

MokeWISE Program Scope of Work:
Project 2c: Amador County Reuse

April 2015

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Problem Statement and MokeWISE Stakeholder Interests

The environmental stakeholders in the MokeWISE process are interested in encouraging the recycling and reuse of water of every kind (graywater, process water, blackwater) when and where ever possible. Recycled water is the single largest source of additional water in California. In 2012, about 670,000 acre feet of treated wastewater was put to beneficial use in California, but this is still only a small part of the 5 million acre feet of treated wastewater produced annually in the state.

Recycled water provides a reliable and plentiful supply, and its use can enable the recharge of overdrawn aquifers and preserve the vitality of California's rivers and the Sacramento-San Joaquin Delta. State-of-the-art recycling facilities such as the Edward C. Little West Basin plant in Los Angeles currently produce recycled water types tailored to specific end uses. The state is preparing standards for potable reuse of recycled water. Santa Clara Valley's recently completed Advanced Water Purification Center expects to supply drinking water at some point.

Environmental stakeholders want to ensure that the potential role of recycled water as a present and future water source for the Mokelumne Watershed is not overlooked due to insufficient information or inaccurate assumptions. They would like to see a comprehensive survey of wastewater and graywater availability, and water end uses in the MokeWISE area, including the EBMUD service area, including what water qualities are needed for those purposes. The study would seek to match available sources of wastewater and treatment levels to potential users.

Other entities see that when municipal wastewater is recycled for irrigation and groundwater recharge, it broadens the spectrum of beneficial uses that the water serves. For instance, spreading ponds may also meet year-round and seasonal wildlife habitat needs for resident and migrating birds, and other wildlife. If the pond area has walking and bird watching trails for the public, it could meet recreational needs. Recycled water can also offset Mokelumne River supplies, which can be left in the river to perform in-stream functions or put towards other beneficial uses. Using recycled water for groundwater recharge conserves the natural resource that is the aquifer, while forgoing Mokelumne River water. The recycling project promotes economic benefits by avoiding the costs imposed upon others from alternative water supply projects, like additional dams. If the water recycling project hires local contractors, it can help to improve the economy in the district. The recycling project can help to avoid the divisiveness caused by water supply projects that are geographically inequitable. That is, projects that impose costs in one area (e.g. dams upcountry), while providing benefits to another area (San Joaquin County, Alameda County, etc.)

Considerations for this project include:

- Designing the project to meet the intent of MoKeWISE to create environmentally, socially and economically acceptable projects;
- Using the recycled water to serve a broad spectrum of beneficial uses e.g.: landscape, recreational, wildlife, and agricultural uses;
- Providing environmental benefits by forgoing surface water; and
- Providing opportunities for public input and participation.

Water suppliers are charged with the timely delivery and affordable supply of high quality surface water for our agricultural and municipal clients, and are committed to maintaining that responsibility for their consumers. Water agencies are also interested in protecting their water rights. Some agencies are not in favor of using recycled water for agriculture purposes due to concerns about quality, cost, and transmission of recycled water resources, for primary users as well as any possible secondary and tertiary effects experienced by anyone in the district as a result of using recycled water. However, these agencies understand and are respectful that other entities may not share this view towards recycled water and do not have an official position either in favor or in opposition to other entities that may be interested in the funding and building of particular infrastructure for recycled water, and including general exploration of opportunities to use recycled water.

Other water agencies are interested in developing cost effective recycled water projects as a way to improve water supply reliability for their customers. If recycled water development results in water that is excess to these agencies needs' and downstream needs, then that water could be made available by these agencies in exchange for equivalent financial or other benefit.

The Amador Water Agency (AWA) has identified three strategies to meet current and future water demands for the public it serves. These include conservation, reuse, and new water supply projects. AWA recognizes that all three strategies will be needed, but that the timing for implementation will vary. Development of reuse infrastructure can be expensive and seeking consensus among local governmental agencies can be challenging.

Currently, all wastewater collected from the City of Sutter Creek, Amador City, and the Martel area (through the Amador Regional Sanitation Authority, ARSA) is treated and primarily used to irrigate the Castle Oaks Golf Course in the City of Ione. All of the wastewater from the City of Jackson is treated and discharged to Jackson Creek where it is captured in Lake Amador and used for agricultural irrigation. Currently the City of Plymouth has plans for its wastewater to be used for irrigating vineyards southwest of the city. Changes are being considered for the City of Jackson, ARSA, and the City of Ione.

AWA desires planning and implementation for reuse such that reuse water can be utilized on parks, commercial landscapes, school grounds, ball fields, median strips, proposed golf courses, compatible agricultural crops, and potentially on residential front yards to reduce the use of water that can be used for domestic purposes.

The continued development and implementation of the Amador County Regional Reuse Study offers a roadmap for future expanded reuse.

The Amador County Regional Reuse Project will implement Alternative 3 as developed in the 2013 Regional Approach for Reuse Study by Amador Water Agency. The Study considered the feasibility and options for increasing tertiary-treated recycled water production and use in the region. It was determined that the Alternative 3, the decentralized alternative, is the preferred alternative. This would upgrade the recycled water treatment plant located in the City of Jackson to serve local users and construct a recycled water treatment plant located in the City of Sutter Creek to serve users located in Sutter Creek, Amador City, Martell, and the Gold Rush Ranch Development. The project will conduct a refinement study to develop a more detailed project description for Alternative 3. After the refinement study, the project will undergo design and construction, as well as salt and nutrient management planning, permitting and user agreements, and environmental documentation. A recycled water rules and mandatory use ordinance will be finalized and adopted. Costs for this project are estimated to be \$21.75 million, with \$400,000 for the refinement study and \$21.35 million for implementation.

Background Information

Amador Water Agency

The Amador Water Agency (AWA) provides both wholesale and retail treated water to Amador Water System, Central Amador Water System Project, La Mel Heights, and Lake Camanche Village. AWA has rights to a total of 17,200 AFY of Mokelumne River, and uses the PG&E system to store and divert 1,150 AFY under the Central Amador Water Project (CAWP), out of a 2,200 AFY contractual right, and owns and operations the Amador Water System (AWS) under which AWA has contractual rights to up to 15,000 AFY. In addition to AWA's surface water rights, it also pumps groundwater for Lake Camanche Village and La Mel Heights.

Table 1 provides a summary of AWA's current and proposed water supplies; **Figure 1** shows the AWA water systems and service area.

Table 1: AWA Water Supplies

Supply	2010 (AFY)	2015 (AFY)	2020 (AFY)	2025 (AFY)	2030 (AFY)
Surface Water	16,150	17,200	17,200	17,200	17,200
Groundwater	296	369	441	511	581
Recycled Water	0	0	0	0	0
Incidental Transfer to EBMUD*	N/A	N/A	N/A	N/A	N/A
Total	16,446	17,569	17,642	17,711	17,781

Source: AWA, 2011

*Incidental transfers to EBMUD are not guaranteed for any specified amount, and so are not projected

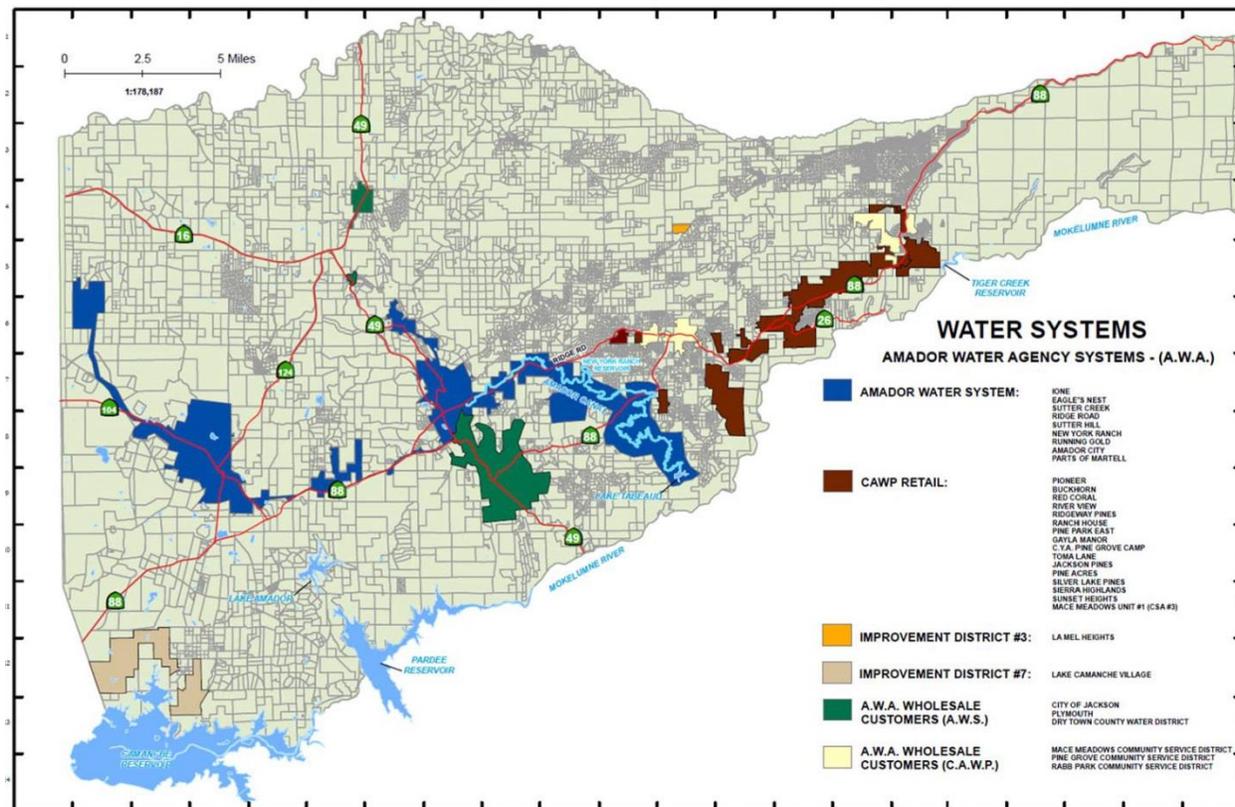
AWA owns and operates three treatment plants, two for the AWS system and one for the CAWP system. These facilities are presented in **Table 2**.

Table 2: AWA Treatment Facilities

System	Facility	Capacity (MGD-ADWF)
AWS	Tanner WTP	6.1
	Ione WTP	3.3
CAWP	Buckhorn WTP	2.6
	Total	12

Source: AWA, 2013

Figure 1: Amador Water Agency's Water Systems



Source: AWA, 2013

Jackson Valley Irrigation District

Jackson Valley Irrigation District (JVID) serves agricultural, industrial, and domestic users within its service area, which includes 345 people, of whom, approximately 140 receive water from JVID. JVID sells raw water to its agricultural, industrial, and some domestic users, and sells bottled water to the approximately 61 domestic users without access to private wells. Water provided by JVID is diverted from Jackson Creek and the Mokelumne River. JVID also owns and operates the Lake Amador Resort Area (LARA) treatment plant, which has a capacity of 175 gpm, but generally operations at 150 gpm when necessary. The LARA plant is supplied by water stored at Lake Amador (Amador LAFCO, 2014).

Wastewater in Amador County

Wastewater services in Amador County is provided by the City of Plymouth, City of Jackson, Mule Creek Prison, City of Ione, AWA, and Amador Regional Sanitation Authority (ARSA) – serving Amador City, City of Sutter Creek, and AWA-Martell.

Treatment facilities associated with the ARSA system include the City of Sutter Creek WWTP, City of Ione Castle Oaks Reclamation Plant (COWRP), and the City of Ione Secondary Treatment Plant. AWA wastewater treatment facilities include the Lake Camanche WWTP and the Gayla Manor WWTP. Wastewater from AWA's Martell system is conveyed to the ARSA system for treatment and disposal. The City of Jackson owns one wastewater treatment facility, which must be upgraded if it is to continue discharging to Jackson Creek (AWA, 2013). Most of the wastewater in the project area is treated to secondary before disposal through discharges to local creeks, spray irrigation, or other means.

Project Information

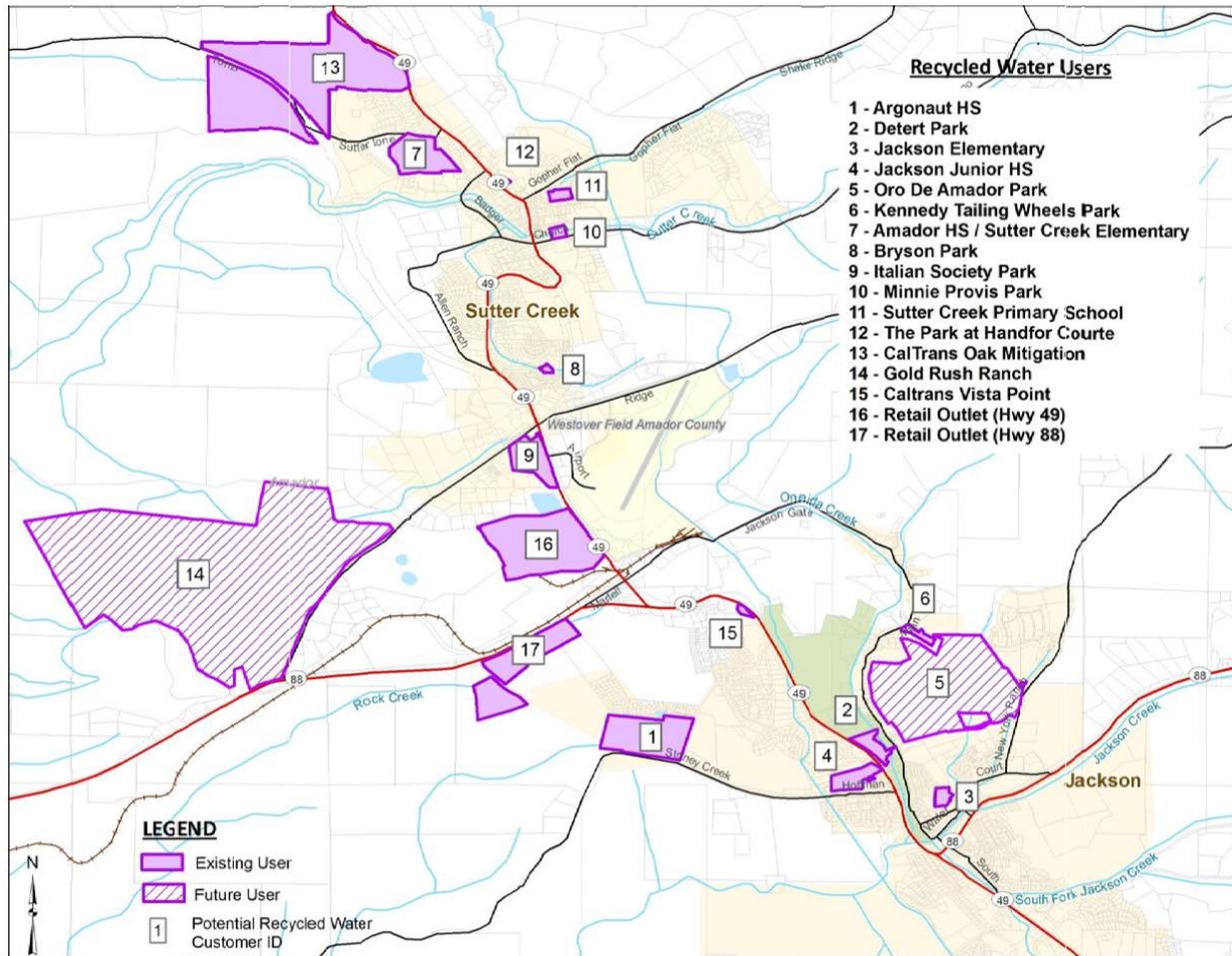
Project Description

The Proposed Project was developed to increase recycled water use in the project area, reduce secondary discharges to the watershed, and protect water supply reliability through increased locally-produced drought resistant supplies. A Regional Approach for Reuse Study (AWA, 2013) was finalized in 2013, and considered the feasibility and options for increasing tertiary-treated recycled water production and use in the region. This report identified three alternatives for serving potential recycled water users shown in **Figure 2**. These alternatives included:

- Alternative 1: A Regional recycled water tertiary plant located in the City of Sutter Creek to serve potential users in the Study area. (Hybrid System)
- Alternative 2: A Regional recycled water tertiary plant located in the City of Jackson to serve potential users in the Study area. (Hybrid System)
- Alternative 3: Upgrade the recycled water treatment plant located in the City of Jackson to serve local users. Construct a recycled water treatment plant located in the City of Sutter Creek to serve users located in Sutter Creek, Amador City, Martell, and the Gold Rush Ranch Development. (Decentralized system)

Based on analysis of the costs, feasibility, and benefits associated with each alternative, Alternative 3, the decentralized option, was determined to be the preferred alternative.

Figure 2: Potential Recycled Water Users



Source: AWA, 2013

Alternative 3: City of Jackson and City of Sutter Creek RWTPs

Alternative 3 is a decentralized system, comprising three phases. Phase 1 would construct a new Recycled Water Treatment Plant (RWTP) near the Sutter Creek WWTP, to serve existing users within the City of Sutter Creek. Phase 2 would expand deliveries of recycled water from the new RWTP constructed in Phase 1 to serve customers in the Martell area, and the new Gold Rush development, once these areas are developed. Phase 2 is anticipated to include construction of a pump station and recycled water transmission main. Phase 3 would serve customers within the City of Jackson, and would involve upgrades to the existing Jackson WWTP to treat to tertiary standards. This would serve to bring the WWTP into compliance with the City of Jackson’s discharge permit. Along with upgrades to the WWTP, this phase would include construction of a booster pump station and distribution pipelines. This alternative would serve all of the potential users identified in the Regional Approach to Reuse Study. **Figure 3** shows the proposed Alternative 3 project (AWA, 2013).

Assuming that all of the wastewater in the City of Sutter Creek, City of Martell, Gold Rush, and the City of Jackson would be treated to tertiary and distributed as recycled water through this project, at buildout, up to 3.74 MGD tertiary water could be available, as shown in **Table 3**.

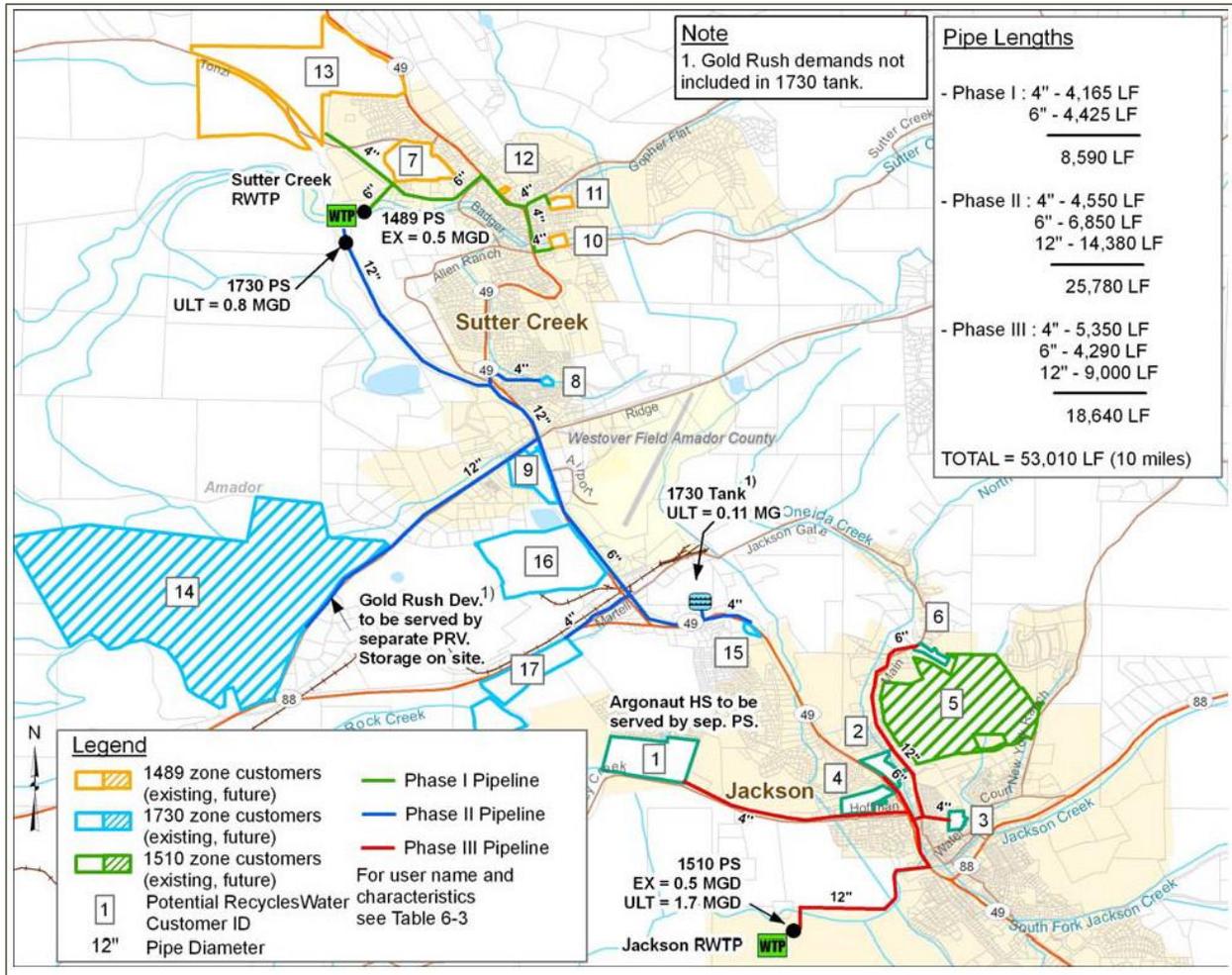
Table 3: Project Wastewater Flows within the Project Area

Community	2020 (MGD)	2025 (MGD)	Buildout (MGD)
City of Sutter Creek	0.41	0.49	0.81
City of Martell	0.72	0.97	1.19
Gold Rush	0.14	0.41	0.41
City of Jackson	0.52	0.72	1.33
Total	1.79	2.59	3.74

Source: AWA, 2013

The Regional Approach for Reuse Study’s analysis was a high-level, conceptual evaluation, and recommended that a Refinement Study be conducted to develop the final elements necessary to decide on whether implementation should move forward. This Scope addresses the effort necessary to complete the Refinement Study, and provides a cursory overview of what steps may be required should implementation of the refined project move forward.

Figure 3. Alternative 3: City of Jackson and City of Sutter Creek RWTPs



Source: AWA, 2013

Project Location

The Project would be located in Amador County, within the AWA and JVID service areas, as shown in **Figure 3**, above.

Project Sponsor

The Project would be implemented by AWA in partnership with JVID.

Scope of Work

Task 1 describes the work necessary for the Refinement Study, while Task 2 identifies the potential efforts required for implementation of the proposed project.

Task 1. Refinement Study

The Refinement Study will involve developing a more detailed project description for Alternative 3, recommended under the Regional Approach for Reuse Study, and should include the following components:

- Coordinate with the Regional Water Quality Control Board (Regional Board) to approve the use of nutrient “best management practices” (BMPs) in lieu of a Salt and Nutrient Management Plan (SNMP). SNMPS are generally required for groundwater basins, however they are difficult to develop in basins where groundwater is found in fractured rock formations, as is the case in the project area.
- Refinement of demand estimates and potential users, including additional users not initially included in the Regional Approach for Reuse Study. These potential additional users may be identified through public outreach/awareness, proximity to proposed refined distribution system, or requests for service. Preliminary outreach to potential users should be conducted under this component, and where possible, letters of interest for recycled water services solicited.
- Conceptual design for the new Sutter Creek RWTP, including identification of preferred treatment trains, facility sizing, preferring site for the new facility, potential for co-siting with the existing Sutter Creek WWTP and means of reducing costs through increased efficiencies with the existing WWTP, identification for all new on-site facilities, and potential need for additional pipelines or pump stations to deliver secondary influent from Sutter Creek WWTP to serve the new RWTP.
- A cultural resources assessment to identify areas of high sensitivity that may be affected by construction of any required project element. Existing data records and information will be reviewed and both federally recognized and currently unrecognized Native American tribes within the region will be consulted. The results of previous cultural resource studies and recorded cultural resources in the records search area will be plotted on 7.5-minute topographic quadrangles. Based on this analysis, an assessment will be prepared to address the sensitivity of the project elements with respect to cultural resources.
- Refinement of the necessary upgrades to the Jackson WWTP to produce tertiary recycled water. This should include identification of the preferred tertiary treatment train technology, and any other modifications necessary to the existing WWTP to accommodate this treatment train. It should also consider any other necessary storage or pumping needs at the upgraded Jackson WWTP.
- Refinement of proposed distribution and storage systems, including preliminary sizing of pipelines, identification of preferred alignments, storage tank sites and sizes, and pump station sites and sizes.

- Refine the recycled water rules included in Appendix D of the Regional Approach for Reuse Study, to be implemented in the project area, with input from appropriate regulatory agencies, governing bodies, and stakeholders.
- Refinement of Recycled Water Process and Procedures included in Appendix D of the Regional Approach for Reuse Study. These should include design and operation standards, signage, monitoring and testing, procedure for accepting applications for recycled water service, plan review, record drawings, post-construction modifications, separation requirements, backflow prevention, etc.
- Refinement of potential permits and agreements that would be necessary to implement the proposed recycled water project and achieve the project goals. Include a table showing the permits, their anticipated timeline for approval, and any necessary additional information required prior to permit approval (e.g., final design, facilities planning, etc.)
- Refinement of the preliminary cost estimates included in the Regional Approach to Reuse Study, based on the updated project description.
- Identify prudent methods for district-wide long-term financial planning for capital expenditures, operations, and maintenance. The study will report on the willingness of the water utilities to participate in that planning prior to making further financial commitments associated with this project.
- Identify one or more ways in which the water supply will be shared; and one or more ways the capital, operations, and maintenance costs of the project will be shared. Following the study, but before the utilities make further legal commitments, financial commitments, funding applications, or permit applications associated with reservoir reoperation, the utilities will identify water supply and cost sharing options acceptable to the utilities.
- Preliminary development of reuse project implementation schedule.
- Identification of potential funding sources to implement the project, including, but not limited to, Department of Water Resources Integrated Regional Water Management (IRWM) grants, State Revolving Fund grants and loans, U.S. Bureau of Reclamation Title XVI grants, and U.S. Department of Agriculture Rural Development grants.
- Additional public outreach to educate potential customers about wastewater reuse, solicit feedback on conceptual design, solicit input on identification of additional users, refinement of demand estimates for identified users, solicit input on proposed recycled water rules, and address potential public concerns regarding the project.

The Refinement Study should contain sufficient detail for AWA and JVID to decide whether to move forward with implementation of the project. It should also provide sufficient detail to support funding applications, inform environmental documentation, and permitting.

Task 2. Implementation

Implementation of the project following approval from AWA and JVID based on the Refinement Study could include the following subtasks:

Subtask 2.1 Salt and Nutrient Management Planning

Per the State Water Resource Control Board's Recycled Water Policy, Resolution No. 2009-0011, SNMPs are required for groundwater basins, with highest priority given to high priority basins. Basin priorities are based on type and extent of use of the groundwater. Groundwater sources in the project area includes the Cosumnes Groundwater sub-basin and unclassified groundwater aquifers, and a SNMP may be required for the project to move forward. The groundwater in this area is in bedrock fractures, making SNMP develop difficult. However, a nutrient "best management practices" (BMPs) may be implemented instead.

Task 2.1 will develop appropriate nutrient BMPs, or an SNMP, in accordance with guidance provided by the Regional Board during the coordination effort completed under Task 1.

Subtask 2.2 Design

Once approved to move forward with the refined project, preliminary and final design should be completed. This task will include final pipeline alignment, facility siting, component sizing, pump station design and siting, RWTP design and siting, upgrades to Jackson WWTP design, and any other design necessary for construction of the project.

Subtask 2.3 Recycled Water Rules and Mandatory Use Ordinance

Concurrent with Task 2.1, the draft recycled water rules, recycled water processes and procedures and a Mandatory Use Ordinance for recycled water (based on California Water Code §13551) should be finalized and adopted. These rules may need to be finalized to obtain appropriate permits and to pursue identified funding opportunities.

Subtask 2.4 Permitting and User Agreements

Permits necessary for construction of the project and distribution and use of recycled water may include, but are not limited to the permits listed in **Table 4**. User agreements should also be finalized during this task. Note that permitting may be a lengthy process, and adequate time should be given to acquire all appropriate permits.

Table 4: Potential Permits and Agreements for Alternative 3

Agency	Permit
Regional Water Quality Control Board	Waste Discharge Requirements NPDES Permit Recycled Water Master Permit
Division of Water Rights	Petition for Change
California Department of Fish and Game	Petition for Change Streambed Alteration Agreement
Local Municipalities and Amador County	Conditional Use Construction Permit Encroachment Permit Tree Removal Permit
Potential Customers	User Agreements

Subtask 2.5 Environmental Documentation

Prior to project construction, environmental documentation compliant with CEQA and NEPA will be required. Given the size and scope of the proposed project, it is anticipated that an Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) would be the appropriate level of documentation. Environmental documentation may also be necessary for eligibility for certain funding opportunities.

Subtask 2.6 Funding

Outside funding opportunities should be pursued to reduce the local cost burden of the project. Potential funding sources are listed in **Table 5**, although this list is expected to be refined under Task 1, above.

Table 5: Potential Funding Opportunities

Agency/Funding Source	Opportunity
California State Water Resources Control Board (State Board)	State Revolving Fund (SRF) Loan Program for Water Recycling Projects
	Proposition 50 Funding Facilities Planning Grant Program
	Proposition 1 Funding
California Department of Water Resources	Proposition 84 Integrated Regional Water Management Implementation Grant
	Proposition 1 Funding
U.S. Bureau of Reclamation	Title XVI Funding
U.S. Department of Agriculture	Rural Development Water and Environmental Programs

Subtask 2.7 Construction

Construction of the project would occur in three phases, consistent with the Refinement Study. As described, Phase 1 would include construction of the Sutter Creek RWTP and delivery of recycled water to adjacent users, Phase 2 would include construction of recycled water distribution system to Gold Rush and Martel developments, and Phase 3 would upgrade the Jackson WWTP and construct recycled water distribution system to serve users in the Jackson area. Construction would require site preparation, such as staging areas, equipment and materials mobilization, and clearing; construction of treatment facilities, pipelines, storage tanks, and pump stations; and site demobilization, such as testing, restoration to pre-construction conditions, and removal of staging areas, equipment, and materials.

Budget

The budget for this project is estimated to be \$21.75 million, but could vary substantially depending on the construction needs of the project (e.g., pipeline lengths, size of mixing facility), or any other considerations. Costs for implementation, should the project move forward to construction, are based on the preliminary costs included in the Regional Approach for Reuse Study. Note that these costs do not include the costs for permits or the cost to prepare funding applications. Costs associated with the project can be broken out as follows:

- Refinement Study: \$400,000
- Phase 1: \$3,660,000
- Phase 2: \$8,820,000
- Phase 3: \$8,870,000

- **Total Project Costs: \$21,750,000**

References

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Amador Water Agency (AWA). 2014. 2010 Urban Water Management Plan. September 2011. Updated 2014.

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City of Sutter Creek and Amador Regional Sanitation Authority. 2012. Draft Wastewater Master Plan. November 26.