Design Review Committee Briefing #43

Subject: Project Group F – Summary of Value Engineering Recommendations

Date: April 2, 2021

The Issue

As preliminary engineering has progressed with updated cost model development, it has become apparent that the current construction cost trend will likely exceed the available budget. The Jacobs progressive design build (PDB) team has a contract task to complete value engineering (VE) on the indicative design and this VE effort has focused on process optimization and cost reduction strategies, This Briefing describes the potential VE concepts and presents the recommended VE changes for incorporation into Project Group F.

Background and Analysis

The Jacobs PDB team presented several concepts for process optimization, deferment, and cost reduction. Over the course of several VE workshops, these concepts have been reviewed and analyzed for viability with whole-plant alternatives to meet both the National Pollutant Discharge Elimination System (NPDES) permit and capacity requirements of the City's wastewater program.

One of the major cost reduction strategies identified in the VE effort is the revision of the 2040 flow and load design parameters defined in Exhibit D, due to the significant reduction in industrial loading associated with the departure of Simplot from the City's wastewater system. Briefing #41 explains the recommended flow and load changes. There are several potential strategies associated with this change, which are presented below. Concepts 1 and 2 investigated the technical implications of updating flow and load projections as described in Briefing #41. Concept 1 process changes include:

Other major VE concepts evaluated are described below Options presented are not mutually exclusive as independent concepts, but rather were considered in combination with overall VE strategies to improve treatment processes and reduce cost.

Concept 1 - Defer Aeration Basin 4

The revised 2040 Flow and Load Design Parameters can be treated within the existing Aeration Basin (AB) capacity in AB No. 1 through AB No. 3 thus deferring the need for additional AB Capacity. Potential consequences of deferring AB No. 4 are reducing operating flexibility and constructability challenges, due to its proximity to the new Blower Building. A proactive solution to this challenge would constructing to construct the AB No. 4 tank and corresponding yard piping as part of Project Group F, while deferring the installation of the mechanical process equipment until flow and load demands require additional capacity. Operations could use the tank for equalization storage in the event of a process upset or required process shutdown. The team is working to identify the exact cost savings from this solution.

Concept 2 - Defer Solids Handling Facility Expansion.

Solids modeling updated using the revised 2040 Flow and Load Design Parameters determined that Solids Handling Facility Expansion (including Rotary Drum Thickeners and the solids blending tank) could be deferred until after 2040. This would be accomplished by thickening the primary sludge in the Primary Clarifiers to a concentration of 3-3.5% solids, which is consistent with current operations. The need to expand the existing polymer feed system is still under evaluation, however the cost associated with this expansion is a small portion of the overall savings realized by eliminating the Solids Handling Facility. The potential savings for Project Group F is $7M with an acknowledgement that costs would increase for Project Group G (expected increase of $3.7M).

Concept 3 – Defer Installation of Aeration Blowers

Scope can be reduced from Project Group F by aligning the initial blower aeration capacity with interim design conditions. This provides better aeration capacity coverage for start-up conditions. Designated space in the new Blower Building would still accommodate deferred additional new blower aeration capacity as treatment demands increase. Identified savings are estimated at $1.3M.

Concept 4 – Re-Use the Existing Chlorine Contact and Re-Aeration Basin.

Cost savings would be realized by re-using the existing plant facilities for disinfection and re-aeration prior to effluent disposal. Concerns were raised with this concept as these facilities are currently nearing the end of their useful life and have potential hydraulic limitations. Identified savings are estimated at $7.6M.

Concept 5 – Modify the Tertiary Treatment Filtration Technology and Equipment.

Concept 5 considered switching tertiary treatment filtration technology from deep-bed sand filtration equipment to disk filter equipment. While more cost effective, disk filter equipment performance is more susceptible to increased loading at higher turbidities and may not as effectively meet phosphorus removal permit limits as deep-bed sand filters, especially during plant process upsets. Due to concerns with performance, cost reduction estimates were not prepared for this concept.

Concept 6 – Defer Installation of Sidestream Phosphorus Treatment.

City operations could potentially rely on robust tertiary treatment filtration to defer one of the planned sidestream phosphorus removal packages. However, the potential long-term repair and maintenance cost of these items could exceed near-term savings.

Concept 7 – Discretionary and Optimized Construction Items.

Several VE and cost savings items are being considered under this concept. The major items identified to-date include reducing nearly half of the paved areas on the final site configuration, co-locating the new digested sludge storage tank with the Sidestream Phosphorus Treatment Facility, design of a consolidated Clean Water Facility (tertiary treatment filtration/UV disinfection/recycled water pump station), and deferment of select demolition items (Trickling Filter 2/Secondary Digesters/Chlorine Contact Basin/W4 Pump Station). Identified savings are estimated to range from $5.9M to $6.7M depending on the level of demolitions deferred.

Potential Consequences

The DRC should be aware of potential consequences associated with these concepts. The primary consequences from this evaluation include:

- **Rapid Flow and Load Growth:** Concept 1 provides a significant opportunity for cost savings. However, the City may see additional growth at a faster rate than projections. This would require additional capital investment (primarily new equipment) be added on relatively short notice. To help alleviate this consequence, the new facilities would be constructed so that this new equipment could be installed in a straight-forward manner to minimize schedule to increase capacity in the future.
- **Stranded-Investment:** Concept 4 is a primary concern for this consequence. Investing capital in facilities near the end of useful life generally includes a risk that a significant replacement may be needed within the planned 20-year improvement horizon.
- **Treatment Performance:** Concepts 5 and 6 both have considerable consequences that could result in treatment performance issues related to meeting NPDES permit requirements. Any realized cost savings would likely be offset by potential permit violation or increased operational costs.
- **Deferred Investment:** Concept 7 has consequences related to deferred demolition. Operations will have maintenance costs associated with facilities not demolished as part of Project Group F. They

have assessed the potential costs, and these are generally minimal on an annual basis. The City will have to identify opportunistic projects to complete this deferred demolition in the future.

Recommendation

The Technical Team recommends proceeding with Concepts 1, 2, 3 and 6 based on the finding that these concepts provide the greatest cost saving potential to the City without impacting whole-plant performance objectives. These concepts provide the opportunity to reduce the cost of Project Group F by approximately $14M.