

## **WESTERN WAKE PARTNERS**

### **Report to the Policy Advisory Committee (PAC11-10)**

Date: June 8, 2011  
To: Policy Advisory Committee  
From: Technical Advisory Committee (TAC)  
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Subject: Consideration of Solids Handling Alternatives

### **Background**

On September 29, 2008, the Policy Advisory Committee (PAC) considered and discussed PAC 09-25, Consultant Selection for Design of Western Wake Biosolids Drying and Energy Recovery Facility. At that time, the PAC directed the Lead Agency to design and bid two alternative solids handling approaches:

Base Design: on-site aerated holding tanks and offsite composting

Alternate Design: biosolids drying coupled with energy recovery

The design engineers for the Western Wake Water Reclamation Facility, ARCADIS/CH2M HILL, are responsible for the Base Design and Brown and Caldwell was selected for the Alternate Design. Selection of the final approach was to be made by the PAC based on a Business Case analysis of the two alternatives, including the actual bids received for construction costs.

The primary reason the PAC directed the Lead Agency to design, permit, and bid two designs was that at the time (fall 2008), while the Alternate Design was preferred due to its projected lower operating cost, planning-level cost estimates indicated that the Base Design would be less expensive to build. It was agreed that the added expense and time it would take to develop two designs would be necessary in order to fully evaluate the Alternate Design. The business case would be used to make an appropriate selection of the biosolids handling approach to be built.

### **Discussion**

As the engineering work and final design process progressed, both the Base and Alternate designs were modified based on regulatory and operational considerations. The following paragraphs describe the design modifications, followed by cost and schedule comparisons.

Modification of the Base Design: The Technical Advisory Committee (TAC) recommends enhancing the Base Design facilities to ensure that any odor impacts on the

surrounding community are minimized. This has been a key discussion point with the residents in the neighborhood around the facility, and the potential for odor-causing incidents is much greater with the Base Design than with the Alternate Design. In addition, odor control facilities were included on the Alternate Design, so comparable facilities would need to be added to the Base Design. Capital and operating costs of the odor control facilities have been included in the business case cost analysis.

Modification of the Alternate Design: New federal rules regulating air emissions from wastewater treatment facilities were promulgated in February 2011, and the impact of these new regulations on the energy recovery system is uncertain. In addition, energy recovery technology is expected to change and improve in the future. Therefore, the Lead Agency directed the design consultant, Brown and Caldwell, to remove the energy recovery system from the facilities to be initially constructed. The Alternate Design now consists of a biosolids dryer that would produce Class A biosolids suitable for use as an agricultural soil amendment, comparable to Cary's operations at the South Cary Water Reclamation Facility. The design still allows the flexibility to install energy recovery in the future, and the TAC will continue to monitor and evaluate regulatory and technology changes.

Cost Analysis: To support the business case analysis, a cost analysis has been performed by Brown and Caldwell using detailed capital cost estimates of the two final designs. The results of the cost analysis show a clear capital and operating cost advantage of the Modified Alternate Design. The analysis shows that after the modifications above were made, the Modified Alternate Design is less expensive than the Modified Base Design on all counts. Design and Phase 1 capital costs for the Modified Alternate Design are \$2.06 million (10 percent) less than the Modified Base Design. Total Phase 1 and Phase 2 Net Present Value (NPV) costs are \$1.5 million (6 percent) less for the Modified Alternate Design, and when operating costs are included, the 20-year NPV costs are \$9.1 million (15 percent) lower than the Modified Base Design.

	Modified Base Design	Modified Alternate Design	Difference (Alternate Minus Base)
Phase 1 Cost			
Additional Design Cost	\$360,000	None	-360,000
Phase 1 Capital Cost	\$24,500,000	\$22,440,000	-2,060,000
<i>Total Phase 1 Cost</i>	<i>\$24,860,000</i>	<i>\$22,440,000</i>	<i>-2,420,000 (-10%)</i>
Phase 2 Capital Cost NPV <sup>1</sup>	\$2,000,000	\$2,600,000	600,000
<i>Total Phase 1 and 2 Capital NPV <sup>1</sup></i>	<i>\$26,500,000</i>	<i>\$25,040,000</i>	<i>-1,460,000 (-6%)</i>
<i>Total Phase 1 and Phase 2 NPV Capital and Operating Cost <sup>1</sup></i>	<i>\$60,230,000</i>	<i>\$51,090,000</i>	<i>-9,140,000 (-15%)</i>

<sup>1</sup> NPV = 20-year Net Present Value

Schedule: Under the original plan approved by the PAC, in order to bid both designs, the two designs must be submitted to the Division of Water Quality (DWQ) for permit review as Contract 2 and Contract 2A. The Modified Alternate Design is nearly ready to submit. The Modified Base Design would be ready for submittal in July 2011. DWQ has indicated that reviewing two designs could add to the time it will take for their review and approval. A schedule comparison of the two approaches is below:

	Two Designs	Modified Alternate Design Only
Design Completion and Permit Application Submittal	July 31, 2011	June 15, 2011
Estimated DWQ Review Completion	December 31, 2011	August 31, 2011
Estimated Bid Advertisement Date	January 3, 2012	September 1, 2011
Bidders Allowed to Submit Alternative Approaches	Yes	Yes
Estimated Start of Construction	June 1, 2012	January 3, 2012

Conclusion: Now that both designs have changed and the cost analysis has indicated that the Modified Alternate Design is expected to be less expensive, it is appropriate to re-evaluate the need for two designs. The only additional information needed to complete the final business case analysis anticipated under the original direction given by the PAC in 2008 is the bid results. Based on the cost analysis presented here, the TAC expects that bids would support a recommendation to proceed with the Modified Alternate Design, and recommends proceeding with permitting and bidding for the Modified Alternate Design alone.

### **Recommendation**

In consideration of the schedule and cost impacts, the TAC recommends proceeding with the Modified Alternate Design, the biosolids dryer, as the preferred method for solids handling, with this single design to be submitted for permitting and advertised for bids.