Influent Pump Station Replacement
for
Central Wastewater Treatment Plant

Briefing to:
The Quality of Life Committee
October 24, 2005
Dallas Water Utilities
Purpose

Describe the benefits of the replacement of an Influent Pump Station as part of a long-term strategy for wastewater flow management for the Central Wastewater Treatment Plant (CWWTP)

Seek support of the agenda item on October 26, 2005 to authorize Engineering Services in the amount of $2,153,513 to Freese and Nichols, Inc. for Evaluation of Alternatives and Design Report for the CWWTP Influent Pump Station
What’s Our Vision?

• To operate Central Wastewater Treatment Plant (CWWTP) as a single system

• What do we get?
  – Maximize treatment plant investment
  – Reduce risk of wastewater overflows
  – Improve operational efficiency
Existing Wastewater Treatment Plants

- Dallas operates two wastewater treatment plants (WWTP)
  - CWWTP is located approximately 3 miles south of downtown Dallas
  - Southside WWTP is located approximately 15 miles southeast of downtown Dallas

- This briefing focuses on wastewater flows to CWWTP
Background of Wastewater Flows at Central WWTP

- Each WWTP section was designed independently to treat wastewater flows from different parts of the city.
- East Bank Interceptor system collects wastewater flows from the downtown side of the Trinity River.
- Cadiz St. Influent P.S. moves flows from the East Bank Interceptor to the CWWTP.
- West Bank Interceptor system collects wastewater and flows by gravity from the Oak Cliff side of the Trinity River to the CWWTP.
Central WWTP Background

- Original WWTP (known as Dallas Section) was expanded in the 1930’s and modernized over the years.
- Second WWTP (known as White Rock Section) was originally constructed in the 1940’s and expanded several times over the past 60 years.
- Activated sludge complexes were constructed in the 1970’s and 80’s to further treat the effluent from the Dallas and White Rock Sections prior to discharge to the Trinity River.
Schematic of WW Flows at CWWTP

Existing

420 ft

400 ft

380 ft East Bank Interceptor

360 ft Cadiz Inf. P.S.

West Bank Interceptor

420 ft

400 ft

380 ft East Bank Interceptor

360 ft Cadiz Inf. P.S.

West Bank Interceptor

Planned

420 ft

400 ft

380 ft East Bank Interceptor

360 ft New Influent Pump Station

West Bank Interceptor

420 ft

400 ft

380 ft East Bank Interceptor

360 ft New Influent Pump Station

West Bank Interceptor

White Rock P.S.
Flow Limitations

General System Limitations

• Older Interceptors constructed to meet past needs do not allow flexibility in managing wastewater flows

• Wastewater flows cannot be directed between WWTPs to fully optimize existing and planned WWTP facilities, especially during peak flows

• Wastewater base flows should be about one-half of WWTP permitted flow to allow for peak flows due to rain events

• Texas Commission on Environmental Quality (TCEQ) requires excess capacity at each WWTP but rain events are not necessarily even across the service areas
Flow Limitations At Central WWTP

- Dallas and White Rock Sections were constructed at different elevations due to the different requirements of the original areas served.

- Transferring wastewater flows from White Rock Section to Dallas Section is not possible and from Dallas Section to White Rock Section is limited and cumbersome.

- Aging infrastructure is a major concern with critical facilities ranging in age from 20 to 70 years.
  - Cadiz St. Pump Station and the peak flow pump stations have exceeded or are nearing their reasonable expected service life.
  - Some infrastructure in the Dallas Section dates from the 1930’s.
Elements to Address Flow Management Strategy for CWWTP

• Replace and consolidate influent pump stations at CWWTP
  – Construct a new Influent Pump Station
  – Decommission the Cadiz Influent Pump Station (CIPS)
  – Decommission two Peak Flow Influent Pump Stations

• Construct an interconnection pipeline from the East Bank Interceptor to the West Bank Interceptor to re-route flows
Influent Pump Station Project

• A new Influent Pump Station (IPS) at CWWTP will replace the existing CIPS

• Project will be delivered in phases
  - Current project replaces CIPS and two existing, deteriorated peak flow pump stations at Central WWTP
Influent Pump Station Project (continued)

- Project will be accomplished in multiple Council awards to manage cash flow
  - Influent Pump Station
    - Design Report and Recommendations
    - Detailed Design
    - Construction Services (engineer support during construction)
    - Construction Contract
  - East Bank Connection pipeline
    - Design is complete
    - Construction Contract
Influent Pump Station Project (continued)

• The new IPS Project represents a major investment
  – Estimated Cost of Influent Pump Station
    • Total Engineering Services Estimate ~ $6,000,000
      – Design Report and Recommendations ~ $2,153,513
      – Future detailed design and construction assistance services to be negotiated based on final configuration of IPS
    • Preliminary Construction Estimate ~ $40,000,000*
  – East Bank Diversion Pipeline
    • Preliminary Construction Estimate ~ $10,000,000*

* Costs may be higher due to increases in the cost of fuel and materials
Other Benefits Of This Approach

• Reduced O&M and power costs
  – New Influent Pump Station will need 20-25% fewer pumps than currently required
  – It consolidates pump station leading to fewer pumps, improved hydraulics and the ability to split flows that leads to a combined power feed/motor/pump and greater efficiency and less maintenance
  – Incorporates power factor correction to eliminate current surcharges

• Complies with existing and future regulations
Influent Pump Station Project Schedule

- Design Report Award: October 26, 2005
- Detailed Design Award: FY 05/06
- Construction Award: FY 06/07
- Estimated Completion Date: 2010
Recommendation

DWU recommends support of the agenda item on October 26, 2005 to authorize Engineering Services in the amount of $2,153,513 to Freese and Nichols, Inc. for Evaluation of Alternatives and Design Report for the CWWTP Influent Pump Station.
Questions & Comments