

CONSULTANT WORK ORDER

Date:	4/2/2026
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1. PROJECT INFORMATION:

Project Title:	MSWRF Sulfuric Acid Testing	
City Project Number:	26-0011-UT	
City Plan Set Number:	N/A	
Consultant Project Number:	TBD	

2. SCOPE OF SERVICES:

Project Summary – The City of Clearwater (City) has identified elevated concentrations of trihalomethanes (THMs), specifically di-bromo-chloromethane (DBCM), in the final effluent at the Marshall Street Water Reclamation Facility (MSWRF). The City has requested that Black & Veatch (ENGINEER) perform engineering services to support the planning, coordination, and evaluation of a Full-Scale Pilot to assess the effectiveness of pH adjustment using sulfuric acid to reduce THM formation. This Work Order includes pilot planning, preparation of the Full-Scale Pilot Work Plan, coordination with the chemical supplier (Hawkins), Odyssey Manufacturing and Advanced Environmental Laboratories, Inc., development of conceptual pilot system layout exhibits, technical support during pilot implementation, data evaluation, and preparation of a Technical Memorandum. All services under this Work Order have been categorized under “Phase I – Pre-Design.” Work under Design, Final Design, Bidding, or Construction Phases is not included unless authorized by the City in writing.

I. PRE-DESIGN PHASE:

Task 1: Project Initiation

- a. Kickoff Meeting – ENGINEER will lead the “MSWRF Sulfuric Acid Testing” project Kickoff Meeting including the development and distribution of agenda and minutes. Discussion at the Kickoff Meeting will include roles and responsibilities (including subconsultants), scope, schedule, deliverables, budget, safety, quality plan, assumptions, and confirmation of the City’s goals for the project. The Kickoff Meeting will be conducted virtually and attended by five ENGINEER professionals including the Project Manager,

- Engineering Manager, Project Engineer, Wastewater Process Lead, and Chemical Feed Lead. ENGINEER will develop an agenda and meeting minutes.
- b. SharePoint Site Setup and Management – ENGINEER will create an externally-facing SharePoint site for the City and ENGINEER teams to access and transfer project documents.

Task 2: Data Collection and Analysis

- a. ENGINEER will develop and submit a data request and track/organize the data provided. This may include PDF scanning of hard copy reports and data manipulation of raw data spreadsheets to facilitate evaluation. ENGINEER will utilize materials from the 2021 and 2024 studies, gather readily available data through sources such as Oculus, and request Excel DMRs (discharge monitoring reports) from City for the daily data (Oculus DMRs typically only include monthly averages but will be retrieved and reviewed).
- b. ENGINEER will analyze data to identify trends at MSWRF continuing off the trends identified during City Project 24-0075-UT MSWRF THMs Evaluation (Completed in October 2025).

Task 3: Full-Scale Pilot Work Plan

ENGINEER will develop a Full-Scale Pilot Work Plan for City review and City submittal to FDEP. The Work Plan will describe the pilot objectives, performance criteria, test conditions, and implementation approach. The Work Plan will include:

- a. Testing Approach and Objectives – Description of THM reduction strategy using pH suppression, summary of chemical dosing approach using sulfuric acid, pilot duration, and anticipated operating envelope for key parameters (e.g., pH, alkalinity, detention time).
- b. Sampling and Data Collection Plan – Identification of sampling locations, frequency, and analytical parameters. ENGINEER will be responsible for data review, tracking, and interpretation.
- c. Roles and Responsibilities – Clarification of specific responsibilities for City staff, ENGINEER, Odyssey Manufacturing Co. (SUBCONSULTANT), AEL LAB (SUBCONSULTANT) and Hawkins (SUBCONSULTANT) during planning and pilot execution, including sampling, chemical handling, data management, and communication with FDEP.
- d. Pilot Schedule and Phasing – High-level pilot schedule including pilot setup, active testing period, data evaluation, and reporting milestones.

- e. Project Specific Health and Safety Plan
- f. Conceptual System Layout Development:

Conceptual Pilot System Layout Exhibits – ENGINEER will develop conceptual pilot system layout exhibits to support internal coordination and regulatory communication. These exhibits are for planning purposes only and will not be used as design or construction documents. Exhibits may include:

- i. A generalized process flow diagram indicating the existing process and the proposed chemical feed locations for the pilot.
 - ii. A conceptual site layout sketch showing the approximate location of temporary chemical storage (e.g., totes or mini-bulk tanks), feed pumps, containment area, and access/clearances in relation to existing facilities.
 - iii. Conceptual injection point schematics showing how chemical feed tubing will be routed to and connected at the selected injection locations.
- g. It is assumed that MSWRF Operations staff will operate the pilot system during the testing period and will monitor and adjust pH levels as required to meet the pilot testing objectives. Additionally, it is assumed that the City will be responsible for safe handling of sulfuric acid during pilot operation, including response to and cleanup of any sulfuric acid spills that may occur during use.

ENGINEER will submit a draft Work Plan for City review, participate in one (1) virtual comment review meeting with attendance by three ENGINEER professionals, and then revise the Work Plan to incorporate City comments and finalize the document.

Task 4: FDEP Coordination and Support

ENGINEER will support the City with Work Plan submission and regulatory coordination related to the Full-Scale Pilot. This includes updates throughout the 2-month pilot period and submittal of the Technical Memorandum described in Task 8.

Task 5: Coordination with SUBCONSULTANTS

ENGINEER will coordinate with Hawkins, Inc. (SUBCONSULTANT) and Odyssey Manufacturing (SUBCONSULTANT) to obtain conceptual chemical feed system

input for the pilot and with AEL Laboratory (SUBCONSULTANT) for sampling results. Allowance budgets are included for each SUBCONSULTANT to provide flexibility based on actual services required during project execution, consistent with project needs and site conditions.

Odyssey Manufacturing

Under this Work Order, Odyssey Manufacturing's services are anticipated to include:

- Engineered Drawings for the system installation which the City can use to request the pilot from FDEP.
- Pilot Testing Equipment Installation including:
 1. 2,550-gallon Assman double-walled tank set on the south end of the concrete pad.
 2. Duplex Enclosed Pump Skid with Prominent Sigma I pumps rated for 17.2 gph @ 102 psi.
 3. Piping on Tank (2" fill line, 3" overflow line to a 5-gallon bucket, and 1" feed piping between pump skid and tank). The 1" feed line will have a Teflon tubing sight-glass on a ½" isolation ball valve to check tank level.
 4. ½" Piping to injection point(s).
 5. Electrical Wiring to Temporary Skid from the Sodium Bisulfite Room.
 6. Flow Signal to Temporary Skid from the Sodium Bisulfite Room.
 7. Safety Shower and Eyewash (there is an existing one inside the outside doorway of the Sodium Bisulfite Room about 20' away). Odyssey will add a permanent Guardian 1904 combination eyewash/safety shower including a 1" supply line on the outside the Bisulfite Building facing the temporary acid tank. This unit will remain with the City following completion of the pilot.
- Startup and Training

ENGINEER will evaluate Odyssey Manufacturing (SUBCONSULTANT) information and incorporate relevant portions into the Full-Scale Pilot Work Plan, as appropriate. An allowance of \$55,000 is included for services to be provided by Odyssey Manufacturing. Final scope will be determined based on project needs and authorized accordingly.

Hawkins, Inc.

ENGINEER will coordinate with Hawkins, Inc. (SUBCONSULTANT) for 50% sulfuric acid delivery throughout the pilot testing. A \$35,000 allowance is included for 50% sulfuric acid use for the 2-month period. It is assumed that sulfuric acid used during the pilot will be procured through Hawkins, Inc. under this allowance. The City will be responsible for operational handling of the chemical during the pilot period.

AEL Laboratory

ENGINEER will coordinate with AEL Laboratory (SUBCONSULTANT) throughout the pilot testing for THM sampling results. A \$15,000 allowance is included for AEL Laboratory testing during the 2-month period.

Task 6: Pilot Implementation Support

ENGINEER will provide technical support during pilot implementation. Services under this task include:

- a. Participating in one (1) onsite visit at the start of pilot implementation to review general conformance of the installed pilot setup with the conceptual pilot system layout and Work Plan intent. Three ENGINEER professionals will participate in this site visit.
- b. Providing technical guidance to City operations staff on chemical dosing strategy, including recommended pH targets, anticipated THM behavior, and considerations related to detention time, mixing, and operational constraints.
- c. Coordinating with Odyssey Manufacturing (SUBCONSULTANT) to address questions on equipment operation, chemical feed system adjustments, and chemical handling considerations, as needed.
- d. Developing and maintaining a data tracking/logging template (e.g., spreadsheet) for City use to record pilot operating conditions and laboratory results.
- e. Performing daily THM sampling. THM sampling assumes daily samples, excluding weekends, over a 2-month period. ENGINEER will coordinate with AEL Laboratories (SUBCONSULTANT) on the analysis of the samples collected.
- f. Attending virtual check-in meetings, every two weeks (six meetings have been budgeted for this task) during the active pilot period to discuss observations, preliminary trends, and any recommended adjustments to pilot conditions. Three ENGINEER professionals will attend these meetings.

Task 7: Full-Scale Pilot Technical Memorandum

ENGINEER will prepare a comprehensive Technical Memorandum (TM) documenting the Full-Scale Pilot. The TM will include:

- a. Background and objectives of the pilot and relationship to prior MSWRF THM evaluations.
- b. Description of the pilot configuration, chemical dosing approach, operating conditions, and monitoring program.
- c. Summary of pilot operating data and laboratory results, including tables and figures illustrating THM reduction performance and key trends.
- d. Evaluation of the effectiveness of the chemical dosing approaches tested, including discussion of operational feasibility, safety considerations, and anticipated chemical usage and operating costs at full scale.
- e. Recommendations for next steps, which may include operational changes, further pilot refinement, or development of a separate scope of services for design of permanent improvements, as directed by the City.

ENGINEER will submit a draft TM for City review, participate in one (1) virtual comment review meeting, with three ENGINEER professionals in attendance, to discuss the Comment Summary Log, and then revise the TM to incorporate City comments and finalize the document.

Task 8: Project Management and Administration

ENGINEER will perform administrative duties associated with the project, including project set-up, resource management, Quality Assurance/Quality Control Plan development, progress monitoring, scheduling, general correspondence, office administration, and invoicing, including monthly progress reports developed and submitted with invoices.

ENGINEER will oversee three subconsultant agreements including invoice review and contract management.

ENGINEER will maintain accurate project documentation, filing, and project cost accounting system throughout the project. ENGINEER will maintain continuous control over the quality of all its work efforts. This will include oversight and review by the Engineering Manager, Wastewater Process Lead, Project Manager and other technical staff, the time for which is included in the budget for Tasks 1-7.

II. DESIGN PHASE:

Not Applicable.

III. FINAL DESIGN PHASE:

Not Applicable.

IV. BIDDING PHASE:

Not Applicable.

V. CONSTRUCTION PHASE:

Not Applicable.

3. PROJECT GOALS:

The primary goal of this project is to plan and support the implementation of a full-scale sulfuric acid pH suppression pilot at MSWRF to evaluate its effectiveness in reducing THM formation under real operating conditions. The pilot will help determine operational feasibility, safety and handling considerations, and the potential for pH suppression to be implemented as a long-term compliance strategy. Findings will be documented in a Technical Memorandum with recommendations for next steps.

Task 1 Deliverables: Kickoff Meeting Agenda and Meeting Minutes.

Task 3 Deliverables: Work Plan for Full Scale Pilot Sulfuric Acid Testing (Draft and Final).

Task 7 Deliverable: Full Scale Pilot Technical Memorandum (Draft and Final) and comment summary log.

Task 8 Deliverables: Monthly progress reports provided with ENGINEER's invoices.

4. FEES:

See Attachment "A". Billing rates will follow the Engineer of Record (EOR) 2023-2027 Master Contract rates schedule.

This price includes all labor and expenses anticipated to be incurred by Black & Veatch for the completion of these tasks in accordance with Professional Services Method "A" – Hourly Rate, as described in the Agreement for Professional Services, for a fee not to exceed three hundred seventy-six thousand and one hundred and ninety-two Dollars (\$376,192).

No permit costs are anticipated or included for this project.

5. SCHEDULE:

The project is to be completed in 10 months from issuance of notice-to-proceed.
The project deliverables are to be phased as follows:

Task	Deliverable/ Milestone	Weeks Following NTP
	Notice to Proceed (NTP)	0
1	Kickoff Meeting	1
2	Data Request	1
3	Full Scale Pilot Work Plan	10
7	Draft Technical Memorandum	35
7	Final Technical Memorandum	40

6. STAFF ASSIGNMENT:

The City's staff assignments to this project:

Michael Flanigan	Public Utilities Director
Kaylynn Price	Utilities Engineering Manager
Samantha Myers	Project Manager
Ryan Alexander	MSWRF Chief Operator
Travis Teuber	Public Utilities Wastewater Treatment Manager
Wayne LaFleur	Public Utilities Maintenance Manager

The ENGINEER's staff assignments to this project include:

Kent Lackey, PE	Senior Vice President
Amanda Schwerman, PE	Client Director
Rebecca Oliva, PE, BCEE, ENV SP, PMP	Project Manager
Zachary Smierciak, PE	Project Engineer
Rama Pandkar, PE, LEED GA, ENV SP	Engineering Manager
Timur Deniz, PhD, PE, BCEE	Wastewater Process Lead
Erin Briggeman, PE	Chemical Feed Lead

7. CORRESPONDENCE/REPORTING PROCEDURES:

Consultant's project correspondence shall be directed to:
Rama Pandkar, with copies to Zach Smierciak and Rebecca Oliva.

All City project correspondence shall be directed to:

Samantha Myers (Project Manager) with copies to Michael Flanigan (Public Utilities Director), and Kaylynn Price (Utilities Engineering Manager).

8. INVOICING/FUNDING PROCEDURES:

City Invoicing Code: 3277327-530100-M1905

For work performed, invoices shall be submitted monthly to:

CITY OF CLEARWATER, PUBLIC UTILITIES
ATTN: PUBLIC UTILITIES ACCOUNTING
1650 N. ARTURAS AVE.
CLEARWATER, FLORIDA 33765-1945
PUEngineering@myclearwater.com

Contingency services will be billed as incurred only after written authorization provided by the City to proceed with those services.

9. INVOICING PROCEDURES:

At a minimum, in addition to the invoice amount(s) the following information shall be provided on all invoices submitted on the Work Order:

1. Purchase Order, Project and Invoice Numbers and Contract Amount.
2. The time period (begin and end date) covered by the invoice.
3. A short narrative summary of activities completed in the time period.
4. Contract billing method – Lump Sum or Hourly Rate.
5. If Lump Sum, the percent completion, amount due, previous amount earned and total earned to date for all tasks (direct costs, if any, shall be included in lump sum amount).
6. If Hourly Rate, hours, hourly rates, names of individuals being billed, amount due, previous amount earned, the percent completion, total earned to date for each task and other direct costs (receipts will be required for any single item with a cost of \$50 or greater or cumulative monthly expenses greater than \$100).

7. If the Work Order is funded by multiple funding codes, an itemization of tasks and invoice amounts by funding code.

10. CONSIDERATIONS:

Consultant acknowledges the following:

1. The Consultant named above is required to comply with Section 119.0701, Florida Statutes, where applicable.
2. All City directives shall be provided by the City Project Manager.
3. "Alternate equals" shall not be approved until City Project Manager agrees.
4. All submittals must be accompanied by evidence each has been internally checked for QA/QC before providing to City.
5. Consultants/Contractors are not permitted to use City-owned equipment (i.e., sampling equipment, etc.).
6. Documents posted on City website must be ADA accessible.

11. ADDITIONAL CONSIDERATIONS:

All work orders should include considerations for the following:

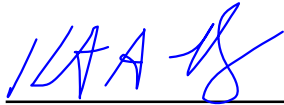
1. Sea Level Rise and Flood Resilience, as applicable.
2. Submittal of a Critical Path Method (CPM) Schedule(s).
3. Submittal of a Project Catalog with the following items, as appropriate:
 - a. Data requests, assumptions, critical correspondence, meeting agenda, sign-in sheets, meeting minutes, document comment-response log(s), technical memorandum/reports, addenda, progress reports, regulatory correspondence, and other project-related documents.
 - b. If construction project, also include design plans, conformed plans, change orders, field orders, RFIs, work change directives, addenda, progress reports, shop drawing and progress submittals, as-builts, record drawings, and other project-related documents such as O&M manuals and warranty information.
 - c. At the conclusion of the project, ENGINEER will combine this information into Project Catalog and submit it to the City for review and comment.
4. Arc Flash labeling requirements:
 - a. All electrical designs and construction shall adhere to NFPA 70 E "Standard for Electrical Safety in the Workplace".
 - b. Updated calculations of Fault and Arc Flash, and provisions for new or updated Arc Flash equipment labeling shall be included in the contract documents.

12. SPECIAL CONSIDERATIONS:

Not Applicable.

13. SIGNATURES:

PREPARED BY:

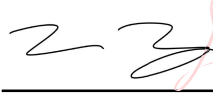


Kent Lackey, P.E.
Senior Vice President
Black & Veatch

04/02/2026

Date

APPROVED BY:



cn=Michael Flanigan,
email=michael.flanigan@m
yclearwater.com, c=US
2026.04.03 09:19:27 -04'00'

Michael Flanigan
Public Utilities Director
City of Clearwater

4/3/2026

Date

ATTACHMENT "A"**CONSULTANT WORK ORDER – PROJECT FEES TABLE**

MSWRF Sulfuric Acid Testing

Black & Veatch

26-0011-UT

City of Clearwater

CONSULTANT WORK ORDER

PROJECT FEES TABLE

Task	Description	Subconsultant Services	Labor	Total
	Pre-Design & Design			
1	Project Initiation	\$0	\$11,180	\$11,180
2	Data Collection & Analysis	\$0	\$11,407	\$11,407
3	Full-Scale Pilot Work Plan	\$0	\$49,630	\$49,630
4	FDEP Coordination and Support	\$0	\$10,737	\$10,737
5	Coordination with Subconsultants	\$105,000	\$35,635	\$140,635
6	Pilot Implementation Support	\$0	\$59,103	\$59,103
7	Full-Scale Pilot Technical Memorandum	\$0	\$29,443	\$29,443
8	Project Management and Administration	\$0	\$28,388	\$28,388
Pre-Design Total:				\$340,523
SUBTOTAL, LABOR AND SUB-CONTRACTORS:				\$
9	Other Direct Costs (prints, photocopies, postage, etc.) (Not applicable to lump sum Work Orders)			\$1,470
	Permit Fees			\$0
SUBTOTAL, WITHOUT CONTINGENCY:				\$341,993
10	Contingency (10%)			\$34,199
GRAND TOTAL:				\$376,192

ATTACHMENT "B"

CONSULTANT WORK ORDER – CITY DELIVERABLES
MSWRF Sulfuric Acid Testing
26-0011-UT

Black & Veatch

City of Clearwater

CONSULTANT WORK ORDER

CITY DELIVERABLES

1. FORMAT:

The design plans shall be compiled utilizing the following methods:

1. City of Clearwater CAD standards.
2. Datum: Horizontal and Vertical datum shall be referenced to North American Vertical Datum of 1988 (vertical) and North American Datum of 1983/90 (horizontal). The unit of measurement shall be the United States Foot. Any deviation from this datum will not be accepted unless reviewed by City of Clearwater, Public Works Department, Geographic Technology Division.

2. DELIVERABLES:

The design plans shall be produced on bond material, 24" x 36" at a scale of 1" = 20' unless approved otherwise. Upon completion the Consultant shall deliver all drawing files in digital format with all project data in Autodesk Civil 3D® file format.

NOTE: If approved deviation from Clearwater CAD standards is used, the Consultant shall include all necessary information to aid in manipulating the drawings including either .pcp, .ctb file or pen schedule for plotting. The drawing file shall include only authorized fonts, shapes, line types or other attributes contained in the standard release of Autodesk software. All block references and other references contained within the drawing file shall be included. Please address any questions regarding format to Mr. Kyle Vaughan, at (727) 444-8232 or email address Kyle.Vaughan@myClearwater.com.

All electronic files (including CAD and Specification files) must be delivered upon completion of project or with 100% plan submittal to City of Clearwater.

CITY OF CLEARWATER, FLORIDA

Countersigned:

Bruce Rector
Mayor

Date: _____

Approved as to form:

Matthew Mytych
Sr. Assistant City Attorney

Date: _____

Attest:

Print Name: _____

Secretary

By: _____
Jennifer Poirrier
City Manager

Date: _____

Attest:

Rosemarie Call
City Clerk

Date: _____

Black & Veatch Corporation

By: KAA

Print Name: Kent Lackey, PE

Title: Senior Vice President

Date: 06/25/2026