



Summary

Consultant	Brown and Caldwell	Contractor (Inspection Points)	Kandey Company
Date of Award	September 2, 2021	Date of Award	August 1, 2022
Completion Date	March 30, 2023	Completion Date	December 31, 2022
Consultant Fee	\$2,444,030.00	Contract Value	\$656,600.00
Spent to Date	\$1,572,525.00 (64% of fee)	Spent to Date	\$502,986.00
Funding	ECWA funded. No outside funding at this time		
Schedule Update	Project schedule delayed due to coordination with subconsultant for main inspection services and construction of access and monitoring points and issues with inspection (see below)		
Board Action Items	- Non at this time		

Scope of Work

This project consists of the following two main components along with the development of a final report outlining the results and recommendations for operational and capital improvements.:

Pipeline Condition Assessment: Inspection of the existing 48- and 42-inch transmission mains located between the Sturgeon Point WTP and the Windom PS in order to provide an understanding of the structural integrity of the transmission mains including identification of leaks, air pockets, and structural deterioration. In addition, the consultant shall prepare the design and bid documents required for the pipeline insertion/extraction configurations for inspection tools and tracking points for each transmission main.

Transient Analysis: Engineering services for the assessment of the hydraulic transients via computer simulation (hydraulic modelling), verified (as close as possible) by field data, to identify transient management practices and potential system improvements that would help mitigate transient impacts on the water distribution system’s life and reliability.

Completed Work

Condition Assessment

To date, Brown and Caldwell (B&C) has completed the project planning and development of bid documents for the construction of the transmission main access points (tool insertion and extraction). All construction work was completed in 2022. With regard to the condition assessment, the project includes a small project to construct transmission main monitoring inspection points and insertion and extraction ports as well two separate inspection technologies as follows:

- **SmartBall Assessment** – This inspection completed on October 18th for the 42-inch transmission main and on October 28th for the 48-inch main involved the inspection of the entire length of both transmission mains from Sturgeon Point to Windom. The intention of this inspection was to identify leaks through the use of acoustics. Initial results from the inspection of the 42-inch main identified twelve potential leak locations. These locations were then screened for any correlations with existing connections with the transmission main. Awaiting final report to identify any remaining potential leaks. Still awaiting results on the inspection of the 48-inch main.



Project Update
Project No. 202100221
Transmission Main Condition Assessment
Contract BC-003, Brown and Caldwell
February 2023

- **PipeDiver Inspection** – This inspection was completed on October 20th on the 42-inch main and on November 2nd on the 48-inch main. This technology, specifically designed for prestressed concrete cylinder pipe (PCCP) involves the use of electromagnetic fields to determine the condition of the main by identifying breaks in the prestressing wires. The entire length of the 42-inch main was inspected while approximately 1/3 of the 48-inch main was inspected. The 48-inch main inspection was halted when the PipeDiver tool could not clear a butterfly valve, it had successfully cleared 5 other butterfly valves prior to getting stuck. The tool was successfully extracted using an access point located within the valve chamber. Currently awaiting results of both PipeDiver inspections.

Transient Analysis

Under this task, B&C has begun the development of a skeletonized version of the Authority's WaterGEMs all pipes hydraulic model of the 48- and 42-inch piping network to identify existing surge elements (pipe material, transmission main elevation profiles, air/vacuum release valves, check valves, coefficients, etc.) and added detailed pump and valve information to provide a complete picture of the system. B&C also developed a field-testing plan incorporating hydrant flow tests and transient pressure monitoring completed by ECWA using pressure sensors recommended by B&C specifically designed for transient analyses. B&C is currently in the process of calibrating the model and verifying the results versus system performance through the summer/fall of 2022.

Next Steps

Condition Assessment

Following receipt and review of the results of the condition assessment tasks (Smartball and PipeDiver) the ECWA with input from B&C will make a determination on the feasibility of completing the PipeDiver assessment on the 48-inch transmission main. This effort will require a risk/reward assessment as there are several more valves that the tool must pass in order to complete the inspection. We anticipate receiving a draft inspection report in February 2023 with a meeting to follow. This report will include the results of all condition assessments completed to date.

Transient Analysis

B&C is continuing model calibration and will shortly begin to run requested scenarios for transient assessments. Transient scenarios will determine the transient pressure differentials due to normal pump startup and shutdown operations together with critical conditions at critical locations within the distribution system. Examples of the general scenarios that will be evaluated include normal pump/system operation and power failures or other uncontrolled shutdown of pump at both Sturgeon point and large pump stations such as Windom and Guenther. Results are anticipated in the in spring 2023.