



TASK ORDER (TO) FORM, TO No. 2015-03
Tracer Study and Mixing Evaluation
City of Griffin, GA
January 28, 2015

Background

The City of Griffin (City) owns and operates two water treatment plants (WTPs), the Harry Simmons WTP and the Still Branch WTP.

Based on the results of the Georgia EPD Sanitary Survey evaluations, a tracer study is required at the Harry Simmons WTP to determine the T10 value of the treatment process. Additionally, EPD requires calculation of the G-value (velocity gradient) of the preflash mixing stage and the G- and GT- values of the flocculation chambers at the Harry Simmons WTP. The City has requested that Burns & McDonnell provide the tracer studies and mixing evaluations at both WTPs.

The City is required by EPD to complete these studies at Harry Simmons WTP by year 2016, and wishes to complete the studies at both WTPs prior to that deadline, although the efforts at Harry Simmons WTP may be authorized first and separately.

Project Team Members

We propose Rebecca Clay as both your Project Manager and Lead Engineer. Rebecca has over 10 years of experience managing water infrastructure projects for Georgia utilities, and has conducted similar studies in the past for Georgia WTPs. Other key team members will include Stacy Scott as quality control. Stacy has an extensive background in piloting and similar WTP hydraulic evaluations and optimization studies.

Scope of Services

The proposed scope of services includes two key elements:

- a. CT Tracer Study
- b. GT Value Assessment

The CT Tracer Study and the GT Value Assessment each apply at both the Harry Simmons and Still Branch WTPs, and the defined scope is identical for the WTPs although the work at each WTP will be conducted independently.

CT Tracer Study

Georgia EPD provides Minimum Standards for Public Water Systems, a guidance manual that includes procedures for conducting tracer studies (Section 11.1.2.2). T10 is the detention or contact time used in the total "CT" tracer study calculation. Burns & McDonnell will develop the CT tracer study procedure, discuss the procedure with Georgia EPD for approval, review the procedure with City operations and key staff, provide oversight during the study, summarize results in a format that the City can submit to EPD for compliance, and conduct a review meeting with the City to discuss how the CT was determined and any recommendations that result.



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The tracer study will be performed by City operations, using City equipment and chemical supplies, and with City laboratory analysis for chemical residuals according to the protocol developed. Generally, the study will involve turning off existing fluoride feed at the WTP until the clearwells exhibit only background fluoride levels, turning up the fluoride to a high dose (within regulation; approximately 3 mg/L) while monitoring the concentration measured at the point of entry, then again turning off the fluoride dose with ongoing point of entry monitoring. This is what EPD defines as the "step-dose procedure". The City will measure and record the fluoride concentration and dosage levels and clearwell levels at the times prescribed by Burns & McDonnell in the protocol, and using a worksheet provided in the protocol. Burns & McDonnell will provide continuous on-site oversight to address questions and administer the protocol on the day that fluoride is turned up to the high dose, and as needed on the following day up to the time that fluoride feed is turned off according to the protocol. Burns & McDonnell will then compile the data collected by the City, produce a T10 determination graph according to EPD's guidelines, and provide the results to the City in a brief technical memorandum format that defines the CT characteristics of the WTP.

GT Value Assessment

G-values, or velocity gradients, apply to the rapid mix and flocculation processes regardless of how the gradients are generated. At the Harry Simmons WTP, both processes are provided through hydraulic baffling, across two parallel treatment trains. At the Still Branch WTP, mixing and flocculation are achieved through mechanical propeller type rotating devices. For Harry Simmons, Burns & McDonnell will calculate the G-value for each train based on as-built drawings of the tanks and baffle configuration, supplemented by on-site verification of the baffle configuration, and then determine the GT values based on minimum and maximum flows through each train. For Still Branch, Burns & McDonnell will calculate the train G-values based on as-built tank drawings and water level data, for volume dimensions, and using nameplate data and submittal information on the mixing equipment. Burns & McDonnell will summarize the GT-value calculation for each WTP rapid mix and flocculation processes in concise technical memoranda provided to the City.

Following completion of the assessments and technical memoranda at each WTP, Burns & McDonnell will conduct a review meeting with the City to discuss the results.

Assumptions

Our Scope of Services has been developed under the following assumptions and our understandings of the City of Griffin's needs on this project:

- The CT tracer study protocol assumes that fluoride is dosed near post-chlorine, into the WTP's filtered water prior to entering the clearwell. This assumption allows fluoride to be used as the medium in the tracer study as a surrogate for chlorine.
- The City will provide needed as-built drawings for each WTP, including drawings defining the finished water conveyance configuration and clearwell dimensions, and rapid mix and flocculation tankage dimensions and baffle configuration (where applicable).
- The City will assist Burns & McDonnell on-site, during completion of the CT tracer study at the Harry Simmons and Still Branch WTPs, in obtaining water level data, blade or baffle dimensions,



mixing equipment horsepowers, speed, and propeller dimensions, minimum and maximum WTP flow rate ranges, and other data as required to complete the GT value assessment. We have assumed that this data collection process will occur during our on-site time as the CT tracer study is being conducted at each WTP.

- No survey is proposed. We have assumed that required dimensions are available on WTP as-built drawings or can be readily field-measured with assistance by City staff.
- We have assumed that one person will be present at each WTP for a maximum of 16-hours (two 8-hour days) during the CT tracer study to respond to questions as needed and provide regular oversight of the protocol execution.
- We have budgeted for one person to conduct the protocol review and final review meetings in person with City staff, to discuss the CT tracer protocols at each WTP, and then following the studies to discuss the CT Tracer Study memoranda for the two WTPs and the GT Value memorandum for the Harry Simmons WTP. Two separate protocol review meetings are anticipated, one for each WTP. Two separate final review meetings are anticipated, one for each WTP.
- The City will make any required submittals to Georgia EPD directly. No permitting activities or regulatory submittals are included in this scope.
- Burns & McDonnell will provide the City with any recommendations for further evaluation that may result from the CT and GT assessments, such as chemical feed point relocation, improved baffling, or increased/decreased mixing energy input. However, any recommendations provided under this Task Order will be preliminary, and will require separate evaluation and design development.
- Two hard copies and one electronic (PDF) copy of each technical memorandum will be submitted to the City.

We will gladly expand this Scope, for commensurate compensation, upon your request.

Schedule

Burns & McDonnell is available to begin work promptly upon your authorization to proceed. The overall evaluation at each WTP, from CT testing protocol development through data assessment, GT value calculation, and technical memoranda submittal, is expected to require three months.

Compensation

Burns & McDonnell proposes to provide these services under the Master Services Agreement with the City of Griffin on a lump sum basis for each WTP as defined in the table below. These values include labor and direct expenses.

Task	Compensation
Harry Simmons WTP CT Study and GT Assessment.	\$19,900
Still Branch WTP CT Study.	\$16,600
TOTAL	\$36,500



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Each task will be separately invoiced according to a percent of completion, distinct for the two WTPs.

The parties hereto have accepted and executed this Task Order according to the terms of the Master Services Agreement dated June 10, 2014:

OWNER:

City of Griffin, Georgia

ENGINEER:

Burns & McDonnell Engineering Company, Inc.

By:

By:

A handwritten signature in blue ink, appearing to read "John Olanow", written over a horizontal line.

Title:

Title:

The word "President" written in blue ink, positioned above a horizontal line.

Date:

Date:

The date "6/15/15" written in blue ink, positioned above a horizontal line.