include irrigation system upgrades as part of site renovations.

Decision points for each project, indicated by stars in Figure 6-4, will occur during each project phase as the project is better defined and uncertainties around cost, funding, agreements, permits, etc. are addressed. Information developed during these phases may result in a decision not to pursue the project further due to cost or other obstacles.

6.2.2 Institutional Needs

This section addresses institutional needs for each recommended project, including:

- Permits.
- Right-of-way / Land Acquisition.
- Environmental Documentation.
- Agreements.
- Water Rights Impact.

6.2.2.1 Permits

Each recommended project will have different sets of permits required for implementation.

Upper Aquifer Nitrate Treatment

The project is anticipated to require the following permits:

- County well construction permits.
- Coastal development permit for construction in the coastal zone.
- Encroachment permits within County right-of-way if new purveyor system interconnections or pipelines are needed to convey treated water to each purveyor.

Water Resiliency Intertie Pipeline

The project is anticipated to require the following permits:

- Encroachment permits would likely be required for construction through a combination within Caltrans, County, and City of Morro Bay. Easements would be needed for construction on private property.
- Coastal development permit for construction in the coastal zone.
- U.S Army Corps of Engineers and California Department of Fish and Wildlife permits may be required if the pipeline includes creek crossings via horizontal directional drilling for construction activity near a streambed or impacts to waters of the U.S. The creek crossings will be evaluated during the design phase.
- SWRCB Division of Drinking Water waivers.

Urban Reuse – Two Schools

Recycled water would be produced under the existing County Recycled Water Use Permit. Encroachment permits would likely be required for construction within County right-of-way.

6.2.2.2 Right-of-Way / Land Acquisition

Each recommended project has different right-of-way or land acquisition needs for implementation.

Upper Aquifer Nitrate Treatment

No land or right-of-way acquisition is anticipated for this project since the two new wells would be located at existing purveyor sites (GSWC and S&T Mututal), and the treatment plant upgrades would occur within the existing GSWC treatment facility site. It is anticipated that if new purveyor system interconnections or pipelines are needed to convey the treated water, they would be constructed in the County public right-of-way.

Water Resiliency Intertie Pipeline

This project would require public right-of-way easements within state and County right-of-way for the pipeline. Private easements may be required for facilities but would be determined during the design phase.

Urban Reuse – Two Schools

No new easements are anticipated since County-owned facilities are anticipated within County right-of-way and customer facilities are anticipated to be located on the customer's property.

6.2.2.3 Environmental Documentation

Each recommended project would require CEQA compliance. The level of CEQA document – Negative Declaration, Mitigated Negative Declaration, Environmental Impact Report – would be determined as part of planning for each project. The Water Resiliency Intertie Pipeline completed a Draft Initial Study and Mitigated Negative Declaration in November of 2023 (SWCA Environmental Consultants, 2023).

6.2.2.4 Agreements

Each recommended project will require different sets of agreements for implementation.

Upper Aquifer Nitrate Treatment

This project would need agreement from GSWC and approval from its regulatory body, the California Public Utilities Commission, to use facilities that were originally funded by GSWC ratepayers and will now be used as part of a regional project that involves other water agencies.

Related to this, project ownership and operational responsibilities will need to be determined for project planning, design, and operation. For example, the upgraded treatment facility could be owned and operated by GSWC with agreements with the other purveyors or owned and operated by a joint powers authority (or variations within those frameworks).

The facility may need new brine disposal agreements as well.

Water Resiliency Intertie Pipeline

The project will need agreements for SWP water purchase and conveyance, either on a long-term basis or an as-needed, annual basis. As project lead, LOCSD will likely need cost-sharing or recovery guidelines with the other purveyors.

Urban Reuse – Two Schools

Prior to initiating construction at each school, the County and each customer will execute agreements for recycled water service that include customer commitments for recycled water use similar to those already executed for other sites.

6.3 Funding and Financing

General funding and financing considerations are presented in Section 6.3.1 followed by funding and financing assumptions specific to each recommended project in Section 6.3.2.

6.3.1 General Considerations

Securing adequate funding for program planning and implementation is one of the biggest challenges facing local agencies. Successful implementation requires both capital costs as well as ongoing funding to support continued administration, operation, maintenance, and replacement. Utilities typically use some combination of internal funding (e.g., water rates), grant funding, and debt funding to pay for project capital costs. O&M costs are typically paid for by internal funds. Grant funds should not be used for O&M costs (and most grant programs explicitly prohibit this practice).

The following sections outline approaches to funding and financing the recommended recycled water projects, followed by identifying various funding sources and their associated requirements.

6.3.1.1 Local Funding

Although grants and loans are available for the planning and implementation of recycled water programs, these grant and loan programs typically require a local funding source to satisfy the cost match requirements. Additionally, local funding is necessary for O&M costs. Thus, a secure local funding mechanism is required for the planning, implementation, operations, and maintenance of a recycled water program.

Internal funding is revenue generated from customers that can be saved up over time to fund initial capital costs, used to pay back loans, or cover ongoing O&M and future replacement costs.

Public agencies have several potential funding mechanisms to choose from, such as general funds, enterprise funds, property taxes, and sales tax. The methods used by individual agencies, however, are typically limited. These funding mechanisms are generally used to compile funds for “pay-as-you-go” funding or debt funding. Debt funding is discussed further in the following section.

6.3.1.2 Debt Funding

Using existing funds for capital payments reduces the net overall costs of capital facilities by avoiding the cost of interest payments on debt funds and arranging financing. However, public agencies rarely have the amount of funds on hand that is necessary to pay for a large capital improvement project. The advantage of debt funding is the availability of a large sum, initially

with payback, extended over many years. The long-term payback period matches well with the anticipated long-term revenue expected from customers. However, the cost of borrowing funds can become a significant portion of a system's payback cost.

Debt funding options for recycled water and water supply projects generally consist of either low-interest loans through public programs or private bonds from the open market. The SWRCB Clean Water and Drinking Water Revolving Fund Programs (CWSRF & DWSRF) are the most popular source of low-interest loans for water projects. Other public debt funding options include the California Infrastructure and Economic Development Bank (I-Bank) and the federal Water Infrastructure Finance and Innovation Act (WIFIA) programs. These programs tend to have higher interest rates than SRF but fewer compliance and reporting requirements.

Many types of private debt options are available on the open market. The three most common types of private debt funding used for recycled water projects are general obligation bonds, revenue bonds, and certificates of participation. These options have higher interest rates than SRF but generally have more flexibility in debt structure. Each has different governance approval requirements.

6.3.1.3 Grant Funding

Potential State and Federal grant funding for water project planning and implementation can change each year as approved budgets and priorities change each year at the state and federal levels. Below is a list of the most popular programs; however, a comprehensive review of available programs is recommended as each project develops.

State grant funding over the next several years will be driven by allocations of funds from California Proposition 4 – the Safe Drinking Water, Wildfire Prevention, Drought Preparedness, and Clean Air Bond Act of 2024. Prop 4 is a $10 billion general obligation bond measure approved by voters in November of 2024. It funds a wide range of environmental and water-related projects aimed at enhancing the state's climate resilience and public safety. Water-related funding buckets include:

- SWRCB Grants and Loans that Improve Water Quality or Help to Provide Clean, Safe, and Reliable Drinking Water ($610M).
- DWR Groundwater Banking, Groundwater Recharge, or Instream Flow Projects that Support Conjunctive Use of Groundwater and Surface Water Supplies ($386M).
- SWRCB Grants and Projects Related to Water Reuse and Recycling ($386M).
- DWR Capital Investments in Brackish Desalination, Contaminant and Salt Removal, and Salinity Management Projects to Improve Water and Drought Resilience ($62M).
- DWR Regional Conveyance Projects or Repairs to Existing Conveyances ($75M).
- DWR Projects related to integrated regional water management to improve climate resilience on a watershed basis ($100M).

Federal funding programs continue to be updated, but the three most popular and likely funding sources for new water projects in Los Osos are the U.S. Army Corps of Engineers (USACE) Water Resource Development Act (WRDA) Grant program, the United States Bureau of

Reclamation (USBR) WaterSMART Grant Programs, and the United States Department of Agriculture (USDA) Rural Development Water and Waste Disposal Loan & Grant Program.

The USACE WRDA grant opportunity is designed to support the planning, design, and implementation of water resource projects that enhance flood protection, ecosystem restoration, navigation, and water supply. USACE WRDA also supports reuse for municipalities, water districts, and regional agencies. WRDA legislation is passed every two years by Congress to authorize new projects and update existing ones. Funding availability and match requirements vary by project type and congressional appropriations and typically fund up to 50% of the total project cost with non-federal sponsors responsible for the remaining share. Projects must be authorized through WRDA and then compete for funding under USACE's annual work plan or other federal appropriations. LOCSD has been in communication with USACE regarding WRDA grant eligibility for the Water Resiliency Intertie Pipeline. USACE has indicated that the project may qualify for up to $5M in WRDA grant funding. However, approximately 25% of the grant amount would be allocated to overhead costs for the project, reducing the available funding for construction to around $3.75M.

The USBR WaterSMART Grants are intended to fund the planning or construction costs of local projects that improve water conservation and management. Through this program, federal funding is provided to irrigation and water districts located in the western US. Funding opportunities and requirements vary depending on available program funding. The amount of available funds for WaterSmart Grants is subject to annual Federal fiscal year appropriations. Generally, USBR will fund 25% to 50% of a project subject to individual program maximum grant limits. Potential funding programs for Los Osos projects include the Drought Response Program and Project Design Grants.

The USDA Water and Waste Disposal Loan & Grant Program provides financial assistance in the form of grants and loans for the development and rehabilitation of water, wastewater, and storm drain systems within rural communities. Funds may be used for costs associated with planning, design, and construction of new or existing water, wastewater, and storm drain systems. Eligible projects include storage, distribution systems, and water source development. There are no funding limits, but the average project size is between $3 and $5 million. Eligible areas are rural areas and towns with populations of 10,000 or fewer. The Los Osos area has a population over 10,000, but LOCSD's water service area population is less than 10,000 and may still be eligible.

6.3.2 Recommended Projects, Funding & Financing Analysis

Annual cost projections were developed for each recommended project by applying the following assumptions:

- Construction is estimated to occur in 2028 for all alternatives, as shown in Table 6-4.
- Pre-construction costs for additional planning, design, permitting, etc. will be funded by cash-on-hand using local funding sources such as general funds, enterprise funds, property taxes, or sales tax. However, these costs are eligible to be included in debt funding, if needed.

- Construction phase costs, O&M costs, and water purchase costs are escalated at 3% per year.
- Construction phase costs are annualized at a 2.1% interest rate over 30 years, which is equivalent to the long-term average historical SRF loan rate. Due to the relatively low capital cost, the urban reuse alternative is assumed to be funded by cash-on-hand and would not use debt funding.
- SRF loans allow for repayment to start after construction is complete. Since all construction phase costs are assumed to be included in the SRF loan, no debt costs are shown during construction in 2028.
- Project costs will be recovered through existing purveyor water rates. For urban reuse, the County will collect revenue based on its recycled water rates.
- No costs from the recommended projects can be allocated to water pollution control. The urban reuse project would slightly reduce deliveries to the Broderson Leach Field.

Key cost assumptions used to develop the annual projections are presented in Table 6-4.

Table 6-4. Recommended Projects, Funding and Financing Assumptions

Items	Upper Aquifer Nitrate Treatment Project	Water Resiliency Intertie Pipeline	Urban Reuse – Two Schools
Capital Cost (2025$)	$8,900,000	$10,800,000	$1,000,000
Pre-Construction Cost (2025$)	$1,000,000	$1,200,000[1]	$90,000
Construction Phase Cost (2025$)	$7,900,000	$9,600,000	$910,000
Construction Phase Cost (2028$)	$8,600,000	$10,500,000	$990,000
Annualized Capital Cost	$390,000	$480,000	N/A
Annual O&M ($/Yr)	$450,000	$30,000	$10,000
Annual Water Purchases (Long-Term Average) ($/Yr)	--	$310,000[2]	--

Note: Refer to unit costs in Section 5.1.2 and detailed cost estimates in Appendix B.

1. Preconstruction costs are estimated as 10% of the total capital costs for consistency across projects. However, LOCSD has already completed some pre-construction phase efforts so the pre-construction cost estimate for the Water Resiliency Intertie Pipeline is likely high.
2. The cost assumes 300 AFY, on average, is purchased and uses the average of the range of water purchase price ($900-$1,200, see Table 5-21). However, water purchase volumes will vary, with some years purchasing up to 600 AF, while others year will have no water purchases at all.

Annual cost projections are shown in the following tables for:

- Upper Aquifer Nitrate Treatment Project (Table 6-5).
- Water Resiliency Intertie Pipeline (Table 6-6).
- Water Resiliency Intertie Pipeline with 50% Construction Grant (Table 6-7). This table is provided due to the potential for grant funding for the project's construction described in Section 6.3.1.3.
- Urban Reuse – Schools (Table 6-8).

Table 6-5. Annual Cost Projections, Upper Aquifer Nitrate Treatment Project

Items	2026	2027	2028	2029	2030	…	2058
Pay-Go	$500,000	$500,000					
Annual Debt Service				$390,000	$390,000		$390,000
Annual O&M				$510,000	$520,000		$1,190,000
Total Annual Cost	**$500,000**	**$500,000**	**$0**	**$900,000**	**$910,000**		**$1,580,000**

Table 6-6. Annual Cost Projections, Water Resiliency Intertie Pipeline

Items	2026	2027	2028	2029	2030	…	2058
Pay-Go	$600,000	$600,000					
Annual Debt Service				$480,000	$480,000		$480,000
Annual O&M				$34,000	$35,000		$80,000
Annual Water Purchases (Average)				$350,000	$360,000		$820,000
Total Annual Cost	**$600,000**	**$600,000**	**$0**	**$864,000**	**$875,000**		**$1,380,000**

Table 6-7. Annual Cost Projections, Water Resiliency Intertie Pipeline with 50% Capital Grant

Items	2026	2027	2028	2029	2030	…	2058
Pay-Go	$600,000	$600,000					
Annual Debt Service				$240,000	$240,000		$240,000
Annual O&M				$34,000	$35,000		$80,000
Annual Water Purchases (Average)				$350,000	$360,000		$820,000
Total Annual Cost	**$600,000**	**$600,000**	**$0**	**$624,000**	**$635,000**		**$1,140,000**

Table 6-8. Annual Cost Projections, Urban Reuse – Two Schools

Items	2026	2027	2028	2029	2030	…	2058
Pay-Go	$45,000	$45,000					
Construction Cost[1]			$990,000				
Annual O&M				$11,000	$12,000		$27,000
Total Annual Cost	**$45,000**	**$45,000**	**$990,000**	**$11,000**	**$12,000**		**$27,000**

Note 1: Due to the relatively low capital cost, the urban reuse alternative is assumed to be funded by cash-on-hand and would not use debt funding.

6.4 Potential Risks and Delays

The potential risks for the implementation of each of the recommended projects and potential actions to minimize these risks are described below.

Upper Aquifer Nitrate Treatment Project

- There are potential implementation barriers to convert GSWC's Rosina Nitrate Treatment Facility to a regional facility. Early engagement with GSWC and other stakeholders is needed to determine if this is a viable regional project and to develop the required institutional arrangments to implement the project.
- The following risks could have significant cost impacts that delay or prevent project implementation. It is recommended that these issues are investigated in detail early in the implementation stages to better define the project and costs, including analysis of:
    - Required upgrades to reliably expand production capacity at the Rosina Nitrate Treatment Facility.
    - Other groundwater quality issues that could require additional treatment facilities.
    - Brine disposal with the expanded treatment capacity.
    - Potential to convey water to purveyors through existing interconnections.

Water Resiliency Intertie Pipeline

- Escalating construction costs could delay the project's implementation and could be mitigated through incorporating design innovations to reduce costs, actively pursuing additional funding and financing sources to minimize ratepayer impacts, and establishing cost-sharing agreements with other purveyors interested in partnering.
- Uncertainty in the imported water purchase terms is also a potential implementation risk. LOCSD should continue to maintain proactive engagement with the County Flood Control District and other stakeholders to clarify and negotiate purchase terms early, ensuring predictable delivery costs and reducing financial uncertainty.

Urban Reuse – Schools

- Customer site conversion costs are the largest risk for this project's implementation. Site specific assessments should be completed first to better understand recycled water conversion costs for each site.
- Uncertainty in funding availability for recycled water conversion could also delay the project so pursuit of grants and engagement with each potential customer should occur during the next phases of implementation.

6.5 Next Steps

Immediate next steps for each of the recommended projects are described below.

Upper Aquifer Nitrate Treatment Project

The purveyors should:

- Engage with GSWC to define a potential institutional pathway for the conversion of the Rosina Nitrate Treatment Facility to a regional facility.
- Define required upgrades to reliably expand production capacity.
- Investigate potential groundwater quality issues.
- Investigate brine disposal feasibility.
- Investigate the feasibility of conveying water to purveyors through existing interconnections.

Water Resiliency Intertie Pipeline

The LOCSD should:

- Complete design of the project.
- Engage with County Flood Control District and other relevant stakeholders to better define potential imported water purchase terms.
- Pursue funding and financing options to minimize ratepayer impacts.
- Develop cost-sharing or recovery guidelines with the other purveyors.

Urban Reuse – Schools

The County should:

- Conduct customer site conversion assessment to estimate recycled water service costs.
- Based on the updated costs and site-specific factors, and if funding is available for recycled water conversion, consider implementing this project.

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Appendix A WRFP Recommended Outline Crosswalk

A

WRFP Recommended Outline	WRFP Study Crosswalk
Project Area	
1. Detailed Maps	Chapter 1
2. Land Use	Section 1.2.5
3. Population	Section 1.2.6
Water Supply Characteristics and Facilities	
1. Description of all wholesale and retail entities.	Section 2.1
2. All sources of water for study area, major facilities, costs (fixed and variable), subsidies, and customer prices.	Section 1.2.3, 2.2, 2.3, 2.4
3. Beneficial uses of receiving waters, degree of use, and portion of flow that is effluent.	N/A
4. Capacities of present facilities, existing flows, estimated years when capacities will be reached for existing major components (water treatment plants, major transmission, and storage facilities).	Section 2.5
5. Groundwater basins; including quantities extracted by all users, natural and artificial recharge, losses by evapotranspiration, inflow and outflow of basins, and safe yield or overdraft.	Section 1.2.3, 2.6
6. Water quality of groundwater and surface water.	Section 1.2.4
7. Water use trends, future demands, prices, and costs.	Section 2.7
8. Sources for additional water and plans for new facilities (for both the local entity and the wholesalers).	Section 2.9
Wastewater Characteristics and Facilities	
1. Description of entities.	Section 3.1
2. Description of existing facilities, including treatment/reuse processes and schematic(s), design criteria, current capacities, current flows, current water quality characteristics and beneficial uses of the water resources affected by the facility, and the current discharge location(s).	Section 3.2
3. Wastewater treatment process schematics (existing and proposed) and flows for each stage of treatment (primary, secondary, and tertiary/advanced).	Figure 3-3
4. Description of current system users (% residential, commercial, industrial, etc.).	Section 3.2
5. Water quality of effluent and any seasonal variation.	Section 3.3
6. Additional facilities needed to comply with waste discharge requirements.	Section 3.4
7. Sources of other problem constituents and control measures.	Section 3.5
8. Existing water recycling users, quantities, and contractual arrangements.	Section 3.6
9. Existing water rights for use of treated effluent after discharge.	Section 3.7
10. Wastewater flow variations, hourly and seasonally.	Section 3.8
11. Description of the current asset, operation, and maintenance management systems used at the treatment facilities.	N/A

WRFP Recommended Outline	WRFP Study Crosswalk
Treatment Objectives for Discharge and Reuse	
1. Future flow increases or other changes to the influent wastewater characteristics.	Section 3.6
2. Required water qualities for potential uses.	Section 4.1
3. Required health-related water qualities or treatment requirements for potential uses, operational and on-site requirements (backflow prevention, buffer zones, dual plumbing, etc.).	Section 4.2
4. Wastewater discharge or reuse requirements and anticipated changes in requirements.	Section 4.2
5. Water quality-related requirements of the RWQCB to protect surface or groundwater from problems resulting from recycled water use.	Section 4.2
Recycled Water Market	
1. Description of market assessment procedures.	Section 5.2
2. Definition of logical service area based on results of market assessment.	Section 5.2
3. Descriptions of all users or categories of potential users.	Section 5.2
4. Summary tables of potential users and related data.	Section 5.2
Project Alternative Analysis	
1. Planning and design parameters and assumptions.	Section 5.1
2. Water recycling alternatives.	Section 5.3 to 5.7
3. Non-recycled water alternatives.	Section 5.8 to 5.9
4. Water conservation/reduction analysis.	Section 2.7.1
5. Pollution control alternatives, if applicable, needed to comply with waste discharge requirements, and possible allocation of costs between recycling and pollution control.	N/A
6. No project alternative.	Section 5.0
7. Comparative environmental analysis.	Section 5.3-5.10
8. Comparison of above alternatives and recommendation of specific alternatives.	Section 5.10
B. Recommended Project	
1. Description of all proposed facilities and basis for selection.	Section 6.1
2. Preliminary design criteria.	Section 6.1
3. Cost estimate based on time of construction.	Section 6.1
4. List of all potential users, quantity of recycled water use, peak demand, and commitments obtained.	Section 6.1.3
5. Reliability of facilities as compared to user requirements.	Section 6.1.3
6. Implementation plan.	Section 6.2
7. Operational plan - responsible people, equipment, monitoring, irrigation scheduling, etc.	Section 6.2
8. Description of any key issues to be resolved, particularly items that may significantly impact the project budget or schedule.	Section 6.4

WRFP Recommended Outline	WRFP Study Crosswalk
C. Construction Financing Plan and Revenue Program	
1. Sources and timing of funds for design and construction.	Section 6.3
2. Pricing policy for recycled water.	Section 2.4
3. Costs that can be allocated to water pollution control.	Section 5.1.2
4. Annual cost projections	Section 6.3
5. Sunk costs and indebtedness.	N/A

Appendix B Detailed Cost Estimates

B

ALTERNATIVES SUMMARY

	Wastewater / Recycled Water Alternatives									Non-Recycled Water Alternatives	
	Urban Reuse		Ag Reuse	Creek Discharge				IPR / DPR			
Alt	**A1**	**A2**	**B**	**C1**	**C2**	**C3**	**C4**	**D**	**E**	**F**	**G**
Item	**Schools**	**Memorial Park**	**Existing Customers (2)**	**New Discharge**	**GRRP, No Treatment**	**GRRP, Ozone/BAC**	**GRRP, MF/RO**	**Seawater Intrusion Barrier**	**Direct Potable Reuse**	**Upper Aquifer Nitrate Trmt**	**Intertie Pipe, Avg Yield**
Existing Conditions											
Annual Supply (AFY)	12	50	12	160	100	150	130	340	340	475	300
Basin Benefit (AFY)	9	38	9	120	75	113	98	360	255	400	300
Capital Cost ($M)	$1.0	$4.6	$5.1	$11.8	$8.1	$15.5	$54.7	$61.1	$59.2	$8.9	$10.8
Annual O&M ($/Yr)	$10,000	$40,000	$50,000	$160,000	$180,000	$360,000	$693,000	$1,595,000	$1,925,000	$452,000	$30,000
Annual Total ($/Yr)	**$55,000**	**$250,000**	**$280,000**	**$690,000**	**$550,000**	**$1,060,000**	**$3,173,000**	**$4,365,000**	**$4,605,000**	**$852,000**	**$520,000**
Unit Cost ($/AFY)	**$6,100**	**$6,700**	**$31,100**	**$5,800**	**$7,300**	**$9,400**	**$32,500**	**$12,100**	**$18,100**	**$2,100**	**$1,700**
										SWP Purchase (Range)	$900-$1,200
										Intertie Pipe Total (Range)	**$2,600-$2,900**

Buildout Conditions

	A		B1	C1	C2	C3	C4	D	E	F	G
Yield at Buildout WW Flows (AFY)	*No increase to yield since it's limited by demand*			240	*No increase to yield since it's limited by creek underflow for blending*		190	460	460	*Non-Recycled Water Alternatives are not impacted by additional wastewater flows*	
Basin Benefit at Buildout (AFY)				180			143	488	345		
Unit Cost at Buildout WW Flows (AFY)				**$3,940**			**$26,860**	**$11,130**	**$17,200**		

Annualized Capital Cost assumes SRF loan @ 2.1% for 30 yrs

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
Unit Costs Sheet

10/30/2025

Capital Costs

Item	Description	Unit	Unit Cost	Notes
1	4-in Pipeline	LF	$250	
2	6-in Pipeline	LF	$282	
3	8-in Pipeline	LF	$315	
4	12-in Pipeline	LF	$404	
5	Trenchless Crossing, 24-in Casing	LF	$600	
6	Storage Tank	GAL	$2.50	
7	Pump Station	HP	$19,000	
8	Production Well - Creek Valley	EA	$1,300,000	
9	Injection Well	EA	$2,200,000	
10	Monitoring Well - Creek Valley	EA	$153,000	
	Monitoring Well - Lower Aquifer	EA	$357,000	
11	Treatment Facility - Ozone / BAC	MGD	$8,240,000	
	Treatment Facility - MF/RO	MGD	$43,300,000	
	Treatment Facility - MF/RO/AOP	MGD	$48,100,000	
	Treatment Facility - O3/BAC/MF/RO/AOP	MGD	$62,000,000	
	Treatment Facility - Nitrate	LS	$2,200,000	Placeholder for GSWC Rosina WTF buy-in and improvements
12	RW Conversion	EA	$350,000	
13	Creek Discharge Structure	EA	$200,000	
		EA		
	Raw Construction Subtotal			
	Construction Contingency		40%	Raw Construction Subtotal
	Land Purchase	ac	$500,000	
	Construction Total			
	Engineering, Construction Management, Admin		30%	Construction Total
	Additional Cost for Potable Reuse		10%	Construction Total
	Capital Total			

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
Unit Costs Sheet

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Operation & Maintenance

Item	Description	Unit	Unit Cost	Basis
1	Pipeline O&M	LS	0.5%	of pipeline construction costs
2	Storage Tank O&M	GAL	$0.04	per gallon
3	BPS O&M	LS	4.0%	of pump station construction costs
5	Well O&M	LS	2.0%	of well construction costs
4	Pumping, RWPS	AF		
	Existing RWPS	AF	$0	
	New RWPS, to Creek Discharge	AF	$0	No net increase in existing costs,
	New RWPS, to Injection Wells	AF	$0	offsets pumping to Broderson
	Brine PS, Pumping to MB Outfall	AF	$110	
6	Well Pumping	AF		
	GW Pumping, Creek Valley	AF	$150	
	GW Pumping, Upper Aquifer	AF	$150	
	GW Pumping, Deep Aquifer	AF	$200	
7	Treatment			
	Treatment Facility - Ozone / BAC	AF	$1,000	
	Treatment Facility - MF/RO	AF	$3,000	
	Treatment Facility - MF/RO/AOP	AF	$3,700	
	Treatment Facility - O3/BAC/MF/RO/AOP	AF	$4,700	
	Treatment Facility - Nitrate	AF	$810	
	Treatment Facility - Chromium-6/PFAS	AF	$1,620	
8	Imported Water Purchase Price	AF	$900 - $2,400	Range described in SWP section
9	Electrical Cost	kWh	$0.30	
10	Brine Fee	AF	$1,000	Estimated, costs have not been verified
11	RO Recovery		80%	

Basin Yield Benefit

Item	Description	% of Yield	Alternative
1	Pumping Offset in Central/Western Lower Aquifer	75%	A1, E
2	Pumping Offset in Creek Valley	75%	A2, B2
3	RW Discharge to the Creek	75%	C1, C2, C3, C6
4	Seawater Intrusion Barrier	106%	D
5	Upper Aquifer Treatment	84%	F
6	Intertie	100%	G

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
A1. Urban Reuse, Two Schools **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	6-in Pipeline		LF	$282	$0
2	8-in Pipeline		LF	$315	$0
3	12-in Pipeline		LF	$404	$0
4	Trenchless Crossing		LF		$0
5	Storage Tank		GAL		$0
6	Pump Station		HP		$0
7	Production Well		EA		$0
8	Injection Well		EA		$0
9	Monitoring Well		EA		$0
10	Treatment Facility				$0
11	Customer Site Conversions	2	EA	$350,000	$700,000
	Raw Construction Subtotal				**$700,000**
	Construction Contingency	20%			$140,000
	Land Purchase		ac	$500,000	$0
	Construction Total				**$840,000**
	Design, CM, ESDC, Admin, Legal	20%			$170,000
	Additional Cost for Potable Reuse				$0
	Capital Total				**$1,000,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$0	LS	0.5%	$0
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$0	LS	4.0%	$0
4	Well O&M	$0	LS	2.0%	$0
5	Pumping, RWPS	0	AFY	$0	$0
6	Well Pumping		AFY		
7	Treatment		AFY		
8	Brine Fee		AFY		
9	Annual Inspection	2	EA	$5,000	$10,000
	O&M Total				**$10,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$45,000
2	Annual O&M			$10,000
	Total			**$55,000**
	Annual Yield (AFY)			12
	Basin Benefit (AFY)			9
	Unit Cost ($/AF)	Based on basin benefit		**$6,110**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
A2. Urban Reuse, Memorial Park **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	6-in Pipeline	4,700	LF	$282	$1,326,000
2	8-in Pipeline		LF	$315	$0
3	12-in Pipeline		LF	$404	$0
4	Trenchless Crossing		LF		$0
5	Storage Tank		GAL		$0
6	Pump Station		HP		$0
7	Production Well	1	EA	$1,300,000	$1,300,000
8	Injection Well		EA		$0
9	Monitoring Well		EA		$0
10	Treatment Facility				$0
11	Customer Site Conversions	1	EA	$350,000	$350,000
	Raw Construction Subtotal				**$2,980,000**
	Construction Contingency	20%			$600,000
	Land Purchase	0.5	ac	$500,000	$250,000
	Construction Total				**$3,830,000**
	Design, CM, ESDC, Admin, Legal	20%			$770,000
	Additional Cost for Potable Reuse				$0
	Capital Total				**$4,600,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$1,590,000	LS	0.5%	$10,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$0	LS	4.0%	$0
4	Well O&M	$1,560,000	LS	2.0%	$30,000
5	Pumping, RWPS	0	AFY	$0	$0
6	Well Pumping		AFY		
7	Treatment		AFY		
8	Brine Fee		AFY		
	O&M Total				**$40,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$210,000
2	Annual O&M			$40,000
	Total			**$250,000**
	Annual Yield (AFY)			50
	Basin Benefit (AFY)			38
	Unit Cost ($/AF)	Based on basin benefit		**$6,670**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
B. Agricultural Reuse **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	6-in Pipeline	4,700	LF	$282	$1,326,000
2	8-in Pipeline		LF	$315	$0
3	12-in Pipeline		LF	$404	$0
4	Storage Tank		GAL	$2.5	$0
5	Pump Station		HP	$19,000	$0
6	Production Well - Creek Valley	1	EA	$1,300,000	$1,300,000
7	Injection Well		EA	$2,200,000	$0
8	Monitoring Well		EA	$357,000	$0
9	Treatment Facility				$0
10	Customer Site Conversions		EA	$350,000	$0
11	Recycled Water Meter		EA	$50,000	$0
	Raw Construction Subtotal				**$2,630,000**
	Construction Contingency	40%			$1,050,000
	Land Purchase	0.5	ac	$500,000	$250,000
	Construction Total				**$3,930,000**
	Design, CM, ESDC, Admin, Legal	30%			$1,180,000
	Additional Cost for Potable Reuse				$0
	Capital Total				**$5,100,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$1,860,000	LS	0.5%	$10,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$0	LS	4.0%	$0
4	Pumping, RWPS	12	AFY	$0	$0
5	Well O&M	$1,820,000	LS	2.0%	$40,000
6	Well Pumping	12	AFY	$150	$0
7	Treatment		AFY		$0
	O&M Total				**$50,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$230,000
2	Annual O&M			$50,000
	Total			**$280,000**
	Annual Yield (AFY)			12
	Basin Benefit (AFY)			9
	Unit Cost ($/AF)	Based on basin benefit		**$31,100**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
C1. Creek Discharge, New Discharge Location **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	6-in Pipeline	7,200	LF	$282	$2,032,000
2	8-in Pipeline	3,400	LF	$315	$1,069,000
3	12-in Pipeline		LF	$404	$0
4	Storage Tank		GAL	$2.5	$0
5	Pump Station		HP	$19,000	$0
6	Production Well - Creek Valley	2	EA	$1,300,000	$2,600,000
7	Injection Well		EA	$2,200,000	$0
8	Monitoring Well - Creek Valley	1	EA	$153,000	$153,000
9	Treatment Facility				$0
10	Discharge Structure	1	EA	$200,000	$200,000
	Raw Construction Subtotal				**$6,050,000**
	Construction Contingency	40%			$2,420,000
	Land Purchase	1.25	ac	$500,000	$630,000
	Construction Total				**$9,100,000**
	Design, CM, ESDC, Admin, Legal	30%			$2,730,000
	Additional Cost for Potable Reuse				$0
	Capital Total				**$11,800,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$4,340,000	LS	0.5%	$20,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$0	LS	4.0%	$0
4	Pumping, RWPS	160	AFY	$0	$0
5	Well O&M	$3,640,000	LS	2.0%	$70,000
6	Well Pumping	160	AFY	$150	$20,000
7	Treatment		AFY		$0
8	Monitoring	1	LS	$50,000	$50,000
	O&M Total				**$160,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$530,000
2	Annual O&M			$160,000
	Total			**$690,000**
	Annual Yield (AFY)			160
	Basin Benefit (AFY)			120
	Unit Cost ($/AF)	Based on basin benefit		**$5,750**

Opinion of Probable Construction Cost

Los Osos Basin Management Committee

Water Recycling Funding Program Facilities Planning Study

C1. Creek Discharge, New Discharge Location, Buildout Flows **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	6-in Pipeline	7,200	LF	$282	$2,032,000
2	8-in Pipeline	3,400	LF	$315	$1,069,000
3	12-in Pipeline		LF	$404	$0
4	Storage Tank		GAL	$2.5	$0
5	Pump Station		HP	$19,000	$0
6	Production Well - Creek Valley	2	EA	$1,300,000	$2,600,000
7	Injection Well		EA	$2,200,000	$0
8	Monitoring Well - Creek Valley	1	EA	$153,000	$153,000
9	Treatment Facility				$0
10	Discharge Structure	1	EA	$200,000	$200,000
	Raw Construction Subtotal				**$6,050,000**
	Construction Contingency	40%			$2,420,000
	Land Purchase	1.25	ac	$500,000	$630,000
	Construction Total				**$9,100,000**
	Design, CM, ESDC, Admin, Legal	30%			$2,730,000
	Additional Cost for Potable Reuse				$0
	Capital Total				**$11,800,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$4,340,000	LS	0.5%	$20,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$0	LS	4.0%	$0
4	Pumping, RWPS	240	AFY	$0	$0
5	Well O&M	$3,640,000	LS	2.0%	$70,000
6	Well Pumping	240	AFY	$150	$40,000
7	Treatment		AFY		$0
8	Monitoring	1	LS	$50,000	$50,000
	O&M Total				**$180,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$530,000
2	Annual O&M			$180,000
	Total			**$710,000**
	Annual Yield (AFY)			240
	Basin Benefit (AFY)			180
	Unit Cost ($/AF)	Based on basin benefit		**$3,940**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
C2. Creek Discharge, GRRP, No Additional Treatment **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	6-in Pipeline	8,100	LF	$282	$2,286,000
2	8-in Pipeline		LF	$315	$0
3	12-in Pipeline		LF	$404	$0
4	Storage Tank		GAL	$2.5	$0
5	Pump Station		HP	$19,000	$0
6	Production Well - Creek Valley	1	EA	$1,300,000	$1,300,000
7	Injection Well		EA	$2,200,000	$0
8	Monitoring Well - Creek Valley	2	EA	$153,000	$306,000
9	Treatment Facility				
10	Discharge Structure	1	EA	$200,000	$200,000
	Raw Construction Subtotal				**$4,090,000**
	Construction Contingency	40%			$1,640,000
	Land Purchase	1.0	ac	$500,000	$500,000
	Construction Total				**$6,230,000**
	Design, CM, ESDC, Admin, Legal	30%			$1,870,000
	Additional Cost for Potable Reuse	10%			$620,000
	Capital Total				**$8,100,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$3,200,000	LS	0.5%	$20,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$0	LS	4.0%	$0
4	Pumping, RWPS	100	AFY	$0	$0
5	Well O&M	$1,820,000	LS	2.0%	$40,000
6	Well Pumping	100	AFY	$150	$20,000
7	Treatment		AFY		$0
8	Monitoring	1	LS	$100,000	$100,000
	O&M Total				**$180,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$370,000
2	Annual O&M			$180,000
	Total			**$550,000**
	Annual Yield (AFY)			100
	Basin Benefit (AFY)			75
	Unit Cost ($/AF)	Based on basin benefit		**$7,330**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
C3. Creek Discharge, GRRP with Ozone / BAC **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	6-in Pipeline	13,700	LF	$282	$3,866,000
2	8-in Pipeline		LF	$315	$0
3	12-in Pipeline		LF	$404	$0
4	Storage Tank		GAL	$2.5	$0
5	Pump Station	16	HP	$19,000	$299,000
6	Production Well - Creek Valley	1	EA	$1,300,000	$1,300,000
7	Injection Well		EA	$2,200,000	$0
8	Monitoring Well - Creek Valley	2	EA	$153,000	$306,000
9	Treatment Facility - Ozone / BAC	0.26	MGD	$8,240,000	$2,177,000
10	Discharge Structure	1	EA	$200,000	$200,000
	Raw Construction Subtotal				**$8,150,000**
	Construction Contingency	40%			$3,260,000
	Land Purchase	1.0	ac	$500,000	$500,000
	Construction Total				**$11,910,000**
	Design, CM, ESDC, Admin, Legal	30%			$3,570,000
	Additional Cost for Potable Reuse	10%			$1,190,000
	Capital Total				**$15,500,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$5,410,000	LS	0.5%	$30,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$420,000	LS	4.0%	$20,000
4	Pumping, New RWPS	150	AFY	$0	$0
5	Well O&M	$1,820,000	LS	2.0%	$40,000
6	Well Pumping	150	AFY	$150	$20,000
7	Treatment	150	AFY	$1,000	$150,000
8	Monitoring	1	LS	$100,000	$100,000
	O&M Total				**$360,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$700,000
2	Annual O&M			$360,000
	Total			**$1,060,000**
	Annual Yield (AFY)			150
	Basin Benefit (AFY)			113
	Unit Cost ($/AF)	Based on basin benefit		**$9,420**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
C4. Creek Discharge, GRRP with MF/RO **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	4-in Pipeline	44,000	LF	$250	$11,009,000
2	6-in Pipeline	16,200	LF	$282	$4,572,000
3	8-in Pipeline		LF	$315	$0
4	12-in Pipeline		LF	$404	$0
5	Storage Tank		GAL	$2.5	$0
6	Advaced Treated Water Pump Station	13	HP	$19,000	$252,000
7	Brine Pump Station	20	HP	$19,000	$375,000
8	Production Well - Creek Valley	2	EA	$1,300,000	$2,600,000
9	Injection Well		EA	$2,200,000	$0
10	Monitoring Well - Creek Valley	2	EA	$153,000	$306,000
11	Treatment Facility - MF/RO	0.4	MGD	$48,100,000	$21,180,000
12	Discharge Structure	1	EA	$200,000	$200,000
	Raw Construction Subtotal				**$29,490,000**
	Construction Contingency	40%			$11,800,000
	Land Purchase	1.5	ac	$500,000	$750,000
	Construction Total				**$42,040,000**
	Design, CM, ESDC, Admin, Legal	30%			$12,610,000
	Additional Cost for Potable Reuse	10%			$4,200,000
	Capital Total				**$54,700,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$21,810,000	LS	0.5%	$110,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$880,000	LS	4.0%	$40,000
4	Pumping, New RWPS	130	AFY	$0	$0
5	Well O&M	$350,000	LS	2.0%	$10,000
6	Well Pumping	130	AFY	$150	$20,000
7	Treatment & Monitoring	130	AFY	$3,700	$480,000
8	Brine Pumping	33	AFY	$110	$0
9	Brine Fee	33	AFY	$1,000	$32,500
	O&M Total				**$693,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$2,480,000
2	Annual O&M			$693,000
	Total			**$3,173,000**
	Annual Yield (AFY)			130
	Basin Benefit (AFY)			98
	Unit Cost ($/AF)	Based on basin benefit		**$32,540**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
C4. Creek Discharge, GRRP with MF/RO, Buildout Flows **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	4-in Pipeline	44,000	LF	$250	$11,009,000
2	6-in Pipeline	16,200	LF	$282	$4,572,000
3	8-in Pipeline		LF	$315	$0
4	12-in Pipeline		LF	$404	$0
5	Storage Tank		GAL	$2.5	$0
6	Pump Station	19	HP	$19,000	$362,000
7	Brine Pump Station	22	HP	$19,000	$422,000
8	Production Well - Creek Valley	2	EA	$1,300,000	$2,600,000
9	Injection Well		EA	$2,200,000	$0
10	Monitoring Well - Creek Valley	2	EA	$153,000	$306,000
11	Treatment Facility - MF/RO	0.6	MGD	$48,100,000	$27,534,000
12	Discharge Structure	1	EA	$200,000	$200,000
	Raw Construction Subtotal				**$36,000,000**
	Construction Contingency	40%			$14,400,000
	Land Purchase	1.5	ac	$500,000	$750,000
	Construction Total				**$51,150,000**
	Design, CM, ESDC, Admin, Legal	30%			$15,350,000
	Additional Cost for Potable Reuse	10%			$5,120,000
	Capital Total				**$66,500,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$21,810,000	LS	0.5%	$110,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$1,100,000	LS	4.0%	$40,000
4	Pumping, New RWPS	190	AFY	$0	$0
5	Well O&M	$510,000	LS	2.0%	$10,000
6	Well Pumping	190	AFY	$150	$30,000
7	Treatment & Monitoring	190	AFY	$3,000	$570,000
8	Brine Pumping	48	AFY	$110	$10,000
9	Brine Fee	48	AFY	$1,000	$47,500
	O&M Total				**$818,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$3,010,000
2	Annual O&M			$818,000
	Total			**$3,828,000**
	Annual Yield (AFY)			190
	Basin Benefit (AFY)			143
	Unit Cost ($/AF)	Based on basin benefit		**$26,860**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
D. Seawater Intrusion Barrier **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	4-in Pipeline	44,000	LF	$250	$11,009,000
2	6-in Pipeline	3,000	LF	$282	$847,000
3	8-in Pipeline	12,000	LF	$315	$3,774,000
4	12-in Pipeline		LF	$404	$0
5	Storage Tank		GAL	$2.5	$0
6	Pump Station	22	HP	$19,000	$422,000
7	Brine Pump Station	26	HP	$19,000	$500,000
8	Production Well	0	EA	$1,300,000	$0
9	Injection Well	2	EA	$2,200,000	$4,400,000
10	Monitoring Well	4	EA	$357,000	$1,428,000
11	Treatment Facility - MF/RO/AOP	0.4	MGD	$48,100,000	$21,470,000
	Raw Construction Subtotal				**$32,840,000**
	Construction Contingency	40%			$13,140,000
	Land Purchase	2.0	ac	$500,000	$1,000,000
	Construction Total				**$46,980,000**
	Design, CM, ESDC, Admin, Legal	30%			$14,090,000
	Additional Cost for Potable Reuse	10%			$4,700,000
	Capital Total				**$61,100,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$21,880,000	LS	0.5%	$110,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$1,290,000	LS	4.0%	$50,000
4	Pumping, RWPS	340	AFY	$0	$0
5	Well O&M	$590,000	LS	2.0%	$10,000
6	Well Pumping	340	AFY	$200	$70,000
7	Treatment	340	AFY	$3,700	$1,260,000
8	Brine Pumping	85	AFY	$110	$10,000
9	Brine Fee	85	AFY	$1,000	$85,000
	O&M Total				**$1,595,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$2,770,000
2	Annual O&M			$1,595,000
	Total			**$4,365,000**
	Annual Yield (AFY)			340
	Basin Benefit (AFY)			360
	Unit Cost ($/AF)	Based on basin benefit		**$12,110**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
D. Seawater Intrusion Barrier, Buildout Flows **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	4-in Pipeline	44,000	LF	$250	$11,009,000
2	6-in Pipeline	3,000	LF	$282	$847,000
3	8-in Pipeline	12,000	LF	$315	$3,774,000
4	12-in Pipeline		LF	$404	$0
5	Storage Tank		GAL	$2.5	$0
6	Pump Station	30	HP	$19,000	$573,000
7	Brine Pump Station	31	HP	$19,000	$594,000
8	Production Well		EA	$1,300,000	$0
9	Injection Well	2	EA	$2,200,000	$4,400,000
10	Monitoring Well	4	EA	$357,000	$1,428,000
11	Treatment Facility - MF/RO/AOP	0.6	MGD	$48,100,000	$27,912,000
	Raw Construction Subtotal				**$39,530,000**
	Construction Contingency	40%			$15,810,000
	Land Purchase	2.0	ac	$500,000	$1,000,000
	Construction Total				**$56,340,000**
	Design, CM, ESDC, Admin, Legal	30%			$16,900,000
	Additional Cost for Potable Reuse	10%			$5,630,000
	Capital Total				**$73,200,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$21,880,000	LS	0.5%	$110,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$1,630,000	LS	4.0%	$70,000
4	Pumping, RWPS	460	AFY	$0	$0
5	Well O&M	$800,000	LS	2.0%	$20,000
6	Well Pumping	460	AFY	$200	$90,000
7	Treatment	460	AFY	$3,700	$1,700,000
8	Brine Pumping	115	AFY	$110	$10,000
9	Brine Fee	115	AFY	$1,000	$115,000
	O&M Total				**$2,115,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$3,310,000
2	Annual O&M			$2,115,000
	Total			**$5,425,000**
	Annual Yield (AFY)			460
	Basin Benefit (AFY)			488
	Unit Cost ($/AF)	Based on basin benefit		**$11,130**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
E. Direct Potable Reuse **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	4-in Pipeline	44,000	LF	$250	$11,009,000
2	6-in Pipeline		LF	$282	$0
3	8-in Pipeline	10,000	LF	$315	$3,145,000
4	12-in Pipeline		LF	$404	$0
5	Storage Tank		GAL	$2.5	$0
6	Pump Station	65	HP	$19,000	$1,232,000
7	Brine Pump Station	26	HP	$19,000	$500,000
8	Production Well		EA	$1,300,000	$0
9	Injection Well		EA	$2,200,000	$0
10	Monitoring Well		EA	$357,000	$0
11	Treatment Facility - O3/BAC/MF/RO/AOP	0.4	MGD	$62,000,000	$27,675,000
	Raw Construction Subtotal				**$32,550,000**
	Construction Contingency	40%			$13,020,000
	Land Purchase		ac	$500,000	$0
	Construction Total				**$45,570,000**
	Design, CM, ESDC, Admin, Legal	30%			$13,670,000
	Additional Cost for Potable Reuse	20%			$9,110,000
	Capital Total				**$59,200,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$19,820,000	LS	0.5%	$100,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$2,420,000	LS	4.0%	$100,000
4	Pumping, RWPS	340	AFY	$0	$0
5	Well O&M	$1,720,000	LS	2.0%	$30,000
6	Well Pumping	0	AFY	$150	$0
7	Treatment & Monitoring	340	AFY	$4,700	$1,600,000
8	Brine Pumping	85	AFY	$110	$10,000
9	Brine Fee	85	AFY	$1,000	$85,000
	O&M Total				**$1,925,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$2,680,000
2	Annual O&M			$1,925,000
	Total			**$4,605,000**
	Annual Yield (AFY)			340
	Basin Benefit (AFY)			255
	Unit Cost ($/AF)	Based on basin benefit		**$18,060**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
E. Direct Potable Reuse, Buildout Flows **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	4-in Pipeline	44,000	LF	$250	$11,009,000
2	6-in Pipeline		LF	$282	$0
3	8-in Pipeline	10,000	LF	$315	$3,145,000
4	12-in Pipeline		LF	$404	$0
5	Storage Tank		GAL	$2.5	$0
6	Pump Station	88	HP	$19,000	$1,672,000
7	Brine Pump Station	31	HP	$19,000	$594,000
8	Production Well		EA	$1,300,000	$0
9	Injection Well		EA	$2,200,000	$0
10	Monitoring Well		EA	$357,000	$0
11	Treatment Facility - O3/BAC/MF/RO/AOP	0.6	MGD	$62,000,000	$35,978,000
	Raw Construction Subtotal				**$41,390,000**
	Construction Contingency	40%			$16,560,000
	Land Purchase		ac	$500,000	$0
	Construction Total				**$57,950,000**
	Design, CM, ESDC, Admin, Legal	30%			$17,390,000
	Additional Cost for Potable Reuse	20%			$11,590,000
	Capital Total				**$75,300,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$19,820,000	LS	0.5%	$100,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$2,340,000	LS	4.0%	$90,000
4	Pumping, RWPS	460	AFY	$0	$0
5	Well O&M	$2,340,000	LS	2.0%	$50,000
6	Well Pumping	0	AFY	$200	$0
7	Treatment & Monitoring	460	AFY	$4,700	$2,160,000
8	Brine Pumping	115	AFY	$110	$10,000
9	Brine Fee	115	AFY	$1,000	$115,000
	O&M Total				**$2,525,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$3,410,000
2	Annual O&M			$2,525,000
	Total			**$5,935,000**
	Annual Yield (AFY)			460
	Basin Benefit (AFY)			345
	Unit Cost ($/AF)	Based on basin benefit		**$17,200**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
F. Upper Aquifer Nitrate Treatment **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	6-in Pipeline	300	LF	$282	$85,000
2	8-in Pipeline		LF	$315	$0
3	12-in Pipeline		LF	$404	$0
4	Storage Tank - Brine Waste Tank	4,500	GAL	$2.5	$11,000
5	Pump Station		HP	$19,000	$0
6	Production Well	2	EA	$1,300,000	$2,600,000
7	Injection Well		EA	$2,200,000	$0
8	Monitoring Well		EA	$357,000	$0
9	Existing Facility Buy In	1	LS	$2,200,000	$2,200,000
	Raw Construction Subtotal				**$4,900,000**
	Construction Contingency	40%			$1,960,000
	Land Purchase		ac	$500,000	$0
	Construction Total				**$6,860,000**
	Design, CM, ESDC, Admin, Legal	30%			$2,060,000
	Additional Cost for Potable Reuse				$0
	Capital Total				**$8,900,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$120,000	LS	0.5%	$1,000
2	Storage Tank O&M	$20,000	GAL	$0.04	$1,000
3	BPS O&M	$0	LS	4.0%	$0
4	Pumping, RWPS	0	AFY	$0	$0
5	Well O&M	$3,640,000	LS	2.0%	$70,000
6	Well Pumping	475	AFY		$0
7	Treatment	475	AFY	$810	$380,000
8	Brine Disposal Fee	475	AFY		$0
	O&M Total				**$452,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$400,000
2	Annual O&M			$452,000
	Total			**$852,000**
	Annual Yield (AFY)			475
	Basin Benefit (AFY)			400
	Unit Cost ($/AF)	Based on basin benefit		**$2,130**

Opinion of Probable Construction Cost
Los Osos Basin Management Committee
Water Recycling Funding Program Facilities Planning Study
G. Intertie, Average Yield (300 AFY) **10/30/2025**

Item	Description	Quantity	Unit	Unit Cost	Cost
1	6-in Pipeline	0	LF	$282	$0
2	8-in Pipeline	0	LF	$315	$0
3	12-in Pipeline	10,500	LF	$404	$4,239,000
4	Trenchless Crossing	2,500	LF	$600	$1,500,000
5	Storage Tank	0	GAL	$2.5	$0
6	Pump Station	0	HP	$19,000	$0
7	Production Well	0	EA	$1,300,000	$0
8	Injection Well	0	EA	$2,200,000	$0
9	Monitoring Well	0	EA	$357,000	$0
10	Treatment Facility -	0.0	EA	$0	$0
11	Intertie	1.0	EA	$185,000	$185,000
	Raw Construction Subtotal				**$5,920,000**
	Construction Contingency	40%			$2,370,000
	Land Purchase		ac	$500,000	$0
	Construction Total				**$8,290,000**
	Design, CM, ESDC, Admin, Legal	30%			$2,490,000
	Additional Cost for Potable Reuse				$0
	Capital Total				**$10,800,000**

Capital cost basis: 2025 dollars (ENR 20 City Avg CCI of 13732 for January, 2025)

Operation & Maintenance

Item	Description		Unit	Unit Cost	Basis
1	Pipeline O&M	$5,930,000	LS	0.5%	$30,000
2	Storage Tank O&M	$0	GAL	$0.04	$0
3	BPS O&M	$0	LS	4.0%	$0
4	Pumping, RWPS	0	AFY	$0	$0
5	Well O&M	$0	LS	2.0%	$0
6	Well Pumping	0	AFY	$150	$0
7	Treatment	0	AFY		$0
8	Imported Water Purchase Price	300	AFY		$0
	O&M Total				**$30,000**

Annual Costs

Item	Description	Interest	Loan Term	Annual Cost
1	Debt Payments	2.1%	30 years	$490,000
2	Annual O&M			$30,000
	Total			**$520,000**
	Annual Yield (AFY)			300
	Basin Benefit (AFY)			300
	Unit Cost ($/AF)	Based on basin benefit		**$1,730**

Appendix C Potential Future Water Demand for the Los Osos Basin Plan Area

C

Potential Future Water Demand for the Los Osos Basin Plan Area

Prepared by the County of San Luis Obispo Department of Planning and Building
June 2024

This document is not a policy document and is a tool to inform BMC planning efforts.

Table 1: Estimated Realistic Increase in Development and Water Demand at Buildout (from Current Baseline) by Water Purveyor and Development Type for the Los Osos Basin Plan Area

Development Type	GSWC		LOCSD		S&T		Self-Source		Total	
	New Develop-ment	New Water Demand (AFY)	New Develop-ment	New Water Demand (AFY)	New Develop-ment	New Water Demand (AFY)	New Develop-ment	New Water Demand (AFY)	New Develop-ment	New Water Demand (AFY)
Single-Family (SF) Residences	790 units	113	210 units	30	20 units	3	50 units	22	1,070 units	168
Multi-Family (MF) Residences	390 units	44	405 units	45					795 units	89
Commercial Service	43,129 sf	17	6,445 sf	3					49,574 sf	19
Retail	135,051 sf	20	93,849 sf	14					228,900 sf	34
Office			49,536 sf	4					49,536 sf	4
Public Facilities & Recreation	Sea Pines	2								2
Total Increase in Water Demand (AFY)		**196**		**96**		**3**		**22**		**317**

Units = dwelling units. One SF unit typically allowed per parcel.

Methodology

1. Reviewed the estimated buildout for the updated Los Osos Community Plan (LOCP).[1]
    a. The buildout provides a communitywide estimate for the Los Osos urban area based on a parcel-specific analysis of site constraints and allowable uses
    b. Does not include the rural areas outside the urban area that are within the Los Osos Basin Plan Area. So needed to add rural areas to the estimate.

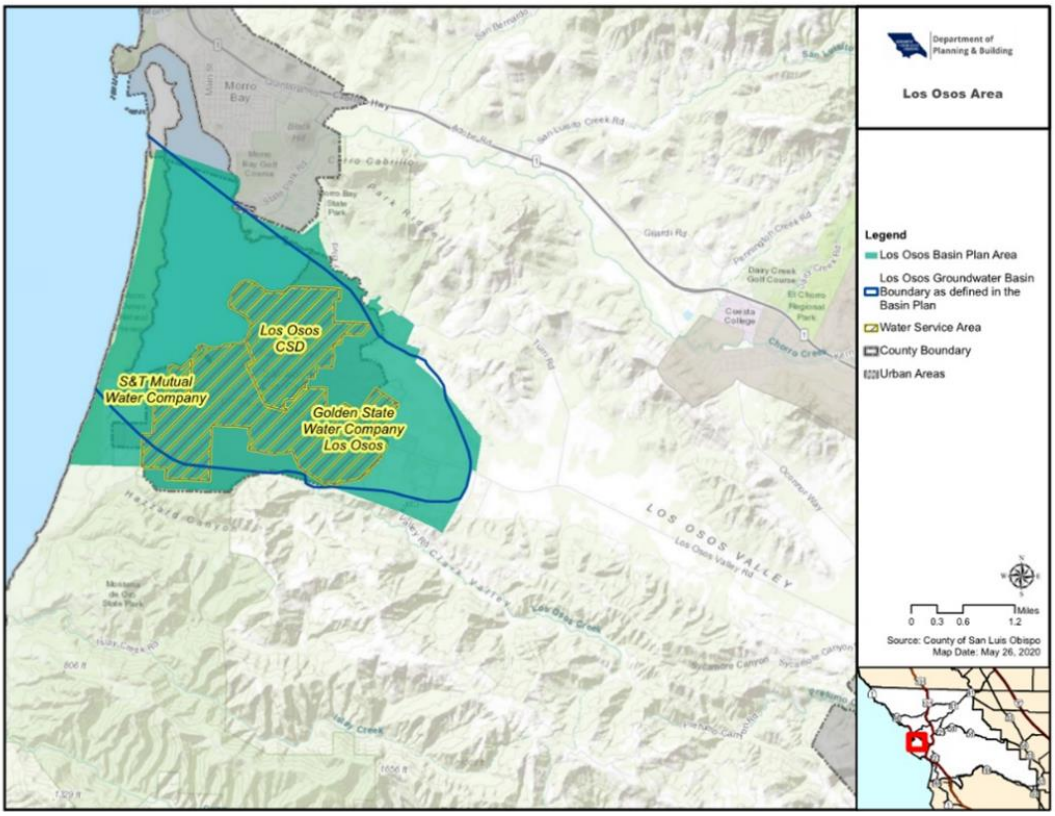

Figure 1: Los Osos Basin Plan Area and urban area

    c. Does not provide a breakdown of development potential by water purveyor service areas. So needed to do the breakdown.
    d. All commercial land is within the urban area and therefore included in the LOCP buildout estimate. Did not need to do additional commercial development potential analysis. Commercial buildout was based on floor area averages for each LUC. The LOCP encourages mixed-use development in the Commercial Retail land use category (LUC). Residences for projected new mixed-use development are included in the residential buildout count, not in the commercial square footage count.

[1] LOCP Table 8-3, page 8-8.

2. Identified key buildout assumptions.
    - Buildout is an estimate of the *realistic* maximum development that can be expected to be permitted within a planning area, as allowed by land use policies, and accounting for existing development and site constraints.
    - Realistic buildout was assumed to be 90% of the maximum allowed development per parcel to account for the likelihood that all existing development will not be replaced at maximum density and that new development will not always occur to the maximum allowed potential.[2]
    - Accounted for redevelopment and subdivision potential, unless otherwise noted.
    - No accessory dwelling units (ADUs) were considered within the Los Osos Basin Plan Area, as they are currently prohibited by the Coastal Zone Land Use Ordinance (CZLUO).[3]

3. Created a parcel inventory for the Los Osos Basin Plan Area, including the rural areas outside the urban area.[4]
    a. Counted the number of parcels within each LUC. [5]
    b. Estimated the number of existing residences per parcel based on Department of Planning & Building addressing data.[6]
    c. Assumed dwelling units in AG, RR, RS, and RSF land use categories are single family (SF) units, except considered dwelling units within mobile home parks (APNs 074-229-020, 074-224-016, -017, and -020) (all in RSF land use category) as mobile homes (MH).
    d. Assumed dwelling units in CR, CS, OP, and RMF are multi-family (MF) units.

[2] This assumption is consistent with the methodology used for the LOCP buildout estimate per County staff and consultant correspondence for the LOCP Environmental Impact Report preparation.
[3] County Code Section 23.08.169.
[4] Source: County Planning and Building GIS data exported July 2022 including Assessor Parcel Numbers, estimated parcel size, water purveyor service area, land use category, and residential address points per parcel.
[5] County Land Use Categories (LUC) are based on the updated LOCP for the urban area and Estero Area Plan maps for rural area. LUCs include: Agriculture (AG), Commercial Retail (CR), Commercial Service (CS), Office Professional (OP), MUC (Multiple Use Category), Open Space (OS), Recreation (REC), Residential Multi-Family (RMF), Residential Rural (RR), Residential Suburban (RS), Residential Single Family (RSF).
[6] One residential address point was assumed to equal one dwelling unit. No construction permits for new dwelling units were finaled in the Los Osos Basin Plan Area between July 2022 and April 2024 (Construction permit search 4/26/24).

Table 2: Parcel Count by LUC and Water Purveyor Service Area

LUC	Number of Assessor Parcels per Water Purveyor Area					
	GSWC	LOCSD	S&T	Self-Source		Total
				Within URL	Outside URL	
AG					36	36
CR	60	130				190
CS	39	19				58
MUC		3				3
OP	1	26				27
OS	9	4		19	2	34
PF	8	4		1	1	14
REC	1	6		1	2	10
RMF	146	175	18	5		344
RR				139	11	150
RS	147	13		3	48	211
RSF	2,191	2,664	187			5,042
Total	2,602	3,044	205	168	100	6,119
Total	2,602	3,044	205	168	100	6,119

Note: Future water demand analysis accounts for subdivision potential and existing development. Larger parcels and vacant parcels have more development potential.
Source: County Planning and Building GIS, accessed July 2022

4. Estimated the new residential development potential using the parcel inventory.
    a. Reviewed the maximum residential density standards for each LUC based on the LOCP Chapter 7: Planning Area Standards for the urban area, the Estero Area Plan for the rural area, and the CZLUO. See Table 3.
    b. Made assumptions about the realistic residential density potential for each LUC, referencing the buildout estimates for the LOCP Final Environmental Impact Report (FEIR) Section 2, Table 2-3. *Residential and Population Buildout Summary*. See Table 3.
    c. Calculated the realistic number of potential dwelling units per parcel based on the residential density standards and assumptions for each LUC in Table 3, using the parcel inventory.
    d. Adjusted the realistic number of potential dwelling units for parcels with environmental constraints that limit development (e.g., wetlands, oak woodlands) and existing uses that are not likely to be redeveloped with higher residential density (e.g., storage units and single-family dwellings within the RMF LUC), referencing County assessor data[7] and satellite aerial imagery.
    e. Subtracted the number of existing dwelling units (per the parcel inventory) from the realistic number of potential dwelling units for each parcel to calculate the realistic increase in dwelling units per parcel.
    f. Added the realistic increase in dwelling units per parcel for each dwelling type and water purveyor service area.
    g. Rounded to the nearest 5 for each category (LUC and water purveyor combination) to reflect a more appropriate degree of accuracy.

[7] County assessor data accessed 2022 for the Los Osos Water Offset Study. Indicated existing business type.

Table 3: Residential Density Standards and Buildout Assumptions by LUC

LUC	Maximum Allowed Residential Density per Land Use Standards	Reference	Buildout Assumptions
AG	1 unit/parcel	CZLUO	Does not account for ag worker housing.
CR	Mixed-use encouraged in Central Business District (CBD) and Baywood Commercial Area (most of this LUC) 15 units/acre, except 19 units/acre for senior housing in the CBD[8]	LOCP Section 7.5	Assumes increase in units on vacant parcels only, unless the parcel is on the waitlist to build MF units. Assume 15 units/acre.
CS, OP, OS, PF	Not allowed	CZLUO LOCP, Section 7.5	Does not account for caretaker units.
MUC	265 multi-family 100 single-family	LOCP Section 7.5	Assumes full Morro Shores buildout.
REC	1 unit/parcel in URL 1 unit/5 acres outside URL	LOCP Section 7.5	
RMF	15 units/acre for <1 acre 26 units/acre for 1+ acres 38 units/acre for senior housing within ½ mile of the Central Business District (CBD)	LOCP Section 7.5	Assumes 18 units/acre for 1+ acres based on the realistic development potential assumptions in the 2020-2028 Housing Element.
RR, RS	1 unit/parcel	CZLUO	
RSF	1 unit/6,000 sf except: • 1 unit/acre in Martin Tract, Bayview Heights, and Vista de Or • 1 unit/20,000 sf in Cabrillo Estates and APNs 074-229-014, 015 • 100 units in Tract 1646 assigned to GSWC service area	LOCP Ch. 7	Accounts for potential subdivisions allowed by planning standards. Assume no SB 9 development.

[8] In CR LUC in Los Osos, residential development is limited to 50% of the total floor area or 60% for affordable housing, except MF units allowed as primary use between 3rd and 4th St in the Baywood Commercial Area. This analysis is based on parcel size and max units/acre allowed.

5. Estimated the new commercial development potential using the LOCP buildout estimate.
    a. Reviewed the LOCP buildout estimate for new commercial development at buildout (LOCP Table 8-3): 49,536-sf office; 228,900-sf retail; 49,574-sf commercial service; and 328,010-sf total.
    b. Distributed this commercial development potential between the water purveyor service areas.
        i. *Office.* All parcels designed OP are within the LOCSD service area except for one (APN 074-294-014; 1205 Los Olivos Ave) in GSWC's service area that is built out with MF units. Therefore, assumed all new office development (49,536 sf) is in the LOCSD service area.
        ii. *Retail and Commercial Service.* Parcels designed CR and CS are within the GSWC and LOCSD service areas. Assumed the development potential is proportional to the percent of vacant parcel acreage per water purveyor service area for each LUC: CR is 59% (135,051 sf) GSWC and 41% (93,849 sf) LOCSD; CS is 87% (43,129 sf) GSWC and 13% (6,445 sf) LOCSD.

6. Identified water demand factors for residential and commercial development.
    a. Used the average residential water demand factors from the Los Osos Water Offset Study[9] published in June 2023 (Table 4-1), which were calculated using a 5-year average of the purveyor's water consumption data for 2017-2022, excluding 2020 due to elevated indoor water use due to the pandemic stay-at-home policies. See Table 4.
    b. Used the commercial water demand factors developed by the City of Santa Barbara based on an analysis of their historic consumption data and land use data[10]. See Table 4.

Table 4: Water Demand Factors

Use Category	Specific Use Type	Water Demand Factor
Residential	SF unit served by water purveyor	0.14 AFY/unit
	MF unit served by a water purveyor	0.11 AFY/unit
	SF unit served by a private well	0.44 AFY/unit
Service Commercial	Restaurants, bars, auto service stations, banks, theatres, grocery stores, laundromats, and health services	0.39 AFY/1000 sf
Retail <20,000 sf	Shopping malls, consumer goods	0.15 AFY/1000 sf
Office	General office space	0.08 AFY/1000 sf

AFY = acre-feet per year. Sources: 2023 Los Osos Water Offset Study (residential) and 2021 Technical Memorandum: Updated Demand Factors for Water Vision Santa Barbara (commercial). Assumed retail uses are less than 20,000 sf.

[9] 2023 Los Osos Water Offset Study.
[10] -2021 Technical Memorandum: Updated Demand Factors for Water Vision Santa Barbara

7. Estimated the potential for new public facilities and recreation development and the associated water demand.
    a. Reviewed the LOCP FEIR (Table 2-4) for the estimated new development potential at buildout in land designated PF and REC. This land is either owned by the State or limited to minimal development, except for the Sea Pines golf course in the GSWC service area (LOCP Section 7.5, p. 7-58 to 7-60).[11]
    b. *Sea Pines Golf Course.* The golf course has an approved Minor Use Permit/Coastal Development Plan (DRC2011-00105 approved 5/9/2019) allowing phased new development with a 1.93-AFY projected increase in water demand, required to be offset 2:1.

8. Created a spreadsheet to estimate annual residential growth projections.[12]
    a. Created an input variable for the residential annual growth rate, so it can be changed to run different scenarios. The growth rate is compounding, based on the number of existing dwelling units each year within the urban area.
    b. Assumed 6,321 existing dwelling units in the Los Osos urban area for the 2024 baseline (LOCP FEIR as of 2010).
    c. Assumed the annual increase will be divided 65% for SF units and 35% for MF units until the buildout development potential is reached for either unit type (from Table 1).[13]
    d. Assumed the annual increase within each water purveyor service area will be proportional to the share of the total number of estimated new SF and MF units at buildout (per the buildout methodology above). Table 5 shows the proportions.

Table 5: Percent of Total Estimated New Dwelling Units per Water Purveyor Service Area

Water Purveyor	SF	MF	Total
GSWC	74%	49%	63%
LOCSD	20%	51%	33%
S&T	2%	0%	1%
Self-Source	5%	0%	3%

    e. Estimated the water demand for new SF units using the water duty factor for the water purveyor service area (rather than the one for private wells), since most new units will be in the purveyor areas.

[11] The County's Midtown Site (12 acres at Los Osos Valley Rd at Palisades Ave, APN 074-229-017) requires a 4:1 mitigation ratio (48 acres) for new development per the Coastal Development Permit for the community sewer (Condition 3). Therefore, it is unlikely this site will be developed.
[12] Did not include a projected growth rate for non-residential development due to a lack of historic permitting data during the decades-long building moratorium for most of the URL.
[13] The County's Growth Management Ordinance (County Code, Title 26) requires 65% to be reserved for SF units and 35% for MF units each year; unused reservations in either category may be used for either unit type.

f. Assumed the 2:1 water offset requirement for new development will remain in effect until 80% of the estimated remaining indoor water savings potential (67.2 AFY) is used up.[14] The estimated water demand for annual new development is a negative number while the 2:1 offset is in effect.

[14] The Los Osos Water Offset Study estimated 84 AFY remaining indoor savings potential.

Appendix D County Recycled Water Rules and Regulations

Available at: https://www.slocounty.ca.gov/departments/public-works/forms-documents/committees-programs/los-osos-wastewater-system/recycled-water-rules-regs

D

Rules and Regulations
Governing the Distribution and Use of Recycled Water

Los Osos Recycled Water System

San Luis Obispo County

October 2022

Document History and Version Control Table		
Version	**Action**	**Action Date**
0.0	Draft for Initial Submittal of Los Osos WRF Engineering Report	10/2013
1.0	Revised Rules & Regulations. For submittal with revised Engineering Report for approval to SWRCB.	2/2018
2.0	Revised Table of Contents to include Appendix C and D, replaced existing Application with updated application	5/21/18
3.0	Updated terms to match cases	5/22

TABLE OF CONTENTS

ARTICLE 1. General Provisions

1.1. Introduction

San Luis Obispo County (County) owns and operates the Los Osos Recycled Water System, a recycled water production and distribution system to approved recycled water customers (Users) within and adjacent to the town of Los Osos. Uses of recycled water, upon approval, include landscape agricultural irrigation and construction water.

1.2. Authority and Sources

This document establishes the County's Rules and Regulations governing the distribution and use of recycled water (Rules and Regulations). The County has the responsibility of enforcing these Rules and Regulations for the distribution and end use of recycled water.

These Rules and Regulations apply to any distributor or user of recycled water and shall govern the design, construction, and use of both the distribution system operated by the County and on-site recycled water systems operated by Users. The applicable terms of these Rules and Regulations shall be contractually binding to Users. It is the intent of these Rules and Regulations to be consistent with the following criteria:

- Title 22, California Code of Regulations, Section 60301 et seq. (Water Recycling Criteria).
- Title 17, California Code of Regulations, Sections 7583 through 7605;
- 2016 California Plumbing Code, Section 1503
- CA DPH's *Guidelines for the Preparation of an Engineering Report for the Production, Distribution and Use of Recycled Water*;
- American Water Works Association ("AWWA") California/Nevada section, *Guidelines for the Distribution of Non-Potable Water and Guidelines for the On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water*
- Applicable regulations by the Regional Board.
- Manual of Cross-Connection Control, by the USC Foundation for Cross-Connection Control and Hydraulic Research.
- CPUC General Order No. 103A

Interested parties may contact the County for copies of documents referenced in these Rules and Regulations.

1.3. Scope and Severability

These Rules and Regulations establish the requirements for recycled water use and the provision of recycled water service by the County to recycled water Users. If there is any conflict between the provisions of these Rules and Regulations and the provisions of any of the documents incorporated by reference, the most stringent requirement will govern.

If any section, subsection, clause, or phrase of these Rules and Regulations is determined to be invalid, the remaining portions of these Rules and Regulations shall remain in effect.

1.4. Protection of Public Health

The County reserves the right to take any action necessary, with respect to the operation of the distribution system and on-site recycled water systems, to safeguard the public health. If real or

potential hazards are evidenced any time during construction or operation of an on-site recycled water system, the County reserves the right and has the authority to terminate recycled water service immediately, without notice. These hazards include, but are not limited to, cross-connections with a potable water system; improper tagging, signing, or marking; or unapproved/prohibited uses.

1.5. Approved Uses of Recycled Water and the Distribution System

1.5.1. Approved Uses

Use Areas may be eligible to use recycled water for uses limited to landscape irrigation, agricultural irrigation or construction water. The use of recycled water for each specific Use Area will be assessed on a case-by-case basis and must be specifically approved by the County. Use Areas must use recycled water only for those uses approved by the County and CDPH.

1.6. User Agreements

User Agreements will be established for all recycled water customers prior to receiving recycled water. Such User Agreements will only be issued after the Use Area has met all the User Agreement conditions, as defined by these Rules and Regulations. The County may revoke the User Agreement at any time due to non-conformance with the Agreement or these Rules and Regulations.

If the on-site recycled water system is found to be in violation of its User Agreement and/or these Rules and Regulations, the County will direct the User to mitigate for such violations. A Use Area inspection by County staff will be scheduled after a reasonable mitigation period to ensure compliance. Failure to comply could result in termination of recycled water service.

ARTICLE 2. Definitions

The following definitions assign specific meaning to terms within these Rules and Regulations and shall be interpreted as follows:

Air gap Generally considered the most protective method of backflow prevention, an Air Gap is a physical separation between the free-flowing discharge end of a water supply pipeline and an open or non-pressure receiving vessel. An approved air gap must be at least twice the diameter of the water supply pipe measured vertically above the overflow rim of the vessel, and in no case less than one inch.

Applicant Party requesting recycled water services from the County.

Approved Use The uses defined by State law as being approved for use of tertiary recycled water.

As-Built drawings Engineered drawings that depict completed facilities as constructed or modified.

Backflow A condition that results in the flow of water into a potable water system from a source other than an approved water supply.

Certification Workshop A one-day course, approved by the County, designed to provide Use Area supervisors, homeowners, and other interested parties with a basic understanding of recycled water and how to operate and maintain a safe and efficient on-site recycled water system.

County The County of San Luis Obispo

Cross-connection Any unapproved and/or unprotected connection between a potable water system and a non-potable system.

Distribution system Facilities under the control of the County including the Los Osos REW service connections with each on-site recycled water system.

Impoundment A lined structure or the body of water in a lined structure containing recycled water which is used for aesthetic, recreational, or irrigation purposes.

Inspector Any person authorized by the County, Regional Board, CDPH, or local health agencies to perform inspections on or off a Use Area before construction, during construction, after construction, or during operation.

Non-potable water Water that is not acceptable for human consumption in conformance with federal, state, and local drinking water standards.

On-site recycled water system The User-operated recycled water system extending from the REW service connection to the Use Area to be provided with recycled water service. This includes any on-site distribution plumbing, irrigation systems, industrial processes, impoundments, or other approved facilities.

Overspray The spray of recycled water outside of a Use Area.

Ponding Any event where recycled water collects in the form of an unauthorized pond, regardless of the size.

Potable Water Water acceptable for human consumption in conformance with all federal, state, and local drinking water standards.

Record drawings Use Area plans and specifications as required for application for recycled water services.

Recycled water Treated wastewater produced and delivered by the County through the distribution system that meets the definition of “disinfected tertiary water recycling criteria” and is approved for purposes other than human consumption.

Recycled water program – The County’s collection of facilities, rules, regulations, and other program elements, authorized by Coastal Development Permit CDP A-3-SLO-09-055/069 and enabling the treatment of Los Osos wastewater for the beneficial distribution and use in the Los Osos area.

Recycled water storage Storage reservoir for recycled water and beginning of distribution system.

Recycled Water User Agreement An executed contract between the County and a User, that may be issued to the User as a condition for obtaining recycled water service for a specific Use Area or Use Areas.

Regional Board The California Regional Water Quality Control Board(RWQCB), Central Coast Region.

Regulatory Agency One of the several federal, state, and local governmental agencies that have regulatory authority over one or more aspects of the County’s recycled water program, including the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers; the California Coastal Commission, State Water Resources Control Board (SWRCB), the Regional Board, and the California Department of Water Resources Control Board Division of Drinking Water Field Operations Branch (SWRCB-DDWFOB).

Rules and Regulations The *Rules and Regulations Governing the Distribution and Use of Recycled Water* for the Community of Los Osos and the authoritative policies governing the County’s Recycled Water program.

Runoff Recycled Water that leaves an approved Use Area via surface flow.

REW service connection The County owned and operated piping and appurtenances extending recycled water service from the distribution system to an on-site recycled water system. If the Use Area is located within a Water Purveyor service area, County ownership and responsibility of the REW service connection ends at, and does not include, the meter assembly, which shall be owned and maintained by the Water Purveyor. If the Use Area is located outside a Water Purveyor service area, County ownership and responsibility of the REW service conditions includes the meter assembly and ends at, and does not include, the flow isolation valve immediately downstream from the meter assembly.

Water Purveyor Owner and operator of water distribution facilities that produces and serves potable water to customers in Los Osos.

Water Recycling Criteria The State of California’s set of requirements for the implementation of recycled water programs as detailed in Title 22, *California Code of Regulations, Section 60301 et seq.*

Unauthorized discharge Any release of recycled water that leaves a respective Use Area or that otherwise violates the provisions of these Rules and Regulations or any applicable federal, state, city, or local statutes, regulations, ordinances, contracts, or other requirements.

UPC *Uniform Plumbing Code*, published by the International Association of Plumbing and Mechanical Officials.

Use Area A defined area designated to be served recycled water through an on-site recycled water system. The Use Area includes all areas where recycled water may be used, as well as all facilities associated with the on-site recycled water system.

Use Area operators Any employee who participates in the operation of an on-site recycled water system within a Use Area.

Use Area personnel Any employee who works in or around the Use Area who may be exposed to recycled water during work hours.

Use Area Supervisor The responsible person designated by the User to provide liaison with the County regarding recycled water matters. A Use Area supervisor is assigned for all Use Sites except residential sites. This person must have the authority to carry out all requirements of the Rules and Regulations, must be responsible for the operation and maintenance of the on-site recycled water system, and must prevent potential violations.

User Means a person, or entity, having a connection to the recycled water system own by the County, or potable water system owned by the water purveyor.

User Agreement See Recycled Water User Agreement.

Water Code The *California Water Code, Division 7*.

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ARTICLE 3. General Responsibilities

A process flow diagram is provided in Appendix E for helping the user acquire a permitted recycled water system. In the process flow diagram, generally actions by the County, the User/ Use Area Supervisor are described.

3.1. County Responsibilities

The County shall be responsible for all aspects of recycled water production and the distribution system by providing high-quality recycled water at the appropriate pressure and quantity.

Specifically, the County shall be responsible for the following aspects of the recycled water program:

1. Observing and permitting the physical installation, connection, and disconnection of the REW service connection, that is the piping, valves and appurtenances necessary to connect the distribution system to on-site recycled water systems. For those Use Areas located outside the service area of a Water Purveyor, the REW service connection includes water meter(s) required to monitor the recycled water deliveries made to Use Area. For those Use Areas located within a Water Purveyor service area, the water meter(s) will be owned by the water purveyor. The County shall restore the land surface of the User's easement (see Section 3.2) to its normal condition following any maintenance work performed within the easement.
2. Provide maintenance of the REW service connection, including the meter, if owned by the County.
3. Controlling and supervising any switch of recycled water supply to a Use Area back to potable water supply.
4. Reviewing applications for recycled water service, and conducting the initial and final inspection of Use Areas as part of the process for obtaining approval for distribution.
5. Periodic monitoring of the User's recycled water management practices, as determined necessary by the County.
6. Outside a Water Purveyor service area, collecting fees from Users for the consumption of recycled water and related services as defined by User Agreements

3.2. User Responsibilities

By accepting recycled water service, the User agrees to comply with and enforce all aspects of these Rules and Regulations under its purview. User shall perform all work and shall be responsible for all costs of construction, operation, and maintenance of all other modifications to the on-site recycled water system that are not specifically the responsibility of the County as stated in Section 3.1. User responsibilities include, but are not limited to:

1. Obtaining and paying for all permits required for the installation, operation and maintenance of User's on-site recycled water system.
2. Granting the County an easement for the construction of the REW service connection.
3. Paying for the installation, connection and disconnection of the REW service connection unless payment responsibility has been defined otherwise.
4. The User will obtain acceptance from the County to route and tie-in piping from the distribution system to the on-site recycled water system. The User will also disconnect the existing potable water supply from the on-site recycled water system under the

supervision of the County and the Water Purveyor within the appropriate service area. The User is responsible for installing the REW service connection as required to ensure that no recycled water enters a potable water system. The connection shall include any cross-connection prevention measures and necessary piping depths, as described in these Rules and Regulations ARTICLE 4.

5. Paying for, furnishing, installing, operating, and maintaining all facilities necessary to convey recycled water from the REW service connection following the water meter assembly to the on-site recycled water system in a manner that is in accordance with these Rules and Regulations and does not harm or damage any person or property.
6. Paying for and furnishing any modifications to the on-site recycled water system necessary to meet any special County requirements to meet water recycling criteria that may not necessarily be explicitly stated in these Rules and Regulations. Such modifications may include, but are not limited to, sprinkler changes or modifications, quick-coupler modifications or installation, modifications to prevent unauthorized discharges, or additional requirements related to new or expanded systems unless payment responsibility has been defined otherwise.
7. Paying for and executing all necessary modifications to the Use Area's potable water system. This includes ensuring any special protection of potable water systems or other facilities from recycled water contact as required by water recycling criteria, aside from the County's responsibility to connect/disconnect the REW service connection unless payment responsibility has been defined otherwise.
8. Providing all initial and ongoing on-site management and operation of the on-site recycled water system to ensure meeting County, CDPH and any other applicable Regulatory Agency requirements for the use of the recycled water.
9. Adherence to the Use Area management practices as described in ARTICLE 6.
10. Obtaining prior authorization from the County before making any modifications to the approved on-site recycled water system.
11. Reporting all violations and emergencies to the appropriate Regulatory Agency or other local authority.
12. Submitting annual self-inspection reports.

3.3. Use Area Supervisor

A Use Area supervisor is assigned for all Use Sites except residential sites and construction water uses.

Use Area Supervisor Designation

The User must designate one representative to be the Use Area supervisor of the Use Area. Use Area supervisors represent the owner, tenant, or property manager as a liaison to the County regarding recycled water matters. Use Area supervisors shall obtain instruction in the use of recycled water from an institution approved by CDPH, as required by Section 7.2. Use Area supervisors must have the authority to carry out any requirements of these Rules and Regulations. It is recommended that the Use Area supervisor be an employee who is permanently stationed at the Use Area. At a minimum, the Use Area supervisor must make frequent visits to the Use Area.

Use Area Supervisor Responsibilities

The Use Area supervisor shall be responsible for the following:

- The operation, maintenance, and prevention of potential recycled water violations within the Use Area.
- The prevention of cross-connections between potable systems and on-site recycled water systems.
- Being present at all cross-connection tests.
- Informing the County of all failures, violations, and emergencies that occur involving the on-site recycled water system.
- Knowing the provisions contained in Title 17 and the Water Recycling Criteria relating to the safe use of recycled water and understanding the basic concepts of backflow and cross-connection prevention, system testing, and related emergency procedures.
- Maintaining accurate records of the on-site recycled water system.
- Ensuring that all appropriate Use Area personnel are properly trained in the uses of recycled water.
- Conducting the required annual self-inspection of the Use Area and providing a written report to the County.

Changing the Use Area Supervisor

The User must notify the County immediately of any change in personnel for the Use Area supervisor position.

3.4. Construction Water Supervisor

As part of the Construction Water Permit application, the permit holder must designate a representative to be the Construction Water Supervisor. The Supervisor represents the water hauler/contractor as a liaison to the County and must attend specialized training prior to the County granting the Construction Water Permit. The City will instruct the Construction Water Supervisor orally and in writing as to the procedures for use of recycled water and the potential health hazards involved with the use of recycled water. See ARTICLE 6 for details on recycled water for construction uses.

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ARTICLE 4. Facility Requirements

The purpose of this section is to provide rules and guidelines for the design, installation, and inspection of the distribution system and on-site recycled water systems. All recycled water systems must conform to the requirements of the California Plumbing Code.

4.1. All Recycled Water Piping

The following are the piping requirements for the distribution system, the connection service, and on-site recycled water systems.

Piping Depth and Separation Requirements

- In accordance with CDPH requirements, there shall be at least a 4-foot horizontal and 1-foot vertical separation between all pipelines transporting disinfected tertiary recycled water and those transporting potable water, with any potable water pipeline above the recycled water pipeline.

In no case is a horizontal separation of less than four feet or construction of recycled water facilities in the same trench as potable water facilities allowed.

Vertical Separation at Crossings

Where a buried constant-pressure recycled water pipeline crosses a buried potable water pipeline, it must be located a minimum of 12 inches below such potable water pipeline. However, constant-pressure recycled water pipelines are allowed to cross over potable water pipelines if the following conditions apply:

1. If there is a minimum of 4 inches vertical separation, and
2. If a full standard pipe length is centered over the crossing, and
3. If the recycled water pipeline is installed in a pipe sleeve that extends a minimum of 10 feet on either side of the potable water piping, or
4. If the recycled water pipeline is constructed of a continuous section of ductile iron pipe with hot dip bituminous coating, or
5. HDPE pipe with fusion-welded joints (per AWWA C906-99), or
6. A continuous section of Class 200 (DR 14 per AWWA C900-97) PVC pipe or equivalent, centered over the pipe being crossed, or
7. A continuous section of reinforced concrete pressure pipe (per AWWA C302-95) centered over the pipe being crossed.

Pipe Specifications

Pipe class specifications include the following requirements:

Type of Recycled Water Piping	Size	Required Class
Constant-pressure PVC	1.5” diameter and smaller 2.0” diameter and larger	Schedule 40 or greater Class 315 or greater
Intermittent pressure PVC lateral piping	All	Class 200 or greater
Copper piping	All	Type “K” or greater

Depth of cover and thrust blocking

All recycled water system piping must be buried to a minimum depth from finished grade to top of pipe (minimum cover) according to the following schedule:

Type of Recycled Water Piping	Minimum Cover
Intermittent Pressure (all sizes)	12 inches
Constant Pressure, 2.5-inch diameter and smaller	18 inches
Constant Pressure, 3-inch diameter and larger	24 inches

Installation

All recycled water piping other than PVC piping with solvent-welded joints must be protected against movement with thrust blocks or restrained joints or other approved methods conforming to the UPC Section 609.1.4.

Cross-connections

No physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water. See Section 4.4.

Supplementing Recycled Water

Supplementing recycled water with any other source shall not be allowed unless the connection between the two systems is protected by an air gap separation that complies with the requirements of Sections 7602(a) and 7603(a) of Title 17 and the approval of the County and the Water Purveyor within the prospective service area has been obtained.

4.2. Distribution System

Distribution system facilities and REW service connections shall be planned, furnished, and installed in accordance with the applicable federal, state, and local statutes, ordinances, and regulations, including these Rules and Regulations. The County reserves the right to determine the location, size, and capacity of each REW service connection. Requests for modification or relocation of an existing REW service connection shall be made to the County in writing and paid for in advance.

4.3. REW Service Connections

4.3.1. Permanent REW Service Connections

General

Every REW service connection shall be equipped with a valve on both sides of, and adjacent to, the meter assembly. The valve on the inlet side of the meter assembly will be owned and maintained by the County and shall be used by the County to control the water supply through the meter assembly. The valve on the outlet side of the meter assembly will be owned and maintained by the User and shall be used by the User to control the flow of recycled water to the Use Area. County ownership and maintenance responsibilities of the REW service connection include the meter assembly and terminate at, and don't include, the valve on the User's side of the meter assembly; except, that if the User Area is located within a Water Purveyor service area, then the meter assembly shall be owned and maintained by the Water Purveyor

Air Gap

If using existing infrastructure and as appropriate, potable water service will be disconnected from the on-site recycled water system and an above-ground air gap will be installed. The air gap will be spaced so that a reduced pressure principal backflow prevention assembly can be installed in the future.

Future Connections

Due to the need to be able to quickly reconnect the on-site recycled water system to the previous potable water supply in the event of recycled water supply failure, the existing potable water system connection point will be configured to allow future connection. Reconnecting any potable water system will only be possible if the recycled water supply is disconnected from the on-site recycled water system. Prior to reconnection to the potable water supply, the User, at its sole cost and expense, shall disinfect the on-site recycled water system in accordance with the procedure set forth in Article 4.5.5.2 (3).

Meter

Unless otherwise decided by the County, all REW service connections must be equipped with a meter assembly as described in the County Standards.

4.4. Cross-connection and Backflow Prevention

Cross-connection and backflow prevention must comply with County Ordinance Cross-Connection Control Ordinance Chapter 8.30.010 through 8.30.100, currently available at https://library.municode.com/ca/san_luis_obispo_county/codes/county_code?nodeId=TIT16FIPR_CH16.10CAFICO website.

4.4.1. Cross-connection Prevention

Consistent with San Luis Obispo County Code, no cross-connections are allowed between the potable water system and any other water system.

4.4.2. Backflow Prevention

Users may be required to install backflow protection if it is determined that there is a backflow hazard on-site which threatens the integrity of the distribution system. The backflow prevention device must be located as close as practical to the downstream side of every potable water meter. Backflow prevention devices must be properly maintained and tested by the User at least annually. The backflow prevention device and its installation shall comply with Water Purveyor requirements.

4.5. On-site Recycled Water Systems

4.5.1. Use Area Site Detail Requirements

The following are the requirements of on-site recycled water system facilities. Before recycled water is delivered to a Use Area, the existing facilities shall be assessed and retrofitted, as necessary, by the User to meet the requirements set forth by this subsection.

The installation, modification, or construction of a new on-site recycled water system will be in accordance with all applicable laws, statues, rules, regulations and guidelines, including those promulgated by a Regulatory Agency. Users shall be responsible for furnishing, installing, operating, and maintaining all on-site recycled water systems necessary to convey water from

the valve immediately following the meter assembly to the approved Use Area in a manner that does not harm or damage any person or property. Refer to ARTICLE 3 for the respective responsibilities of the County and User regarding modifications to on-site recycled water systems. If any facility within the Use Area does not meet the requirement of these Rules and Regulations, Users should bring this to the attention of the County before proceeding with on-site recycled water system design or construction.

Plans, specifications, and drawings of on-site recycled water system facilities shall be submitted and approved by the County prior to commencing construction.

4.5.2. General Facilities

Piping Location and Specifications

Requirements for piping location, separation, and specifications are specified in Section 4.1.

Drinking Facilities

Drinking water facilities, such as drinking fountains, shall be protected from overspray. Protection shall be by design, construction practices, or system operation. In some cases, the User will be required to relocate the fountains to a better location for shielding purposes. The User shall verify and ensure that no drinking fountains are inadvertently connected to the on-site recycled water system.

Hose Bibs

The User will identify all hose bibs on the existing irrigation systems that will carry recycled water. These hose bibs shall either be capped off or converted to a coupler designated for recycled water use. The use or installation of hose bibs within any public access on-site recycled water system that operates regardless of the hose bib style, construction, or identification, is prohibited.

Picnic Tables

Wood picnic tables subject to overspray from recycled water irrigation systems will be modified to the maximum extent possible to be protected from contact with recycled water. As applicable, the User will relocate the picnic tables, replace the tables with plastic tables, and/or paint the tabletops with a bead-up finish.

Overspray, Runoff, and Ponding

On-site recycled water systems must be designed to minimize overspray, runoff, and ponding. Users must specify appropriate irrigation devices to prevent overspray in narrow areas. If, during the coverage test, noticeable overspray, runoff, and/or ponding is observed, facilities will be adjusted or removed and relocated as needed.

Protection of Aquifers

On-site recycled water systems must be designed to prevent irrigation of recycled water within 50 feet of any domestic water supply well. In addition, recycled water impoundments must be located at least 100 feet (horizontal separation) from any domestic water supply well.

Backflow Prevention Requirements

No physical connection is allowed between the REW service connection as described in Section 4.41 and the potable water system. Backflow prevention devices are required for potable water systems as described in Section 4.4.2.

4.5.3. On-site Recycled Water System Specifications

4.5.3.1. Coupling and Valve Specifications

Valves

All recycled water valves should be of a type that can only be operated by designated Use Area operators.

Couplers

New quick-coupling valves must be installed specifically for recycled water use. New quick-coupling valves must be 3/4-inch or one-inch diameter nominal size and of brass construction with a maximum working pressure of 150 psi. To prevent unauthorized use, the valve must only be operated by a special coupler key for opening and closing the valve. New quick-coupling valves must be installed approximately 12 inches from walks, curbs, header boards, or paved areas. Quick-coupling valves must be installed in a valve box.

To prevent cross-connection or contamination by accidentally interconnecting or interchanging attachments, coupler types that are used on any potable water system within the Use Area shall not be used on any portions of the on-site recycled water system. The installation of quick-coupling valves on a potable water system near a recycled water irrigation system must be of a different type; keys and attachments must not be interchangeable.

4.5.3.2. Other Valves and Devices Specifications

Sprinkler heads

Sprinkler precipitation rates shall be made as uniform as practical across the Use Area. Check valves (either in-line or built into the sprinkler head assembly) shall be used to eliminate low- head drainage after the flow control valve has closed.

Irrigation Controllers

On-site recycled water system irrigation controllers must be automatic, with multiple start/stop times for any 24-hour period, and be installed according to the approved record drawings.

Flow control (recommended but not required)

Automatic flow-control devices are recommended to be used to shut down the on-site recycled water system if a break or other similar high flow/low pressure situation develops.

Centralized control systems, controllers that measure or can be programmed to use evaporation rates, and systems that use controls such as moisture sensors can help prevent or minimize runoff and/or ponding.

4.5.4. Recycled Water System Identification

The exposed portions of any recycled water system, including all piping and appurtenances, shall be clearly identified as follows and in accordance with CDPH requirements. The method of identification shall be clearly detailed on all record drawings, specifications, and engineering reports. At a minimum, all recycled water piping and appurtenances (including, but not limited to, valves, valve boxes, and controllers) shall be colored purple (specifically Pantone color #512, here and throughout these Rules and Regulations) or distinctively wrapped in purple tape in accordance with Chapter 5. Section 116815 of the California Health and Safety Code. This does not apply to water delivered for agricultural use.

4.5.4.1. Pipe Identification

All new piping, whether for a new or retrofitted system, must be marked per these requirements to clearly distinguish between recycled water and potable water systems.

Identification of Buried Recycled Water Lines

New buried recycled water piping (mains and laterals) shall be of purple-colored pipe with the continuous wording "RECYCLED WATER – DO NOT DRINK" printed on opposite sides of the pipe. The pipe must be laid with the wording facing upwards. An acceptable alternative is to identify all new buried recycled water lines with continuous lettering on three-inch (3") minimum width, purple marking tape with one-inch black or white contrasting lettering bearing the continuous wording "RECYCLED WATER – DO NOT DRINK." This tape must run continuously on top of all piping and must be attached to piping with plastic tape banded around the marking tape and the pipe every five feet on center. Marking tape must extend to all valve boxes and/or vaults and exposed piping.

Identification of Existing Buried Recycled Water Lines

Existing buried piping that will be converted to recycled water use need not be marked unless the piping becomes exposed, such as during installation of new pipeline or maintenance of existing pipe. The exposed section must be marked as indicated above for new piping.

Identification of Above-grade Recycled Water Lines

All above-grade recycled water pipelines, whether new or existing, must be labeled with the words "RECYCLED WATER - DO NOT DRINK" and color-coded purple to differentiate recycled water pipelines from potable water pipelines. If purple identification tape is used to label the pipe and/or color-code the pipe, the tape must be adhesive, permanent, and resistant to environmental conditions. Purple bands may also be painted around the circumference of the pipe at 10-foot intervals for color-coding. Purple PVC pipe is not an acceptable alternative for color-coding above-ground lines and appurtenances because the purple color will fade over time when exposed to sunlight.

Identification of Recycled Water Lines inside Structures

Exposed (not buried) constant-pressure recycled water pipes, such as copper or galvanized pipelines, that might be used in a structure such as a parking garage to route recycled water, must be identified per the UPC Appendix J, with the exception that the labeling on the piping must read “RECYCLED WATER – DO NOT DRINK.” Intermittent-pressure lines inside a structure must be identified by affixing decals to this piping at 10-foot intervals and wherever the piping changes directions. These decals must be purple in color and must be imprinted in nominal one-inch-high, black, uppercase letters, with the words “RECYCLED WATER – DO NOT DRINK,” and must be adhesive, permanent, and resistant to environmental conditions.

4.5.4.2. Valve Boxes Identification

Valve boxes must have an advisory label or “nameplate” permanently molded into or affixed onto the lid with rivets, bolts, or similar. Labels must be constructed of a weatherproof material with the wording "RECYCLED WATER” permanently stamped or molded into the label.

4.5.4.3. Quick-coupling Valve Identifications

The covers on all new quick-coupling valves must be permanently attached and made of purple rubber or vinyl with the words "RECYCLED WATER" imprinted on the locking cover. A

Recycled Water identification tag must be permanently attached to the quick-coupling valve or the inside of the box so that it is clearly visible when the box lid is removed.

Any wands, sprinkler heads, fittings, or other attachments used in conjunction with the quick-coupling valves must be labeled with the words, "RECYCLED WATER - DO NOT DRINK."

4.5.4.4. Other Valve and Device Identification

Isolation Valves

New and existing isolation valves must be installed in a marked valve box with a recycled water identification tag at the top of the valve box extension.

Remote Control Valves

New and existing remote-control valves must be installed in a marked valve box with a recycled water identification tag on the valve.

Pressure-regulating Valves and Strainers

New and existing pressure-regulating valves and strainers must be installed in a marked valve box with a recycled water identification tag on the valve/strainer.

Water Meters, Pumps, Pump Control Valves, and Air/Vacuum Relief Valves

All of these recycled water devices must be tagged with a recycled water identification tag.

Recycled Water Backflow Prevention Devices

If applicable, these devices must be tagged with a recycled water identification tag.

Identification Tags and Stickers

Identification tags and stickers must be weatherproof and durable, such as those that are plastic or plastic-coated. Recycled water identification tags and stickers must have a purple background with permanent black lettering stating, "RECYCLED WATER - DO NOT DRINK" and ". AGUA RECICLADA – NO SE BEBA”.

Irrigation Controllers

All on-site recycled water system controllers must be identified by affixing a sticker or “nameplate” to the outside of the controller cabinet, the inside of the controller cabinet, or the outside or inside of the controller cabinet enclosure. Stickers or nameplates must be weatherproof, and must contain wording in English and Spanish indicating that the controller is for a recycled water system.

4.5.4.5. Signage Specification

All User Areas must post clearly visible signs conforming to this subsection and installed per the locations indicated on the approved record drawings. The User will be responsible for posting signs that notify the public of the use of recycled water for irrigation in areas that are accessible to the public. These signs shall be conspicuous, no smaller than 4 inches by 8 inches in area, and show an international symbol for non-potable water. The lettering on the signs must be a minimum of 1/2-inch in height and must be black or white on a purple background. See **Figure 1** below for an acceptable symbol. The signs will also say “RECYCLED WATER - DO NOT DRINK.” The sign(s) shall be of a size easily readable by the public. The prescribed wording should also be translated and posted in Spanish (“AGUA RECICLADA – NO SE BEBA”) and any other appropriate languages.

Figure 1

Use Areas with Fenced Facilities

Advisory signs indicating the use of recycled water must be installed at all entrances to the Use Area at a minimum. The County may require additional signing on a case-by-case basis.

Use Areas within Facilities Not Surrounded by Fences

Advisory signs must be placed where they can be easily seen. To the extent necessary to advise passersby, signs must be posted at the property line near crosswalks, at driveway entrances, at outdoor eating areas, or as otherwise determined by the County. For irrigated streetscapes (such as parkways or frontage landscaping), signs should be placed at street corners as appropriate to notify passersby. Signs must be placed no further than 1,000 feet apart. For irrigated medians, a sign is usually placed at the midpoint of every median, and every 1,000 feet for longer median areas.

Impoundments and Other Water Bodies

The minimum requirements for impoundment signs are as follows:

Minimum wording: "This ____ [insert type of water feature here, such as "Pond", etc.] Uses Recycled Water – Do Not Drink – No Se Beba."
Minimum size: no less than 4 inches high by 8 inches wide.
Location: Must be permanently, legibly printed and posted in conspicuous places.
Design: Colors for lettering and background follow the same guidelines as for irrigation signs.

4.5.4.6. Required Temporary Connection to Potable Water Service

To prevent cross connections, an irrigation system is not allowed to receive recycled water until its site has passed a required cross-connection test. This means that this irrigation system must

be supplied with water from a jumper (temporary connection) to an on-site potable water system up to and during the cross-connection test. After passing this test, the jumper must be removed, and the system connected to the recycled water meter. Jumpers, providing water from the public recycled water system into the on-site recycled water system, are prohibited at all times. Irrigation systems not needing a temporary potable water source are usually systems where there is no potable water at the site, such as some streetscapes and medians

4.5.5. Conversion of Facilities

4.5.5.1. Conversion from Potable to Recycled Water Use

With the exception of pipe identification and pipe separation, on-site recycled water systems where the existing buried piping system is converted from potable water to recycled water must meet the same requirements as new facilities. However, any new buried piping added to existing piping at a converted Use Area must meet the identification and separation requirements for new systems. In addition, any existing piping uncovered for any reason during construction must be marked according to new pipe identification requirements to the extent feasible. Prior to the conversion of an existing potable water system to recycled water use, the User shall, at a minimum submit record drawings and a report outlining the measures necessary to bring the system into full compliance to the County for review and approval. No existing potable water facility shall be converted to, or incorporated into, a recycled water facility without proper testing and approval by the County.

4.5.5.2. Conversion from Recycled to Potable Water Use

If the County deems it necessary to convert recycled water facilities to potable water use, it shall be the responsibility of the User, at User's cost and expense, to implement the following, as determined by the County:

1. Notifying CDPH of the intention to return to potable water use.
2. Arrange to have the County disconnect and plug the Use Area REW service connection.
3. The On-site recycled water system will then be disinfected in accordance with the following procedures.
    a. Shock the on-site recycled water system to be converted with 50 ppm of chlorine for 24 hours.
    b. Measure the chlorine residual after 24 hours. If a residual greater than 25 ppm is maintained, then continue to the next step. If the residual is below 25 ppm, then re-chlorinate by returning to the previous step until the chlorine residual can be maintained above 25 ppm.
    c. Flush the on-site recycled water system with potable water and perform a standard bacteriological test. The final test results must be acceptable to the Department of Public Utilities before recharging the former on-site recycled water system with potable water
4. Install and test approved backflow prevention assemblies on all potable water meter connections as required by cross-connection requirements.
5. Remove all recycled water quick-couplers.
6. Notify all Use Area personnel of the change.
7. Remove all recycled water warning labels/signs from the on-site recycled water system and the Use Area.
8. Notify CDPH both prior to and upon completion of conversion back to potable water.

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ARTICLE 5. Use Area Acceptance

5.1. Request for Service

All requests for recycled water service must be made by an applicant (Applicant) who will be required to complete and sign the appropriate application form(s). Upon receipt, the County will review the application and, in the County's sole discretion, may prescribe special requirements and conditions that are specific to the proposed Use Area such as needed facilities, special connection requirements, and the allowable uses of recycled water. Such requirements and conditions will be issued in writing by the County to the Applicant. Upon receipt of the recycled water user request, the County shall notify the appropriate Water Purveyor of such request within the Purveyor's service area so that the Purveyor can ensure the User meets all backflow requirements.

5.2. Pre-Application Inspection

Before the on-site recycled water system is designed (or converted) for recycled water use, each Use Area will be inspected by the County and the Water Purveyor, if applicable. The locations of potential ponding, runoff, overspray, and other problems will be identified. The County will indicate how the on-site recycled water system needs to be designed to address potential violations of these Rules and Regulations. If such potential problem areas cannot be corrected by system design, the Applicant may be required to conduct and pay for a program of special inspection, monitoring, and reporting. Such special inspection and monitoring programs will identify the locations within the Use Area where potential problems (e.g. ponding, runoff, and overspray) are most likely to occur, and describe the corrective monitoring, reporting and contingencies.

5.3. Design Approval

Before any new on-site recycled water system is constructed, or any existing on-site recycled water system is modified, the draft record drawings prepared by the Applicant must be approved by the County. The draft record drawings prepared by the Applicant must also be approved by the Water Purveyor with respect to type and placement of the backflow assembly. Approval will be contingent upon evidence that all applicable design requirements for the Use Area are satisfied and that the on-site recycled water system as designed can be operated in accordance with the Rules and Regulations. While the County reviews the draft record drawings, the Applicant is responsible for meeting all requirements, even those requirements not shown on the record drawings for existing on-site recycled water system uses. Applicant shall submit to the County three sets of plans for the proposed new or revised on-site recycled water system on 8-1/2" X 11" or 24" X 36" size paper utilizing County standard format. No work shall begin by User until plans have been approved by the County and fees have been paid.

5.4. Information Required on Record Drawings

The following is a list of the information required on the record drawings for every Use Area. Note that compliance with every item on this list does not guarantee that the draft record drawings will be approved, because regulations and policies may change, and some Use Areas may require additional provisions.

- Supply the following **information box** for each recycled water system with its own meter; place this information on the same sheet as the meter/point of connection it pertains to. Fill out the items as applicable, but do not delete any of them.

GENERAL USE AREA INFORMATION for RECYCLED WATER USE

1. LANDSCAPED RECYCLED WATER IRRIGATION USE AREA: *(square footage*).
2. PUBLIC ACCESS TO USE AREA GROUNDS IS *(indicate: UNRESTRICTED or RESTRICTED)*.
3. OWNER: *(legal property owner's name).*
4. PROPERTY MANAGER CONTACT: *(name, title, and telephone number).*
5. USE AREA SUPERVISOR: *(name, title, and telephone number)*
6. TENANT (S): *[name(s) & phone number(s); if not applicable, state NOT APPLICABLE].*
7. ON-SITE WELL LOCATIONS: *(for example, ONE; if none, state NONE)*.
8. WELLS ON ADJACENT SITES LOCATED WITHIN 1000 FT. OF RECYCLED WATER APPROVED USE AREA OR ANY RECYCLED WATER IMPOUNDMENT: (*for example, ONE; if none, state NONE).*
9. OUTDOOR DRINKING FOUNTAINS IN/NEAR THE RECYCLED WATER APPROVED USE AREA: (*for example, ONE; if none, state NONE).*
10. OUTDOOR EATING AREA(S) IN/NEAR THE RECYCLED WATER APPROVED USE AREA: (*for example, ONE; if none, state NONE).*
11. IMPOUNDMENTS OR WATER FEATURES ON USE AREA: (*examples below; if none, state NONE).*

Number:	Type:	Water Source:	Volume:
One	*fountain*	*recycled*	*400 gallons*
One	*pond*	*potable*	*40,000 gallons*

- Indicate other governmental entities that may have access to the site such as USDA, Dept. of Public Health, EPA, etc.
- Indicate all **sources of water** on the plans.
- Show the location and size of all **water meters** on the piping plans.
- Show location and type of all **backflow prevention devices** for potable water systems.
- Show location and type of all **strainers, pressure-regulating valves, and master valves**.
- Show location of all **water pipelines** (including potable water lines and well discharge lines) crossing the Use Area. If space does not permit this information to be placed on the irrigation plans, then a separate Use Area or utility plan can be used to show this information. *Exception:* Although it may not be possible to show the location of all water pipelines for existing irrigation systems converting to recycled water, all locations where

future recycled water piping must be separated from potable water piping must be clearly indicated on the plans.

- Clearly identify all adjacent **streets**, and locations of all major improvements on the Use Area.
- Show the location of all **public facilities supplied with recycled or potable water** service. Public facilities include, but are not limited to, drinking fountains, outdoor eating areas, restrooms, snack bars, swimming pools, wading pools, decorative fountains, and showers. Show the pipelines supplying these facilities.
- Show the location of any wells, lakes, ponds, reservoirs, or other **Impoundments** located within the Use Area or within 100 feet of the Use Area, and indicate the type of water source.
- Indicate that the **separation between potable and recycled water lines** meets minimum state separation requirements (see Guidance Criteria for the Separation of Water Mains and Non-Potable Pipelines for requirements). Show sleeving and other cross-connection prevention measures where applicable.
- When **potable water piping is not present** within the Use Area, state in a note that the cross-connection test requirement is waived for Use Areas where potable water piping is not present.
- **Show all details necessary** to properly construct the on-site recycled water system, including the details conforming to any special requirements for the Use Area. The purpose of the details is to show the materials and methods necessary to clearly identify all water systems within the Use Area.
- Include an **irrigation equipment legend** specifying all materials of construction for the on-site recycled water system, including:
  - A pipe schedule listing pipe sizes, materials of construction, and type of water conveyed by the piping.
  - A listing of valve types, including quick-coupling valves.
  - All pertinent information for each type of sprinkler head and/or emitter.
  - Indication of purple-colored pipe with recycled water stenciling and quick-coupling valves with purple covers where recycled water is used.
- Show the proposed locations and types for all **recycled water signs**.
- Add **signature lines** for Applicant and County to all irrigation plan sheets, detail sheets, and specification sheets that pertain to the on-site recycled water system.
- Impoundment type of use or activity to be allowed.

5.5. Acceptance Inspection

5.5.1. Construction Inspection

The County will conduct on-site inspections during the construction phase of the on-site recycled water systems to ensure that materials, installation, and procedures are in accordance with the approved record drawings, specifications, and all applicable regulations. Accordingly, the Applicant must notify the County of the schedule for all phases of planning, construction and start-up so that inspections can be scheduled.

5.5.2. Cross-connection Test

The Applicant must pass a cross-connection test before connecting the on-site recycled water system to the distribution system at any Use Area where both recycled and potable water are present within the Use Area. The test must be performed in accordance with Appendix A. This test is to ensure the absolute separation of the recycled and potable water systems. The Applicant must notify the County at least 48 hours prior to the test so that a County representative may be present. The cross-connection test must be done under the supervision of the County and performed by an AWWA-certified cross-connection control specialist hired by the applicant unless hired otherwise. For sites with designated Use Area supervisors, the Use Area supervisor must be present at the test. **The test must be done with potable water supplying the on-site recycled water system** (see *Required Temporary Connection to Potable Water Service* within Section 4.5.4.6). A written report documenting the test results must be submitted by the certified cross-connection control specialist to the Use Area supervisor and the County following test completion.

5.5.3. Final Inspection and Approval to Receive Recycled Water

Before the on-site recycled water system is connected to recycled water, the County will perform a final inspection to ensure all requirements have been met. This inspection may be coordinated with the cross-connection test. The County inspector will check to see that the proper equipment was used and that all required tags, labels, and signs are in place.

The County inspector must grant final approval before recycled water can be supplied to the Use Area. Final approval will be granted when construction has been completed in accordance with approved record drawings, all cross-connection tests have been performed, a final on-site inspection has been conducted, and all requirements have been met satisfactorily. After final approval is granted and all applicable fees have been paid, the County will finalize the installation of the REW service connection with the service meter assembly. Upon request, CDPH will be provided with a copy of all test and inspection reports as well as notification that recycled water service has started. During the lifetime of the on-site recycled water system, the County will periodically inspect the Use Area to ensure compliance with all applicable Rules and Regulations.

5.5.4. Coverage Test

Users are responsible for minimizing overspray, runoff, and ponding from their on-site recycled water system. To ensure that the User is doing so, the County will conduct an inspection of the on-site recycled water system. After the on-site recycled water system begins receiving recycled water, the User must contact the County to schedule a coverage test walk-through of the system. For sites with designated Use Area supervisors, the Use Area supervisor must be in attendance. If modifications to the system (other than minor adjustments) are required, the User will be notified in writing of the changes required. Any required modifications to the system must be made in a timely manner. All modifications to the system are the responsibility of the User, and the User must pay all costs associated with such modifications.

5.5.5. Record Drawings

The Applicant must provide record drawings to show on-site recycled water system as constructed. These drawings must include all changes in the work constituting departures from the original contract drawings, including those involving both constant-pressure and intermittent-pressure lines and appurtenances. All conceptual or major design changes must be approved by the County before the Applicant implements the changes in the construction contract. The

on-site recycled water system record drawings must be submitted to the County within ninety (90) days of the Use Area receiving recycled water.

5.6. User Agreement Issuance and Renewal

5.6.1. Recycled Water User Agreement

Upon approval of the application by the County, a non-transferable User Agreement may be executed between the County and Applicant authorizing the Applicant to receive recycled water service subject to the terms and conditions of these Rules and Regulations and federal, state, and regulatory agency rules and regulations. The User Agreement shall include, but not be limited to, the Use Area location, an estimate of the quantity (including seasonal schedule) of recycled water to be used, and permitted uses of recycled water.

5.6.2. User Agreement Renewal

If a portion or all the Use Area property is transferred to a new owner or tenant, or a new Use Area supervisor becomes responsible for on-site recycled water system maintenance, the User must notify the County within 30 days to receive a new User Agreement.

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ARTICLE 6. Operation, Maintenance, and Management

The operation, maintenance and management of Use Areas are the responsibilities of Users while the operation and maintenance of the distribution system, including the REW service connection, is the responsibility of the County. The following operation, maintenance, and management requirements satisfy the requirements of the Water Recycling Criteria.

6.1. General Requirements

The following general requirements may pertain to both the County and the Users, as applicable, for recycled water system components within their respective purview.

1. The use of recycled water must be limited to the Use Areas designated and approved by the County.
2. A Use Area supervisor shall be designated, as required by Section 3.3 of this document.
3. Runoff of recycled water and overspray shall be prevented or minimized. Runoff and overspray shall be regularly monitored by the User. Any runoff, ponding, or overspray shall be corrected immediately by the User. Adequate measures shall be taken to minimize ponding and to prevent breeding of mosquitoes of public health significance.
4. Drinking water facilities, such as drinking fountains, shall be protected from overspray. Protection shall be by design, construction practices, or system operation.
5. Users will be responsible for continuous maintenance of the on-site recycled water system. This includes, but is not limited to,
    - Testing pressures periodically with a pressure gauge to maintain appropriate pressure levels. Valves or pressure regulators should be adjusted so that the systems are operating at the pressure required by the sprinkler heads or emitters.
    - Routine testing the accuracy of time clocks. Time clocks should be recalibrated or repaired as necessary.
    - Repair or replacement of broken risers, sprinklers, valves, or other appurtenances as soon as the damage is discovered. These should be replaced with the appropriate make and model of equipment to maintain uniformity throughout the on-site recycled water system.
6. Users shall ensure that all on-site recycled water system facilities are maintained, operated, and repaired at all times in a manner that does not cause illness or injury to any person, and in a manner that does not cause damage or injury to the real or personal property or any person or entity, including the County.
7. Recycled water identification signs, tags, stickers, and above-grade pipe markings shall be regularly checked for proper placement and legibility as described in Section 4.5.4. Damaged, unreadable, or missing signs, tags, stickers, and pipe markings shall be repaired or replaced by the User.
8. Use Areas shall be managed so that public contact with recycled water is minimized.
9. The use of recycled water shall at no time create odors, slime, or deposits, become a public or private nuisance.

10. All reduced pressure principal backflow prevention assemblies, pumps, and other mechanical devices must be inspected quarterly for leaks and shall be repaired or replaced as necessary.
11. Screens and backwash filters shall be routinely cleaned to keep the on-site recycled water system operating optimally.
12. Users shall provide written notification, in a timely manner, to the County of any material change or proposed change in the character of the use of recycled water.
13. Users shall provide written notification, in a timely manner, to the County of any material modification or proposed modification to an on-site recycled water system. This includes converting any piping used for recycled water back to potable water, such as switching from a recycled water system to a backup potable water system. The County will notify the User if any additional approval is required from other regulatory agencies or the applicable Water Purveyor and if disinfecting procedures are required.
14. Users will maintain accurate records of all inspections, modifications, and repair work.
15. In the event of a break in the on-site recycled water system, low pressure, low flow or poor water quality, the User will notify the County.
16. Users will notify the County immediately of all failures in the system resulting in an unauthorized discharge or contamination of a potable water system. Any incident concerning recycled water use that may involve public illness must be reported to CDPH and to the County. The County will specify if a written report is required. In the event of an unauthorized discharge, the Use Area supervisor should make every effort to contain the recycled water and prevent it from leaving the Use Area or entering into a potable water system. Emergency cross-connection procedures are described in Section 6.7.2.
17. Potable Water shall be provided for workers as required by law.
18. Toilet and washing facilities shall be provided for workers as required by law.
19. A first-aid kit should be available on site, to prevent any cuts and other injuries incurred from contacting recycled water.
20. A copy of these Rules and Regulations, an on-site recycled water system layout map, and an on-site recycled water system operations manual shall be made available to Use Area operators at all times.

6.2. Irrigation-specific Requirements

1. Sprinkler heads shall be adjusted so they achieve 80% head-to-head coverage throughout their intended arc. There should be no obstruction that would interfere with the free rotation and smooth operation of any sprinkler, such as trees, tall grass, shrubs, or signs. The system should be tested during the daytime, so adjustments can be made.
2. Valves or pressure regulators shall be adjusted so that irrigation systems are operated at the appropriate pressure for the sprinkler heads or emitters.
3. The duration or length of an irrigation cycle (run time) should be no longer than the time necessary to saturate the soil's root zone.
4. There shall be no recycled water irrigation within 50 feet of any well for domestic supply unless all the following conditions have been met:
    a. A geological investigation demonstrates that an aquitard exists at the well between the uppermost aquifer being drawn from and the ground surface;

b. The well contains an annular seal that extends from the surface into the aquitard;
c. The well is housed to prevent any overspray from coming into contact with the wellhead facilities;
d. The ground surface immediately around the wellhead is contoured to allow surface water to drain away from the well; and
e. The owner of the well approves of the elimination of the 50-foot buffer zone requirement noted above.

6.3. Impoundment-specific Requirements

1. The use of Impoundments supplied by recycled water shall be specified by individual User Agreement and shall be limited to:
    1. Golf course ponds
    2. Decorative ponds or water features in housing or commercial developments
    3. Others as approved by the County and CDPH.
2. Impoundments shall not occur within 100 feet of any domestic water supply well.
3. Impoundments are recommended to be lined and impoundment construction approved and inspected by the County.
4. User should develop a maintenance program to help prevent the growth of algae subject to approval by the County, which may include but is not limited to adequate aeration, circulation, and chemical application.

6.4. Recycled Water for Construction Use

Water is used at construction sites for controlling dust including spraying water on disturbed areas, pre-watering areas to be disturbed, spraying water on material storage piles, and spraying water in uncovered trucks transporting material. Water is also used at construction sites for soil compaction.

Under the County's Master Reclamation permit, construction water is a permitted use of recycled water within *Los Osos groundwater basin* limits. Potable water must still be used at construction sites for other uses i.e. water to construction trailers, hand washes, hose bibs and temporary sprinklers. The Contractor/Customer must obtain an approved potable connection from the County to serve these uses.

Through the recycled water distribution system and the Construction Water Permit Program, recycled water is available to permitted water haulers for construction purposes at two locations along the County's recycled water distribution system, one at 2025 10th street and another at the Los Osos Water Reclamation Facility. The 10th street hydrant offers 24-hour access to recycled water to Construction Water Permit holders. The hydrants are metered and read monthly by the County to record recycled water usage. Permit holders will have access to an unlimited supply of recycled water for use consistent with these procedures.

To utilize these facilities, water haulers must obtain a Construction Water Permit. Annual permits will be issued after the applicant meets the following permit requirements:

1. Applicant submits Construction Water Permit application
2. Applicant identifies a Construction Water Supervisor and attends County sponsored Construction Water Supervisor training,
3. County verifies air gap on water hauling vehicle(s) and
4. Applicant provides payment of applicable Construction Water Permit fees.

For annual permit renewal, customer will attend County-sponsored training, pay permit fee, and receive permit and vehicle identification sticker(s). Annual Construction Water Permits will be issued to interested water haulers or contractors on July 1 and run through June 30. Annual permit fees will be adopted by the County Board of Supervisors by resolution.

6.4.1. Personnel Training

The Construction Water Supervisor is responsible for training all personnel involved with the use of recycled water, including each water tank truck driver, so they are familiar with these p procedures. At a minimum, the training program should convey the following information:

- Recycled water, although highly treated, is non-potable and must never be used for human consumption.
- Working with recycled water is safe, if common sense is used and appropriate regulations are followed.
- Recycled water shall be applied to ensure that no ponding or runoff occurs.
- Recycled water shall be applied to minimize aerosol formation spraying
- Recycled water shall be applied to prevent public or employee contact with the water.

Training programs should also instruct personnel in proper procedures for hydrant use, vehicle identification, cross connection and contamination issues as described.

6.4.2. Hydrant Use

The Construction Water Permit is valid for access to the two recycled water hydrants. No recycled water shall be taken from the hydrants until Construction Water Permit has been issued. All water trucks carrying recycled water must have an air gap to be part of the Construction Water Permit Program.

Tank filling shall be carried out from the roadside of the hydrant. The water truck shall be parked on the roadway or pull out area. Recycled water shall not be allowed to overflow water tank. Hoses and tanks shall be kept in good condition free from any leaks.

Hydrant locations shall be left in a clean state. Permit holders shall immediately report a leaking hydrant to County Public Works Utilities Division.

6.4.3. Vehicle Identification Requirements

Construction Water Permit holders shall ensure that tank trucks and other equipment which contain or contact recycled water are clearly identified with warning signs which state, for example, “Recycled Water- Do Not Drink.”

6.4.4. Cross Connection/Contamination

State law prohibits a connection between the recycled water and the potable water systems. Therefore, no fittings, hose or pipe, or any other appurtenance using recycled water shall connect to a potable water source. Furthermore, recycled water cannot be introduced into any permanent piping system and that no connection can be made between tank truck and any part of the domestic water system.

Water trucks, water tanks, or any other receptacle, including but not limited to pipe or hose used for storage or conveyance of recycled water, shall be dedicated solely to that use. Any use other than recycled water must be approved by the County Health Department.

Any water truck, water tank or other storage receptacle to be converted from recycled water to potable water shall be thoroughly cleaned and disinfected to the satisfaction of the County Utilities Division and the County Health Department.

6.4.5. Program Monitoring

County staff will monitor water haulers accessing the hydrants to verify compliance. A Construction Water Permit may be withdrawn if it is known that the permit holder is using the recycled water at sites outside the *Los Osos Groundwater Basin* or in a manner otherwise inconsistent.

6.5. Management Recommendations

The following practices are recommended, although not required, by these Rules and Regulations, to optimize management of on-site recycled water systems:

1. Use tensiometers, gypsum blocks, soil probes, the “feel method,” and/or the California Irrigation Management Information System to estimate soil moisture levels. Inspect and maintain any selected instrumentation regularly to ensure the accuracy and reliability of these methods.
2. Use automatic rain shut-off devices to reduce irrigation if significant rainfall occurs.
3. Use multiple rain shut-off devices to reduce ponding if the precipitation rate is higher than the infiltration rate of the soil.
4. Group irrigated areas into zones of similar water use. For example, irrigate grass areas separately from shrub areas and sunny areas separately from shady areas.
5. As needed, aerate the soil to improve infiltration of air and water into the soil.
6. Provide as much flexibility as possible into the design of the on-site recycled water system. Built-in ability to make changes as necessary can add to the efficiency of the system.
7. Perform good horticultural, fertilization, mowing, de-thatching, aeration, and pest control practices, as necessary, to create the best growing environment for landscape vegetation.

6.6. Scheduled Inspections and Tests

6.6.1. County Conducted Inspections

The County will formally inspect each reuse area at least once a year. Schools shall be inspected twice per year.

6.6.2. Annual Self Inspection Report

Users shall conduct an inspection at least once per year while the on-site recycled water system is in use. The results of this inspection must be documented and submitted in a written report to the County, based on a report form to be mailed to each Use Area supervisor by the County once a year. Each Use Area supervisor must submit the results of the observations, along with a description of any corrective actions taken. Each Use Area supervisor must keep a copy of the report for his/her records and return the original to the County. The questions on the annual inspection report are as follows:

- Is there evidence of recycled water runoff from the Use Area? Show affected area on a sketch and estimate flow rate and daily volume.

- Is there an odor of wastewater originating from within the Use Area? If yes, indicate apparent source, characterization, direction of travel, and any public use areas or off-site facilities potentially affected by the odors.
- Is there evidence of recycled water ponding, and/or evidence of mosquitoes breeding within the irrigation area due to ponded water?
- Are warning signs, tags, stickers, and above-ground pipe markings properly posted to inform the public that irrigation water is recycled water, which is not suitable for drinking? Are these signs in all the appropriate languages based on the community in which the Use Area is located?
- Is there evidence of leaks or breaks in the on-site recycled water system piping or tubing?
- Is there evidence of broken or otherwise faulty irrigation system emitters or sprinklers?
- Has your designated Use Area supervisor changed in the past year?
- Have any other operational or management changes been implemented at the Use Area that represent differences from the terms, conditions, and other provisions of your Use Area Agreement?
- What corrective actions are being taken to correct any problems noted above?

Backflow preventer testing on potable connections must be conducted in accordance with the County protocol. Backflow preventer test reports must be included with the Annual Self-Inspection Report.

6.7. Emergency Procedures

6.7.1. General Requirements

In case of earthquake, flood, fire, major freeze, nearby construction, or other incident that could cause damage to the recycled water or potable water systems, the Use Area supervisor must inspect all potable water systems and the on-site recycled water system for damage as soon as it is safe to do so. If either system appears damaged, both systems should be shut off at their points of connection. The Use Area supervisor must immediately contact the County for further instruction.

To prevent contamination, damage, or a public health hazard, the User may make emergency modifications or repairs without the prior approval of the County. As soon as possible after the modification, but within 24 hours, the User must notify the County of the emergency modifications and file a written report within three days.

6.7.2. Emergency Cross-connection Procedures

If a cross-connection is suspected or occurs, the following emergency cross-connection response plan must be implemented immediately.

1. The User must notify the County by telephone immediately. This notification must be followed by a written notice within 24 hours that includes an explanation of the nature of the cross-connection, date and time discovered, and the contact information of the person reporting the cross-connection if different from the Use Area supervisor.
2. The County will notify CDPH and other regulatory agencies, as appropriate, of the reported cross-connection.
3. User must immediately shut down the recycled water supply to the on-site recycled water system.

4. User must keep potable water systems pressurized and post "Do Not Drink" signs at all potable water fixtures and outlets.
5. User must provide bottled water for employees until water from the potable water system is again deemed safe to drink.
6. After final approval has been obtained from CDPH, the County will bring the recycled water back into service and inform the User to remove the "Do Not Drink" signs from potable water fixtures and outlets.

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ARTICLE 7. Employee Training Requirements

7.1. General Requirements

Employee training shall be implemented and sustained by Users to assure safe and proper operation of the on-site recycled water system. The training programs shall be site-specific, fully compliant with these Rules and Regulations, and shall be implemented prior to the receipt of recycled water.

The Use Area's training program shall be developed by the applicant and described in an attachment to the User Agreement. The training program description will identify the entity that will provide the training, identify all entities that will receive the training, and address all the following requirements:

1. Use Area personnel, residents, and the public shall be made aware that recycled water is not approved for drinking purposes.
2. Use Area personnel and others must be notified that recycled water is in use, through the posting of signs, and the other means required by these Rules and Regulations.
3. Use Area personnel shall be instructed against taking food into areas that are still wet with recycled water or consuming food that may have come in contact with recycled water.
4. The Use Area will maintain a copy of all applicable recycled water rules, regulations and reports, an on-site recycled water system layout map, and an on-site recycled water system operational manual.
5. All Use Area operators will be familiar with, and have access at all times to, written maintenance instructions, irrigation schedules, controller charts, record drawings, and these Rules and Regulations.
6. Training shall be provided to all Use Area personnel before recycled water is delivered to the Use Area, as an orientation for new Use Area personnel, and as an annual refresher course for all Use Area operators. At a minimum, the training should convey the following information:
    a. Recycled water, although highly treated, is non-potable and must never be used for human consumption.
    b. Regulations prohibit ponding, overspray, and runoff of recycled water.
    c. Working with recycled water is safe if common sense is used and the Rules and Regulations are followed.
    d. State law prohibits a connection between the recycled water and potable water systems.
7. The training program should instruct Use Area operators in proper procedures for reporting unauthorized discharges, identifying and correcting cross-connections, and isolating and/or repairing the on-site recycled water system in the event or an earthquake or other disaster.

7.2. Use Area Supervisor Training

The Use Area supervisor must pay for and attend a Use Area Supervisor Certification Workshop from an institution approved by CDPH and the County, within the first 120 days of receiving recycled water service. Failure to attend the Use Area Supervisor Certification Workshop may result in the termination of recycled water service.

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ARTICLE 8. Recycled Water Service

8.1. General Statement

The County shall provide recycled water on a case-by-case basis where the County determines recycled water is technically and economically feasible. Providing recycled water service shall be at the discretion of the County. Determination of the allowable uses of recycled water shall be in accordance with the treatment standards and water quality requirements set forth in the State of California's Water Recycling Criteria and with the intent to protect the public health. Recycled water service shall, in addition, be subject to the availability of distribution facilities or the technical and economic feasibility of making such facilities available, as determined by the County. No person or entity other than the County shall deliver recycled water to a Use Area.

8.2. Conditions of Service

Recycled water service will be made available to the User under the following terms and conditions:

8.2.1. Compliance with Regulations

Recycled water shall be used in a manner that complies with all applicable federal, state, and local statutes, ordinances, regulations and other applicable requirements for the treatment level supplied, as determined by County. The use of recycled water shall not, at any time, cause pollution, contamination, or a private or public nuisance, as defined by section 13050 of the California Water Code, Division 7 (Water Code). Recycled water shall be used by Users at all times in a manner that does not cause illness or injury to any person and in a manner that does not harm or damage any real or personal property of any person or entity, including the County.

8.2.2. Distribution

The County reserves the right to control and schedule distribution of recycled water as necessary to:

1. Safeguard public health;
2. Maintain acceptable working pressure;
3. Manage the availability of recycled water supply; and
4. Construct, maintain, and operate County facilities.

8.2.3. Metering

All Recycled water use shall be metered, and all recycled water used on any Use Area where a meter is installed must pass through said meter, which will be installed, calibrated and maintained by the County. Users shall be held responsible, and charged, for all recycled water passing through the meter(s), unless otherwise specified by the County.

8.3. Charges for Service

The schedule of recycled water rates, service charges, and other charges will be established in User Agreements. If a Use Area is located within a Water Purveyor service area, water rates or tariffs will be determined and billed to the User by the applicable Water Purveyor, and the User will pay all water rates or tariffs directly to the Water Purveyor.

8.4. Disputed Recycled Water Bills

Any disputed recycled water bills will adhere to the process specific in the agreement, signed between the County and the User, will take precedent. Unless otherwise stated in the agreement, if the User believes that the amount of recycled water in any billing statement it receives from the County is inaccurate in any way, the User shall so notify the County in writing within sixty (60) days of the date of the billing statement was received by the User. Unless the User provides such written notification to the County within sixty (60) days, the amount of recycled water in said billing statement shall be deemed to be an accurate amount that was based upon an accurate meter. The User will not be able to claim any adjustments, credits, or offsets to any billing statement unless it provides the County in writing the reasons why the User believes the billing statement is inaccurate within sixty (60) days of the date the County first sent the billing statement to the User.

8.5. Non-Registering Recycled Water Meter

When a meter is found to be out of order, the charge for recycled water will be governed by the amount of recycled water delivered in the corresponding period immediately prior to the failure, unless the County and the User agree upon a different amount.

ARTICLE 9. Prohibitions and Enforcement

The County shall be responsible for the enforcement of these Rules and Regulations. The County may employ any of the following enforcement procedures to return a User to compliance with these Rules and Regulations, a User Agreement, or any federal, state, or local regulation.

9.1. Prohibitions

9.1.1. There shall be no cross-connection between an on-site recycled water system and any potable water system.

9.1.2. A User shall not cause or permit an unauthorized discharge.

9.1.3. A User shall not violate any Federal, State, County, or city statute, law, rule, regulation or contract governing the use of recycled water including but not limited to: California Code of Regulations Title 17, Sections 7583 through 7605; California Code of Regulations, Title 22, Section 60301 et seq (Water Recycling Criteria); the 2010 California Plumbing Code, Chapter 16, Part II; these Rules and Regulations; and the User Agreement.

9.1.4. Any bypass or connection around the meter between the distribution system and the on-site recycled water system shall be prohibited unless specifically authorized in writing by the County for a limited period of time.

9.1.5. No person shall cover a recycled water meter box with trash, rubbish, dirt, or other foreign matter, or permit ivy or other shrubbery to cover a meter box, or park automobiles or other vehicles over a meter box.

9.1.6. No person shall tap, open, or connect any recycled water service. Only the County may connect an on-site recycled water system to the recycled water distribution system, and only the County may turn recycled water on.

9.2. Rights of Inspection and Monitoring

9.2.1. Rights of Entry

The County shall have the right to enter the Use Areas to determine whether the User is complying with all requirements of these Rules and Regulations, or any other regulatory requirements. Owners or occupants of premises where recycled water is used shall allow the EPA, Regional Board, CDPH, the County or the County's representative ready access at all reasonable times to all areas of the Use Area.

9.2.2. Rights to Monitor

The County shall have the right to set up on the User's property such devices as are necessary to conduct inspections, compliance monitoring, and/or metering operations, from County-owned facilities serving the Use Area. Where necessary, keys and/or lock combinations shall be provided to the County for Use Area access during normal business hours.

9.2.3. Access to Facilities

Where a User has security measures in force which would require proper identification and clearance before entry onto the premises, the User shall make necessary arrangements with his/her security guards so that, upon presentation of suitable identification, personnel from EPA, the Regional Board, CDPH, the County or the County's representative shall be permitted to enter without delay for purposes of performing their specific responsibilities.

9.2.4. Obstruction to Access

Any temporary or permanent obstruction to safe and easy access to the Use Area to be inspected and/or monitored shall be promptly removed by the User at the written or verbal request of the County and shall not be replaced. The costs of clearing such access shall be borne by the User.

9.2.5. Access Delayed or Refused

Unreasonable delays in allowing the County access to a Use Area shall be a violation these Rules and Regulations.

9.2.6. Administrative Inspection Warrant.

If a User refuses permission to enter, inspect, or monitor, the County may seek an Administrative Inspection Warrant pursuant to the procedures provided in Code of Civil Procedure Sections 1822.50 through 1822.59 as amended, to perform the duties imposed upon the County pursuant to these Rules and Regulations.

9.3. Violations

A User is in violation of these Rules and Regulations whenever the User violates or causes a violation of any of the terms of the Ordinance, these Rules and Regulations, any condition or provision of a User Agreement issued pursuant to this article, any rule adopted by the County to administer or enforce this article, and any notice, order, demand issued by the County pursuant to these Rules and Regulations.

Any violation of these Rules and Regulations shall be a public nuisance.

9.3.1. Available Remedies for Violations.

Notwithstanding any other remedies available in state or federal law, the County may do any of the following to address a violation of these Rules and Regulations:

(a) Take action pursuant to these Rules and Regulations.

(b) Issue a notice of compliance.

(c) Issue an administration citation to the User and/or the person or entity that caused the violation.

(d) Modify or revoke the User's User Agreement.

(e) Cease County recycled water service pursuant to a show cause hearing.

(f) Pursue civil and/or criminal action pursuant to local, state or federal law, including, but not limited to California Government Code Section 54740.

The County may take action as appropriate to the situation. Any action taken shall be pursuant to the provisions of these Rules and Regulations, except that to the extent the County issues an administrative citation or issues any order that requires ceasing Recycled Water service, the User may appeal the citation or the order pursuant to the procedures in Chapter 1, Article 4. Filing an appeal under Chapter 1, Article 4 does not stay enforcement of the citation or order pursuant to Subsection 1-408(f). If a User has an appeal right pursuant to this section, the Director shall notice the User of his/her/its appeal right at the time the administrative citation and/or order ceasing Recycled Water service is issued.

9.4. Administrative Citation

The County may issue an administrative citation with a monetary fine as provided in the Master Fee Schedule. The Master Fee Schedule may provide for a scheme of penalties for types and/or reoccurrence of violations. Administrative citations shall be issued pursuant to Section 1-308. In addition to any other means of collection, the penalty may be collected through the User's issued utility bill pursuant to Article 1 of Chapter 6 (including discontinuance of service upon non-payment).

9.5. Show Cause Hearing Terminating Recycled Water Service.

If a violation is not corrected by timely compliance of a notice or demand, pursuant to these Rules and Regulations or pursuant to Section 9.3.1 (b), above, the County may order any User to show cause before the Director why the User's recycled water service should not be terminated, in accordance with the following:

(a) Notice of Show Cause Hearing. A notice shall be served on the User, specifying the time and place of a hearing to be held by the County regarding the violation, and directing the offending party to show cause before the County why an order should not be made directing the termination of recycled water service. The notice of the hearing shall be served personally or by certified mail, return receipt requested, at least ten days before the hearing. Service may be made on an authorized representative of the User, or the occupant(s) and/or owner(s) of record of the property.

(b) Hearing. The County shall conduct the hearing and take the evidence of the User and County staff and shall provide the User a reasonable period of time to present his/her/its position.

(c) County Action. After the hearing, the County may do any of the following based upon substantial evidence that the action is necessary to protect the public health and safety of the water supply:

(i) An order to the User and County staff, directing that the recycled water service be discontinued and/or severed;

(ii) An order to the User and County staff, that following a specified time period, the recycled water service be discontinued and/or severed unless adequate measures have been taken by the User and such further orders and directives as are necessary and appropriate to ensure compliance with this article.

(iii) Any other action within the authority of the County.

(d) Subject to Appeal. Any order under subparts (c)(ii) or (c)(iii), above, is subject to appeal pursuant to Article 4 of Chapter 1. Users shall be notified of their appeal at the time the County issues the order.

(e) Failure to Appear. The County may direct staff to immediately disconnect the recycled water service if the User fails to appear for the hearing or otherwise respond to the notice of the show cause hearing and if the County finds it is necessary to protect the public health and safety of the water supply.

(f) Reinstate Recycled Water Service. The County shall reinstate recycled water service and approve reconnection to the recycled water system upon proof of the elimination of the non-complying actions. Reinstatement of recycled water service shall be in accordance these Rules and Regulations or other guidelines established by the County.

9.6. Fraud or False Statements.

Pursuant to the provisions of 18 U.S.C. §§ 1001, relating to fraud and false statements, and the provisions of Section 309(c)(2) of the Act governing false statements, representations or certification in reports required under the Act, any person who knowingly makes any false statements, representation or certification in any application, record, report, plan or other document filed or required to be maintained for these Rules and Regulations or User Agreement, or who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required under these Rules and Regulations, shall, upon conviction, be punished by a fine or imprisonment, or by both.

a) Cost Reimbursement. All costs incurred by the County by any means, whether direct or indirect, because of a User failing to comply with any provision of this article shall be reimbursed to the County by that User. The County may seek collection through the User's County issued utility bill pursuant including discontinuance of service upon non-payment.

(b) Remedies Nonexclusive. The remedies provided for in this section are not exclusive or mutually exclusive. The County may take any, all, or any combination of the remedies provided in this section and/or State or Federal law against a noncompliant User. While enforcement will generally be in accordance with these Rules and Regulations, the County is not limited by these Rules and Regulations from taking other actions to enforce the provisions of this article.

9.7. Emergency Suspensions

The County may immediately suspend a User's recycled water service, after informal notice to the User, whenever such suspension is necessary to protect public health, water supply, or the environment. The County may also immediately suspend a User’s recycled water service, after notice and opportunity to respond, if the continued use is a threat to public health, the water supply, or the environment.

(a) Immediate Cessation upon Notification. Any User notified of a suspension of service shall immediately comply with said Notification. In the event of a User's failure to immediately comply voluntarily with the suspension order, the County may take such steps as deemed necessary, including immediate severance of the recycled water connection, to protect the public health, water supply, or the environment. The County may allow the User to recommence use when the User has demonstrated to the satisfaction of the County that the corrections have been completed.

The County may also elect to inform the Regional Board and/or CDPH depending on the nature of the violation. The Regional Board or CDPH may initiate enforcement action, which may include fines, against any User who discharges, uses, manages, transports, or stores recycled water in violation of any applicable discharge requirement prescribed by the Regional Board or in a manner that creates or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code, Section 13050.

(b) Statement of Cause and Preventative Measures. A User that is responsible, in whole or in part, for any improper use causing imminent endangerment of public health, the water supply, or the environment, shall submit a detailed written statement, describing the causes of the improper use and the measures taken to prevent any future occurrence, to the County prior to the date of any show cause or termination hearing.

(c) Prior Hearing Not Required. Nothing in this section shall be interpreted as requiring a hearing prior to any emergency suspension under this section.

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ARTICLE 10. Service Termination

10.1. Turn-off at User's Request

A User may request that service be discontinued, either temporarily or permanently, by giving at least two working days advance notice to the County. The User assumes full responsibility for all charges incurred from the effective date of service until User notifies the County to discontinue service.

10.2. Turn-off by the County

The County may discontinue a User's service for any of the following reasons:

1. Non-Payment of Bills - Service may be discontinued for nonpayment of any water charges by a User subject to the terms of the User Agreement.
2. Non-Compliance - Service may be discontinued for non-compliance with the terms and conditions of the User Agreement or in these Rules and Regulations.
3. Water Quality - Service may be discontinued if, at any point in the County's Distribution System, the Recycled Water does not meet the quality requirements of the County or a regulatory agency. Service would, in such case, be restored when the County determines recycled water again meets the quality requirement.
4. For Non-Compliance with Regulations - Service may be suspended or terminated in the manner provided herein at any time the User's operations do not conform to these Rules and Regulations as determined by the County in its sole discretion. Where safety of water supply or public health is endangered, or regulatory agency regulations have been violated, service may be suspended immediately without notice. Otherwise, all defects noted shall be corrected within the period specified by the County.
5. For Waste of Water - To protect against serious and negligent waste or misuse of recycled water, the County may suspend service if such wasteful practices are not remedied after notice to such effect has been given to the User.
6. For Unauthorized Use of Recycled Water - When the County has discovered an unauthorized use, the service may be suspended without notice. Use of recycled water on a site that has not been approved for the use of Recycled Water requires the immediate notification of CDPH.

10.3. Restrictions on Recycled Water Availability Due to the Public Interest

The availability of recycled water may be restricted or prohibited by the County whenever the public interest so requires, including, but not limited to, the following circumstances:

1. In the event of a fire and subject to the direction of the Chief of the City Fire Department
2. In the event of maintenance, repairs, or other circumstances necessitating a partial or complete shutdown of the distribution system.
3. In the event of an inadequate supply of recycled water.

10.4. Re-Establishment of Service

The County shall have the right to refuse to re-establish service following termination of service for violation of these Rules and Regulations or the terms of a User Agreement. Any request to re-establish service after the termination of recycled water service shall be in the manner prescribed for initially obtaining recycled water service from the County. To resume or continue service that has been suspended, the User may be required, at the County's discretion, to pay a restoration fee, as determined by the County.

APPENDIX A

Cross-connection Control Test Procedure for On-site Recycled Water Systems

The following is the required methodology for conducting cross-connection control tests for Use Areas where both Recycled Water and Potable Water are intended to be used in separate piping systems. A certified AWWA Cross-connection Specialist must perform the test.

Test equipment must be dedicated for use with Recycled Water. Backflow testing equipment used for Recycled Water must not be reused on Potable Water systems.

CROSS-CONNECTION CONTROL TEST PART I:

The Potable Water system shall be activated and pressurized. The on-site recycled water system shall be shut down at its point of connection to the Distribution System and depressurized — this is usually done by manually bleeding a control valve and/or quick-coupling valve that is located at the lowest point of elevation in the on-site recycled water system.

1. Any proximate Potable Water systems shall remain pressurized for a minimum period specified by the Cross-connection Specialist while the on-site recycled water system is depressurized. The minimum period the on-site recycled water system is to remain depressurized shall be determined on a case-by-case basis, considering the size and complexity of the Potable Water system and the on-site recycled water system.
2. All on-site recycled water system control valves and quick-coupling valves, irrigation systems, and impoundment inlets shall be tested and inspected for flow. If the on-site recycled water system has been truly shut down at its point of connection, then continuous flow from any part of the on-site recycled water system indicates a cross-connection.
3. All Potable Water fixtures (interior and exterior)—faucets, hose bibs, drinking fountains, toilets and urinals, supply lines to decorative fountains, etc.—shall be tested and inspected for flow. No flow from a Potable Water outlet indicates that it may be connected to the on-site recycled water system, and therefore constitutes a cross-connection to be remedied.
4. If no cross-connections are discovered, proceed to the second part of the test. If any cross-connections are found, they must be disconnected, and the Use Area must be re-tested by an AWWA Cross-connection Specialist per these procedures, that is, beginning again with Part I of the Cross-connection Control Test.

CROSS-CONNECTION CONTROL TEST PART II:

1. The Potable Water system shall be shut down at its point of connection and depressurized. In the case of a Potable Water system in a multi-story building, the Potable Water system pressure may be reduced by the amount deemed necessary by the Cross-connection Specialist and monitored with a gauge installed at a low point of elevation in the Potable Water system.
2. The on-site recycled water system shall then be activated and pressurized.
3. The on-site recycled water system shall remain pressurized for a minimum period of time specified by the Cross-connection Control Specialist while the Potable Water system is depressurized (or, in the case of a multi-story building Potable Water system, remains in a state of reduced pressure). The minimum period of time the Potable Water system is to remain depressurized shall be determined by the Cross-connection Control Specialist on a case by case basis.

5. All Potable Water fixtures (interior and exterior)—faucets, hose bibs, drinking fountains, toilets and urinals, supply lines to decorative fountains, etc.—shall be tested and inspected for flow. Some flow may occur from water breaking loose from an air lock in an overhead water line. The amount of flow to cause a concern shall be determined by the Cross-connection Specialist. If the Potable Water system has been truly shut down at its point of connection, then continuous flow from any part of the Potable Water system (that is beyond the drainage generated by an air lock breaking free) indicates a cross-connection. In the case of a Potable Water system in a multi-story building, the testing of all fixtures may be used in combination with a pressure gauge (as mentioned in Step No. 1. above), or the pressure gauge may be used instead of the testing of all fixtures. If the potable water system has been truly shut down at its point of connection, then an increase in the potable water system pressure viewed at the gauge over a period of time specified by the Cross-connection Specialist indicates a cross-connection with the Recycled Water System.
6. All on-site recycled water system control valves, quick-coupling valves, and any other approved Use Area facilities (such as supply lines to impoundments), shall be tested and inspected for flow. No flow from any particular on-site recycled water system control valve, quick-coupling valve, or any other Recycled Water fixture indicates that it may be connected to the Potable Water system, and therefore constitutes a cross-connection to be remedied.
7. If no cross-connections are discovered, then the Potable Water system shall be re-pressurized. If any cross-connections are found, they must be disconnected, and the on-site recycled water system must be re-tested by a Cross-connection Control Specialist per these procedures, that is, beginning again with Part I of the Cross-connection Control Test.

The Cross-connection Control Specialist responsible for completing the above test(s) must indicate the results on a San Luis Obispo Cross-connection Notification Form and return it to the County.

APPENDIX B

References

1. **California Code of Regulations (CCR), Title 22, Division 4, Chapter 3, "Water Recycling Criteria"** - CA DPH regulations that specify the acceptable uses of Recycled Water and the requirements for Recycled Water use areas. Water Recycling Criteria regulations govern both Distribution Systems and on-site recycled water systems.
2. **California Code of Regulations (CCR), Title 17, Division 1, Chapter 5, Group 4 "Drinking Water Supplies"**- Title 17 specifies requirements intended to protect public drinking water supplies from contamination. Some requirements specified in Title 17 include specifications for backflow prevention devices, designation of a Recycled Water site supervisor, and requirements for cross-connection testing.
3. **California Code of Regulations (CCR), Title 24, Part 5 "California Plumbing Code"** - Part 5 incorporates, by adoption, the 2009 edition of the Uniform Plumbing Code of the International Association of Plumbing and Mechanical Officials with the California amendments.
4. **California Water Code, Division 7 "Water Code"** – Also known as the *Porter-Cologne Water Quality Control Act*, this legislation finds the people of California have a primary interest in the conservation, control, and utilization of water resources and that the quality of water shall be protected by the state. The legislature assigns primary responsibility for the coordination and control of environmental water quality to the State Water Resources Control Board and each Regional Water Quality Control Board.
5. **California Coastal Commission** The Coastal Commission, in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone. Development activities, which are broadly defined by the Coastal Act to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal permit from either the Coastal Commission or the local government. The Coastal Commission has issued Coast Development Permit CDP A-3-SLO-09-055/069 for the construction and operation of the Los Osos Water Recycling Facility and collection/disposal/reuse facilities.
6. **California Regional Water Quality Control Board, Central Coast Region ("Regional Board")** – The Regional Board is the regional branch of the agency responsible for preserving the quality of California's water resources. Amongst other responsibilities, the Regional Board is responsible for issuing National Pollutant Discharge Elimination System (NPDES) permits, which regulate wastewater discharges to surface waters. The use site report submitted by the user that addresses compliance with the use area requirements and along with completed shut-down test results shall be submitted to RWQCB for approval prior to use.
7. **State of California Department of Public Health "CDPH"** – The CDPH is responsible for protecting and promoting the safety of California's drinking water. Specific to the County's recycled water program, CDPH is responsible for developing the criteria and regulations for Recycled Water use, evaluating and approving Recycled Water systems, and for making recommendations to the Regional Board regarding the public health implications of Recycled Water use. The use site report that addresses compliance with the use area requirements and along with completed shut-down test results shall be submitted to CDPH-DWFOB for approval prior to use.

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Appendix C - APPLICATION FOR RECYCLED WATER SERVICE

Submit the following to the San Luis Obispo County Department of Public Works for review by the County and California Dept. of Public Health. It is important that the County receives a copy of the Record Drawings and information contained in this list. The County may have comments on the plans so anticipate a resubmittal prior to acceptance. The final set of plans is for the County to conduct the final use site inspection, cross connection control shutdown test.

SITE INFORMATION		
Date:		
Service Address:		APN:
Land Use: ☐ Residential ☐ Commercial ☐ Industrial ☐ Agriculture		
Recycled Water Use: ☐ New ☐ Retrofit		
Number of Wells: ☐ Potable: ☐ Yes ☐ No		
Drinking Fountains: ☐ Yes ☐ No		
Outside Eating Areas ☐ Yes ☐ No		
CUSTOMER BILLING – APPLICANT - INFORMATION		
Applicant: ☐ Owner ☐ Lessee ☐ Other (specify):		
Billing Name:		
Billing Address:	Telephone:	
City	State	Zip Code
Email Address:		
OWNER INFORMATION *(If Different from Applicant)*		
Owner's Name:		
Address:	Telephone:	
City	State	Zip Code
Email Address:		
SITE SUPERVISOR INFORMATION		
Name:		
Relationship to Applicant: ☐ Self ☐ Employee ☐ Other (specify):		
Address:	Telephone:	
City	State	Zip Code
Email Address		

Estimated Recycled Water Requirements			
Recycled Water Use	**Area (Sq. Ft.)**	**Annual Demand/ Acre Feet**	**Peak Demand (GPM)**
Landscape Irrigation			
Agricultural Irrigation			
Other (specify):			

By accepting recycled water service, the User agrees to comply with and enforce all aspects of the most current version of the *Rules and Regulations Governing the Distribution and use of Recycled Water.*

Signature of the *Responsible Party* indicates acknowledgement of the responsibility for items summarized in Article 3 of the County's Rules and Regulations:

_____ **Date**_____

Terms and Conditions for Recycled Water Service

Applicant's Obligations:

Applicant shall design and construct the recycled water system in compliance with the provisions of the County of San Luis Obispo's Rules and Regulations, as may be amended from time to time, all of which are incorporated herein by reference.

Applicant shall use recycled water in compliance with all local, state and federal laws and regulations including, but not limited to, the County's Master Reclamation Permit from the California Regional Water Quality Board ("RWQCB") and all directives and/or orders issued by RWQCB or any other regulatory agency; the Master Engineering Report and the County's Rules and Regulations Governing the Distribution and Use of Recycled Water, as may be amended from time to time, all of which are incorporated herein by reference.

Applicant agrees to maintain applicant's irrigation system consistent with the County's Rules and Regulations, as may be amended from time to time, all of which are incorporated herein by reference. Any agreement between Applicant and a third party of management or landscape system maintenance shall not in any way relieve Applicant of any obligation, term or condition of these terms and conditions. Applicant agrees to inform third parties and to require and be responsible for their compliance with Applicant's obligations set forth herein.

Applicant agrees to designate a Site Supervisor, as that term and its attendant responsibilities are defined in the County's Rules and Regulations, for Applicant's premises, including but not limited to the recycled water Use Area. Applicant agrees to have the Site Supervisor and any successors attend any required training performed by the County on a regular basis. Applicant agrees to provide the County with a twenty-four (24) hour emergency contact number for the Site Supervisor and Applicant further agrees to notify the County within two (2) weeks if a change to the Site Supervisor is made. Applicant agrees to observe the use area quarterly for the presence of soil saturation, ponding, nuisance odors, or vectors.

Applicant Agrees to notify the County immediately if any of the following occurs:

- A cross-connection between the recycled water system and any other water supplies found.
- A failure of the Applicant's recycled water system occurs causing a discharge of recycled water to the storm drain system or surface waterway.

3. Access: Applicant grants the County access/right of entry to Applicant's premises where recycled water is being utilized for the following purposes:
   - Inspection of recycled water facilities,
   - Inspection for compliance with these "Terms and Conditions for Recycled Water Service".

4. Prohibitions: Applicant understands and agrees that the following are expressly prohibited:
   - Cross-connections between the Applicant's non-potable water system and any other water supply,
   - Conversion of irrigation systems utilizing recycled water to potable water.

5. Signage: All areas of recycled water use that are accessible to the public shall be posed with signage that conforms to the County's Rules and Regulations.

APPENDIX D

CONSTRUCTION WATER PERMIT – RECYCLED WATER

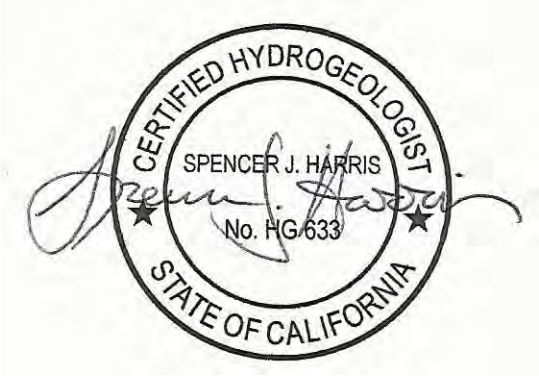
Effective Date: July 1, _____ - June 30, _____
This permit must be available by for review by County staff at all times in the water carrying vehicle.
Permit No._____, Fees Paid $_____ Approved_____

Water Carrier Information	_____ Recycled Water Carrier Name _____ Address _____ City State Zip _____ Office Phone Mobile Phone
Vehicle Description	_____ Vehicle Type: _____ Make and Model Description
Construction Water Supervisor	_____ Name _____ Address _____ City State Zip
Site/Use Location	Site Location(s)/address(es) of Recycled Water Use: _____ _____ _____ _____
Certification	I hereby certify under penalty of perjury that the information provided on this application, and in any attachment, is true and accurate to the best of my knowledge and that I have read and agree to abide by all applicable procedures for use of recycled water. _____ Signature of Water Carrier Title Date

Appendix E Transient Model Scenario for the Los Osos WRFP Study

E

TRANSIENT MODEL SCENARIOS
for the
LOS OSOS
WATER RECYCLING FUNDING PROGRAM STUDY



Prepared for

Los Osos Community Services District
County of San Luis Obispo
Los Osos Basin Management Committee

OCTOBER 2025

CLEATH-HARRIS GEOLOGISTS
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San Luis Obispo, CA 93401

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1.0 Introduction

Cleath-Harris Geologists (CHG) has completed basin management modeling scenarios using the Transient Model for the Los Osos Water Funding Recycling Program (WFRP) Study. The purpose of the WRFP Study is to evaluate recycled water and supplemental supply alternatives to improve the sustainability of the adjudicated Los Osos Groundwater Basin (Basin). The Transient Model was developed to provide a calibrated, dynamic tool that can simulate seawater intrusion, groundwater levels, and streamflow in order to estimate Basin sustainable yield and potential impacts to water resources for management scenarios, in support of the WRFP Study[1].

A total of seven scenarios were evaluated, six using the Transient Model and one (Intertie) which did not require numerical modeling to evaluate. These scenarios are as follows:

- Current Condition Baseline
- Sustainable Yield (2026) Baseline
- Broderson 50%
- Creek Discharge
- Upper Aquifer
- Seawater Barrier
- Intertie (Supplemental Water)

The definition of sustainable yield is presented below, followed by the methodology used for evaluating sustainable yield using the Transient Model. A description of each scenario, along with tables and figures summarizing the results are presented in this report.

2.0 Sustainable Yield Definition

The following sustainable yield definition (as "safe yield") is provided by the Stipulated Judgement:

> For purposes of adjudication of a groundwater basin, "safe yield" is defined as "the maximum quantity of water which can be withdrawn annually from a ground water supply under a given set of conditions without causing an undesirable result." An undesirable result means "a gradual lowering of the ground water levels resulting in depletion of the supply" or other adverse impacts, such as permanent ground subsidence or seawater intrusion. (*See City of Barstow v. Mojave Water Agency* (2000) 23 Cal.4th 1224, 1234; *City of Los Angeles v. City of San Fernando* (1975) 14 Cal.3d 199, 278; *City of Pasadena v. City of Alhambra* (1949) 33 Cal.2d 908, 929; Water Code § 10721(w).)

[1] CHG, 2025, Construction and Calibration of the Transient Model for the Los Osos Groundwater Basin, October 2025. Model report available on-line here: https://www.losososbmc.org/transient-model-construction-and-calibration-and-baseline-scenario-technical-memorandums

> The concept of safe yield looks at the long-term sustainability of groundwater supplies and may include opportunities for capture of temporary surpluses that may be available. (*See City of Los Angeles, supra*, 14 Cal.3d at 279-281.)

The Sustainable Groundwater Management Act (SGMA) uses a similar definition for sustainable yield, although SGMA does not apply to the LOBP plan areas covered by the Stipulated Judgement. SGMA definitions listed below are from California Water Code §10721:

(w) "Sustainable yield" means the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result.

(x) "Undesirable result" means on or more of the following effects caused by groundwater conditions occurring throughout the basin:

(1) Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater level or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.
(2) Significant and unreasonable reduction of groundwater storage.
(3) Significant and unreasonable seawater intrusion.
(4) Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.
(5) Significant and unreasonable land subsidence that substantially interferes with surface land uses.
(6) Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

(r) "Planning and implementation horizon" means a 50-year time period over which a groundwater sustainability agency determines that plans and measures will be implemented to ensure that the basin is operated within its sustainable yield.

The Transient Model was constructed and calibrated over a 45-year hydrologic base period. A hydrologic base period is a series of years covering wet and dry periods representative of long-term conditions over which the cumulative departure from average rainfall is close to zero. Per the California Water Code sustainable yield definition, a hydrologic base period should be used for sustainable yield calculations.

3.0 Methodology

The most common symptom of groundwater basin overdraft is a chronic decline in water levels and the loss of groundwater storage over time. In coastal basins hydraulically connected to the ocean, however, overdraft conditions from excess pumping results in seawater intrusion, rather than chronic water level declines, as freshwater storage is replaced with seawater. Therefore, the evaluation of Basin sustainability in Los Osos considers movement of the seawater intrusion front, which was defined in the Los Osos Basin Plan (LOBP) as the position of the 250 milligrams per liter (mg/L) chloride concentration contour.

3.1 Adaptive Method

The methodology used for evaluating the sustainable yield with a numerical flow model is based on the Adaptive Method approved by the BMC at their October 27, 2021 meeting. The Adaptive Method set thresholds for limiting the maximum inland extent of the intrusion front to 2021 Basin conditions. Two threshold lines were drawn parallel to the coast, one for Zone D and one for Zone E, corresponding to the maximum inland extend of the observed intrusion front for Fall 2021.

The Transient Model is used to distribute and maximize purveyor groundwater production over a planning horizon while not allowing seawater intrusion to encroach further inland of the 2021 threshold lines. The estimated sustainable yield is the resulting maximum Basin production achieved. This approach establishes that further degradation of Basin water quality is an undesirable result.

The Sustainable Yield 2026 Baseline Scenario used for the WRFP study incorporates 2025 infrastructure, which includes existing purveyor wells and currently developed urban reuse. The estimated annual production for non-purveyor sectors (Agriculture, Private Domestic, and Community Facilities) used for the scenario are based on the 5-year average from 2019 to 2023, as presented in Table 1.

Table 1. Baseline Groundwater Production Estimates (2019-2023)

YEAR	PURVEYORS	DOMESTIC[1]	COMMUNITY	AGRICULTURE	TOTAL
	ACRE-FEET[2]				
2019	991	110	60	630	1,790
2020	1,063	110	80	650	1,900
2021	1,026	110	130	620	1,890
2022	1,016	110	90	680	1,900
2023	984	110	60	500	1,650
AVERAGE	1016	110	80	620	1,830

Note: [1]Domestic production is recommended update value from 2023 Water Offset Study.
[2]All figures except Purveyors rounded to the nearest 10 acre-feet.

3.2 Planning Horizon

Based on input from the Technical Advisory Committee for the WRFP Study and from BMC Staff, a 50-year base period was selected for evaluating the Sustainable Yield 2026 Baseline Scenario. The 50-year base period was selected to align with SGMA's planning and implementation horizon (see definitions section above) and consist of climate conditions during the 45-year calibration base period (1979-2023) coupled with five additional years of balanced hydrologic conditions from the record (2002-2006). As previously mentioned, the Transient Model was used to distribute and maximize community purveyor groundwater production while not allowing seawater intrusion to encroach further inland of the 2021 threshold lines within the planning horizon.

4.0 Scenario Results

A total of seven scenarios were evaluated, six using the Transient Model and one (Intertie) which did not require numerical modeling to evaluate. Each scenario is described below. For scenarios where wastewater flows are projected to exceed current disposal capacity, the excess flows are assumed to go to new agricultural reuse (no-offset of existing ag pumping), in order to isolate benefits to the Basin when comparing reuse alternatives.

4.1 Current Condition Baseline

The Current Conditions Baseline scenario represents current development conditions in the Basin with respect to groundwater production, and is the average pumping over five years (Table 1). Results of the Current Condition Baseline scenario are shown in Figures 1a and 1b (attached). Figure 1 shows Lower Aquifer Zone D chloride concentrations contours at the end of the calibration period (Summer 2023), at the end of the 50-year planning horizon. Figure 1b shows the same simulated concentration contours for Lower Aquifer Zone E.

The intrusion front is simulated to move inland of both Zone D and Zone E threshold lines. Based on these threshold exceedances within the transient planning horizon, a Basin yield of 1,830 acre-feet per year (AFY), together with the recent spatial pumping distribution, does not meet the Adaptive Method definition for sustainability.

Table 2 and Table 3 show mass balance results for the 45-year Transient Model calibration period and for the 50-year planning horizon under the Current Condition Baseline scenario, in AFY. Mass balance is an accounting of the major sources of Basin inflow and outflow and does not account for concentration changes.

Table 2: Basin Mass Balance – Base Period Calibration (WY 1979-2023)

SOURCE	DESCRIPTION	INFLOW (AFY)	OUTFLOW (AFY)	BALANCE (AFY)
GHB*	Seawater intrusion	434	6	428
	Eastern Basin Boundary	0	89	-89
RIVER	Bay and Ocean water bodies	655	2,110	-1,455
STREAM	Los Osos Creek	873	142	731
RECHARGE	Deep percolation and return flow	3,585	0	3,585
ET	Phreatophyte consumptive use	0	98	-98
DRAIN	Warden Creek and Sweet Springs	0	139	-139
WELL	Groundwater Production	0	2,933	-2,933
STORAGE	Groundwater in Storage	2,300	2,330	-30
	TOTAL	7,847	7,847	0

*All General Head Boundary (GHB) inflow and a portion of the outflow is across the ocean boundary (intrusion), while the remaining portion of the outflow is freshwater moving toward Warden Lake across the eastern Basin boundary.

Table 3: Basin Mass Balance – Current Condition Baseline Scenario

SOURCE	DESCRIPTION	INFLOW (AFY)	OUTFLOW (AFY)	BALANCE (AFY)
GHB	Seawater intrusion	128	15	113
	Eastern Basin Boundary	0	109	-109
RIVER	Bay and Ocean water bodies	632	2,252	-1,620
STREAM	Los Osos Creek	737	72	665
RECHARGE	Deep percolation and return flow	3,076	0	3,076
ET	Phreatophyte consumptive use	0	102	-102
DRAIN	Warden Creek and Sweet Springs	0	133	-133
WELL	Groundwater Production	0	1,826	-1,826
STORAGE	Groundwater in Storage	1,480	1,544	-64
	TOTAL	6,053	6,053	0

A comparison of the mass balance results between the historical base period and current conditions shows an 1,107 AFY reduction in average well pumping. Under the Current Condition Baseline scenario, this decline in pumping is projected to result in a substantial decline in seawater intrusion (as General Head Boundary inflow), along with increased outflow to the Bay. Other projected changes in basin flow dynamics include less net recharge from Los Osos Creek and from return flows.

4.2 Sustainable Yield (2026) Baseline

The Sustainable Yield Baseline scenario uses Year 2025 infrastructure and optimizes the pumping distribution between purveyor wells to maximize purveyor production while maintaining the seawater intrusion front west of the 2021 threshold lines. Results of the Sustainable Yield Baseline scenario are shown in Figures 2a and 2b (attached). Figure 2a shows Lower Aquifer Zone D chloride concentrations contours at the end of the calibration period (Summer 2023), and at the end of the 50-year planning horizon. Figure 2b shows the same simulated concentration contours for Lower Aquifer Zone E.

Purveyor Operational Constraints

The specific distribution of pumping for a sustainable yield scenario may require adjustments to purveyor system wells, pumps, or operations that can involve evaluation, testing, design, permitting, and contractor services for implementation. Based on input from purveyor staff, the time required for system adjustments may be up to five years. Therefore, during the first five years of the 50-year Sustainable Yield Baseline scenario, the pumping distribution is limited to current conditions at 1,830 AFY (Table 1). Following these initial five years, during which water system adjustments may be evaluated and implemented, the optimized sustainable yield distribution would be feasible.

Results

The Sustainable Yield 2026 Baseline Scenario uses Year 2025 infrastructure and optimizes the pumping distribution between purveyor wells to maximize purveyor production while maintaining the seawater intrusion front west of the 2021 threshold lines. Simulated pumping at individual purveyor wells were constrained by historical production records and purveyor operations, with the sustainable yield distribution assumed to be achievable within five years.

Based on the optimized distribution of pumping, and following five years of current condition pumping at 1,830 AFY, Basin production at 2,020 AFY is sustainable over the remaining 45-years, for a time-weighted-average Sustainable Yield of **2,000 AFY** over the 50-year planning horizon. Table 4 shows the mass balance results for the 50-year planning horizon.

Table 4: Basin Mass Balance – Sustainable Yield (2026) Baseline Scenario

SOURCE	DESCRIPTION	INFLOW (AFY)	OUTFLOW (AFY)	BALANCE (AFY)
GHB	Seawater intrusion	114	16	98
	Eastern Basin Boundary	0	110	-110
RIVER	Bay and Ocean water bodies	639	2,187	-1,548
STREAM	Los Osos Creek	820	80	740
RECHARGE	Deep percolation and return flow	3,009	0	3,009
ET	Phreatophyte consumptive use	0	99	-99
DRAIN	Warden Creek and Sweet Springs	0	109	-109
WELL	Groundwater Production	0	1,998	-1,998
STORAGE	Groundwater in Storage	1,548	1,531	17
	TOTAL	6,130	6,130	0

4.3 Broderson 50%

The purpose of the Broderson scenario was to provide a basis for comparing the relative benefit to Basin sustainable yield from recycled water discharges at the Broderson community leach field, compared to other uses of recycled water. This scenario compliments the Sustainable Yield Baseline scenario by defining a baseline benefit for Broderson discharges.

The scenario design uses existing 2025 infrastructure but sends 50 percent of Broderson discharges (224 AFY) to new agricultural reuse in the Eastern Area (no offset to existing agricultural well pumping). Being a sustainable yield scenario, the seawater intrusion front is not allowed to extend inland of the 2021 threshold lines. Based on the optimized distribution of pumping, a Basin yield of 1,945 AFY is sustainable over the planning horizon, representing a 55 AFY loss in Basin yield for a decline of 224 AFY in Broderson discharges. The resulting Basin benefit for Broderson discharges is estimated at 25 percent.

4.4 Creek Discharge

The Creek Discharge scenario adds infrastructure for recycled water discharge into Los Osos Creek at a location approximately 2,600 feet upstream of Los Osos Valley Road. Two purveyor supply wells were also added in the creek valley. A total of 160 AFY of recycled water is assumed to be discharged over six months of every year (during the summer and fall quarters), with 160 AFY of groundwater pumped by the two purveyor wells. The Transient Model was then used to optimize the pumping distribution between the remaining purveyor wells to maximize purveyor production while maintaining the seawater intrusion front west of the 2021 threshold lines. Results of the Creek Discharge scenario are shown in Figures 3a and 3b (attached). Figure 3a shows Lower Aquifer Zone D chloride concentrations contours at the end of the calibration period (Summer 2023), and the end of the 50-year planning horizon. Figure 3b shows the same simulated concentration contours for Lower Aquifer Zone E.

Based on the optimized distribution of pumping, a Basin yield of 2,120 AFY is sustainable over the planning horizon, which is a gain of 120 AFY compared the Sustainable Yield Baseline scenario. The resulting Basin benefit for Creek Discharge is 75 percent; for 160 AFY of recycled water discharged into Los Osos Creek, the Basin sustainable yield increases by 120 AFY (with two purveyor wells pumping in the creek valley). Table 5 shows mass balance results for the scenario.

Table 5: Basin Mass Balance – Creek Discharge Scenario

SOURCE	DESCRIPTION	INFLOW (AFY)	OUTFLOW (AFY)	BALANCE (AFY)
GHB	Seawater intrusion	119	16	103
	Eastern Basin Boundary	0	99	-99
RIVER	Bay and Ocean water bodies	636	2,181	-1,545
STREAM	Los Osos Creek	947	87	860
RECHARGE	Deep percolation and return flow	3,023	0	3,023
ET	Phreatophyte consumptive use	0	100	-100
DRAIN	Warden Creek and Sweet Springs	0	103	-103
WELL	Groundwater Production	0	2,120	-2,120
STORAGE	Groundwater in Storage	1,668	1,687	-19
	TOTAL	6,393	6,393	0

4.5 Upper Aquifer Development

The Upper Aquifer scenario adds infrastructure for nitrate removal, piping, and the use of two existing purveyor wells and one future well to develop the Upper Aquifer in the Western Area. The three program wells are assumed to provide up to 550 AFY of Upper Aquifer water to the treatment plant. The Transient Model is then used to optimize the pumping distribution between the remaining purveyor wells to maximize purveyor production while maintaining the seawater intrusion front west of the 2021 threshold lines. Results of the Upper Aquifer scenario are shown in Figures 4a, 4b, and 4c (attached). Figure 4a shows Upper Aquifer Zone C chloride concentrations contours at the end of the calibration period (Summer 2023), at the end of the 50-year planning horizon. Figures 4b and 4c show the same simulated concentration contours for Lower Aquifer Zone D and Zone E, respectively.

No threshold line has been established for the Upper Aquifer, and the intrusion front would be expected to move inland of current conditions following significant Upper Aquifer development in the Western Area. As shown in Figure 4a, increased Upper Aquifer development results in the intrusion front moving up to approximately 200 feet inland of the bayfront after 50 years.

Based on the optimized distribution of pumping, a Basin yield of 2,405 AFY is sustainable over the 50-year planning horizon, which is a gain of 400 AFY (after removing 5 AFY during nitrate

treatment) compared to the Sustainable Yield Baseline. The resulting Basin benefit for Creek Discharge is 84 percent; for a 475 AFY of increased pumping from the Western Area Upper Aquifer, the Basin sustainable yield increases by 400 AFY. Table 6 shows mass balance results for the planning horizon.

Table 6: Basin Mass Balance – Upper Aquifer Scenario

SOURCE	DESCRIPTION	INFLOW (AFY)	OUTFLOW (AFY)	BALANCE (AFY)
GHB	Seawater intrusion	103	17	86
	Eastern Basin Boundary	0	109	-109
RIVER	Bay and Ocean water bodies	662	1,885	-1,223
STREAM	Los Osos Creek	839	78	761
RECHARGE	Deep percolation and return flow	3,104	0	3,104
ET	Phreatophyte consumptive use	0	95	-95
DRAIN	Warden Creek and Sweet Springs	0	81	-81
WELL	Groundwater Production	0	2,405	-2,405
STORAGE	Groundwater in Storage	1,548	1,586	-38
	TOTAL	6,256	6,256	0

4.6 Seawater Barrier

The Seawater Barrier scenario adds infrastructure for two injection wells near the boundary of the Western and Central Areas. The injection well locations are inland of the seawater intrusion front, with one well dedicated to injection into Zone D and the other into Zone E. The two injection wells are assumed to provide up to 340 AFY of injection capacity (after reverse osmosis treatment of 425 AFY of recycled water). The Transient Model is then used to optimize the pumping distribution to maximize purveyor production while creating a pressure barrier that maintains the seawater intrusion front west of the 2021 threshold lines. Results of the Upper Aquifer scenario are shown in Figures 5a and 5b (attached). Figure 5a shows Lower Aquifer Zone D chloride concentrations contours at the end of the calibration period (Summer 2023) and the end of the 50-year planning horizon. Figure 5b shows the same simulated concentration contours for Lower Aquifer Zone E.

Based on the optimized distribution of pumping, a Basin yield of 2,360 AFY is sustainable over the planning horizon, which is a gain of 360 AFY compared to the Sustainable Yield Baseline. The resulting Basin benefit for a Seawater Barrier is 106 percent; for 340 AFY of purified recycled water injection into the Western Area Lower Aquifer, the Basin sustainable yield increases by 360 AFY. Table 7 shows mass balance results for the 50-year planning horizon.

Table 7: Basin Mass Balance – Seawater Barrier Scenario

SOURCE	DESCRIPTION	INFLOW (AFY)	OUTFLOW (AFY)	BALANCE (AFY)
GHB	Seawater intrusion	81	18	63
	Eastern Basin Boundary	0	100	-100
RIVER	Bay and Ocean water bodies	636	2,119	-1,483
STREAM	Los Osos Creek	872	60	812
RECHARGE	Deep percolation and return flow	2,916	0	2,916
ET	Phreatophyte consumptive use	0	94	-94
DRAIN	Warden Creek and Sweet Springs	0	79	-79
WELL	Groundwater Production	340	2,360	-2,020
STORAGE	Groundwater in Storage	1,591	1,606	-15
	TOTAL	6,436	6,436	0

The travel time for injected water to reach active supply wells was evaluate for the Seawater Barrier scenario using particle tracking. The resulting travel times were in excess of 10 years and indicate that subsurface retention requirements would not be a significant constraint for a Seawater Barrier project.

4.7 Intertie

The Intertie scenario adds infrastructure for bringing supplemental water to Los Osos. Up to 600 AFY is anticipated during wet and many normal years, while no water may be available in dry years or some normal years. An average of 300 AFY of supplemental water is assumed to be available, therefore, the benefit to the basin is assumed to be 300 AFY, which can be added to the Sustainable Yield scenario results for a net Basin supply of 2,300 AFY.

5.0 Pumping and Recycled Water Reuse Distribution Summary

The Transient Model is used to optimize the distribution of pumping for purveyor wells. These distributions have been compiled by Basin planning area for each scenario. The distribution of recycled water has also been compiled based on the reuse type. A summary of results from each scenarios showing pumping and recycled water distributions is present in Table 8 below.

Table 8: Pumping and Reuse Distribution

ITEM	Baseline Current Condition	Baseline Sustainable Yield	Broderson 50%	Creek Discharge	Upper Aquifer	Seawater Barrier	Intertie
	Acre-Feet per Year						
Production by Sector							
Purveyor	1016	1204	1150	1325	1610	1565	1204
Community	83	69	68	68	68	68	69
Private domestic	110	110	110	110	110	110	110
Ag irrigation	617	617	617	617	617	617	617
TOTAL	**1826**	**2000**	**1945**	**2120**	**2405**	**2360**	**2000**
Reuse Distribution							
Intertie[1]	0	0	0	0	0	0	300
Recycled Water	528	637	575	702	853	829	797
Seawater Barrier[2]	0	0	0	0	0	340	0
Broderson	455	449	224	422	448	284	449
Bayridge	15	21	22	15	22	15	21
Golf	55	65	66	66	66	66	65
Ag Reuse[3]	3	70	227	3	281	3	230
Urban reuse	0	32	36	36	36	36	32
Creek Discharge	0	0	0	160	0	0	0
Purveyor Distribution by Area							
Upper West	40	72	75	75	550	75	72
Upper Central	258	430	449	406	447	495	430
Lower West	247	182	155	175	160	150	182
Lower Central	471	521	421	509	454	845	521
Alluvial	0	0	0	16	0	0	0
Lower East	0	0	0	144	0	0	0

Benefit Ratio		0%	25%[4]	75%	84%	106%	100%
Basin Benefit		0	55[4]	120	400	360	300

[1]Intertie is supplemental water (not reuse).

[2]After RO treatment 340 AFY used for injection

[3]New Ag Reuse – no offset of existing Ag pumping

[4]Calculated benefit for increased discharges

6.0 Transient Model Use and Uncertainty

The primary use of the Transient Model for the WRFP study is to simulate future locations of the 250 mg/L seawater intrusion front for various scenarios of Basin pumping and recycled water discharges. These simulated seawater intrusion front locations are compared to the location of threshold limit lines established in 2021 for Lower Aquifer Zone E and Zone D. A scenario is considered sustainable for planning purposes if the intrusion front does not move inland of either of the two threshold lines.

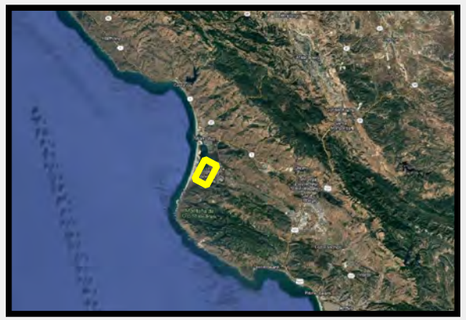
The Transient Model Calibration and Construction Report and model files were reviewed by two independent groups; a consultant team (Lynker and One-Water Hydrologic) retained by San Luis Obispo County, and the formal project peer reviewer GSI Water Solutions. Model calibration statistics meet industry standards and the two peer review teams are in agreement that the Transient Model is suitable for use as a planning tool in the WRFP study.

This WRFP study uses the first fully transient, dual density model of the Los Osos Basin. The model is currently the best available tool for evaluating seawater intrusion, although there will always be room for improvement. The amount of predictive uncertainty in model results has not been quantified. The peer reviews have identified areas for improvement, including quantifying the predictive uncertainty. Peer reviews and periodic updates using the latest monitoring data are part of the Basin management process and will benefit future modeling efforts.

FIGURES

2023

+50yrs



Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone D
  Model Layer 3

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

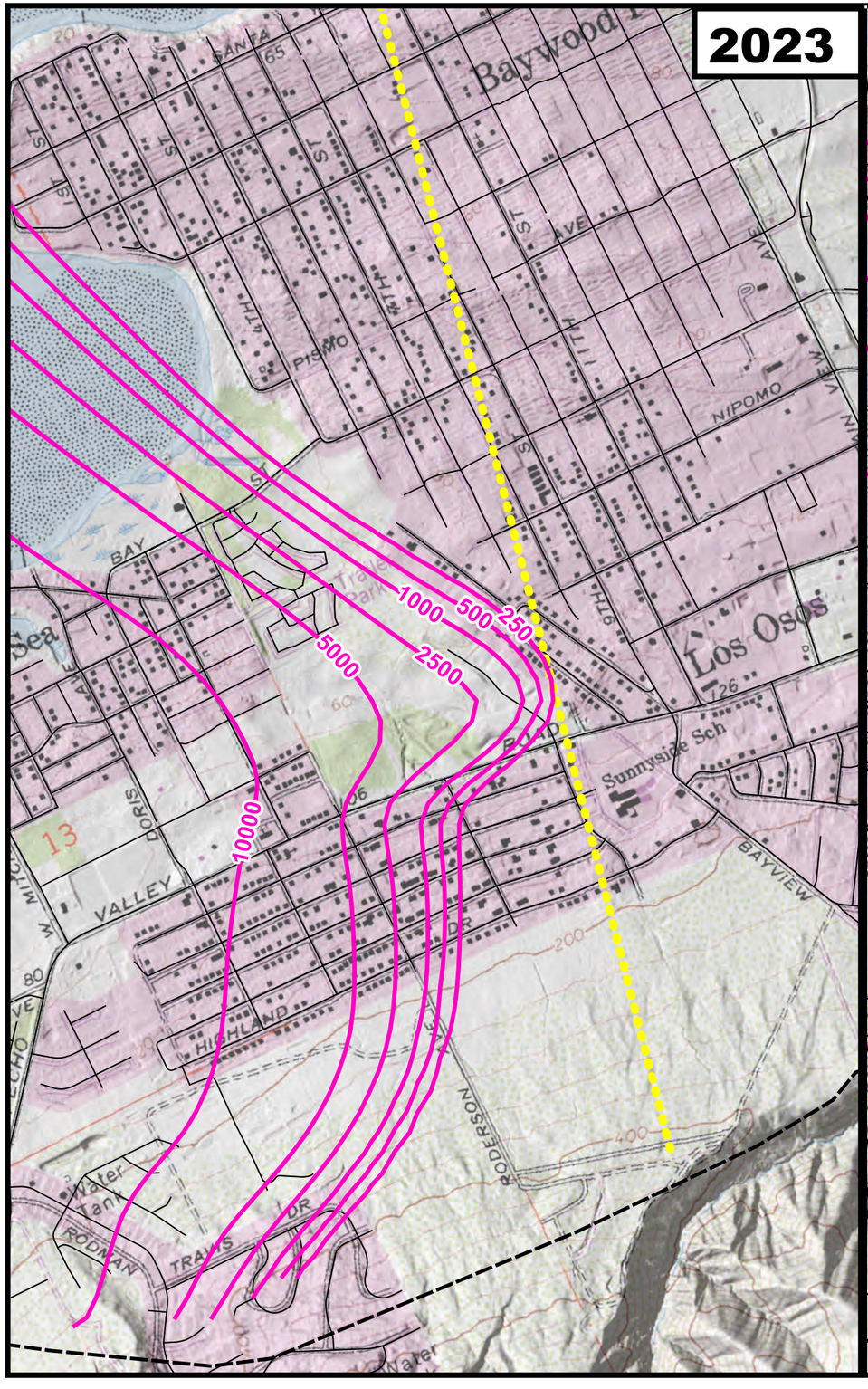
N

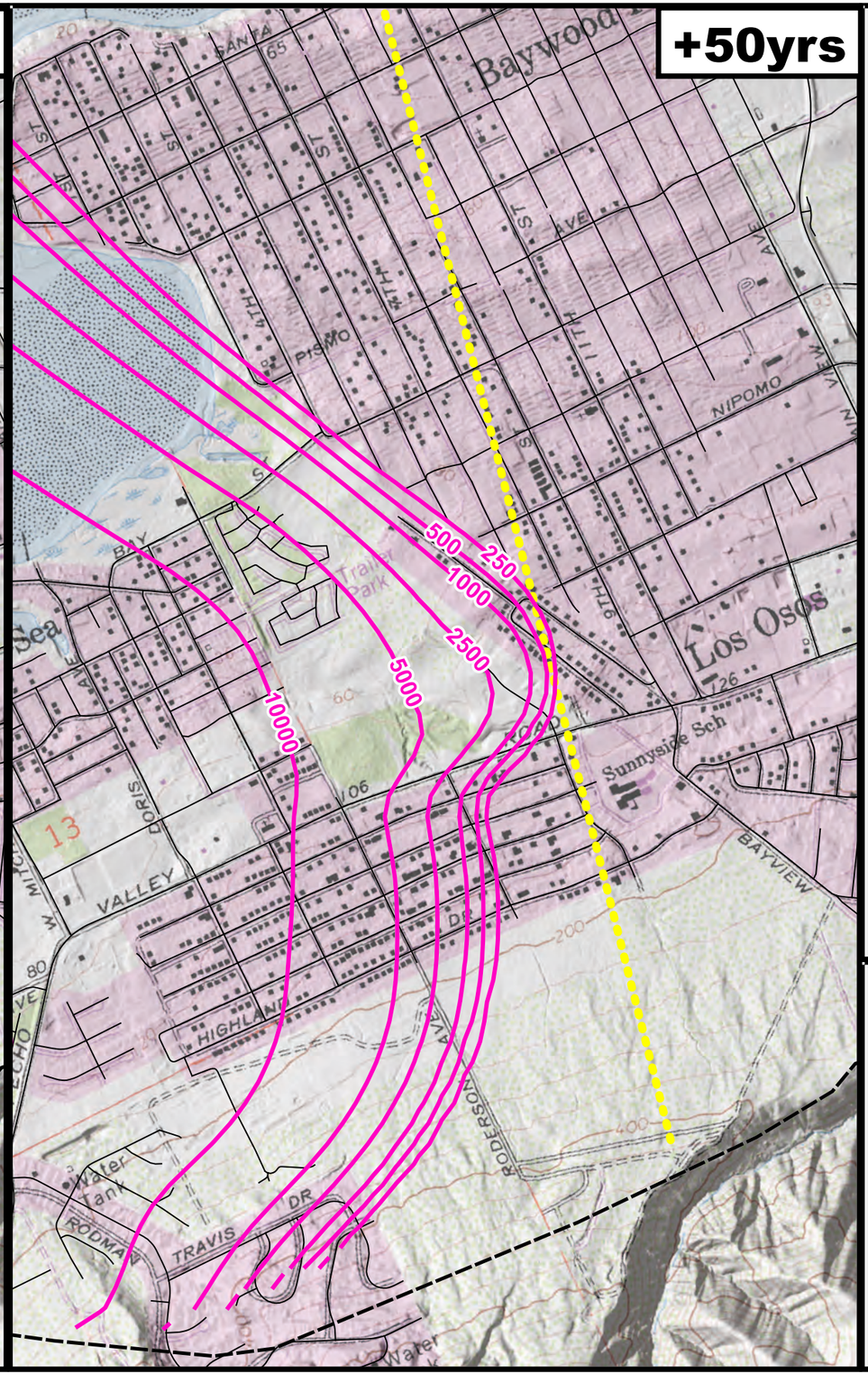
Figure 1a
Simulated Chloride Concentration
Lower Aquifer - Zone D

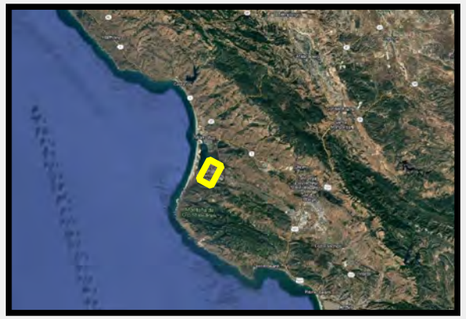
Current Conditions Baseline
Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists







Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone E
  Model Layer 7

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

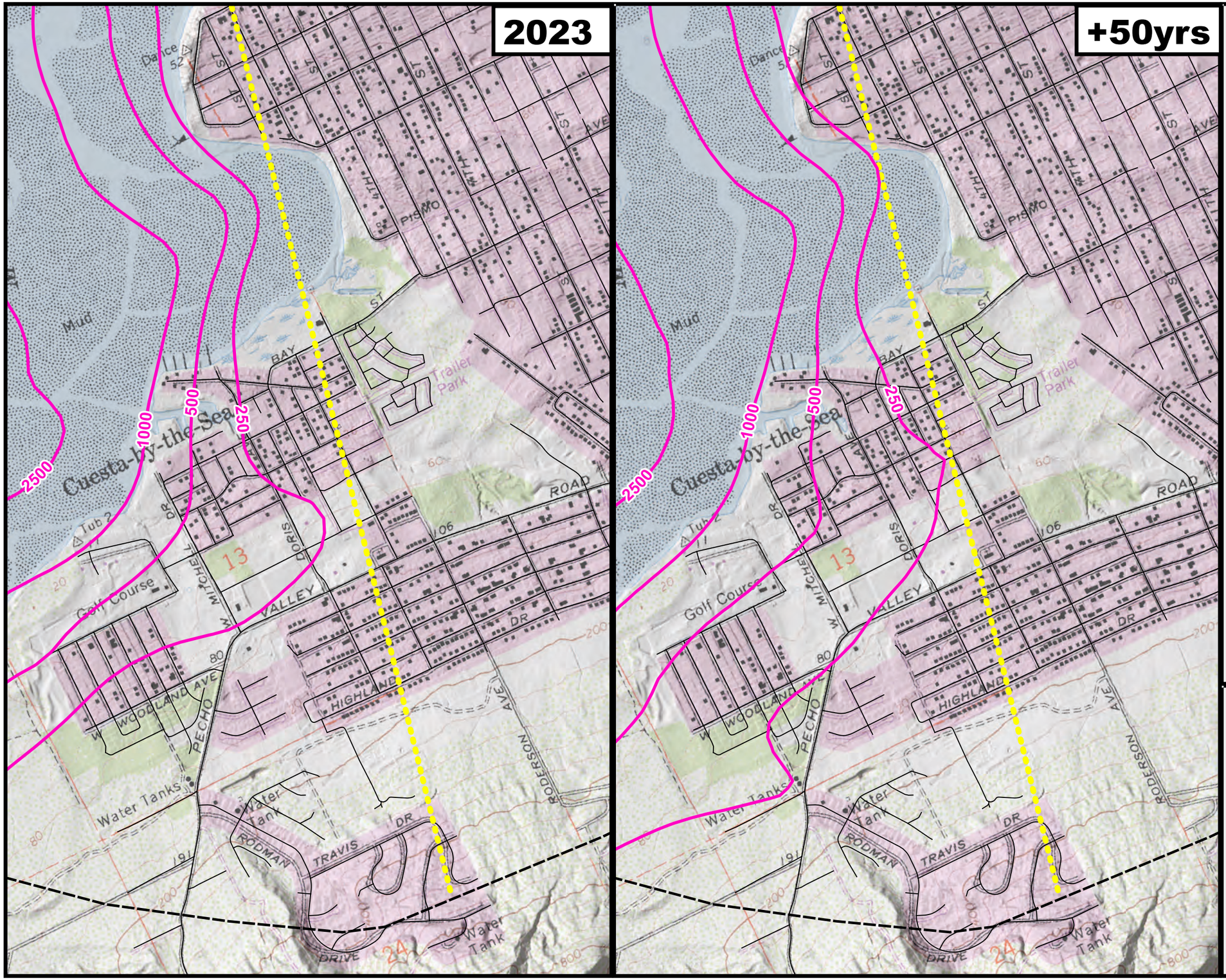
N

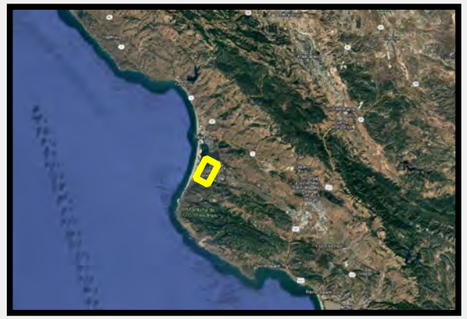
Figure 1b
Simulated Chloride Concentration
Lower Aquifer - Zone E

Current Conditions Baseline
Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists





Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone D
  Model Layer 3

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

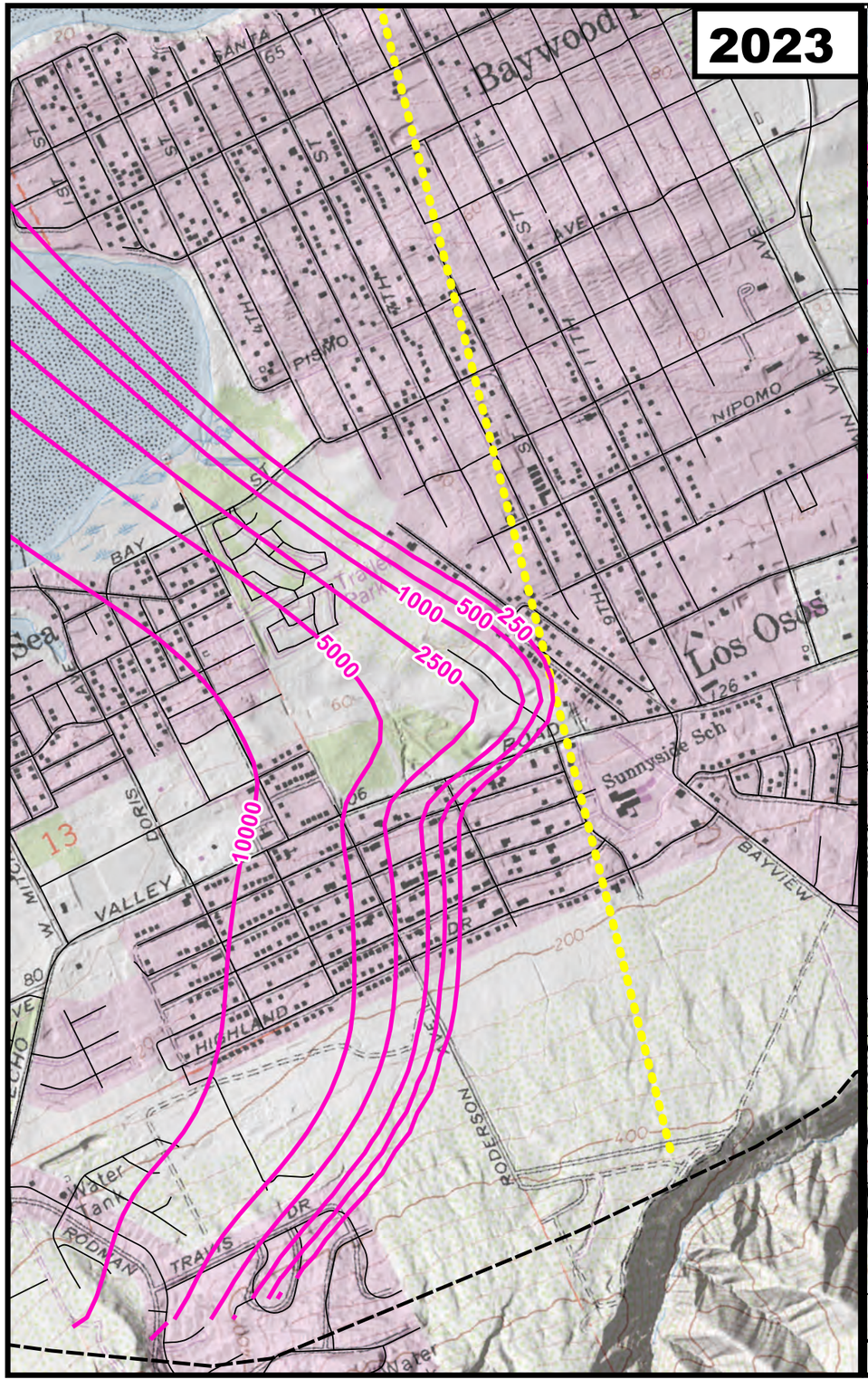
N

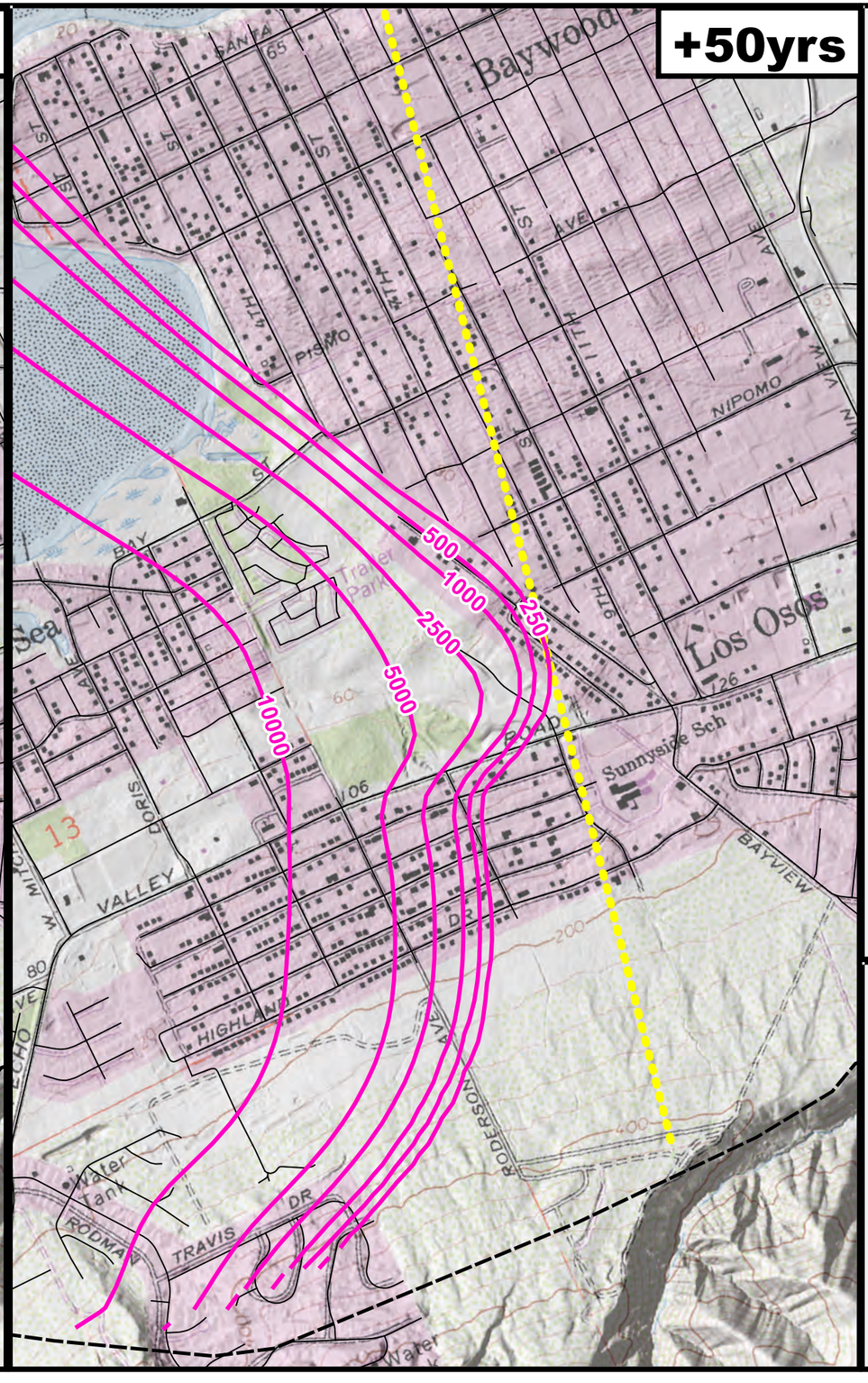
Figure 2a
Simulated Chloride Concentration
Lower Aquifer - Zone D

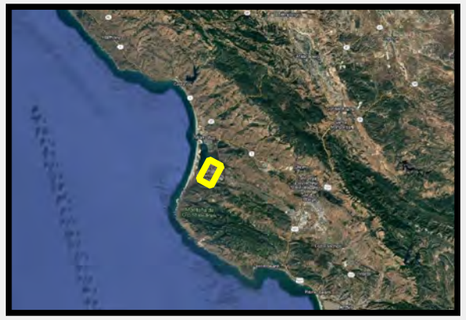
Sustainable Yield (2026) Baseline Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists







Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone E
  Model Layer 7

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

N

Figure 2b
Simulated Chloride Concentration
Lower Aquifer - Zone E

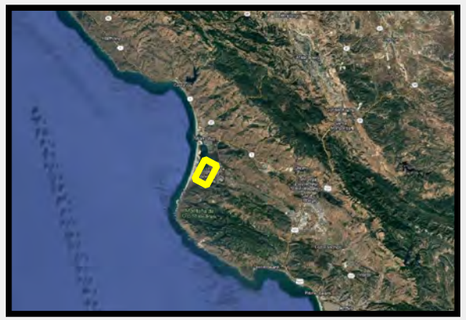
Sustainable Yield (2026) Baseline Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists

2023

+50yrs



Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone D
  Model Layer 3

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

N

Figure 3a
Simulated Chloride Concentration
Lower Aquifer - Zone D

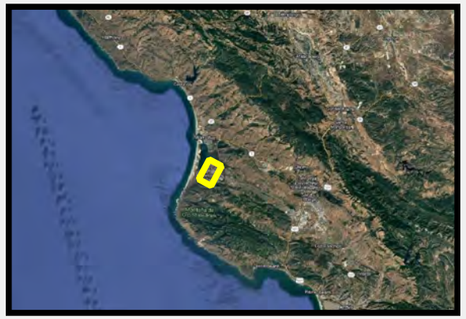
Creek Discharge Scenario
Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists

2023

+50yrs



Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone E
  Model Layer 7

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

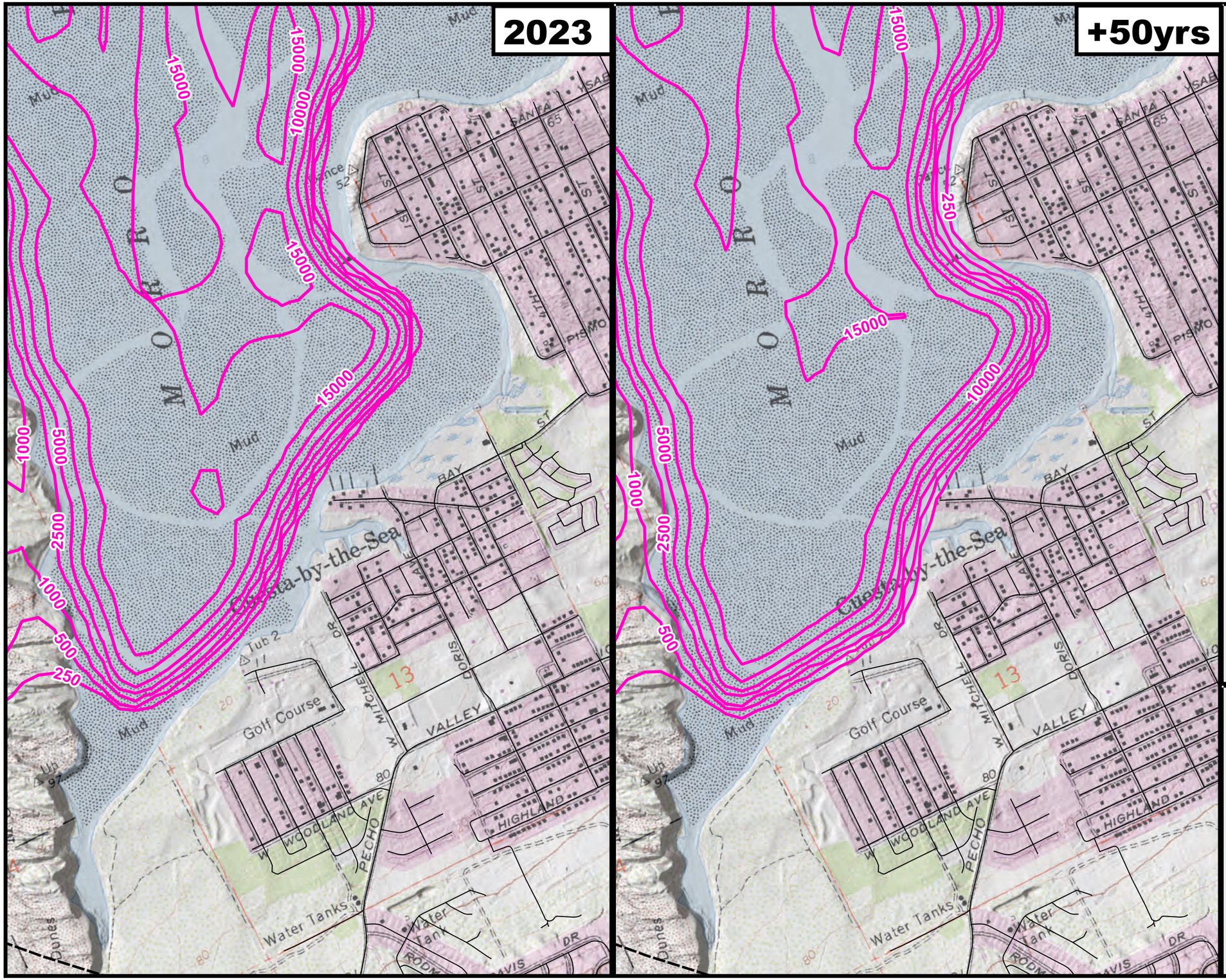
N

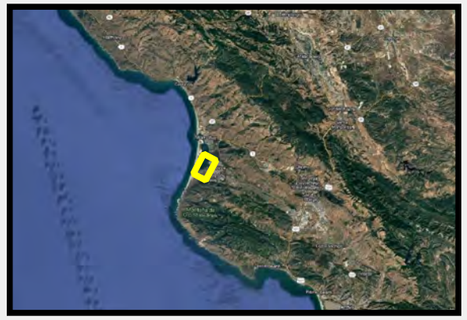
Figure 3b
Simulated Chloride Concentration
Lower Aquifer - Zone E

Creek Discharge Scenario
Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists





Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

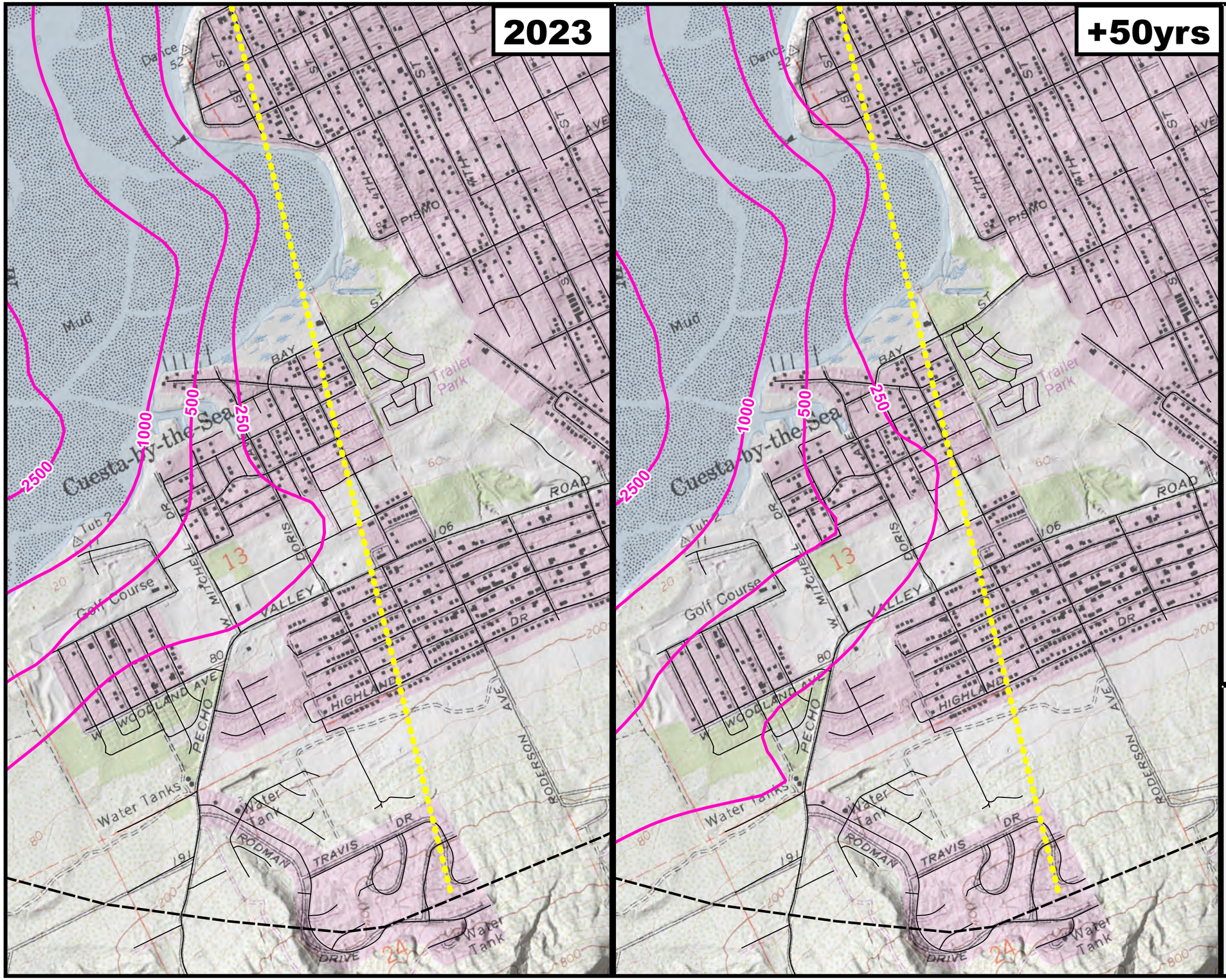
N

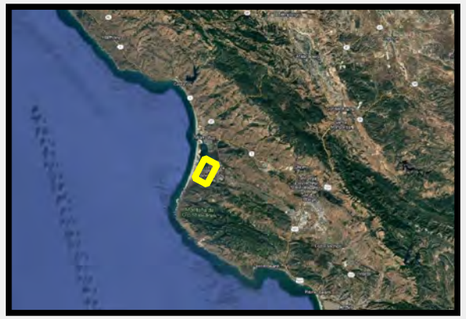
Figure 4a
Simulated Chloride Concentration
Upper Aquifer - Zone C

Upper Aquifer Scenario
Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists





Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone D
  Model Layer 3

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

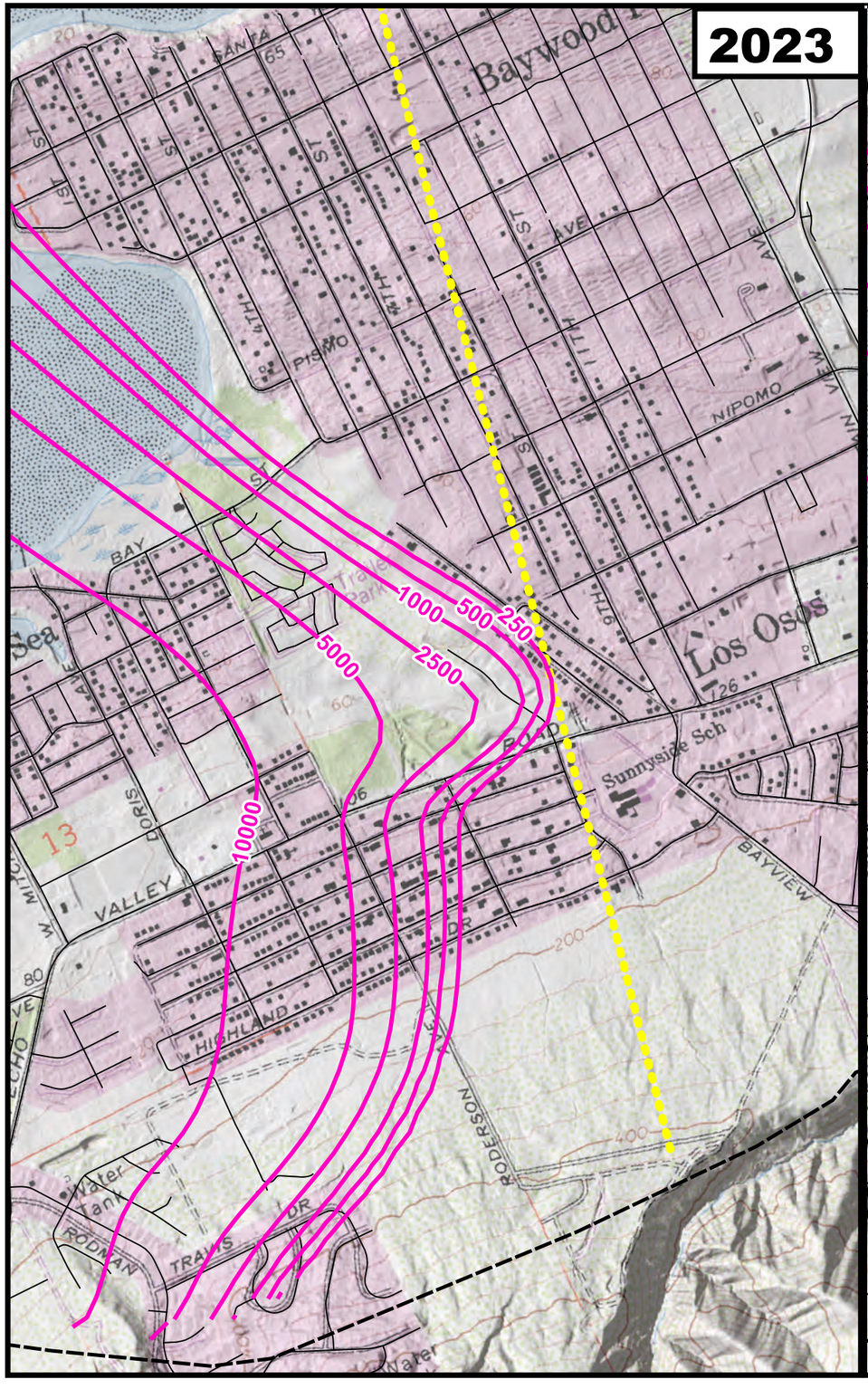
N

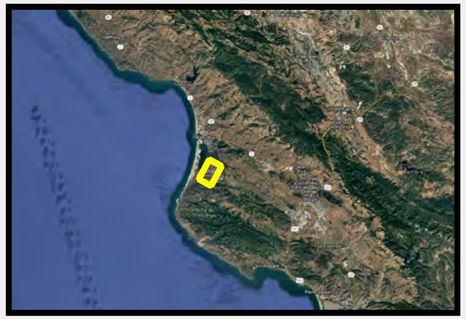
Figure 4b
Simulated Chloride Concentration
Lower Aquifer - Zone D

Upper Aquifer Scenario
Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists





Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone E
  Model Layer 7

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

N

Figure 4c
Simulated Chloride Concentration
Lower Aquifer - Zone E

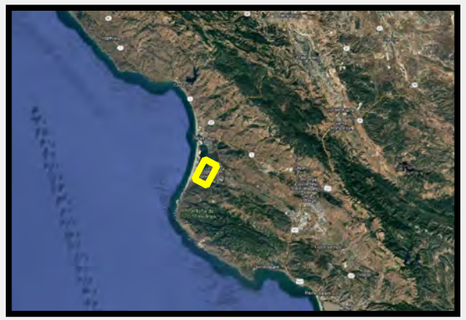
Upper Aquifer Scenario
Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists

2023

+50yrs



Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone D
  Model Layer 3

Simulated Injection Well

- Zone D
- Zone E*

*Shown on figure 5b

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

N

Figure 5a
Simulated Chloride Concentration
Lower Aquifer - Zone D

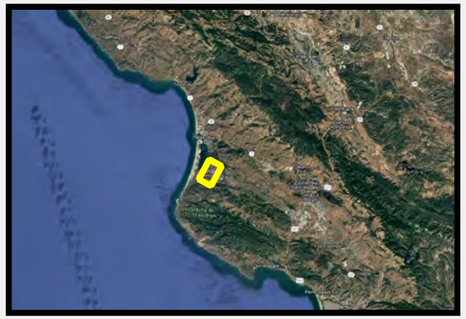
Seawater Barrier Scenario
Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists

2023

+50yrs



Explanation

- Basin Boundary (LOBP)
- Chloride Concentration Contour (mg/L Chloride)
- Threshold Line
  Lower Aquifer - Zone E
  Model Layer 7

Simulated Injection Well

- Zone D
- Zone E

Model predictive uncertainty with respect to the simulated intrusion front location is not currently quantified and is recommended as a future improvement

0 1,200 2,400 ft

N

Figure 5b
Simulated Chloride Concentration
Lower Aquifer - Zone E

Seawater Barrier Scenario
Transient Model
Los Osos WRFP Study

Los Osos BMC

Cleath-Harris Geologists