



## PROJECT MEMORANDUM

**Project Name:** On Call Wastewater Technical Services      **Date:** January 18, 2018  
**Client:** Amador Regional Sanitation Authority      **Project No.** 500.SG17BD  
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**Subject:** Wastewater Master Plan Draft Technical Memorandum Peer Review

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### 1.0 Introduction

Carollo Engineers was retained by the Amador Regional Sanitation Authority for peer review, and to provide written comments regarding conclusions and options for Wastewater Master Plan Draft Technical Memorandum (TM) #1 through #5, prepared by Hydrosience Engineers, Inc., listed below.

- TM #1 Update of Evaluation of Existing Facilities
- TM #2 Update of Flow Projections
- TM #3A Update of Initial Evaluation and Screening of Options
- TM #3B Surface Water Discharge Evaluation
- TM #4 Update of Alternatives Analysis
- TM #5 Capital Improvement Plan

The TM were marked as DRAFT and dated November 2017, with the exception of TM #3B that was dated February 2012. This peer review was not intended to be a detailed review of the engineering analysis performed and documented in the TM, but rather to serve as another look at the interpretation of, and conclusions drawn, from the engineering/planning data.

### 2.0 TM Review Comments

Listed below are the significant peer review comments for each of the TM:

#### TM #1 Update of Evaluation of Existing Facilities

- We generally agree with the conclusions in Section 5.0 of TM #1.
- It should be noted that removal of accumulated sludge in Henderson Reservoir will likely not result in significant additional storage capacity. Typically such sludge would have a solids concentration of five percent or less and not be displacing a significant amount of water. Removal of materials such as sand or silt would be beneficial for increased storage capacity because it is truly solid material that displaces water, where sludge mostly is organic material and with a five percent solids concentration it consists of ninety-five percent water.

- Sampling and analysis could determine the actual solids concentration of the existing sludge to decide if it is beneficial and cost effective to remove.

## **TM #2 Update of Flow Projections**

- We generally agree with the conclusions in Section 4.0 of TM #2.
- The Anticipated Annual Growth Rates presented in Table 2 appear reasonable and consistent with similar California agencies we are familiar with.
- Residential Population Projections presented in Table 3 and Non-Residential Land Use Projections in Table 4 appear reasonable for the purpose of planning.
- The Wastewater Treatment Plant (WWTP) influent flow reduction identified in the 2014-2016 average (Table 5) is consistent with most California WWTPs during the same period. These reductions were a result of water conservation during the extended period of drought. After significant precipitation in the 2016-2017 rain season many agencies have seen WWTP influent flows increase as water conservation restrictions were relaxed.
- The Flow Projections presented in Sections 3.2.2 and 3.2.3 appear reasonable and appropriate for planning purposes. We strongly agree that reductions of collection system infiltration/inflow (I/I) should be analyzed when sizing new WWTP processes to determine the cost/benefit of constructing WWTP facilities versus collection system improvements to reduce I/I.

## **TM #3A Update of Initial Evaluation and Screening of Options**

- We generally agree with the conclusions in Section 4.0 of TM #3A.
- The evaluation and screening of alternatives presented in TM #3A appears thorough and complete, identifying alternatives that are reasonable for planning purposes based on the screening criteria utilized, and can be practically implemented.

## **TM #3B Surface Water Discharge Evaluation**

- TM #3B was prepared by Robertson-Bryan, Inc.(RBI) in February 2012 to evaluate the feasibility of obtaining a National Pollution Discharge Elimination System (NPDES) permit for the alternative of tertiary treatment with discharge of WWTP effluent to Sutter Creek.
- A meeting with Michael Bryan of RBI was held on December 21, 2017 to discuss any significant changes to the evaluation conducted by RBI in 2012. His opinion was that nothing significant has changed and that the TM #3B conclusions remain valid. Therefore, it is reasonable to assume the permit process and issues identified in TM #3B can be used to pursue an NPDES permit for surface water discharge.

#### **TM #4 Update of Alternatives Analysis**

- The five alternatives evaluated in TM #4 include:
  - Alternative 1: ARSA Sprayfields
  - Alternative 2: Noble Ranch Sprayfields
  - Alternative 3: Surface Water Discharge
  - Alternative 4: ARSA Sprayfields and Golf Course Irrigation
  - Alternative 5: Surface Water Discharge and Golf Course Irrigation
- The conclusions in Section 7.0 of TM #4 select Alternative 1 as the preferred alternative based on a significant advantage in the non-economic analysis score. It is not typical to select the preferred alternative solely based on non-economic analysis, since the criteria for non-economic analysis can be fairly subjective. Since this is a planning level decision that will significantly impact the rate payers if a project is implemented, it is customary to also consider the economic analysis in selecting the preferred alternative.
- The economic analysis presents capital costs for each alternative in Section 4.1.1 based on customary and industry accepted planning level cost estimating criteria, including significant contingencies for unknowns. With the same criteria applied to each alternative, a relative cost comparison was developed and presented in Table 5.
- In the non-economic analysis, public acceptance was one criteria used to score alternatives. It would be prudent to consider the economic analysis results in the public acceptance criteria, since the impact to the sewer rates and affordability to the rate payers may determine final selection of the preferred alternative. It is noteworthy that the economic analysis identifies Alternative 3 as the least cost alternative, with Alternative 1 at a significantly higher cost.
- It appears each of the alternatives could be constructed to accommodate previously proposed development or future new development that may occur.

#### **TM #5 Capital Improvement Plan**

- TM #5 presents a 25-year Capital Improvement Plan (CIP) based on Alternative 1 as the preferred alternative for planning. The CIP is detailed and complete for the preferred alternative.
- The combined 5-year and 10-year Capital Costs identified in Table 10 total \$46.3 million for the preferred alternative. As a comparison, it should be noted the Total Capital Costs for Alternative 3 in Table 5 of TM #4 total \$33 million.
- The proposed Recycled Water Market Assessment discussed in Section 4.0 would not be useful under Alternative 1 since all the effluent would be committed to land application. The study may have value if tertiary treatment is implemented in the future.

### **3.0 Conclusions**

The Master Plan TM documents appear complete and as such can be adopted by the ARSA Board, however we recommend adoption be conditional that the preferred alternative (Alternative 1) identified in TM #4 is not final and subject to change by Board action. This would complete the Master Planning process and allow work to continue on a solution to the existing WWTP and effluent disposal constraints in a timely manner.

After the Board selects and adopts the final alternative, the next steps of the project; predesign, rate study, environmental, legal, final design, and administrative actions required to implement the solution can begin. It is important to select the final alternative without delay in order to construct a project that meets the currently proposed end date of July 31, 2022, of the 2007 Lone Disposal Agreement.

Key Board policy issues to be considered when deciding the final preferred alternative include:

- Financial impact to the rate payers.
- Flexibility required to serve proposed (Gold Rush Ranch) and future development.
- Ability of ARSA to maintain future control of wastewater treatment and disposal options, and long-term costs.

Based on review of the information presented in the Master Plan TM, it appears that Alternative 3, (Tertiary WWTP with discharge to Sutter Creek) should be the pursued as the preferred alternative. This conclusion is based on the following criteria:

- Project cost is significantly less than other alternatives.
- ASRA will no longer be dependent on agreements with other land owners/agencies for disposal/reuse of WWTP effluent.
- The existing WWTP was constructed in 1949, and most facilities require replacement or extensive rehabilitation with any alternative, at a significant cost to the existing rate payers.
- A new tertiary WWTP can be designed to accommodate future growth or recycled water demands by adding facilities as needed, funded by new users.
- The future costs of repairs/improvements to existing infrastructure such as large transmission pipelines, storage reservoirs, and dams, is avoided.
- There may be environmental benefits that result from discharge of highly treated wastewater to the creek.