



AGENDA ITEM SUMMARY FORM

MEETING DATE: November 14, 2023
PREPARED BY: Chris Whittaker
AGENDA CONTENT: 2024 Utility Master Plan Update

AGENDA ITEM SECTION: Regular Agenda

BUDGETED AMOUNT: **FUNDS REQUESTED:**
\$247,700.00

FUND:

EXECUTIVE SUMMARY:

HDR will update the existing master plan for the City of Angleton's water distribution and wastewater collection systems to evaluate the adequacy of the existing systems to serve current customer demands and future growth in the City. Future growth will be evaluated for years 2028 and 2033 (5 years and 10 years). This scope of services will evaluate the existing facilities, analyze hydraulic deficiencies in the systems, and identify Capital Improvement Projects (CIP) to meet the City's current needs and anticipated growth through the 2033 planning horizon.

RECOMMENDATION: Council to approve HDR for an amount of \$247,700.00 to perform the 2024 Utility Master Plan Update.



November 7, 2023

Chris Whittaker
City Manager
City of Angleton
121 South Velasco Street
Angleton, Texas 77515

**Re: Proposal for Professional Engineering Services
2024 Utility Master Plan Update**

Dear Mr. Whittaker:

HDR Engineering, Inc. (HDR) is pleased to provide you with this fee proposal for Professional Engineering Services to assist the City of Angleton, Texas (City) in updating its utility master plan for both the collection (Sanitary sewer) and distribution (water) systems. For your convenience, this proposal consists of a General Overview, Scope of Services, Fees, Terms and Conditions Sections, and Schedule.

GENERAL OVERVIEW:

HDR will update the existing master plan for the City of Angleton's water distribution and wastewater collection systems to evaluate the adequacy of the existing systems to serve current customer demands and future growth in the City. Future growth will be evaluated for years 2028 and 2033 (5 years and 10 years). This scope of services will evaluate the existing facilities, analyze hydraulic deficiencies in the systems, and identify Capital Improvement Projects (CIP) to meet the City's current needs and anticipated growth through the 2033 planning horizon.

SCOPE OF SERVICES:

Task 1. Project Kickoff, Project Management, and Quality Assurance/Quality Control

HDR will prepare for and conduct a project kickoff meeting. During this meeting, HDR and the City will review the overall scope of work, identify data requirements, and establish criteria for system assessment and planning, including the following criteria:

Water System Criteria:

- Minimum pressure during average day, maximum-day, and peak-hour demands
- Maximum pressure during low demands
- Maximum allowable velocity for pipelines
- Maximum allowable head loss for pipelines
- Required fire flows at a minimum pressure of 20 pounds per square inch (psi)
- Pipeline age or maintenance frequency to trigger replacement, based on GIS data and information provided by the City.

Wastewater System Criteria:

- Minimum and maximum velocity for gravity and force main pipes
- Maximum allowable percent of hydraulic capacity in gravity pipe
- Maximum permissible manhole surcharge
- Pipeline age or maintenance frequency to trigger replacement

During the execution of the project, HDR will prepare for and lead up to five (5) interim project meetings as needed to obtain necessary information, update City staff on progress and any issues, and review interim project information. These meetings will be a combination of in-person and virtual, as appropriate for the subjects to be discussed.

Under this task HDR will:

- monitor project expenditures
- negotiate and monitor subconsultant agreements if needed
- prepare monthly progress reports to accompany invoices
- complete quality assurance/quality control (QA/QC) reviews of work products

Task 2. Data Collection and Review

HDR will request and analyze relevant data furnished by the City pertaining to the City’s water and wastewater system service areas, and the City’s ETJ. Requested data may include, but is not limited to:

- Access to the geographic information system (GIS) of the City’s water and wastewater systems, which HDR has previously updated to reflect newly added infrastructure. For the purposes of this scope of work and fee estimate, HDR assumes that the information contained in the City’s GIS is current and up to date, and no additional data will be needed to reflect the current water and sewer systems.
- Spatial land use data
 - Location and equivalent single-family connection (ESFC) count of developments constructed since the 2018 Utility Master Plan (UMP)
 - Location and ESFC count of developments anticipated to be constructed by 2028 and 2033
 - Account level customer billing/meter data, either spatial or tabular, including addresses
- Last 5 years of hourly water supply and production data
- Last 5 years hourly inflows to the City’s wastewater treatment plant
- Wastewater lift station and water booster pump station SCADA records, i.e. on/off times, run times, and pump station controls
- Updated information regarding the capacities of the City’s wastewater lift stations, including:
 - Any additional lift station drawdown or other capacity tests performed since completion of the 2018 UMP
 - As-built and pump manufacturer information
 - Existing operational status of each lift station
- Location, size, capacity, and usage levels of any agency interconnections
- Water supply contract(s) with the Brazosport Water Authority (BWA)

HDR will lead an in-person meeting with City operations staff to identify operational issues with both the water and wastewater systems, and identify areas of concern for staff, including high/low water system

pressures, inadequate fire flow, wastewater I/I and manhole surcharges during wet weather, and areas of stagnant flow/odor issues during dry weather.

Deliverables:

- Data needs request via email
- Meeting with operations staff with follow-up meeting summary

Schedule:

- Data needs request will be provided within two weeks of NTP
- Meeting with operations staff will occur two weeks following receipt of the data requested

Task 3. Water and Wastewater Hydraulic Model Update and Analysis

HDR will update the existing conditions hydraulic models of the water and wastewater system, utilizing the software used for the 2018 UMP (Innovyze InfoWater and InfoSewer). Note that Innovyze has recently ceased support for InfoWater and InfoSewer and more recent versions of the software may need to be used. New infrastructure or facilities constructed since the 2018 UMP will be imported into the modeled networks. HDR will update the water demands and wastewater flows in the existing conditions models based on current population data, water billing data and land use information. HDR will conduct quality control (QC) review of updated hydraulic models.

a. Existing Systems Analysis

Water System

HDR will analyze the updated existing system water model during max-day, peak-hour, and max-day with fire flow scenarios. The model results will be used to identify any system deficiencies such as low pressures, inadequate fire flow or high pipe velocities. The model results will also be used to determine if adequate storage and pumping are available to serve the current population and meet regulatory requirements.

Wastewater System

HDR will analyze the updated existing system wastewater model results to determine anticipated system response to wet weather storm events. The wet weather peaking factor of 4 used in the 2018 UMP will be used for the analysis of the updated hydraulic model. HDR will review the trigger criteria established in the 2018 UMP and compare to the updated model results. The system analysis will identify deficiencies including surcharged pipes and manhole overflows.

- b. Technical Memorandum. HDR will prepare a technical memorandum describing the hydraulic model update process and existing system analysis results. HDR will conduct Quality Control reviews of the draft and final memorandum.

Assumptions:

- Two coordination meetings with the City are anticipated, to be conducted through a virtual platform.
- No changes will be made to existing model pipe sizes, pipe invert elevations, lift stations, or pump stations. The model update will be limited to addition of new infrastructure added to the systems since the 2018 UMP.
- No changes will be made to the hydraulic modeling software used previously (Innovyze InfoWater and InfoSewer), except to update to current versions supported by Innovyze.
- No changes will be made to existing diurnal flow patterns established previously.
- No changes will be made to existing water or wastewater peaking factors established previously.
- No changes will be made to level of service criteria established previously.
- The updated wastewater model will not be calibrated. HDR will validate model flows with available WWTP influent data, and lift station flow records. Lift station draw-down tests will not be performed or used to refine the model.
- The updated water model will not be calibrated with fire hydrant testing data, field pressure data, or SCADA data.

Deliverables:

- Draft and Final Model Update Technical Memorandum , in electronic PDF format.

Schedule:

- Draft Model Update Technical Memorandum three months after receipt of requested data.
- Final Model Update Technical Memorandum two weeks after receiving the City's comments on the Draft Technical Memorandum. It is assumed that the City will provide review comments one week after receiving the Draft Technical Memorandum.

Task 4. Future System Analysis and CIP Development

- a. Population, Water Demand and Wastewater Flow Projections. HDR will use City planning and regional water planning data to revise population projections and forecast population through 2028 (five years) and 2033 (10 years). HDR will update existing development/land use projections in the City's ETJ. HDR will meet with City staff to identify the location and magnitude of anticipated near-term growth (within the next five years). Water demands and wastewater flows from anticipated new developments will be spatially distributed based on development acreage and anticipated equivalent single-family connections (ESFC), with the gallons per capital day (GPCD) and/or ESFC rates determined in the 2018 UMP.
- b. Future System Modeling and Analysis. HDR will create 5-year and 10-year future scenarios in the water and wastewater models, with demands and flows based on the updated 5-year and 10-year projections.

- c. Capital Improvements Plan (CIP) Development. HDR will validate timing and sizing of water and wastewater CIP projects proposed in the 2018 UMP, based on the current population and revised projections. The proposed timing of CIP projects will be adjusted based on revised projections. The pipe size and project limits will also be validated with updated flow and demand projections, as well as updated model results. HDR will recommend new CIP projects to address system deficiencies noted in the updated hydraulic model, as well as projects necessary to serve anticipated growth. HDR will develop a planning level opinion of probable construction cost (OPCC) for recommended CIP projects. The OPCCs will be based on planning level unit construction costs, as well as soft costs not directly associated with construction activities.
- d. Wastewater Treatment Capacity Evaluation. HDR will compare the current available capacity at the Oyster Creek Wastewater Treatment Plant (OCWWTP) to flows as predicted by the hydraulic model. Based on the updated growth projections, HDR will evaluate when an expansion to the OCWWTP may be required.
- e. Inflow & Infiltration Evaluation. HDR will perform a sensitivity analysis to estimate the impact of implementing an inflow and infiltration (I&I) reduction program. HDR will reduce peak flows by 10%, 20% and 30% and determine the improvements to system response for each. HDR will coordinate any known areas of high I&I with the City. The sensitivity analysis will not provide recommendations on specific locations or measures to reduce I&I.

Assumptions:

- Two coordination meetings with the City are anticipated, held through a virtual platform.
- A condition assessment of water or wastewater infrastructure is not included in this scope of work, and CIP projects will be based only on system capacity needs.
- The City will provide location and ESFC counts for known developments anticipated within the next five years and ten years.
- The City will provide cost information for recently constructed water and wastewater utility projects.

Deliverables:

- Draft and Final CIP Development Technical Memorandum, in electronic PDF format.

Schedule:

- Draft CIP Development Technical Memorandum three months after completion of Task 3.
- Final CIP Development Technical Memorandum two weeks after receiving the City's comments on the Draft Technical Memorandum. It is assumed that the City will provide review comments one week after receiving the Draft Technical Memorandum.

Task 5. Water Supply Evaluation

HDR will review the City's current water supply contract(s) with the BWA to determine the annual and max-day supplies available from BWA. HDR will evaluate the City's current water supplies (surface water from BWA and groundwater). HDR will coordinate with the City to determine population and associated water demands for 2053 (30 years) and 2073 (50 years). HDR will compare current supplies with water

demands projected for 2028, 2033, 2053, and 2073 to determine additional supplies the City may need to develop. Three options will be evaluated: (1) additional purchases from BWA, (2) development or re-development of City-owned groundwater supplies, and (3) a combination of both. Evaluation of other potential sources of supply such as purchase from other suppliers, aquifer storage and recovery, brackish groundwater and ocean water desalination, and direct potable and non-potable reuse of effluent will be considered additional services and will not be evaluated under this scope of services. HDR will develop planning level opinions of probable construction cost for the three alternatives

Assumptions:

- One coordination meeting with the City is anticipated, held through a virtual platform to determine long-term population and water demand projections.
- The City will provide information concerning the City’s existing and abandoned/retired groundwater supply wells.

Deliverables:

- Draft and Final Water Supply Technical Memorandum, in electronic PDF format.

Schedule:

- Draft Water Supply Technical Memorandum four months after completion of Task 3.
- Final Water Supply Technical Memorandum two weeks after receiving the City’s comments on the Draft Technical Memorandum. It is assumed that the City will provide review comments one week after receiving the Draft Technical Memorandum.

FEE:

HDR will complete the above Scope of Services for a lump sum fee of \$247,700. A budget of fees per task is provided below:

Fee Estimated per Task

Task No.	Description	Task Fee
1	Project Management and Controls and QA/QC	\$44,000
2	Data Collection and Review	\$31,650
3	Water and Wastewater Model Updates & System An.	\$57,850
4	Future System Analysis and CIP Development	\$96,000
5	Water Supply Evaluation	\$18,200
Total		\$247,700

TERMS AND CONDITIONS:

This project will be performed under the current Master Agreement for Professional Services with the City, and its terms and conditions will apply.

SCHEDULE:

hdrinc.com

4828 Loop Central Drive, Suite 800, Houston, TX 77081-2220
(713) 622-9264



HDR will complete Tasks 1-5 and submit the draft technical memorandum within 7 months of receipt of the data requested in Task 2. HDR will finalize the three Technical Memorandums per City comments and present a summary to Council at a date and time mutually agreed upon by HDR and the City.

We appreciate the opportunity to be of service on this project. If you have any questions, please do not hesitate to contact me at (713) 622-9264.

Sincerely,

HDR Engineering, Inc.

David C. Weston
Vice President/Area Manager

Acceptance: Please indicate acceptance of this letter agreement by affixing your signature or that of your authorized representative in the space below.

City of Angleton, Texas

Signature: _____

Printed Name: _____

Title: _____

Date: _____