



Waukesha Water Utility

SERVING WAUKESHA SINCE 1886

115 DELAFIELD STREET
WAUKESHA, WI 53188-3615

Telephone: (262) 521-5272 • Fax: (262) 521-5265 • E-mail: contactus@waukesha-water.com

MEMORANDUM

DATE: January 15, 2018

TO: Water Utility Commissioners

FROM: Dan Duchniak, General Manager

RE: CH2M Amendment for Distribution System Water Quality Testing

The Waukesha Water Utility is currently working with a team of consultants for the Great Water Alliance Program implementation of Great Lakes water for the City of Waukesha. As part of the program, a team from CH2M was to lead the effort on developing a transition plan to the new water supply. The transition plan included pipe loop testing, flushing of the distribution system and post transition testing of the system.

Originally, the water supply was slated to be acquired from the City of Oak Creek. The transition to their supply was less complicated due to the fact that they used the same disinfection chemicals and did not add any chemicals for corrosion control. Due to our switch to a Milwaukee supply, the transition plan will undergo several modifications due to the fact that Milwaukee uses a different disinfection chemical and corrosion control chemical.

In addition to the testing, we would also like CH2M to develop a unidirectional flushing program using our iPads for electronic record keeping of water quality during the flushing program. We also see a benefit of incorporating this program into other aspects of our utility operations.

Therefore, we have negotiated a contract consistent to the value that was originally under the contract with CH2M for this work. The project team will remain the same with Tony Myers leading the effort and Dr. Vern Snoeyink and Dr. Gregory Harrington providing technical support for the effort. We will coordinate with Greeley and Hansen as they work on the program.

Since the water transition is a focused effort that is independent of the construction portion of the program, we believe it is most efficient and cost effective to separate this work from the program and have it be completed independently from the program.

The total cost of the Distribution System Water Testing program will be \$1,465,000 between 2018 and 2023. The breakdown of costs per year is estimated as follow: 2018 - \$600,000; 2019 - \$540,000; 2020 - \$150,000; 2021 - \$105,000; 2022-2023 - \$70,000. This includes a \$250,000 allowance for the construction of a pipe loop testing apparatus and \$225,000 for lab testing.

Funds have been budgeted and the dollars are available in the Great Lakes budget and this change will be budget neutral for 2018 and for the program.

I look forward to presenting these items for approval at our meeting on January 18. If you have any questions or need any further information, feel free to contact me at any time.

Recommended Motion: Move to approve the amendment with CH2M for Distribution System Water Quality Testing under a time and expenses contract in the amount of \$600,000 for 2018.

Draft
Professional Services Agreement Amendment
On-Call Engineering Services for
Great Lakes Application Support

This Amendment is made to the Professional Services Agreement (Agreement) dated July 14, 2015 between the Waukesha Water Utility (UTILITY) and CH2M HILL ENGINEERS, Inc. (PROVIDER), with its principal local place of business at 135 South 84th Street, Milwaukee, Wisconsin 53214.

The UTILITY and the PROVIDER amend Article II Compensation and Payment, to increase the not to exceed amount by \$1,465,000. Compensation is estimated to occur over the following years:

2018 - \$600,000

2019 - \$540,000

2020 - \$150,000

2021 - \$105,000

2022-2023 - \$70,000

Rates will be consistent with the Waukesha Water Utility PM/CM Great Lakes Water Supply Program rates.

Scope of Work

The scope of work is for on-call services which will include distribution system water quality work associated with the transition to a Lake Michigan water supply. The scope of work is described in Exhibit A attached.

Schedule

The schedule covers work from January 2018 through June 30, 2023. A general schedule for the Scope of Work is in the attached Exhibit A.

All other provisions of the Agreement remain in full force and effect.

Waukesha Water Utility

CH2M HILL ENGINEERS, INC.

By:

Dan Duchniak, P.E.
General Manager

By:

Abraxas J. Catalanotte, P.E.
Vice-President

Date:

Date:

Exhibit A

Scope of Services

Waukesha Water Utility Distribution System Water Quality

Background

The Waukesha Water Utility (WWU) will be obtaining treated Lake Michigan water from the City of Milwaukee Wisconsin in approximately 2023. The purpose of this scope of services is to assist WWU in their transition to a Milwaukee water supply, related to water quality in the WWU distribution system.

Tony Myers (CH2M HILL ENGINEERS) will be the project manager for this scope of services.

The tasks for this scope of services are summarized below. Additional tasks may be added via amendment to the On-Call services contract between WWU and CH2M HILL ENGINEERS.

Task 1 Pipe Loop Testing

The Pipe Loop Test Plan prepared in 2016 will be revised for the differences in water quality between Milwaukee and Oak Creek as the water supplier. The Pipe Loop Test Plan will be reviewed by WWU, then the Wisconsin Department of Natural Resources (WDNR). A meeting with WWU and WDNR will be held to discuss and agree to the Pipe Loop Test Plan.

A pipe loop testing apparatus will be designed. Options for construction of the pipe loop testing apparatus will be evaluated by WWU and CH2M HILL. CH2M HILL will oversee construction of the pipe loop apparatus.

WWU will obtain galvanized and copper pipe from the distribution system and buildings for use in the pipe loop test apparatus. WWU will assist with transportation and set up of the pipe loop test apparatus at a facility in Waukesha, and subsequently in Milwaukee.

CH2M HILL will operate the pipe loop test apparatus for approximately one year and collect water and pipe scale samples. Water and pipe scale samples will be analyzed in laboratories approved by WWU and CH2M HILL. Water chemistry impacts from the new transmission pipe will be evaluated, including pH, alkalinity, disinfection residual and disinfection byproducts. Two meetings with WWU and WDNR will be held during the Pipe Loop Testing phase to review preliminary results.

Utilizing the results of the pipe loop testing program and distribution system water quality testing, a Pipe Loop Testing Technical Memorandum (TM) will be developed recommending changes to WWU's current lead/copper corrosion control program and water chemistry. The TM will be reviewed by WWU, then WDNR. A meeting with WWU and WDNR will be held to discuss and agree on the recommendations in the Pipe Loop Testing TM.

The recommendations in the distribution system water quality work do not guarantee actual water quality observed in the distribution system.

Deliverables

- Revised Pipe Loop Testing Plan
- Pipe Loop testing apparatus construction drawings and specifications
- Pipe Loop Testing TM
- Meeting agenda, minutes, presentations

Meetings

- Pipe Loop Test Plan review (1 WWU, 1 WDNR)
- Pipe loop design review (1 WWU, 1 Milwaukee)
- Pipe Loop test preliminary results (2 WWU, 2 WDNR)
- Pipe Loop test TM (1 WWU, 1 WDNR)

Assumptions

- Pipe loop test apparatus will be located in an existing Waukesha and Milwaukee WaterWorks building with adequate space and easy access to finished drinking water and sewer disposal.
- Pipe loop testing will continue for approximately one year.
- Pipe loop water sampling will be once per week, and the test apparatus will be visited three times per week for operations.
- An allowance for sample analysis is preliminarily estimated at \$225,000 for direct contract with the testing laboratory(s). This amount may need to be adjusted once the pipe loop test plan has been finalized and testing proceeds.
- An allowance for construction of the pipe loop test apparatus is preliminarily estimated at \$250,000. This amount may need to be adjusted once the pipe loop test apparatus procurement price information has been obtained.
- Basic water chemistry testing will be conducted concurrently and at the same location as the pipe loop testing.
- WWU will obtain pipe samples from the WWU distribution system and assist with pipe loop transportation and set up at each location.

Task 2 Distribution System Water Quality Sampling

An Initial Distribution System Evaluation – System Specific Study will be conducted for the WWU distribution system. The distribution system hydraulic model will be used to recommend revisions to WWU's sampling locations for disinfection by-products and Total Coliform Rule after the transition to a Milwaukee water supply. Current lead/copper sampling locations will be reviewed with WWU, and recommendations for sample location modification, if any, will be made.

Recommendations will be summarized in a Distribution System Water Quality Sampling TM and submitted to WWU. The TM will be reviewed by WWU, then WDNR. A meeting with WWU and WDNR will be held to discuss and agree on the recommendations in the TM.

Deliverables

- Distribution System Water Quality Sampling TM
- Meeting agenda, minutes, presentations

Meetings

- Sample location review (1 WWU)
- TM review (1 WWU, 1 WDNR)

Assumptions

- WWU provides information on existing sample locations, location selection criteria, previous reports and WDNR correspondence on the IDSE, Lead/Copper Rule and Total Coliform Rule.

Task 3 Great Lakes Compact Water Supply

Meet with WDNR to discuss the Great Lakes Compact requirements for the new water supply. If required, update the Water Supply Service Area Plan based upon the Compact Council approved service area. The plan will include an updated service area map consistent with the Compact Council approved service area.

Deliverables

- Updated Water Supply Service Area Plan

Meetings

- WDNR Meeting to discuss Great Lakes Compact requirements (1)
- Meeting Agenda and minutes

Task 4 Distribution System Monitoring

CH2M HILL will review distribution system water quality data collected by WWU before and after the water supply transition to determine how the transition is working and to provide early warning for potential water quality changes. A Distribution System Water Quality Monitoring TM will be prepared outlining approaches and costs to distribution system water quality monitoring, with options from manual sample collection to on-line monitoring stations. The distribution system model will be used to identify sample locations.

The Distribution System Water Quality Monitoring TM will be submitted to WWU for review. CH2M HILL will facilitate meetings with WWU and WDNR to discuss the Distribution System Water Quality Monitoring TM and decide upon the monitoring approach to employ. Comments provided will be addressed prior to finalizing the Distribution System Water Quality Monitoring TM.

Deliverables

- Distribution System Water Quality Monitoring TM
- Meeting agenda, minutes, presentations

Meetings

- Distribution System Water Quality Monitoring TM review (1 WWU, 1 WDNR)
- TM review (1 WWU, 1 WDNR)

Assumptions

- WWU provides information on existing distribution system water quality monitoring procedures and data.
- Design and construction of distribution system water quality monitoring stations are not included, but can be added by amendment to this contract.

Task 5 Unidirectional Flushing Plan

A Unidirectional Flushing (UDF) Program Plan will be developed for the WWU distribution system. This task includes:

- Hydraulic modeling to develop a distribution system UDF operational plan in coordination with WWU operations staff
- Development of a wastewater disposal plan
- Development of hydrant flushing processes including valve isolation to maintain water service while disposing of flushing water
- Technical assistance during the flushing program.
- Hydraulic modeling to indicate areas with high water age and areas that should be routinely flushed to maintain water quality.

Key activities include:

- Apply the InfoWater distribution system model.
- Review linkage of GIS data for valves and hydrants to hydraulic model.
- Develop targets for minimum flush velocity, maximum segment flush length, and maximum flush volume for any flush sequence. The targets will be developed for the number of sequences that can be completed in one day of flushing.
- Develop map book of flush sequences showing closed valves, target hydrant flow, target pipe velocity, length of segment to flush, and estimated flush volume. This volume information will be used to develop the flushed water disposal plan and coordinate with hydrant flushing general permit application.
- To support the field work for the flushing program, an ArcGIS Collector Application (Collector App) will be developed that will allow for capture of the field data that is planned for tracking during the flushing events. The Collector App will allow for population of this data into a database table that can then be used to summarize and map flushing results across the service area. The Collector App will be developed to be deployed on an iPad with ArcGIS Online.
- Technical assistance during the flushing program for visual assessment of flushed water and field testing.

CH2M HILL will facilitate a meeting with WWU to obtain concurrence with the UDF Plan and hydrant flushing permit.

Deliverables

- UDF Plan
- Collector App
- Meeting agenda, minutes, presentations

Meetings

- UDF Plan review (1 WWU)

Assumptions

- WWU provides information on existing distribution system flushing procedures and data.
- WWU provides labor and materials for implementing the UDF plan.

Task 6 Water Transition Plan

Using the results from the previous tasks, a Water Supply Transition Plan for bringing in the new water supply to the WWU distribution system will be developed. The plan will include recommended adjustments to water chemistry and distribution system sampling, monitoring and operations.

The Water Supply Transition Plan will be submitted to WWU for review. CH2M HILL will facilitate meetings with WWU and WDNR to discuss the Water Supply Transition Plan. Comments provided will be addressed prior to finalizing the Water Supply Transition Plan.

Key points of the Water Supply Transition Plan will be summarized for residential water users and industrial water users. Meetings will be held with the top 10 water users, major medical facilities and the home water treatment company organization to explain the water transition and answer technical questions.

During the water transition and for approximately 6 months afterwards, CH2M HILL will be available to answer technical questions on the water quality aspects of the water supply transition.

Deliverables

- Water Supply Transition Plan
- Key point summaries for residential and industrial customers
- Meeting agenda, minutes, presentations

Meetings

- Water Supply Transition Plan review (1 WWU, 1 WDNR)
- Top 10 water users (10)
- Major Medical facilities (2)
- Home Treatment Company Organization (1)
- Public meetings (3)

Assumptions

- WWU will attend meetings with the top 10 water users, medical facilities, home treatment companies and public meetings.

Schedule

The general schedule for completing Tasks 1 through 6 follows:

Task 1 Pipe Loop Testing – January 2018 to June 2020

Task 2 Distribution System Water Quality Sampling – January 2018 to December 2018

Task 3 Great Lakes Compact – January 2018 to December 2018

Task 4 Distribution System Water Quality Monitoring – January 2019 to December 2019

Task 5 Unidirectional Flushing – June 2019 to June 2022

Task 6 Water Transition Plan – January 2020 to June 2023