

# MEMORANDUM

Date: November 16, 2012  
To: TERI WISSLER ADAM, EMC PLANNING GROUP  
From: SHANNON J. PETERSON, STEVEN G. TANAKA  
Subject: PARAIISO SPRINGS RESORT – REVIEW OF WATER SYSTEM

This technical memorandum provides Wallace Group's peer review of the subject water system proposed for the Paraiso Springs Resort, Monterey County. This work is defined as Task 2.1 in our agreement with EMC Planning dated October 2, 2012.

## DOCUMENTS REVIEWED

The following lists the major technical documents reviewed as part of this task:

- Paraiso Springs Resort – Estimated Potable Water Demand and Potable Water Source – Technical Memorandum dated January 27, 2009.
- Field Pilot Test Report – Paraiso Hot Springs Potable Water Treatment Plant, Fluoride Reduction AD74 Adsorption.
- Paraiso Springs Resort – Estimated Wastewater Production and Proposed Treatment, Irrigation, and Storage – Technical Memorandum dated January 27, 2009 (revised August 3, 2010).

## COMMENTS TO DOCUMENTS REVIEWED

The following outline is a summary of the information that was provided in the technical documents that were reviewed:

- Potable Water Demand
- Potable Water Source
  - Quantity
  - Quality
- Proposed treatment of constituents

Based on the information that was provided in the documents, the following comments have been generated:

1. **Potable Water Demand:** We agree with the generation of the potable water demand calculations that estimate the total peak demand will be 29.43 gpm (42,380 gpd) at buildout. Potable water demands do not include landscape irrigation, pool water, or spa water, as these demands will be met with other water sources on-site.
2. **Potable Water Source:** Potable water source will be from two on-site wells. After applying Monterey County's source capacity credit of 50%, the design



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capacity of Well No. 1 is 29.3 gpm and design capacity of Well No. 2 is 167 gpm. The source wells have sufficient capacity to meet the buildout demands of the development, including accounting for 5% loss of water during the activated alumina regeneration process.

On page 9 of The Paraiso Springs Report – Estimated Demand and Potable Water Source document is a schematic of the proposed water system which includes reference to a 1.5 MG water reservoir, along with other uses of the well water (landscape/vineyard and laundry facilities). These additional uses and the buildout demand corresponding to these uses were not outlined in the text of the report. It is recommended that an overall system description be provided to ensure sufficient water supply is available for the proposed additional demands.

- 3. Potable Water Source Quality:** Water quality tests indicate fluoride levels exceed the public health standard of 2.0 mg/L fluoride for drinking water. According to the Paraiso Springs Report – Estimated Water Demand and Potable Water Source document, page 8, the recommended treatment option for removal/reduction of fluoride in the source water is activated alumina. We agree with the general recommendation of using activated alumina, however a life cycle cost analysis should be performed to determine the overall cost of the system when considering backwash water removal. According to the report, backwash water for the activated alumina treatment system would be stored and trucked offsite. Trucking costs and quantities should be determined and included in the cost estimate if this is the final design decision. Other alternatives for backwash water handling should also be considered, including sending backwash water to the proposed on-site wastewater treatment system, or disposing of backwash water in an on-site percolation pond to reduce long-term operational costs of hauling the backwash water offsite.

Although we concur that the activated alumina process is viable for this Project, the Report does not provide any details as to the analysis of other treatment alternatives (RO and ion exchange) and how the Project Proponent arrived at the recommended process. Based on our understanding of this evaluation, the Project Proponent is to “consider a comparison of activated alumina treatment to reverse osmosis treatment and ion exchange, and consider aspects such as cost, energy consumption, waste disposal and management, water efficiency/recover, and other parameters.”

The Paraiso Springs Report – Estimated Demand and Potable Water Source document also states that approximately 5% source water is lost as backwash water to regenerate the system. According to the pilot test information, this value is closer to 14%. Actual backwash water quantities and the characteristics in the backwash water should be carefully evaluated to determine final disposal options that might be available in lieu of trucking offsite. The Report needs to characterize/summarize the waste stream quantity and quality based on the AdEdge Report, quantify the amount of waste to be hauled off-site, corresponding estimated truck trips, and define



the proposed method of disposal (e.g., off-site haul and disposal at a named/specific facility qualified to receive such waste).

The report states that the proposed treatment system will require storage of an acid solution (sodium hypochlorite) and caustic soda for regeneration and cleaning of the filter material. The report indicates that both chemicals will be delivered onsite in 275 gallon totes and stored in secondary containment. The quantity of chemical that will be used for cleaning the water treatment media should be quantified, and cost of the chemical and delivery of the chemical to the site should be included in the life-cycle cost estimate. The quantity of stored chemicals should also be evaluated to ensure the containment and storage facilities meet the proper codes corresponding to the quantity of chemicals stored onsite.

The Paraiso Springs Report should generally describe the water plant, show a schematic layout of the plant or at least describe the required facilities, whether a facility building will be envisioned to house the treatment unit/equipment, electrical and chemical storage facilities, what amount of area is envisioned to house the water plant facilities, where backwash waste water will be stored prior to off-site disposal.

4. There was no discussion in the report to indicate whether other treatment (i.e. disinfection) will be necessary for the potable water. It should be clarified whether the raw well water will require any treatment and/or chlorine residual in addition to the activated aluminum filter prior to distribution.
5. In general the overall source water quantity and proposed water treatment system will meet the proposed demands of the development. Based on the amount of detail provided in the technical documents that were reviewed, additional design details will need to be produced to determine the overall capital and life cycle cost of the system.

SJP:SGT