SUPPLEMENTAL AGREEMENT NO. 3
FOR PROFESSIONAL SERVICES
City of Olathe, Kansas

This Supplemental Agreement made this 18th day of November, 2019, by and between the City of Olathe, hereinafter referred to as the "City", and Black & Veatch Corporation, hereinafter referred to as the "Consultant".

WITNESSETH:

WHEREAS, the City and Consultant have previously entered into an Agreement, dated May 2, 2017 ("the Agreement"), for the WTP2 Alternative Disinfection Project; PN 5-C-004-16 hereinafter referred to as the "Project"; and

WHEREAS, SECTION II, Paragraph B of the Agreement provides that Consultant will provide, with City's concurrence, services in addition to those listed in the Professional Services Agreement, when such services are requested or authorized in writing by the City.

WHEREAS, this Supplemental Agreement No. 3 between the parties heretofore is to provide Disinfection Manual and CT Tracer Test for the Project as outlined in **Exhibit A** of this Supplemental Agreement No. 3, attached hereto and incorporated herein by reference; and

WHEREAS, the City is desirous of entering into Supplemental Agreement No. 3 to pay the Consultant for additional services rendered to the City related to the Project; and

WHEREAS, the City is authorized and empowered to contract with the Consultant for the necessary additional professional services under the Agreement, and necessary funds for the payment of said services related to the Project are available and authorized under the Agreement.

NOW THEREFORE, the parties hereby agree as follows:

A. Exhibit B of the Agreement is hereby amended as follows: Add scope of services as outlined in Exhibit A of this Supplemental Agreement No. 3.

B. The total fee for the aforementioned additional professional services provided pursuant to this Supplemental Agreement No. 3 is $78,582, which raises the total fee for all services provided under the Agreement from $1,162,275 to $1,240,857.

IN ALL OTHER RESPECTS, the terms and conditions of the Agreement will remain in full force and effect, except as specifically modified by this Supplemental Agreement No. 3, including all policies of insurance which will cover the work authorized by this Supplemental Agreement No. 3.

IN WITNESS WHEREOF, the parties hereto have caused this Supplemental Agreement No. 3 to be executed as of the day and year first above written.

CITY OF OLATHE, KANSAS

By: _____.
Michael E. Copeland, Mayor

ATTEST:

_____
City Clerk

(Seal)

APPROVED AS TO FORM:

_____
City Attorney/Deputy City Attorney/
Assistant City Attorney

Black & Veatch Corporation
By: Derek L. Cambridge
Associate Vice President

EXHIBIT A
Scope of Services

This scope describes additional engineering services the Consultant will provide the City in connection with the Water Treatment Plant 2 Alternative Disinfection Project.

TASK 7 – PREPARE DISINFECTION MANUAL

Consultant shall develop a disinfection manual for the purpose of plant operations under different conditions and regulatory compliance. The manual will describe the following:

- Brief description of the disinfection chemical feed systems (Chlorine dioxide, Sodium Hypochlorite, Ferrous Chloride, and Ammonia Feed Systems). The manual shall cover tank quantities and capacities, metering pump ranges, and available feed points for each chemical. The manual will not include specific equipment O&M manuals for pumps, tanks etc.
- Create a new process flow diagram for the whole plant with all chemical feed points (main and backup disinfection process) with a table of Key Performance/Process Indicators (KPI) for the disinfection process and rest of plant.
    - Owner will provide KPI's for indicators not associated with the disinfection process.
    - Once the Corrosion Control Study is completed, update the KPI's to match the requirements from the study.
    - The process flow diagram should show quantities and capacities for each process.
- Describe locations for online analyzers and controls linked to SCADA with operating strategy
- Describe locations and frequency for collecting operations grab samples and associated KPIs.
- Describe location and frequency for collecting compliance grab samples and associated KPI's
- Describe impact of operating parameters on CT such as changes in flow, temperature, and chlorine dioxide concentration.
- Create a new operations CT spreadsheet for the daily log spreadsheet.
- Describe impact of chlorine dioxide concentration at the effluent of the contact basin on quenching chemical dosage.
- Prepare emergency plan for chlorine dioxide system failure and need to earn CT credit using free chlorine and total chlorine.
- Prepare plan for adding chlorine and ammonia under different operating conditions.
- Evaluate membrane warranty considerations and impact on operations with optimizing the ammonia feed point.

- Conduct chlorine dioxide reformation potential testing to finalize ammonia feed point location.
- Selection of distribution sample locations for chlorine dioxide/chlorite.
- Draft sampling locations correspondence to KDHE.
- Identify if public notification is required for process and prepare draft release.
- Conduct process training workshops
    - Three separate workshops, 3 hours each

A plant overview map showing locations of all chemical feed points and analyzers associated with the disinfection process. Anticipate the process schematic will be used for basis of this map. This information will all be compiled in a manual prepared by our O&M group that will operator friendly and accessible for training.

TASK 8 – CT TRACER TEST

This scope of work describes the tasks to complete tracer studies to provide a baffling factor (T_{10}/T_{theory}) for use in CT calculations at the Chlorine Dioxide Facility. The work will be completed in three tasks; development of the tracer protocol for KDHE approval, conducting the tracer tests, and providing a report to summarize the results.

Tracer testing will be conducted to calculate T_{10} disinfectant contact times for the chlorine dioxide through the contact basin.

Task 1. Develop test protocol.
A testing protocol will be developed for the chlorine dioxide basin. The tracer study will use the step-dose approach, with fluoride as the tracer compound. Hydrofluosilic acid (HFA) will be added at a constant rate to the basin influent and fluoride residuals will be measured at the effluent sample location. A maximum target concentration of 0.7 mg/L will be achieved. This will result in a fluoride concentration at the tap below the secondary MCL of 2.0 mg/L, even with the existing fluoride system remaining in operation, and well below the MCL of 4.0 mg/L. Testing will occur at the following conditions:

- Minimum Plant flow with both cells in service
- Current available maximum flow with both cells in service
- At least 91% of the maximum design flow with one cell in service (18.2 to 20 MGD through one cell)

B&V will lead a review session with Olathe staff and KDHE, incorporate comments into the protocol, and issue a final protocol for testing.

Task 2. Conduct tracer tests. Black & Veatch (B&V) staff will oversee testing; providing two staff members to conduct testing. Olathe staff will be responsible for equipment procurement (chemical feed pump, tank for HFA supply, and interconnecting piping to feed point), setup, and water quality analysis.

Task 3. B&V will perform the data analysis and development of the tracer study reports. The final report will be signed and sealed by a Kansas Licensed Professional Engineer and provided to the City for submission to KDHE.

Owner: City of Olathe, KS

Project: Disinfection Manual and CT Tracer Test

PHASE/Task WORK BREAKDOWN STRUCTURE	PHASE	Sr. Project Director	Project Manager	Admin	Engineering Manager	Civil Engineer	Civil Technician	Process Director/QC	Process Engineer	Process Sr. Technician	Process Technician	O&M Engineer	SUBTOTAL, hours	SUBTOTAL, Billings $	SUBTOTAL, EXPENSES	TOTAL Billings
Task 7 - Prepare Disinfection Manual	0000	-	-	-	-	-	-	-	-	-	-	-	-	$ -	$ -	$ -
Description of Chemical Feed Facilities	0010	-	2	-	-	4	-	-	-	4	-	8	18	$ 2,932	$ 158	$ 3,090
New Process Flow Diagram with KPIs	0011	-	1	4	-	-	16	-	-	16	16	8	61	$ 8,384	$ 534	$ 8,918
Descrbibe Locations of Analyzers	0012	-	-	-	2	2	-	-	-	4	-	-	8	$ 1,270	$ 70	$ 1,340
Decribe location and frequency of grab samples	0020	-	-	-	-	2	-	-	-	4	-	-	6	$ 872	$ 53	$ 925
Create new CT spreadsheet	0030	-	1	-	2	12	-	-	-	8	-	-	23	$ 3,434	$ 201	$ 3,635
Describe impact of chlorine dioxide concentration	0040	-	-	-	2	2	-	-	-	6	-	-	10	$ 1,580	$ 88	$ 1,668
Prepare Emergency Plan	0050	-	-	-	4	2	-	-	-	6	-	-	12	$ 1,978	$ 105	$ 2,083
Evaluate membrane warranty	0060	-	-	-	2	2	-	-	-	6	-	-	10	$ 1,580	$ 88	$ 1,668
Prepare Report	0070	2	8	12	16	24	-	16	-	30	-	8	116	$ 20,058	$ 1,015	$ 21,073
	0080	-	-		-	-	-	-	-	-	-	-	-	$ -	$ -	$ -
	0090	-	-	-	-	-	-	-	-	-	-	-	-	$ -	$ -	$ -
CT Tracer Test	0100	-	-	-	-	-	-	-	-	-	-	-	-	$ -	$ -	$ -
Develop Test Protocol	0110	-	2	-	-	8	-	-	40	-	-	-	50	$ 7,776	$ 438	$ 8,214
Conduct Tracer Test	0120	-	2	-	-	8	-	-	90	-	-	-	100	$ 15,526	$ 1,275	$ 16,801
Perform Data Analysis and Prepare Report	0130	-	1	4	4	8	-	-	40	-	-	-	57	$ 8,668	$ 499	$ 9,167
	0140	-	-	-	-	-	-	-	-	-	-	-	-	$ -	$ -	$ -
DO NOT DELETE ANY OF THE "TOTAL" ROWS BELOW. THESE GENERATE THE TOTALS FOR THE BUDGET																
Total, Hours		**2**	**17**	**20**	**32**	**74**	**16**	**16**	**170**	**84**	**16**	**24**	**471**			
Total, Billings														**$ 74,058**	**$ 4,524**	**$ 78,582**