CITY OF ARROYO GRANDE

WATER SUPPLY ALTERNATIVES STUDY UPDATE

November 12, 2021

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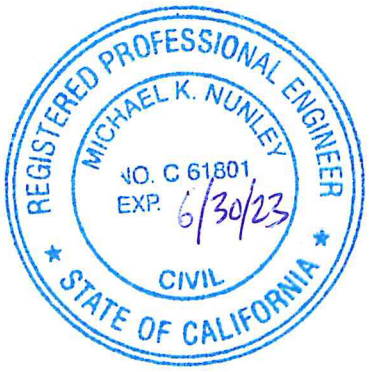

Michael K. Nunley

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1.0 INTRODUCTION AND OVERVIEW

1.1 Introduction

Michael K. Nunley and Associates, Inc. (MKN) was retained by the City of Arroyo Grande (City) to update the City's 2004 Water Supply Alternatives Study Report. In 2004 the City performed an analysis of potential additional water sources to supplement the City's existing groundwater and Lopez Reservoir supplies and to meet the projected future needs of the City. This report categorized water supply alternatives as "short term", "intermediate term", and "long term" with the objective of identifying one or more for implementation in each category. The purpose of this report is to provide a summary of previous studies performed to date, provide a preliminary list of current available water options, and provide an updated list of the most promising options.

1.2 Water Supply

The City has developed a water supply that utilizes groundwater from two separate formations and water from the Lopez Project. Wells 1, 3, 4, 5, 7 & 8 extract water from the Santa Maria River Valley Groundwater Basin. As part of the Groundwater Management Agreement between the City of Arroyo Grande, Grover Beach, Pismo Beach and Oceano Community Services District (Oceano CSD), the City is entitled to groundwater extractions of 1,323 acre-feet per year (AFY). 160 AFY of groundwater is also available from Pismo Formation Wells 9 and 10. The City has a contract entitlement of 2,290 AFY from the Lopez Project.

A maximum combined total of 3,773 AFY of water is available from the City's wells and the Lopez Project. The 2015 Urban Water Management Plan (UWMP) noted only 3,584 AFY would be available during the third year of a multiple dry year event. This includes 2,061 AFY of water from the Lopez Project and 1,523 AFY of groundwater. However, current groundwater modeling results indicate significantly less water may be available from the Santa Maria River Valley Groundwater Basin than the current entitlement.

1.3 Water Demand

The City provided annual reports for the State Water Resources Control Board Division of Drinking Water (DDW) to provide historical water billing information. Table 1-1 summarizes water delivery by use category compared with total production. For purposes of this study, the difference between production and delivery is considered to be non-revenue water (NRW).

Table 1-1 Historical Water Delivery and Production by Category (AFY)

Category	2016	2017	2018	2019	2020
Water Delivered					
Single-family Residential	1,259.1	1,380.8	1,409.0	1,369.9	1,500.4
Multi-family Residential	219.1	251.0	213.5	280.1	246.4
Commercial/Institutional	200.7	355.7	277.6	321.8	246.4
Industrial	0	0	0	0	0
Landscape Irrigation	145.8	104.5	234.8	103.6	245.2
Other	0	0	0	0	0
Total Urban Retail Delivered	**1,824.7**	**2,092**	**2,134.9**	**2,075.5**	**2,238.5**
Agricultural	0	0	0	0	0
Other Public Water Systems	0	0	0	0	0
Total Water Production	1948.1	2193.7	2212.5	2138.0	2318.5
Non-Revenue Water (NRW)	123.4	101.7	120.5	62.5	80.0
NRW as Percentage of Delivery	6.8%	4.9%	5.6%	3.0%	3.6%

The City's 2015 UWMP summarized current water deliveries and predicted future water deliveries as follows:

Table 1-2 - Water Delivery Projections from 2015 UWMP (AFY)

Category	2015	2020	2025	2030	2035
Single-family Residential	1,517	1,957	2,013	2,083	2,113
Multi-family Residential	190	245	252	261	264
Commercial/Institutional	178	230	236	245	248
Industrial	0	0	0	0	0
Landscape Irrigation	169	217	224	231	235
Institutional/ Governmental	53	69	71	73	74
Total Urban Retail	**2,106**	**2,718**	**2,796**	**2,893**	**2,934**
Agricultural	0	0	0	0	0
Other Public Water Systems	0	0	0	0	0
Non-Revenue Water	133	150	154	159	161
Total Water Use	**2,239**	**2,867**	**2,949**	**3,052**	**3,096**

As shown, the UWMP predicted 2020 water deliveries of 2,718 AFY and total production of 2,867 AFY including NRW. An annual increase of 42.9 AFY in production per year was projected through 2035. The City recorded 2020 production of 2,318.5 AFY, which is approximately 24% lower than predicted (2,867 AFY). This

difference indicates implementation of the City's water conservation program has had a significant impact on water demand.

For this study, future water usage was projected based on historical demand in units of gallons per capita per day (gpcd). Approximately 99% of the City population is within the City's water service area, with very few customers outside City limits. Therefore, City population is a close approximation of service area population. California Department of Finance estimated a 2020 population of 17,617 for the City of Arroyo Grande. Dividing 2020 water use of 2,318 AFY by 2020 population resulted in 117 gpcd usage. The 2015 UWMP calculated average three-year water usage (2013-2015) of 138 gpcd and projected this per capita usage through General Plan buildout (population of 20,000). Applying future water demand of approximately 127 AFY, or the average of 138 and 117 gpcd, to a future 20,000 service area population yielded a conservative future demand of 2,540 AFY.

1.4 Supplemental Water

The City anticipates having sufficient water available through buildout based on the average year and multiple dry year scenarios presented in the 2015 UWMP. However, securing an additional 250 AFY (approximately 10% of projected future demand) would allow the City to reduce groundwater usage and further protect the groundwater basin. The following table predicts water delivery to meet future demand of 2,540 AFY assuming the City has acquired an additional 250 AFY of supplemental water. For future production estimations it is assumed Lopez Project deliveries are reduced during a multiple dry year scenario as discussed in Section 1.2, whereas full City entitlement is 2,290 AFY.

This water supply portfolio would allow the City to reduce groundwater pumping to approximately 15% of their combined 1,323 AFY Santa Maria River Valley Groundwater entitlement and 160 AFY Pismo Formation production capacity in a multiple year drought scenario.

Table 1-3 – Future Water Production Projections During Multiple Dry Year Scenario

Source	Supply (AFY)
Lopez Project	2,061
Supplemental Water	250
Groundwater	229
Total Production	**2,540**

2.0 REVIEW OF PREVIOUS STUDIES

The City of Arroyo Grande has partnered with surrounding water agencies such as the South San Luis Obispo County Sanitation District (SSLOCSD), City of Grover Beach, City of Pismo Beach, and Oceano CSD to prepare multiple water supply studies to assess the feasibility of potential water supply projects. This section provides a synopsis of previous water supply studies conducted by the City and partnering agencies.

2.1 2004 City of Arroyo Grande Water Supply Alternatives Study

The 2004 City of Arroyo Grande Water Supply Alternatives Study prepared by the Wallace Group analyzed seventeen water supply alternatives the City could implement to increase water supply and meet future demands. The study identified nine short term alternatives that could be implemented within a five-year period with low complexity and cost, three intermediate alternatives that could be implemented over a ten-year period with moderate complexity and cost, and three long term alternatives that could be implemented within a ten to fifteen-year time frame with high complexity and cost. For each alternative, the study considered infrastructure needs, water quality and supply reliability, and cost. The objective of the report was to provide a preliminary analysis of each alternative, identify the most viable options, and advise City Council to conduct further studies of the supply alternatives that were identified as the most feasible and cost effective. The following table summarizes findings from that study.

Table 2-1 Summary of Findings from Water Supply Alternatives Study for City of Arroyo Grande (Wallace Group, 2004)

2004 Alternative	Background	Water Quality/Reliability	Required Infrastructure	Required Agreements	2004 Cost	Additional Considerations
Short-Term Alternatives						
Private Well for Cemetery Irrigation	• Arroyo Grande Cemetery District currently uses potable water from City for irrigation. • Could provide 38 AFY and 48 AFY at buildout	Adequate for intended use	• New well • Piping • Pump and electrical Equipment	• Cemetery District Approval • City Council Approval • County Environmental Health Services Department permit required	Less than City water	Implementation schedule anticipated to be less than a year
Pismo Formation Well	• The City currently uses Well No. 9 • Proposed Well No. 10 could allow City to extract 160 AFY or more (total) from Pismo Formation	Adequate for intended use with treatment, but lower yield and lower quality when compared to other City groundwater	• New well • Treatment plant • Piping • Pump and electrical Equipment	• Currently planned by the City • County Environmental Health Services Department permit required	$425,000 (installed costs)	• Implementation schedule would be approximately two years • Basin is low yield and lower quality
Rancho Grande Pismo Formation Well (Irrigation)	• Well would serve Rancho Grande Park • Active well is owned by Castlerock Development and supplies construction water • City could obtain the well or drill a separate well at the park	Adequate for intended use	City could obtain the well and construct a pipeline or drill a new well and construct a pipeline. New well would require pump and electrical equipment.	County Environmental Health Services Department permit required	--	• Implementation schedule would be approximately two years • Basin is low yield and lower quality
Purchase Water – Santa Barbara County	• Potential to purchase 400 AFY from a Santa Barbara County Water Contractor • Pipeline capacity from contractors north of the City is limited • Pipeline is sized to supply flow from State Water contractors south of City	• Deliveries can be as low as 30% of the entitlement but "drought insurance water" can be purchased for up to 100% of contract amount. • State Water is offline one month per year • Water quality is adequate for intended use	Existing infrastructure could be used to deliver State Water to Lopez Water Treatment Plant (WTP). County staff stated Lopez pipeline capacity is sufficient but must be confirmed.	State Water entitlement holder, Santa Barbara County, DWR, and Central Coast Water Authority (CCWA) must approve. Contract would likely include paying sunk costs of State Water to entitlement holder.	$1400/AF + Buy-in costs	• Several years to implement this option • Would require voter approval per Measure A
Purchase water – SLO County	• 20,170 AF available from SLO County • No excess pipeline capacity according to County staff • 140 AFY may be available from Pismo Ranch development • County had begun discussions with CCWA.	• Deliveries can be as low as 30% of the entitlement but "drought insurance water" can be purchased for up to 100% of contract amount. • State Water is offline one month per year • Water quality is adequate for intended use	Requires engineering evaluation to determine hydraulic capacity of existing system	State Water entitlement holder and County must approve.	--	• Several years to implement this option • Would require voter approval per Measure A

Table 2-1 Summary of Findings from Water Supply Alternatives Study for City of Arroyo Grande (Wallace Group, 2004)

2004 Alternative	Background	Water Quality/Reliability	Required Infrastructure	Required Agreements	2004 Cost	Additional Considerations
Additional Groundwater Entitlement	City is limited to 1,323 AFY of groundwater extraction by the Basin Management Agreement	Very reliable	• Would require a hydrogeologic study • Wells with excess capacity already exist but additional wells or pipelines may be needed	• Would require modifying the Basin Management Agreement	--	If the additional entitlement is available, option would be the most cost effective, reliable, and easily implemented long term solution
Purchase private well water	Safe yield in the Basin Management Agreement is 5,300 AFY for applied irrigation	Quality consistent with existing groundwater supply	• New wells required to meet County Environmental Health Department requirements • Treatment infrastructure • Pipeline construction	• Supply agreements with landowners • County Environmental Health Services Department permit required	--	• Potential pipelines across environmentally sensitive areas • Less than two years to implement
Lease State Water	Short-term 3- to 5-year contracts for surplus water sales are allowed by DWR	Reliable in the short term	Same requirements as purchasing water from SLO or Santa Barbara County.	Agreement between City and State Water entitlement holder		• May violate State law if provided to new developments • Can be utilized until long-term source is secured • Several years to implement this option • Would require voter approval per Measure A
Reclaimed Price Canyon Oil Field Water	• Water produced during oil extraction must be returned to the reservoir unless it can be treated and disposed • Anticipated flows of 730 AFY for 10 years • Potential exchange for Lopez Water released to sustain habitat and fisheries. Extracted and treated water would be released to Arroyo Grande Creek. Exchanged raw water would be treated at Lopez WTP for use by City.	• Only viable for ~ 10 years • Water quality is adequate for intended use	• Treatment plant at oilfield • Pump Station • Electrical equipment • Pipeline • Capacity of the Lopez pipeline and WTP would need to be investigated	• EIR • Impact to Habitat Conservation Plan • Agreements with Landowners for pipeline easements • Agreement with Plains (owner) • Permits with resource agencies and County departments	$850/AF	• Could compromise steelhead fingerprinting of Arroyo Grande Creek for spawning purposes • SLO County would own the pipeline after 7,300 AF had been delivered
Water Conservation	• Water Conservation Program is anticipated to save 10% of usage • Phase 1 100 AFY savings • Phase 2 will involve irrigation retrofits	N/A	None	--	Decreases City revenue	--

Table 2-1 Summary of Findings from Water Supply Alternatives Study for City of Arroyo Grande (Wallace Group, 2004)

2004 Alternative	Background	Water Quality/Reliability	Required Infrastructure	Required Agreements	2004 Cost	Additional Considerations
Intermediate Alternatives						
Additional Stormwater Basins (Irrigation)	• Modify stormwater basins to serve as storage basins for irrigation use • Rancho Grande Park, AG Cemetery, Caltrans ROW potential users with approximately 75 AFY	• Low reliability, low quality • Irrigation water is not typically required after large storm events	• New basins may be required to preserve storage capacity or infiltration capacity in existing basins • Improvements to existing basins would include cleaning, lining, pumps, electrical equipment, and pipelines.	--	--	Protected wildlife may complicate modification of existing basins
Increased Lopez Entitlement	Amount of surplus water is currently limited until the Habitat Conservation plan (HCP) is completed	Surplus water not considered a reliable supply	• Additional treatment capacity at the Lopez WTP • Additional conveyance may be needed in the Lopez pipeline	• SLO County approval • HCP Adoption	$350/AF + infrastructure improvements	
Nacimiento Project	Currently 6,120 AFY of unallocated raw water supplied to SLO County	• High reliability • Requires local treatment • Scheduled shut-downs every 2-3 years	Either: • Additional City of SLO treatment and pipeline connecting downstream of Lopez WTP; or • Increase Nacimiento pipeline capacity south of San Luis Obispo to SLO Airport and extend pipeline to Lopez WTP	• Treated water scenario would require wheeling agreement with City of SLO • Agreement with County • Approval by Nacimiento participants	• Between $1,800 and $3,300 / AFY • Other parties could share in project cost	Cost would be less if the City participates during project inception
Long-Term Alternatives						
Desalination	• Potential joint venture between South County Agencies to construct a Regional Facility • Grover Beach and other agencies have expressed interest in participation	• Adequate for intended use • High reliability	Seawater extraction, treatment, pumping, storage, and pipeline facilities would be required	Significant environmental issues associated with new ocean outfall if required	$3,000 to $4,000/AFY (2001 reference)	
Recycled SSLOCSD Water (Secondary-23)	• Secondary SSLOCSD water could be used for landscape irrigation on restricted areas • Approximately 2,250 AFY of recycled water available	• Adequate for intended use • High reliability	• Pumping facilities • Transmission pipeline	Agreement with SSLOCSD	$1.4 million or $3,800/AF	Secondary recycled water market is very small with combined cemetery and freeway landscaping use of 45 AFY
Recycled SSLOCSD Water (Tertiary)	• Highly treated effluent can be used for landscape irrigation of unrestricted areas such as golf courses and public parks • Estimated use of 595 AFY	• Adequate for intended use • High reliability	• Pumping facilities • Transmission pipeline • Significant plant upgrades	Agreement with SSLOCSD	$16.3 million or $3,100/AF	

Table 2-1 Summary of Findings from Water Supply Alternatives Study for City of Arroyo Grande (Wallace Group, 2004)

2004 Alternative	Background	Water Quality/Reliability	Required Infrastructure	Required Agreements	2004 Cost	Additional Considerations
Recycled SSLOCSD Water (Tertiary-demineralized)	• Uses include: SSLOCSD area landscape irrigation, groundwater recharge, agricultural irrigation, potential augmentation of Arroyo Grande creek • Available flow 950 AFY	• Adequate for intended use • High reliability	• Pumping facilities • Transmission pipeline • Significant plant upgrades including salt removal	Agreement with SSLOCSD	$25.6 - $29.1 million or $4,900 - $5,200/AF	
Alternatives Considered But Not Evaluated						
Nacimiento/State Water Exchange	• Alternative considered but not further evaluated • City would contract with County to receive Nacimiento Water • Nacimiento Water would be exchanged for State Water by a current State Water entitlement holder who has the ability to receive Nacimiento Water	Adequate for intended use	• Existing infrastructure could be utilized to convey water • Additional treatment and conveyance capacity may be needed for Lopez WTP and pipeline	• Agreement with SLO County for Nacimiento Water • Agreement with State Water entitlement holder	--	--
Conoco-Phillips Refinery Well Water	• Alternative considered but not further evaluated • New wells would be required on Conoco-Phillips Refinery property	Very low reliability	Wells and conveyance infrastructure	Agreement with Conoco-Phillips Refinery	--	Existing wells have experienced drawdown and two have lost production. Representatives of the refinery have concluded they are not in a position to sell water or allow additional wells to be drilled on their property.

The following table summarizes work completed after the 2004 Alternative Study for the alternatives determined to be the most feasible.

Table 2-2 - Update to 2004 Water Supply Alternatives Study

2004 Alternative	Final Action or Conclusion
Private Well for Cemetery Irrigation	This alternative was determined infeasible because groundwater does not exist under the property.
Pismo Formation Wells	The construction of a well at the Deer Trail site (Well No. 10) is completed. Wells No. 9 and 10 require treatment and can provide a combined 160 AFY. Well No. 11 and treatment system were completed for an additional 40 AFY but is not yet permitted. The development of irrigation wells to serve the Park was not pursued.
Water Purchase or Lease from SLO County	The City understands various agencies have had discussions with SLO County about acquiring additional water from the State Water Project, but no decision has been determined. An updated analysis is provided in this study.
Water Purchase or Lease from Santa Barbra County	No update. This alternative has not been further evaluated since the 2004 Study.
Additional Groundwater Entitlement	While 1,323 AFY of groundwater is entitled to the City under the Groundwater Management Agreement, recent groundwater modeling indicates significantly less water may be available.
Purchase Private Well Water	Wells in the upper Arroyo Grande Valley Sub-Basin may be available but projects have not been pursued. The Groundwater Sustainability Plan is underway for the Arroyo Grande Valley Sub-basin. A well pump was designed for the irrigation of Strother Park, but not yet constructed. It is anticipated to provide 8 - 9 AFY. It is assumed a future developer will fund the project.
Reclaimed Price Canyon Oil Field Water	Currently the treatment facility discharges Price Canyon Oil Field Water to Pismo Creek. It was determined to be too expensive to extend the pipeline to Arroyo Grande Creek for exchange with Lopez Water.
Conservation	The City documents progress on the conservation program monthly and reports to the City Council. Currently, the City is saving 400 - 500 AFY due to conservation and has spent $2.0M on retrofits and rebate programs.
Additional Stormwater Basins	This alternative has been implemented. Poplar Basin was expanded to handle runoff from the Applebee's and Rite Aid development on Grand Avenue. The Elm Street Sport Complex uses storm water as irrigation water when available. The City's low impact development standards have added underground retention to new developments.
Increased Lopez Entitlement	A study conducted by Stetson Engineers evaluated raising spillway to increase storage and determined that raising the dam would be subject to Bureau of Dam Safety requirements. Each foot of height would add approximately 1000 AF of storage.

2.2 2006 Water Supply Study: Desalination

The 2006 Water Supply Study: Desalination prepared by the Wallace Group for the City, Oceano CSD, and City of Grover Beach further analyzed the construction of a desalination facility as recommended in the 2004

Water Supply Alternatives Study. The report assumed the desalination project would be a joint project among the three agencies to meet future demands. The study made the following assumptions:

- Facility will be located at the South San Luis Obispo County Sanitation District Wastewater Treatment Plant (SSLOCSD WWTP).
- Source water will be extracted from new beach wells near the SSLOCSD WWTP.
- Brine will be disposed using the existing ocean outfall.
- The facility will use reverse osmosis (RO) as the desalination method.

The study determined that treated water from the facility should match existing water quality standards, be distributed to each agency's storage tanks, and all costs would be divided among the agencies. The report outlined the permitting process for relevant regulatory agencies such as the Regional Water Quality Control Board and California Coastal Commission, discussed applicable policies of the Coastal Act, and concluded multiple permits and an Environmental Impact Report were required. The estimated capital cost of the facility was approximately $17 million, and the 20-year life cycle cost analysis determined the cost per acre foot of desalinated water would be $2,675/AF[1]. The timeline for the project from the completion of a feasibility study through construction was estimated to be 86 months (7+ years).

2.3 2006 Supplemental Water Supply Study: Nacimiento Pipeline Extension

The Nacimiento Water Supply Project (or "Nacimiento Pipeline Project") was intended to deliver raw water from Nacimiento Reservoir to agencies in San Luis Obispo County, ultimately extending from the Reservoir to the City of San Luis Obispo and terminating at the City Water Treatment Plant. The 2006 Supplemental Water Supply Study: Nacimiento Pipeline Extension prepared by the Wallace Group for City of Grover Beach, Oceano CSD, and the City evaluated the viability of the Nacimiento Pipeline Project to supply approximately 2,300 AFY of potable water to meet future demands, as reported in the 2004 Water Supply Study. The study presented two alignments of the extension, identified and discussed the design and regulatory requirements of the project, and provided a 20-year life cycle cost analysis including capital and O&M costs for the project. The report compared two pipeline alignments: Orcutt Road to Lopez Reservoir (Alignment A, 17.5 miles long) for treatment at Lopez WTP; and Plains Oilfield to Arroyo Grande Creek (Alignment B, PXP 18.07 miles long) for exchange of Arroyo Grande Creek and Lopez Project water. The study concluded that the Plains Oilfield pipeline was the most cost-effective method but was uncertain of the time frame for availability of the pipeline. The Orcutt Road alignment had a significantly higher cost but considerably reduced the construction schedule. The project required improvements to the Lopez WTP for treatment of raw water such as the installation of chemical pretreatment, new membrane filtration system, and disinfection to meet state and federal water quality standards. The existing Lopez Project pipeline also would require pumping improvements to increase capacity and maintain adequate delivery rates and pressure to all users. Agencies would be required to sign the Nacimiento Project Water Delivery Entitlement Contract, which defines the operation and maintenance, delivery entitlement, and regulatory requirements for each agency. The estimated capital cost of the Orcutt Road alignment was $30,100,000 with estimated annual O&M cost of $5,960,000 and 20-year life cycle cost of $3,827/AF. The estimated capital cost of the Plains Pipeline alignment was $11,860,000 with an estimated $5,800,000 annual O&M cost and 20-year life cycle cost of approximately $3,010/AF. The cost for this alignment was lower since a water discharge pipeline constructed by Plains Exploration (PXP) would be reused for part of the project. The report concluded the project would require a minimum of 5 years to complete planning, permitting, design, and construction if the Orcutt Road alignment was selected. However, if the recommended Plains Pipeline alignment was selected, the timeline could increase by 10 years since the pipeline would be necessary for oil water production during that period. The report concluded that more information was required regarding the timeline for the Plains Pipeline due to the high uncertainty before a feasibility study is conducted.

[1] Estimated capital and 20-year life cycle costs in 2006 dollars

2.4 2009 Final Recycled Water Study

The 2009 Water Recycling Update Report prepared by the Wallace Group for the SSLOCSD reevaluated previous recycled water studies and proposed alternative projects for the District in response to the 2004 Water Supply Alternatives Study. The SSLOCSD provides wastewater services to the City of Arroyo Grande, City of Grover Beach, and community of Oceano and operates a wastewater treatment plant with a capacity of 5,600 AFY. The report provided a detailed overview of each agency's water supply systems, wastewater characteristics of the District, recycled water regulations, and described the potential for a recycled water market. The report evaluated the viability of recycled water use within the District through multiple proposed projects and evaluated the cost, water quality impacts, public perception, constructability, and construction impact for each project. The recycled water projects considered were landscape irrigation for the Elm Street Park/Soto Sports Complex, groundwater recharge and stream augmentation at the Arroyo Grande Creek, direct agricultural irrigation of food crops, and toilet flushing. All the proposed projects would require upgrades to the existing SSLOCSD WWTP. Turf irrigation, direct food crop irrigation, and indirect potable reuse projects required adding coagulation and sedimentation ahead of filtration and disinfection or adding a direct filtration process with disinfection. The report determined that a full-scale direct agricultural irrigation project, possibly in combination with an indirect potable reuse project, was the most cost effective and viable recycled water project with an estimated cost of $1,200 to $1,400 per AF. The SSLOCSD WWTP would require process improvements including microfiltration, reverse osmosis, and advanced oxidation using ultraviolet light. These improvements would have an estimated construction cost of $14.3 million[2]. The report concluded with five near-term recommendations for the recycled water projects: conduct additional feasibility studies regarding aquifer recharge, begin to request Title XVI funding for recycled water projects, develop a conceptual design for the recycling facility, develop a public outreach plan, and coordinate with Regional and State Boards to secure project funding.

2.5 Recycled Water Facilities Planning Study

The 2016 Recycled Water Facilities Planning Study prepared by Water Systems Consulting, Inc. for the SSLOCSD and the City to identified, evaluated, and analyzed two potential locations for an advanced treatment plant (ATP). The report describes the current and projected water system and water use characteristics, identifies permitting requirements, potential project funding, and illustrates an implementation plan for the two potential locations. The project plan, regardless of the alternative site locations, consist of a two-phase implementation plan. Phase 1 is to construct the ATP to treat flows from Pismo Beach WWTP and Phase 2 will expand treatment to include flows from the SSLOCSD WWTP. Alternative 1 included construction of the ATP onsite at the existing WWTP to provide water for groundwater recharge and or agricultural irrigation. Alternative 2 included construction of an offsite ATP to treat secondary effluent from the Pismo Beach WWTP and the District's WWTP to provide water for groundwater and or recharge agricultural irrigation. The report recommended that an Environmental Impact Report be prepared to further evaluate the location and discussed advantages and disadvantages for both options. Key benefits of the onsite ATP (Alternative 1) compared to an off-site ATP (Alternative 2) were less infrastructure for conveyance, no additional property was needed for the onsite location, and O&M costs were lower. Alternative 1 was estimated to cost $3,900 per AF for Phase 1 and $2,800 per AF for Phase 2. The main disadvantage of this alternative was increased regulatory restrictions and permits needed to upgrade the existing facility. The report stated the key advantage of the offsite location (Alternative 2) was less regulatory restrictions, but the capital and O&M costs were higher than the onsite option. Alternative 2 was estimated to cost $4,400 per AF for Phase 1 and $3,000 per AF for Phase 2. The report also compared cost between using recycled water for groundwater recharge only and for a hybrid approach that included groundwater recharge and agricultural irrigation with both project location options. The groundwater recharge-only projects would have a lower capital cost and higher O&M costs but provide higher water quality to the basin long term. The hybrid projects would result in higher capital cost, but lower O&M costs once a framework for participating agencies to contribute to project costs was developed. The report provided near term and long-term project components that all stakeholders need to address and

[2] Costs in 2008 dollars

further evaluate before a project option can selected and outlines permitting steps needed to begin the next evaluation process.

3.0 EVALUATION OF VIABLE ALTERNATIVES

3.1 State Water

3.1.1. Background

San Luis Obispo County Flood Control and Water Conservation District (SLOCFCWCD) and Santa Barbara County Flood Control and Water Conservation District (SBCFCWCD) are State Water Project contractors. San Luis Obispo County and Santa Barbara County subcontractors receive flow through the Coastal Branch Aqueduct and distribution facilities operated by Central Coast Water Authority (CCWA). Water delivered in both counties is treated at the Polonio Pass Water Treatment Plant. The distribution system of the Lopez Project is used to deliver State Water to County Service Area 12 subcontractors (including Avila Beach CSD, Pismo Beach, San Miguelito Mutual Water Company, and Oceano CSD).

3.1.2. Water Quality and Reliability

State Water is treated for the Coastal Branch service areas by CCWA and delivered for potable use but annual availability for new supply is subject to drought conditions since it is an imported surface water supply. For example, in March 2021, California Department of Water Resources (DWR) announced "Table A" deliveries would be reduced to 5% of requested supplies[3]. SLOCFCWCD has an agreement with DWR for up to 25,000-acre feet per year (AFY) of "Table A" allocation but can currently only deliver 4,830 AFY of water through Coastal Branch facilities[4]. Undelivered "Table A" water is used by SLOCFCWCD to meet local needs in years when statewide "Table A" water supply allocation is less than what is requested by Contractors. For example, "Table A" allocation of 5% results in 1,250 AFY of new "Table A" water being available to San Luis Obispo County, which the SLOCFCWCD can then use in combination with its stored carryover water ("Table A" from previous years) to deliver up to 100% of the water supply amounts requested by their subcontractors.

3.1.3. Institutional or Legal Constraints

A City ballot measure passed in 1990 required voter approval to receive State Water. However, during the last major drought the City passed a 2016 ballot measure to allow purchase of State Water on an emergency basis only. Purchasing State Water on an emergency basis during drought conditions would be legal, but permanent supply would require a new ballot measure to be passed.

For the City to obtain State Water, an existing subcontractor must develop an agreement with the City to transfer State Water since CCWA facilities are fully subscribed. Some additional capacity may be available in the treatment and distribution facilities but all CCWA members and San Luis Obispo County subcontractors must approve use of this additional capacity by Arroyo Grande unless existing entitlement is transferred.

The City would need to find a willing State Water subcontractor to purchase their Table A allocation. San Luis Obispo County Public Works staff stated they did not know of any interested subcontractors at this time. Many existing subcontractors are interested in procuring more State Water. OCSD has expressed an interest in a short-term transfer of State Water to the City which is discussed separately in this study (see Section 3.2). Only State Water subcontractors downstream of Arroyo Grande on the Lopez Project could contract with the City without requiring the City to procure capacity in either the Coastal Branch or the Lopez Project.

[3] https://water.ca.gov/News/News-Releases/2021/March-21/SWP-Allocation-Update-March-23

[4] "Table A" allocation refers to an agency's contracted amount of State Water. It can be adjusted by the Department of Water Resources each year based on overall availability of water, considering drought and other impacts to the state surface water supplies.

3.1.4. Infrastructure

State Water can be conveyed to the Lopez Project for delivery to the City of Arroyo Grande. Based on discussions with County of San Luis Obispo Public Works Department Staff, the capacity of Polonio Pass Water Treatment Facility and Coastal Branch is fully subscribed by existing State Water subcontractors. The capacity of Lopez Project is also fully subscribed by South County Zone 3 water purveyors. The 2020 Draft Urban Water Management Plan for SLOCFCWCD Zone 3 (2020, WSC) states an additional 300 AFY capacity may be available in the Coastal Branch and Lopez Projects when comparing existing agreements for Lopez and State Water to the hydraulic capacity of the pipelines.

3.1.5. Cost

Assuming no treatment or distribution improvements are required to deliver State Water to Arroyo Grande, permanent acquisition of water from a State Water subcontractor will require buy-in costs to reimburse the subcontractor for past debt service. Historically, this has been a limitation for agencies in acquiring State Water if they were not early subcontractors. The total cost for State Water could vary widely depending on the specific opportunity. City staff will continue to work with subcontractors and the County to identify any willing sellers.

3.1.6. Feasibility

This alternative is not recommended for consideration as a long-term water supply for the following reasons:

- Fully subscribed pipeline and treatment capacity in the Lopez and CCWA facilities.
- Requirement for approval by CCWA and San Luis Obispo County subcontractors.
- Impact of drought on long term reliability.
- Requirement for City to pass a new ballot measure for long-term water supply.

However, the City should continue to engage with the County in case plans are developed to acquire more State Water, acquire additional pipeline or treatment capacity from CCWA, or new partnerships arise to facilitate State Water exchange through the Zone 3 system.

3.2 Oceano CSD

3.2.1. Background

OCSD water sources include State Water, Lopez Water, and groundwater. Lopez and State Water are delivered through the Zone 3 system. In 2009, the City and OCSD entered a five-year agreement for 100 AFY of either Lopez Water or groundwater to be delivered to the City as a temporary water supply. Cost was assigned to be 105% of current Lopez Water costs with a credit of $275/AFY for any groundwater used.

From discussions with OCSD, up to 300 AFY of OCSD's water may be available to the City on a short-term basis. The actual amount would depend on availability of water supplies to meet OCSD's demand on a year-to-year basis.

3.2.2. Water Quality and Reliability

OCSD would need to assess availability of water each year before committing to deliveries to the City since all of OCSD's water supplies could be affected by drought conditions. State Water is treated and delivered for potable use but is subject to drought conditions since it is supplied by imported surface water. For example, in March 2021, California DWR announced "Table A" deliveries would be reduced to 5% of requested supplies[5]. SLOCFCWD has an agreement with DWR for 25,000-acre feet per year (AFY) of Table A allocation, but can currently only deliver 4,830 AFY of water through CCWA facilities. Undelivered "Table A" water is used

[5] https://water.ca.gov/News/News-Releases/2021/March-21/SWP-Allocation-Update-March-23

by SLOCFCWCD to meet local needs in years when statewide "Table A" water supply allocation is less than what is requested by Contractors. For example, "Table A" allocation of 5% results in 1,250 AFY of new "Table A" water being available to San Luis Obispo County, which the SLOCFCWCD can then use in combination with its stored carryover water ("Table A" from previous years) to deliver up to 100% of the water supply amounts requested by the Subcontractors including OCSD.

OCSD has typically not taken its full 750 AFY of Table A State Water entitlement due to the high variable cost for State Water, but has stored unused water in San Luis Reservoir, a State Water Project facility. This stored water can be extracted when requested by OCSD, increasing reliability of this supply.

In the future, Lopez Project participants will have the ability to use State Water to offset their usage of Lopez Water, then store their unused Lopez Water in Lopez Reservoir. Pending agreements are being finalized among Lopez Project and State Water contractors. If the City can obtain excess OCSD water and store it in Lopez Reservoir, it would be available for extraction in later years improving long-term reliability.

3.2.3. Institutional or Legal Constraints

A temporary agreement would be required between OCSD and the City but the arrangement would be legal for both agencies. Purchasing OCSD water as a permanent supply could be affected by OCSD and City regulations. OCSD has an ordinance preventing long-term sale of their State Water entitlement but has been able to enter into short-term agreements in the past. The City of Arroyo Grande passed a ballot measure in 2016 to allow the City to purchase State Water on an emergency basis but a previous ballot measure prevents permanent purchase of State Water. Purchasing State Water under non-emergency conditions would require a new ballot measure to be passed. If OCSD acquired State Water in excess of current "Table A" amounts, OCSD may be able to legally sell this water to Arroyo Grande on a long-term basis.

3.2.4. Infrastructure

No additional infrastructure would be required as long as OCSD does not exceed their allotted capacity of CCWA or Lopez facilities to provide water to Arroyo Grande.

3.2.5. Cost

The previous agreement between OCSD and the City established a cost equivalent to 105% of Lopez Water price. OCSD's current price for Lopez Water is $1674 per AF, which results in a purchase price of approximately $1758 per AF under the original agreement. Cost would be negotiated prior to finalizing any agreement.

3.3 Interagency Connections

3.3.1. Background

The City's water service area is located within 300 feet of Golden State Water-Cypress Ridge's (GSWCR's) service area near the intersection of Cathedral Lane and Cornerstone Lane. Both agencies are members of the California Water/Wastewater Agency Response Network (CalWARN) which promotes mutual aid during emergencies. The City could initially rely on their joint CalWARN membership with GSWCR to provide emergency water supply.

Developing an emergency connection could be the first step in long-term purchase of water by the City. Nipomo CSD (NCSD) receives supplemental water under a Wholesale Agreement with the City of Santa Maria and is completing design of interconnections to deliver water to GSWCR, Golden State Water's other Nipomo service area, and Woodlands Mutual Water Company. The City of Santa Maria sells a "municipal mix" of State Water and groundwater to NCSD.

This connection could also benefit GSWCR and NCSD by allowing transfer of water from Lopez Project contractors via Arroyo Grande's water distribution system if needed.

3.3.2. Water Quality and Reliability

A connection between the City and GSWCR could improve reliability for both agencies. Construction of an interconnection and development of a mutual aid agreement could, at a minimum, allow transfer of water during emergency conditions. All water conveyed to the City would be potable water.

GSWCCR utilizes groundwater and intends to receive supplemental water from NCSD as described above. Reliability of groundwater and supplemental water could be impacted by drought, as discussed in the other sections where State Water is considered. However, this can be mitigated by Santa Maria procuring other available State Water, storing water in San Luis Reservoir for extraction during dry years, or supplementing with groundwater.

3.3.3. Institutional and Regulatory Constraints

GSWCR and the City of Arroyo Grande are both signatory to CalWARN as described above, so they can provide emergency relief to each other. This could facilitate short-term emergency water transfers between the two systems if they are connected. A Memorandum of Understanding (MOU) or similar agreement between GSWCR and the City would develop guidelines for design, construction, and funding a new connection.

Long-term opportunity to purchase supplemental water from NCSD and wheel it through the GSWCR system could be explored in the future. NCSD has constructed facilities that connect and convey water from the City of Santa Maria to NCSD's water system. NCSD's water system connects to and will be conveying water to Woodlands Mutual Water Company and GSWCR. NCSD entered into a Wholesale Agreement with the City of Santa Maria to purchase a minimum of 2,500 AFY beginning in the 2025-26 fiscal year, with a maximum allowable delivery of 6,200 AFY. Additional infrastructure will be needed to reach the maximum allowable delivery amount. The District is importing a minimum of 1,000 AFY in the 2021-22 fiscal year and the years leading up to the 2025-26 fiscal year. An easement agreement with SBCFCWCD limits delivery to 3,000 AFY at this time. This quantity includes allocations for Nipomo Mesa purveyors including GSWCR, Woodlands Mutual Water Company, and another Nipomo GSWC service area. If the City of Arroyo Grande and NCSD pursue a permanent sale of water, NCSD may need to revise the easement agreement to purchase additional water beyond the 3,000 AFY limit. It is our understanding NCSD and County of San Luis Obispo staff are negotiating with SBCFCWCD to revise this limit.

Other exchanges among the City, Lopez Project contractors, GSWCR, and NCSD could be explored but are outside the scope of this study.

3.3.4. Infrastructure

Hydraulic grade line (HGL) elevations in the City's Main City Pressure Zone and the primary GSWCR zone appear to be similar (approximately 312 ft mean sea level (MSL)). An engineering study will be needed to confirm the amount of water that could be conveyed among the three systems and to size interconnection piping and metering facilities. A typical interconnection includes a buried vault with meter, valves, bypass piping, instrumentation, flow control capability, and power. Additional improvements within the City or GSWCR system may be needed depending on the design flow for the interconnection.

If long-term purchase of water is pursued in the future, additional improvements will be needed within the NCSD water system and may be needed within the GSWCR water system.

3.3.5. Cost

Hydraulic analysis of both systems and agreement on design criteria would be required before cost can be determined, but cost components are summarized below:

- Capital cost of interconnection facility (including planning, design, and construction).
- Operation and maintenance of interconnection facility.

If long-term purchase of NCSD supplemental water is pursued, the following cost components may be required:

- Capital cost of GSWCR and NCSD improvements (including planning, design, and construction).
- Operation and maintenance costs to wheel water through the GSWCR and NCSD systems.
- Purchase cost for supplemental water from NCSD.

3.4 Nacimiento Water Project

3.4.1. Background

The Nacimiento Water Project can deliver 15,750 AFY of raw water through facilities including the reservoir intake, pumping stations, tanks, and pipelines. Existing participants include San Luis Obispo County Service Area 10A (Cayucos), Bella Vista Mobile Home Park (Cayucos), Santa Margarita Ranch Mutual Water Company, City of Paso Robles, Templeton CSD, Atascadero Mutual Water Company, and City of San Luis Obispo. As discussed in previous studies, the Nacimiento Water Supply Project was not extended south past the City of San Luis Obispo.

3.4.2. Institutional and Regulatory Constraints

The project is fully subscribed by existing participants and capacity must be acquired from current participants without adding pipelines or pumping facilities to deliver more water. However, participants are not using their full allocations. County staff have noted the participants are working to develop a surplus water sales program that would support transfers of Nacimiento Water Project water to non-participants within the central coast region.

To transfer Nacimiento Water, a new pipeline would be required connecting the City of San Luis Obispo to Lopez Reservoir for treatment at Lopez Water Treatment Plant. Another approach could be construction of a new pipeline from the City of San Luis Obispo to the Avila area currently served by the Lopez Project. Alternatively, if no new pipeline was constructed the City would need to be able to exchange Nacimiento Water for State Water through existing Zone 3 partners. However, there are no Zone 3 partners who are also customers of the Nacimiento Water Project.

3.4.3. Infrastructure

An exchange of State Water for Nacimiento Water would not require new pipelines or connections, in theory. However, there are no partners in both projects who could facilitate this transfer other than SLOCFCWCD who may have the potential to facilitate transfers or exchanges.

3.4.4. Feasibility

This alternative should not be explored further at this time since there are no appropriate partners engaged in both the Nacimiento Water Project and State Water Project, and no Nacimiento Water is currently available. San Luis Obispo County staff has noted SLOCFCWCD has the capability to purchase additional Nacimiento water from Monterey County Water Resources Agency beyond the current Nacimiento Water Project contracted amount. The City should continue to engage with the County in case plans are developed to extend the Nacimiento Water Project to south San Luis Obispo County or new partnerships arise to facilitate water exchange through the Zone 3 system.

3.5 Central Coast Blue

3.5.1. Background

The Preliminary Engineering Report for Central Coast Blue (CCB PER, WSC/Carollo, 2021) provided background information for this Study. The Central Coast Blue Project is intended to protect the Northern Cities

Management Area of the Santa Maria River Valley Groundwater Basin against groundwater contamination from seawater intrusion and augment groundwater supply. The project involves the construction of an advanced water purification facility (AWPF) that will treat effluent from the Pismo Beach Wastewater Treatment Plant (PBWWTP) and the SSLOCSD Wastewater Treatment Plant (SSLOCSD WWTP) to Title 22 standards for indirect potable reuse for groundwater injection into the SMGB. Participants of the project include the Cities of Pismo Beach, Arroyo Grande, and Grover Beach which are members of the Northern Cities Management Area (NCMA).

The project would be implemented in two phases. Phase 1 will include the construction of the AWPF, five injection wells and associated monitoring wells, pipelines, and the conveyance system. Only effluent from the PBWWTP would be treated in this phase. Phase 2 will increase the AWPF capacity to process effluent from SSLOCSD WWTP and incorporate two additional injection wells. The project will increase water supply reliability of the NCMA by injecting 900 AFY during Phase 1 and a total of 3,500 AFY when Phase 2 is completed.

3.5.2. Water Quality and Reliability

The SMGB provides groundwater for the NCMA agencies. Water supply reliability is limited by drought conditions, seawater intrusion, and overall groundwater level reductions in the Santa Maria Valley Groundwater Basin. Since 2009 the NCMA agencies have reduced groundwater pumping in efforts to prevent seawater intrusion. The Central Coast Blue Project will increase groundwater supply and reliability for the NCMA and improve the overall water quality by injecting highly purified recycled water that complies with Title 22 standards and the Central Coast Regional Water Quality Control Board requirements for minerals and drinking water maximum contaminant levels into the SMGB.

The Central Coast blue project would inject up to 900 AFY of purified water in Phase 1 and 4,390 AFY in Phase II. A groundwater model has been developed to determine how much water could be extracted at these two phases of project implementation without negatively impacting the groundwater basin. Results of the modeling analysis indicate the agencies will be able to extract as much water as they are injecting, and possibly more, without causing seawater intrusion.

The City of Arroyo Grande has agreed to participate to a 25% level in the Phase I project, which is noted as 225 - 250 AFY of expected benefit for the City in the September 14, 2021, Staff Report to City Council.

3.5.3. Institutional or Legal Constraints

Operating and management agreements are being developed among the Cities of Arroyo Grande, Pismo Beach, and Grover Beach for completion of permitting, design, construction, and management of Central Coast Blue. Permitting and regulatory constraints have been identified by the project stakeholders and are being addressed as part of the implementation strategy.

3.5.4. Infrastructure

The Central Coast Blue Project will require the construction of the AWPF which will utilize ultrafiltration, reverse osmosis, and UV disinfection with advanced oxidation processes for water treatment and the development of injection and monitoring wells. The project will also require additions to the PBWWTP and the SSLOCSD WWTP infrastructure such as additional treatment facilities, a conveyance system, and multiple pump stations. Existing extraction wells would be utilized to deliver water to the City.

3.5.5. Cost

A cost analysis was prepared for the project that assumed a 1% interest rate over a 30-year payback period. The total cost for Phase 1 after injection is $2,400/ AF and $1,800/ AF for Phase 2. Total cost includes capital cost, annualized capital cost, and annualized O&M cost. The PER notes the Phase 1 cost “before injection” is $3,400 AFY, since 900 AFY would be injected but the PER states this will result in a yield of 1,700 AFY of groundwater that can be extracted without increasing potential seawater intrusion.

3.5.6. Additional Considerations

The City could improve reliability by exchanging Central Coast Blue allocation for State Water and/or Lopez Water. As discussed in Section 3.2, in the future, Lopez Project participants will have the ability to use State Water to offset their usage of Lopez Water, then store their unused Lopez Water in Lopez Reservoir. This could allow the City to store unused water they have exchanged for their Central Coast Blue allocation.

Exchanging Central Coast Blue allocation for State Water and/or Lopez Water could also provide higher water quality. Both surface water supplies have lower mineral content and hardness than groundwater.

3.6 Recycled Water "Scalping Plant" Concept

3.6.1. Background

In a June 24, 2021, letter to City Council, Hartman Engineering identified an option for a "scalping plant", defined in the letter as "decentralized treatment plant(s) which can provide recycled water to the City of Arroyo Grande without the added infrastructure of developing large scale water treatment facilities and the associated new pipe networks." The letter recommended locating the scalping plant near Arroyo Grande High School and surrounding agricultural fields where raw wastewater could be extracted from a SSLOCSD sewer trunk main and treated for irrigation use. This water would be exchanged for groundwater in order to allow the City to extract unused groundwater. The project could be phased to produce up to 400 AFY according to the letter.

3.6.2. Water Quality and Reliability

The development of a scalping plant would provide a reliable water supply for irrigation. The letter states that this project could reduce groundwater pumping by agricultural businesses and naturally reduce seawater intrusion potential by providing recycled water as an alternative.

Mineral content could be a challenge for agricultural users, depending on the crops in production. High total dissolved solids and chlorides can present a challenge as noted in previous recycled water studies. This concern could be alleviated by blending with groundwater. However, this would reduce the beneficial groundwater extraction offset.

There may also be concern from potential consumers about use of treated wastewater for food crops. Users would also be required to obtain permitting for recycled water use and meet Title 22 requirements for placement of irrigation systems and for prevention of cross-connection with potable water supplies.

3.6.3. Institutional or Legal Constraints

The letter claims the permitting process for decentralized treatment plants have a streamlined regulatory pathway with the Regional Water Quality Control Board (RWQCB). One of the key benefits identified in the letter is that scalping plant designs have the ability to be scalable to meet current and future demands without excessive permitting limitations.

Since the plant would discharge waste to the existing SSLOCSD trunk mains, no Waste Discharge Requirement Orders would be necessary. However, a Title 22 Engineering Report will be necessary to receive RWQCB approvals for recycled water treatment and delivery. The project would also require California Environmental Quality Act review and any other permits for treatment, pipelines, pump stations, and storage facility construction.

In order to provide a quantifiable water supply benefit to the City, contracts with agricultural users would be necessary. Users would need to agree to reduce groundwater pumping by a 1:1 ratio to delivered recycled water. The City would need to have the right to extract this exchanged water from their wells.

3.6.4. Infrastructure

The letter notes that the key advantage of a scalping plant is its limited infrastructure requirements. The scalping plant would not require the development of a large-scale water treatment facility. As envisioned by the letter's author, the scalping plant would consist of a packaged membrane bioreactor system with disinfection and pumping and would utilize the existing network of irrigation pipe to distribute recycled water. The letter assumes existing pipe is nearby and available for connecting to the plant.

3.6.5. Cost

Cost cannot be accurately estimated at this time due to the range of variables, but cost components are summarized below:

- Capital cost of scalping plant (including planning, design, and construction)
- Operation and maintenance of scalping plant.

In a similar project developed for a community in Madera County, a 0.25 MGD (280 AFY) recycled water treatment facility was constructed for $6.5M construction cost. Assuming 30-year financing at 1.5% (recent State Water Resources Control Board State Revolving Loan Fund terms), this would result in annual debt service of $270,000 or $970/AF. The following table summarizes operation and maintenance costs projected for the first year of operation.

Table 3-1 Example Estimated First-Year O&M Costs for 280 AFY Recycled Water Treatment Facility

Category	Cost
Labor and Materials	$420,000
Utilities (Power, Water, and Communication)	$160,000
Outside Services (Sludge Disposal, Laboratory Testing, and Engineering)	$80,000
Regulatory Permits and Fees	$33,000
Administration	$74,000
Total	$767,000 ($2740/AF)

Total estimated cost, including only construction and operation/maintenance, for the recycled water plant in Madera County is $3,710/AF for this 280 AFY facility. It is likely the cost per AF for a 400 AFY facility would be lower due to economy of scale and the ability to discharge solids back to the collection system instead of requiring offsite disposal. First year of operation tends to be higher until a treatment system reaches a steady state of performance and less operator time is required. However, this cost does not include land acquisition, resource agency permits, design, financing, recycled water distribution pipelines, or other costs beyond those identified above. This cost opinion is considered adequate as a conceptual, planning-level cost until preliminary design is performed.

3.6.6. Feasibility

While the project is feasible, developing planning-level costs would require preliminary design. No costs were presented in the letter addressed to Council.

The City would need to identify interested customers before proceeding with this alternative. Discussions with potential irrigation users would be required to determine if they are likely to reduce groundwater pumping in

exchange for recycled water. This has proven to be a challenge in similar projects since agricultural businesses are often concerned about committing to reducing their water usage and sometimes have concerns regarding safety and quality of recycled water, particularly mineral quality.

3.7 Water Conservation

As discussed in Section 1.3 of this Study, the City recorded 2020 deliveries that were 24% or approximately 550 AFY lower than predicted. This is due to the City's conservation efforts, including the tiered rate structure, restrictions to irrigation during drought conditions, rebate programs such as "cash for grass", and retrofits of low flow fixtures. Further reduction through water conservation would require more stringent restrictions and penalties for using excess water. It is difficult to predict how the City could further reduce water consumption beyond the current level of success.

3.8 Stormwater Capture

3.8.1. Background

The San Luis Obispo County Stormwater Resource Plan (SWRP, 2020, County of San Luis Obispo Public Works Department) identified and prioritized stormwater and dry weather runoff capture projects in the County, including the City of Arroyo Grande. The SWRP provides the basis for this discussion.

The City is located within the Arroyo Grande/Pismo Creeks Watershed Group for stormwater planning efforts. It is one of nine Watershed Groups identified in San Luis Obispo County. The Arroyo Grande Creek watershed has a total drainage area of 103 square miles (mi^2) of which 68 mi^2 is above Lopez Dam.

The SWRP identified the following projects within the Watershed Group:

- Stormwater Infiltration Basins
- Pismo Preserve Roads Improvement Project
- Oceano Drainage Improvement Project
- South Halcyon Green/Complete Street
- Corbett Creek Floodplain and Stream Restoration Project

Of these projects, only the infiltration basins were identified as having a water supply benefit. No cost was identified but a benefit of 26 AFY was estimated across the Watershed Group, which includes the Cities of Arroyo Grande, Grover Beach, Pismo Beach, community of Oceano, and other unincorporated areas of San Luis Obispo County.

3.8.2 Water Quality and Reliability

Surface flow from Arroyo Grande Creek would be the primary water supply under this alternative. Arroyo Grande Creek supply is subject to drought conditions and is strongly dependent on releases at Lopez Dam. The SWRP notes water quality is "generally good but for high concentrations of nitrate and orthophosphate, and marginal temperatures in the lowermost reaches." Orthophosphate loading to groundwater would likely be reduced through adsorption during percolation but nitrate could have an impact to groundwater if this alternative is implemented.

3.8.3 Infrastructure and Regulatory Constraints

Arroyo Grande Creek flow is regulated by releases from Lopez Dam. Operations have been altered since the mid-1980s to improve flow conditions in the stream in order to enhance habitat. The SWRP notes these conditions are "likely providing a disproportionate amount of the suitable steelhead rearing habitat in the County, and thus are potentially high priority areas for protection and habitat enhancement." Therefore, any attempts to retain flows to or along Arroyo Grande Creek could affect endangered species habitat and would require environmental review.

Permitting for new pipelines, open channels, infiltration basins, or modifications to existing basins would be required. Project-specific review would be necessary to identify permitting and regulatory requirements.

3.8.4 Cost

Total cost and cost per AFY cannot be determined at this time, but capital cost of new basins, open channels, and piping (including planning, design, and construction) and cost of operation and maintenance should be considered.

3.8.5 Feasibility

Water supply benefit appears to be very low, considering the entire Watershed Group would only realize an estimated 26 AFY of additional water supply. However, these projects could be pursued as new development occurs or as existing basins are improved or upgraded in the future.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

The City has adequate water supply under normal and three-year drought conditions per the 2015 UWMP. However, acquiring an additional 250 AFY could allow the City to meet future demands while reducing reliance on native groundwater.

This Study analyzed the following water supply alternatives to meet future water demand under drought conditions and to provide redundancy:

- State Water Project
- OCSD Supply
- Interagency Connections
- Nacimiento Water Project
- Central Coast Blue
- Recycled Water "Scalping Plant" Concept
- Water Conservation
- Stormwater Capture

The most feasible water supply alternatives appear to be the following:

- Short-Term:
    - Partnering with Oceano Community Services District on a short-term water supply agreement.
    - Pursuing an emergency connection with GSWCR.
- Long Term:
    - Participation in Central Coast Blue.
    - Negotiation with OCSD for long-term water purchase.
    - Negotiation with GSWCR and NCSD for supplemental water after an emergency connection is pursued with GSWCR.

State Water Project and Nacimiento Water Project participation do not appear to be feasible at this time. City staff will continue to engage with County staff to identify potential opportunities to partner and acquire water from either supply if it becomes available.

The Scalping Plant Concept requires negotiation with potential agricultural users prior to beginning planning and design work. Customers willing to reduce groundwater pumping in exchange for recycled water are critical to success.

The City's water conservation program has been very successful. It is difficult to determine how much additional enforcement effort, rebates, or incentive programming would be required to further reduce customer demand.

Stormwater capture does not appear to provide a significant supply of water to the City based on the San Luis Obispo County Stormwater Resource Plan. However, it could be pursued as new development continues and as existing stormwater basins are modified and low impact development standards are implemented.

4.2 Recommendations

The following next steps are recommended to continue developing the City's water supply portfolio:

- Continue to engage in Central Coast Blue. Pursue potential delivery of State Water or Lopez Water in exchange for Central Coast Blue allocation.
- Begin development of a Memorandum of Understanding with GSWCR for planning, design, and construction of an emergency interconnection.
- Begin initial discussions with GSWCR and NCSD for purchase of excess Nipomo supplemental water.
- Negotiate with OCSD on a temporary water supply agreement.
- Engage with OCSD to explore long-term water purchase.
- Approach potential agricultural customers to discuss exchange of recycled water for reduced groundwater pumping. This will determine if the Recycled Water "Scalping Plant" Concept is viable.
- Continue to regularly engage with County staff in case surplus Nacimiento or State Water is available and could be transferred to the City.