"…meeting community needs…enhancing quality of life."

Department of Utilities

To: Chairperson Greg Dannecker and Members of the Utilities Committee

From: Chris Shaw, Utilities Director

cc: Kelli Rindt, Enterprise Fund Accounting Manager

Date: September 2, 2015

Re: ***Change Order #2 to CH2M HILL for Regulatory Upgrades and Process Improvements Project Engineering Services to the Appleton Water Treatment Facility in the amount of $13,500 and reducing the Contingency to $12,614***

BACKGROUND:

The Appleton Water Treatment Facility uses chlorine for primary disinfection in two chlorine contact tanks. The chlorine contact tanks were expanded during the Regulatory Upgrade and Process Improvement Project (RUPIP). Ammonia can be added at the middle and end of the chlorine contact tanks and a chloramine residual is maintained through the two clearwells (total of 5 million gallons) before pumping to the distribution system.

The water plant currently has ultrafiltration membranes that can achieve the Giardia removal requirements of the Surface Water Treatment Rule (SWTR). Recently added UV disinfection can also achieve the Giardia removal requirements of the SWTR, plus some virus inactivation and at least 3-log Cryptosporidium inactivation.

In order to determine the level of disinfection credit the new tanks can produce, a draft tracer test plan needs to be prepared by CH2M Hill and presented and approved by WDNR before actual testing begins. The testing will create data for the regulator to use to assign final disinfection formula factors. It should be noted that the AWTF has to maintain minimum contact tank requirements and the derived formula will be used by the AWTF staff to define the level of disinfection and ensure the minimums are not breached.

PROJECT SCOPE OF WORK

Task 1 – Finalize Tracer Test Plan
The draft Tracer Test Plan will be discussed with WDNR and comments incorporated. A final test plan will be prepared.

Task 2 - Data Collection
Samples will be collected by staff in four locations:

- CT 1A weir hatch
- CT 1B weir hatch
- CT 2A weir hatch
- CT 2B weir hatch

The number of samples will be determined by the test plan. A sample labeling scheme will be outlined in the test plan. The AWTF will provide sample bottles and analyze the samples. A data collection form will be provided in the test plan.

It is assumed that three water flow rates will be used, one at high flow of about 20 to 24 MGD (10-12 MGD through each basin), one at average flow of about 12 MGD (6 MGD through each basin) and one at less than average day flow of about 8 MGD (4 MGD through each basin). The need for a third water flow will be determined after WDNR review of the test plan. The AWTF will control flow through the CT basins and operate the fluoride feed system.

During the tracer test, the following parameters will be monitored: fluoride residual (background and after addition), pH, temperature, water level in the CT basins, flow meter reading, initial volume or weight of tracer in feed tank, and final volume or weight of tracer in feed tank.

An additional 4 samples will be collected for disinfection byproducts (total trihalomethanes and haloacetic acids).
CH2M Hill will have an engineer on site to assist with one day of tracer testing.

Task 3 - Data Analysis
The City will provide the data collection forms to CH2M Hill. CH2M Hill will normalize the data by calculating the concentration divided by the steady state concentration (C/C_0) and plotting it as a function of time. The T10 value will be determined from the plot by determining the time the curve passes through the C/C_0 value of 0.10. This value will be determined for each flow condition.

Task 4 - Report Preparation
CH2M will prepare a Tracer Test Report summarizing the test conditions and results. The report will be discussed with WDNR as they determine the final T10 values to be used for regulatory compliance.

ENGINEER DELIVERABLES

During report preparation, CH2M will work with the City to propose an overall disinfection plan that identifies log removal of Giardia, Virus and Cryptosporidium for the water treatment plant. Two copies of the draft report will be sent to WDNR and the City. A conference call will be held with the City and WDNR to discuss the report and gather comments. Five copies of the final report will be sent to the City, along with an electronic PDF file, and two copies to WDNR.

CH2M HILL will incorporate contractor changes contract drawings into revised "as built" drawings to create Record Drawings. Two half size copies of the record drawings, and one electronic copy in MicroStation will be provided.