



Warren, Rhode Island

WASTEWATER TREATMENT FACILITY UPGRADES VALUE ENGINEERING RESULTS



Town Council Meeting
April 25, 2016

COMMITMENT & INTEGRITY DRIVE RESULTS

Introduction

- Wright-Pierce Value Engineering (VE) Study was beneficial and adds value to the project
- A number of cost reduction measures have been identified
- Presentation Overview
 - Big Picture Themes
 - Value Engineering Approach
 - Most Significant Concepts



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Big Picture Themes

- Wright-Pierce presented several big picture themes:
 - Finite capital expenditure of \$20M
 - Woodard & Curran Facility Plan recommended plan is a reasonable approach
 - Reduce capital cost while meeting Town's objectives
 - Re-use existing infrastructure where applicable



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Value Engineering Approach

- Wright-Pierce developed and presented concepts and opinions of cost
- Wright-Pierce recommends Woodard & Curran consider and determine which concepts should be evaluated and taken forward in the detailed design
- The Wright-Pierce Report presented a total of 37 concepts, as follows:
 - 18 categorized as recommended
 - 16 categorized as consider
 - 3 Wright-Pierce concepts are rejected by Wright-Pierce
- Of these Woodard & Curran is recommending that 15 concepts are evaluated further through the detailed design
- See summary table attached to the Woodard & Curran memo



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Concepts with Potential for Significant Impact

- Of the 37 Wright-Pierce Concepts, Woodard & Curran identified 4 major items for this presentation*:
 - General Conditions – Construction Duration
 - General Conditions - Inflation
 - New Reactor Tanks for Nitrogen Removal
 - Sludge Handling Building

* In the interest of time we selected the most significant items. We can review any or all 37 concepts if the Town Council chooses.



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General Conditions - Duration

- Woodard & Curran based the 30% Design Cost Estimate on a 12 month construction duration
- Wright-Pierce recommended that planning for 21 to 24 months is more appropriate
- Woodard & Curran agrees 12 months is optimistic and it is more prudent to plan for 18 to 24 months
- Wright-Pierce estimated that the cost impact is \$626,000
- Woodard & Curran estimated that the cost impact is \$280,000 and does not recommend increasing the capital budget item b/c cost can be absorbed by:
 - the project contingency - \$2.2M
 - conservative nature of the 30% design cost estimate
 - VE cost reduction measures



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General Conditions - Inflation

- Wright-Pierce Report states:
 - General Contractors estimate a project assuming current labor rates, materials, etc.
 - To account for assumed increases in prices an inflation rate should be applied
- Wright-Pierce used an inflation rate of 3% to calculate a cost impact of \$1,000,000
- Woodard & Curran does not typically inflate 30% design cost estimates
- For comparison with the VE Report, Woodard & Curran used the Engineering News Record Construction Cost Index rate of 2%
- Woodard & Curran calculated a cost impact of \$390,000 and does not recommend increasing the capital budget item b/c cost can be absorbed by:
 - the project contingency - \$2.2M
 - conservative nature of the 30% design cost estimate
 - VE cost reduction measures



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New Reactor Tanks for Nitrogen Removal

- Wright-Pierce used a non-calibrated model which found the new reactor tank volume can be reduced by 50% (reduction of 25% of total existing and new reactor volume)
- Wright-Pierce estimates that this could save \$1,330,000
- Wright-Piece notes that the Wright-Pierce model was not based on historical process performance data
- Wright-Pierce recommends that Woodard & Curran review the process model to verify the required volume
- Woodard & Curran verified the 30% design volume by reviewing our calculations and model which are based on historical process performance data
- Woodard & Curran is recommending that the volume remain per the 30% design



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Sludge Handling Building

- Woodard & Curran 30% design includes a new Sludge Handling Building:
 - Existing Sludge Handling Building is from 1940s
 - Mechanical thickening and sludge storage are currently in the Operations Building basement
 - Causes corrosive environment, health hazards and is not compliant with current electrical code
- Wright-Pierce recommended an alternative approach:
 - Reduce excavation and new building construction
 - Utilize existing space in the Operations Building
 - Redistribute the proposed Sludge Handling Building functions:
 - Chemical storage
 - Gravity thickening
 - Sludge transfer pumps
 - Mechanical thickening and sludge storage
- Woodard & Curran agrees but has a variation on the Wright-Pierce layout



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Wright-Pierce Sludge Handling Layout

- Chemical storage – in new building constructed above the existing Chlorine Contact Tank
- Gravity thickening – selective demo of existing sludge building leaving only the foundation. Construct new gravity thickening tanks inside the foundation
- Sludge Transfer Pumps – installed inside the existing sludge building foundation
- Mechanical thickening and sludge storage – install in the Operations Building
- Wright-Pierce estimated the cost savings is \$750,000



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Woodard & Curran Sludge Handling Layout

- Chemical storage – some chemicals in the Operations Building, some in a new slab-on grade building
- Gravity Thickening – new structure located next to the Operations Building
- Sludge Transfer Pumps – located in the Operations Building
- Mechanical thickening and storage – new structure located next to the Operations Building
- Woodard & Curran estimated the cost savings is \$200,000



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Summary

- The Wright-Pierce Value Engineering Analysis:
 - Considered overall intent of project
 - Reviewed several major facilities
 - Provided concepts for Woodard & Curran to consider
- The Wright-Pierce Report includes:
 - 18 recommended concepts at \$1.5M savings
 - 16 consider concepts at \$1.0M savings
 - Total potential savings of \$2.5M
 - Refer to Table 3-1
- Woodard & Curran recommends further evaluation of 15 concepts to be carried forward in the final design



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