

SURFACE WATER CONVERSION: NORTHEAST WATER PURIFICATION PLANT (NEWPP) EXPANSION

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Abstract:

Decades of groundwater withdrawals in the Texas counties of Harris, Galveston, and Fort Bend have caused land subsidence, with some areas sinking by several feet. As a result, regulations were promulgated to limit groundwater usage, requiring utilities to convert to surface water sources. By 2025, surface water must supply at least 60 percent of a utility's total annual water usage, based on the current Regulatory Plans for the Fort Bend Subsidence District and Area 3 of the Harris-Galveston Subsidence District. In response to the new regulations plus sharply increasing water demands, Houston and four regional water authorities in the area embarked on a multi-year project to plan, design, and construct a major expansion to the existing Northeast Water Purification Plant (NEWPP). The project will increase capacity at the existing conventional water treatment facility from 80 million gallons per day (MGD) to 400 MGD. To meet reduction mandates, the entire expansion capacity must be operational by June 2024, while the first module of production must deliver at least 80 mgd of treated water by August 2021. Designing, constructing, commissioning, and starting-up over \$1 billion of infrastructure within this timeframe is a challenging undertaking. To address the budget, schedule, and quality challenges; a design-build approach was selected for delivery of the project. This presentation will discuss the planning, procurement, and selection of the Design-Builder.

1. Introduction:

Planning efforts for the NEWPP Expansion began over 4 years ago with the key stakeholders bringing on a Technical Consultant to evaluate the existing plant, the water to be treated, and the options for achieving the mandate. This project is but one of several key investments such as the Luce Bayou Inter-basin Transfer Project that will provide water to the City of Houston and its regional water authority partners.

2. Objectives:

Upon the completion of this presentation, the observer will have an understanding of the project drivers, the history, and purpose of the project. They will gain insight into the procurement process that was used and the legal considerations that were taken into account by the project team during the procurement phase of the project, and will have an understanding of the selection process and criteria used to select the Design-Build partner.

3. History and Purpose:

Mandates from the Harris-Galveston and Fort Bend Subsidence Districts require that 60% of all water demand be supplied by surface water no later than January 2025. This is an increase from the current requirement of 30%. Additionally, the requirement rises to 80% in 2035. In order to address this requirement, the City of Houston and its regional water partners have embarked on a number of projects that will insure a sufficient source of surface water is available within the water rights of the City. Beginning with the Luce Bayou Inter-basin Transfer Project, continuing on through the Northeast Water Purification Plant Expansion, and culminating in new transmission lines and other infrastructure improvements, this expansion is only one piece of an overall larger effort.

4. Delivery Method Considerations:

In determining the most appropriate delivery method for this project, a number of considerations were taken into account. All Multiple delivery options were initially considered, but three were selected for further evaluation. The City decided on the Two Phase Design-Build method for a number of key reasons, including schedule and budget certainty, and the ability to influence the design through collaboration with the Design-Builder.

5. Procurement and Selection:

Texas Statute, Title 10, Chapter 2269 governs the design-build procurement of Civil Works in the State of Texas. It mandates the use of a qualifications based procurement. The City consulted with a number of legal sources both internal and external, in addition to industry experts to insure ensure that the procurement adhered to the law.

6. Legal Procurement Considerations:

While this project is one of the largest water design build projects in the U.S., it also presents the challenge of being one of the first major projects to procure a design-builder under the Texas statutory requirements. One of the challenges that the City faced with this procurement was that not only was it the largest of its kind, it was also the one of the first of its kind to use this law. There is little case law associated with this statute, and not many projects from which to obtain lessons learned.

7. Lessons Learned:

On a project of this magnitude, there are many lessons to be learned. The One key to success is to engage industry early. Make certain that word is out to professional organizations, trade organizations, and potential design-build partners far enough in advance that they can plan for a project of this size. Consultation with design-build experts is critical. Have your management team in place early to assist in making key

decisions and to have a better understanding of the planning considerations are just a few of the lessons learned.

8. References:

Texas Statute, Title 10, Chapter 2269

Request for Qualifications (RFQ: #15-01) to provide Design-Build Services for the Northeast Water Purification Plant Expansion dated March 20, 2015

Request for Proposals (RFP # DB15-01) to provide Design-Build Services for the Northeast Water Purification Plant Expansion dated April 30, 2015