

EXECUTIVE SUMMARY

This Engineering Report (ER) summarizes the engineering work and analyses performed by MKN & Associates, Inc. (MKN) to identify and recommend solutions to the non-nitrate- and nitrate-related potable water quality violations and concerns within the community of San Lucas, California.

The community of San Lucas has experienced historical water quality issues including salinity, nitrate, iron, manganese, and sulfate contaminants violating California drinking water standards, and the existing treatment system is no longer adequate to mitigate these constituents. It should be noted that while the primary intent of this ER is to present solutions to remedy the non-nitrate water quality concerns (i.e., salinity, iron, manganese, and sulfate), the project alternatives presented in the following ER are also intended to address nitrate-related water quality issues as well. For additional information to supplement the reader's knowledge of San Lucas's historical nitrate-related water quality issues, please see *San Lucas County Water District – Feasibility Study Peer Review - Nitrate Work (MKN, 2024)*. Additionally, San Lucas experiences color and odor issues within their water supply, which is likely to be a result of the constituents named above. The poor water quality has also led to distribution system-wide deficiencies over time, causing health-related issues in the community as well as damage to the distribution system and personal property of community members.

Based on level of required treatment, available local water supplies, existing Local Area Formation Commission (LAFCo) service areas and discussions with project stakeholders, four alternative solutions were developed:

- **Alternative No. 1 – Intertie with King City**

Consists of a physical connection of the San Lucas County Water District's (SLCWD) system with the California Water Service Company (Cal Water) King City system and includes: the construction of an approximately 8.2-mile pipeline to the SLCWD system, a booster pump and chemical injection station, a master meter and backflow preventer at the connection point (Sub-Alternative B), abandonment of existing Well #3, removal of existing treatment facility, and rehabilitation of the existing distribution system.

- **Alternative No. 2 – Wellhead Treatment – Manganese Dioxide Filtration and Ion Exchange**

Involves constructing manganese dioxide and ion exchange treatment systems, a new concrete masonry unit (CMU) building, chemical storage and injection systems, electrical and controls infrastructure, 7,000-gallon FRP waste equalization tank and associated disposal infrastructure, and rehabilitation of the existing distribution system.

- **Alternative No. 3 – Wellhead Treatment – Manganese Dioxide Filtration and Reverse Osmosis**

Involves constructing manganese dioxide, reverse osmosis, and forced draft degasifier treatment systems, a new CMU building, chemical storage and injection systems, electrical and controls infrastructure, 10,000-gallon FRP waste equalization tank and associated disposal infrastructure, and rehabilitation of the existing distribution system.

- **Alternative No. 4 – Wellhead Treatment – New Well Drilling**

Involves the acquisition of land and construction of a new well. Given uncertainty surrounding the water quality of the new well, if constructed, it is assumed that this alternative would be paired with the wellhead treatment methodology presented in Alternative No. 2 or 3.

In addition to the alternatives listed above, each alternative has two associated sub-alternatives (one of which will be selected along with the primary alternative selection):

- **Sub-Alternative A – SLCWD Ownership**

Under this sub-alternative, SLCWD would continue to own and operate the water system assuming only additional operations and maintenance (O&M) costs associated with the selected alternative.

- **Sub-Alternative B – Physical and/or Managerial Consolidation with Cal Water, King City**

Under this sub-alternative, Cal Water would own and operate the existing SLCWD system as well as any improvements constructed as a result of this project. This means that San Lucas residents would assume the Cal Water rate structure and O&M costs associated with the selected alternative.

Capital, O&M, and consumption costs associated with each alternative and sub-alternative were developed and are presented in **Table ES-1**.

Table ES-1: Estimated Costs of Alternatives			
Alternative	Monthly Consumption Charges Per Service¹	Monthly O&M Costs per Service	Total Capital Costs²
Alternative 1A	\$100	\$20	\$23,548,000
Alternative 1B	\$182	\$42	\$27,807,000
Alternative 2A	\$100	\$120	\$7,753,000
Alternative 2B	\$182	\$143	\$12,036,000
Alternative 3A	\$100	\$112	\$8,654,000
Alternative 3B	\$182	\$135	\$12,937,000
Alternative 4A	\$100	\$112 - \$120	\$12,959,000 - \$13,858,000
Alternative 4B	\$182	\$135 - \$143	\$17,242,000 - \$18,141,000

(1) Consumption charges are estimated water use charges based on typical water use and the water purveyor's billing rates.
 (2) Total Capital Costs shown do not reflect potential reduction of capital costs due to grant funding and/or contributions from Mission Ranches and the Naraghi Family to address nitrate pollution. Grant funding for capital improvements from the State Water Board Division of Financial Assistance may be eligible for up to \$80,000 per connection (currently 97 connections estimated), assuming Deputy Director approval. Unfunded costs will need to be paid for through other funding sources including a potential loan that would need to be repaid through increased water rates over time.

Following evaluation of all alternatives and sub-alternatives, Alternative Nos. 2 and 3 are recommended to mitigate the ongoing water quality issues experienced by San Lucas in conjunction with either Sub-alternative A or B. Alternative Nos. 2 and 3 are the preferred alternatives for the following reasons:

- **Improved Water Quality.** Both alternatives will successfully resolve the water quality issues experienced by San Lucas and bring the distribution system into compliance with California drinking water standards.
- **Cost.** Both alternatives are approximately 15 million dollars less than Alternative No. 1 and 10 million dollars less than Alternative No. 4.
- **Construction Impact.** Both alternatives will pose less construction-related impacts to the community and environment when compared to Alternative No. 1 or 4.
- **Timing.** Both alternatives will require less permitting, coordination, and investigation efforts than Alternative No. 1 or 4, giving San Lucas the quickest opportunity for improved drinking water.

Alternative No. 3 may be more preferable and feasible from a waste disposal standpoint. An evaluation of waste disposal alternatives was performed and found that cost of waste disposal and ease of permitting is more preferable under Alternative No. 3 rather than Alternative No. 2.

Either sub-alternative is recommended as the selected sub-alternative will not affect the ability of Alternative Nos. 2 or 3 to address the water quality issues experienced by San Lucas and is predominately a matter of stakeholder preference. As such, the selected alternative and sub-alternative will be finalized following future stakeholder and community input.