



**CITY OF POMPANO BEACH**  
 100 W Atlantic Blvd, Pompano Beach, FL 33060

<p><b>WORK AUTHORIZATION NO: 26</b></p>	<p><b>COPBFL Project Manager:</b>  <b>Phone:</b> 954-786-5504  <b>Email:</b> Randolph.brown@copbfl.com  <b>COPBFL Contract Specialist: Antonio Pucci</b>  <b>Phone:</b> 954-786-5574  <b>Email:</b> Antonio.Pucci@copbfl.com</p>
<p><b>Firm Name: Carollo Engineers, Inc., Inc.</b>  <b>Address: 2728N University Dr, Bldg. 2700</b>  <b>City/State/Zip: Coral Springs, FL 33065</b></p>	<p><b>Firm's Contact Representative: Liz Fujikawa</b>  <b>Phone:</b> 954.837.0030  <b>Email:</b> efujikawa@carollo.com</p>
<p>In accordance with solicitation number <u>RLI-E-23-20</u> , Ordinance number <u>ORD.NO. 2021-39</u> dated <u>February 23, 2021</u> for the City of Pompano Beach hereby directs the firm to perform the services for the project as detailed in the attached scope of work, attached hereto and made a part of this Work Authorization for the amount specified below.</p> <p>All terms and conditions of the Original Contract dated <u>February 23, 2021</u> approved via Ordinance No. <u>ORD. NO. 2021-39</u> remain unchanged and in full force and effect and shall govern the work described herein to its completion, independent of the Original Contract's effective termination date.</p>	
<p><b>Description:</b>          The City has requested Carollo Engineers, Inc. (Consultant) to prepare an update of the Water Master Plan that is consistent with the Water Supply Facilities Work Plan (WSFWP) 2025 Update and the most current Lower East Coast (LEC) plan published by the South Florida Water Management District (SFWMD). The Master Plan will be completed for a 20-year period, with considerations of an ultimate scenario beyond the 20-year horizon that is consistent with the projection methodology used for the most recent Consumptive Use Permit (CUP) renewal. The Water Master Plan will use the new water demand projections that will be determined in WSFWP 2025 Update under a separate work assignment.          The Water Master Plan will include the following planning periods: existing/immediate (2025), 2030, 2040, and ultimate/build out. The Water Master Plan will also include an update of the desktop assessment for the remaining useful life of pipelines to establish a risk-based replacement schedule for the distribution system pipelines. The water treatment component of the Water Master Plan will include a condition assessment of major assets of the plants, a compilation of the recommendations (by others) of treatment options to address regulatory requirements, an analysis of plant capacity vs. projected demand, and a planning level evaluation of the renewal and replacement (R&amp;R) needs of the existing treatment facilities based on operational, regulatory, and capacity limitations to the extent major assets are expected to remain in operation in the short term. The consultant will suggest CIP projects with the objectives of sustaining level of service and projected demands. Consultant will also compile CIP projects proposed by others as deemed applicable by the City to optimize treatment capacity and to prepare for future regulatory compliance requirements.</p>	
<p><b>Total Work Authorization Amount: \$284,928.08</b></p>	
<p>CIP/Account No. (For City's internal use):</p>	

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed the day and year hereinabove written.

Attest:

**CITY OF POMPANO BEACH**

\_\_\_\_\_  
KERVIN ALFRED, CITY CLERK

By: \_\_\_\_\_  
REX HARDIN, MAYOR

APPROVED AS TO FORM:

By: \_\_\_\_\_  
GREGORY P. HARRISON, CITY MANAGER

\_\_\_\_\_  
MARK E. BERMAN, CITY ATTORNEY

(SEAL)

“CONSULTANT”

Carollo Engineers, Inc.  
(Print or type name of company here)

Witnesses:

Jose Ainsel Lopez  
JOSE A. ROJAS

(Print or Type Name)

Vanessa

Vanessa Negran Vieira  
(Print or Type Name)

By: Laura Baumberger

Print Name: Laura Baumberger

Title: Senior Vice President

Business License No. \_\_\_\_\_

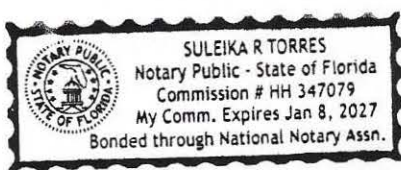
STATE OF FLORIDA

COUNTY OF HILLSBOROUGH

The foregoing instrument was acknowledged before, by means of  physical presence or  online notarization, me this 8 day of May, 2024, by Laura Baumberger as Senior Vice President of Carollo Engineers, Inc., a Florida corporation on behalf of the corporation. He/she is personally known to me.

Suleika R Torres  
NOTARY PUBLIC, STATE OF FLORIDA

NOTARY’S SEAL:



Suleika R Torres  
(Name of Acknowledger Typed, Printed or Stamped)

HH 347079  
Commission Number

Scope of Work  
City of Pompano Beach  
Water Master Plan Update  
Planning Services  
March 29, 2024

## PROJECT DESCRIPTION

The City of Pompano Beach (City) has requested to Carollo Engineers, Inc. (Consultant) to prepare an update of the 2020 Water Master Plan that is consistent with the Water Supply Facilities Work Plan (WSFWP) 2025 Update and the most current Lower East Coast (LEC) plan published by the South Florida Water Management District (SFWMD). The Master Plan will be completed for a 20-year period, with considerations of an ultimate scenario beyond the 20-year horizon that is consistent with the projection methodology used for the most recent Consumptive Use Permit (CUP) renewal. The Water Master Plan will use the new water demand projections that will be determined in WSFWP 2025 Update under a separate work assignment.

The Water Master Plan will include the following planning periods: existing/immediate (2025), 2030, 2040, and ultimate/build out. The Water Master Plan will also include an update of the desktop assessment for the remaining useful life of pipelines to establish a risk-based replacement schedule for the distribution system pipelines. The water treatment component of the Water Master Plan will include a condition assessment of major assets of the plants, analysis of treatment capacity vs. projected demand, and a planning level evaluation of the renewal and replacement (R&R) needs of the existing treatment facilities based on operational, regulatory, and capacity limitations. Consultant will suggest Capital Improvement Plan (CIP) projects with the objectives of optimizing treatment capacity, preparing for future regulatory compliance requirements, reducing operating costs, and enhancing the reliability of treatment and operations through a repair and replacement program.

## SCOPE OF WORK

### Task 1: Project Management and Meetings

#### Subtask 1.1 - Project Management and Communication

Consultant will provide overall project management and communication between its staff and the City staff or its delegates, as needed. Consultant will track and manage the budget, project tasks, and schedule.

Consultant will provide monthly progress summaries that will include itemized listings of work completed and work that will be anticipated in the upcoming month. These summaries will be delivered in the form of a letter that will accompany the monthly progress payment request.

#### Subtask 1.2 - Project Kickoff and Progress Meetings

Consultant will facilitate a Project Kickoff Meeting to review the project tasks, schedule, lines of communication, and quality management procedures. The Kickoff Meeting will also be a working meeting to

discuss project needs, efficient and effective data collection approaches, and other items necessary to quickly begin the project.

Consultant will schedule progress meetings with City staff to keep staff informed of the project status, discuss upcoming tasks and deliverables, and to address issues relating to the project. It is estimated that the project will require, in addition to a kickoff meeting, two (2) modeling/operations workshops, two (2) progress meetings or field visits, one (1) preliminary results meeting, and a final meeting. These meetings will be combined with the deliverable review meetings when possible. The agenda, meeting materials, meeting minutes, and action/decision logs for each meeting will be prepared by Consultant and distributed to all project team members. Other coordination outside of progress meetings may be conducted over Teams calls, which may be regularly scheduled between the Consultant project manager and City project manager.

#### Task 1 Deliverables

- » *Meeting agenda and minutes (electronic)*
- » *Progress summary letters with invoice*
- » *Overall project updates at progress meetings*

#### **Task 2: Quality Management**

Consultant's project manager will coordinate quality control and quality assurance review of the project including data sourcing and processing, assumptions, and evaluations, and transferring of newly updated information into the project deliverables. Quality assurance and quality control (QA/QC) will be thorough on all deliverables to ensure they meet standards and contract requirements. QA/QC in reference to the potable water distribution system will be performed by a senior infrastructure master planning engineer, while QA/QC in reference to the water treatment plant will be performed by a senior process design engineer. In addition, deliverables will be thoroughly checked by the Senior Professional.

#### **Task 3: Planning Framework / Data Collection and Analysis**

Task 3 involves gathering of data and past reports necessary for execution of the project and will result in an overall planning framework for the Water Master Plan throughout the planning horizon of 2045. The planning framework consists of population projections and water demands, as well as diurnal patterns, peaking factors, and the criteria that will be used to evaluate the adequacy of system infrastructure. The Consultant will use the population and demand projections determined in the WSFWP 2025 Update, developed under a separate work authorization. Geographic distribution of the population and water demands in the model will be based on water billing data, traffic analysis zones (TAZ), and/or planned new developments (for future scenarios), as applicable and available from the City. Specific items included in Task 3 are detailed in the subtasks described below.

##### **Subtask 3.1 – Data and Past Studies Gathering**

Carollo will develop a comprehensive list of data and reports from past studies that will be requested from the City. Data sources may include but are not limited to:

- Reports or summaries of past studies that contain recommendations that they City may want to carry forward in the Water Master Plan and recommended CIP.
- Land use and zoning maps.
- Current and near term allocated service commitments and utility service agreements.
- Permits and historical Water Treatment Plant (WTP) monthly operating reports (MORs).
- Three last years of monthly water consumption data from billing records by account/parcel, meter type, and meter size.
- Hourly consumption data (volume, not revenue) for one dry month and one wet month from as many representative meters as practical from each meter type.
- Updated graphic information system (GIS) data (service area, pipelines, pumping facilities, parcels, water meters, hydrants, record of pipe breaks/failures, record of work order request, Insurance Services Office, Inc. (ISO) requirements map, etc.).
- If recently updated: WTP drawings or improvement project memorandums, high service pump station (HSPS) pump curves, HSPS standard operating procedure (SOP), record drawings, latest ISO compliance report and City Infrastructure performance criteria.

Where record information does not exist, Carollo will work with the City to agree upon the most reasonable assumptions possible to maintain progress on the project. Additional data may be requested as needed. The Consultant will coordinate with City staff to obtain these documents. Communication will be by phone calls, meetings, and emails with the City Project Manager.

#### Subtask 3.2 - Water Distribution System Planning Framework

For the Water Master Plan, the Consultant will use the population and demand projections determined in the WSFWP 2025 Update, consistent with regulatory requirements.

Consultant will also use historical Supervisory Control and Data Acquisition (SCADA) system output reports from the water treatment facilities from the last meter replacement program until April 2024 to develop maximum month, maximum day, and peak hour factors that will be used to evaluate various demand conditions. Diurnal demand patterns will also be developed using consumption data by land use from billing/metering data.

#### Subtask 3.3 – Review of Past Studies of Water Treatment Plant Operational Performance and Characterization

The Consultant will request and compile WTP performance data from recent, available past studies for the Consultant's use in complementing the assessments by others that will be compiled into projects in Task 7. In the case that the requested information is not available from past studies, the Consultant will request MOR data for either the past five (5) years, or for the period between when WTP meters were last replaced and now, whichever is longer. The data will be used to establish a baseline of performance for the plant, if not available or not complete for all processes from past studies. Data to be compiled includes finished water pH, turbidity, TOC, color, disinfection by-products, alkalinity, and other parameters as appropriate. Softened and

membrane treated water will be characterized by flow/recovery, pH, and alkalinity. Data provided to the Consultant from City shall be in an editable electronic format (Excel). 7.

This effort will not include characterization of raw water or evaluation of water supply facilities since both topics are part of the scope of the WSFWP, developed under a separate work authorization.

The Consultant will also request access to review asset management records (i.e., work orders or past failures) to identify assets with an important probability of failure within the plant.

### Task 3 Deliverables

- » *Data Request List with sources, comments, and updates.*
- » *Presentation with Water Distribution System Planning Framework (to be scheduled at the same time or after presentation of preliminary demand projection results for the WSFWP 2024 Update project, completed as part of a separate work authorization)*
- » *Presentation of Findings from WTP Performance Data Compilation*

### **Task 4: Hydraulic Model Update, Calibration, Scenario Development, and Performance Assessments**

Consultant will update the City's potable water model to reflect most recent GIS, perform a complete calibration of flow, pressure, and fire flow as required by the City Fire Marshall; replace the previously developed scenarios with the updated infrastructure and new demand distribution, and updated diurnal patterns. Consultant will also create an ultimate buildout scenario that is consistent with the planning horizon presented as part of the recent CUP renewal. System evaluations and analyses will be conducted for each scenario. Recommendations resulting from the performance assessments will be provided.

#### **Subtask 4.1 – Water Model Update**

The existing InfoWater model will be updated to include all existing pipes using GIS databases obtained from the City. Connectivity, elevation, and gap analyses will be performed. Water consumption at each served meter will be extracted from the billing database and allocated to the appropriate junctions in the water model. When a parcel with a meter does not have a model junction in the vicinity, the respective water demand will be assigned to the closest pipe downstream of the served parcel (service lines/laterals will not be included in the model). Diurnal consumption patterns by meter type that were derived under Subtask 3 will be entered along with allocated demands. The diurnal patterns assigned will be consistent with the land use shown in GIS layers.

Water demands allocated to master meters will be assessed individually to determine if demand is consistent with the use and size of the parcels/community/business served. Any areas of the City Service Area that remain with little to no allocation will be brought to the City's attention for validation.

#### **Subtask 4.2 – Water Model Calibration**

Using SCADA data currently collected by the City from the water distribution system at defined locations (select fire hydrants, pressure transducers, and plant meters to distribution), consultant will calibrate the

model. Other data useful to obtain a high confidence calibration include the high service pumps speeds, runtimes, and individual flows; and storage tank in/out flow and levels. Availability of these data in the frequency/intervals/formats required will be evaluated with the City prior to establishing a calibration period and duration.

There will exist two calibration scenarios in the model:

- Base Calibration Scenario, and
- Fire Flow Calibration Scenario.

The updated and calibrated water model will serve as the parent of all other scenarios, therefore will be the basis for the assessments of the water distribution system. The Fire Flow Calibration Scenario will be developed at maximum day demand conditions and will be used to issue fire flow availability reports for ISO compliance and Fire Marshall records.

#### Subtask 4.3 – Existing Water System Scenario Development and Performance Evaluations

Once the model's accuracy has been established through the calibration results, a Existing Average Daily Demand (ADD) scenario will be created that will be used to evaluate the existing distribution system in terms of capacity, pressure, and water age. This evaluation will set up a baseline condition for ADD.

A Existing Maximum Day Demand (MDD) Scenario will be created from the Fire Flow Calibration Scenario. This Existing MDD Scenario will be evaluated to assess the ability to meet maximum day and peak hour (maximum hour within a maximum day) demands as well as required fire flow.

#### Subtask 4.4 – Future Water System Scenario Development and Performance Evaluations

The Existing AAD and Existing MDD scenarios will be cloned to create model scenarios for 2030, 2040, and ultimate build-out (consistently with CUP renewal). These new future scenarios would be set up to simulate ADD, MDD plus fire flow, and peak hour demand (results of MMD at peak hour) system conditions under future demands. Demand projections developed as part of the SWFWP under a separate work assignment will be used in this task: projected demand will be allocated to the model junctions in different future scenarios (2030, 2040, ultimate build out) consistently with TAZ or Census projections (developed by the Bureau of Economics and Business research -BEBR- and the US Census Bureau, respectively) and institutional knowledge of staff from City Planning and Utilities Departments.

The different scenarios will be run and evaluated, and the need for variation in the standard operation of high service pumps and tanks to meet future demands will be established. The scenario envisioned is as follows:

- Base Calibration Scenario
  - » *Existing AAD*
    - 2030 AAD
    - 2040 AAD
    - Ultimate Buildout ADD
- Fire Flow Calibration Scenario





» *Existing MMD*

- 2030 MDD + FF
- 2040 MDD + FF
- Build Out MDD + FF
- Existing PHF (results of Existing MMD at peak hour)
- 2030 PHF (results of 2030 MMD at peak hour)
- 2040 PHF (results of 2040 MMD at peak hour)
- Build Out PHF (results of Build Out MMD at peak hour)

The water distribution system performance evaluations include:

- Assessment of the existing and future distribution and transmission pipelines versus City and typical municipal standards (velocity, pressure).
- Desktop-based identification of restrictions in distribution system such as at canal crossings, high head losses, etc.
- A desktop evaluation of system redundancy/vulnerability based on pipe break simulation.
- Evaluation of water age and identification of alternative projects to decrease water age in affected areas.
- Brief analysis of the opportunity for optimization of system pressures and energy consumption.
- Ability to and impacts of serving the City through interconnects with neighboring utilities in the event of an emergency.
- Assessment of fire flow availability.

Task 4 Deliverables

- » *Updated and Calibrated Potable Water Hydraulic Model*
- » *Presentation of Update and Calibration Results*
- » *Presentation of Preliminary Existing Distribution System Evaluation Results for City comment and input (may be combined with the above)*

**Task 5 – Potable Water Pipeline Replacement Assessment**

Carollo will use the 2020 desktop evaluation of the water distribution system assets to update the baseline age- and material-based replacement profile of the system. From there, the Consultant will collaborate with the City to identify critical assets and those of key concern. The Consultant will review any available condition assessment data, and records of inspection, maintenance, breaks, and repairs to produce estimated remaining useful life projections of the water distribution system assets (pipelines, pump station and storage assets). The Consultant will do a site visit to perform a visual condition assessment of critical or key assets, including storage and pumping facilities, and aerial crossings. It is assumed that City staff will provide support and access to the facilities in the field. This subtask does not include condition assessment of water treatment facilities (which is included in Task 7).

Consultant will use the updated desktop analysis results and field condition assessments as the primary basis for scoring probability of failure (POF). The consequence of failure (COF), which has not yet been established for the potable water distribution system as part of a Master Plan, will be scored using a CIP prioritization scoring criteria that will be developed with City participation during a progress meeting/workshop. Using the POF and COF scores, a Business Risk Exposure (BRE) factor will be assigned. The BRE will be used to develop the risk based prioritized CIP. For the critical infrastructure with non-favorable BRE, alternative critical infrastructure will be identified and evaluated. Selected alternatives will be incorporated in the proposed CIP.

#### Task 5 Deliverables

- » *Presentation Preliminary Results – including POF and COF matrices and scores for City comment and input. Evaluation of alternative critical infrastructure.*

#### **Task 6: Storage Capacity Analysis**

Consultant will complete a regulatory storage volume assessment for each planning period (Existing, 2030, 2040, and ultimate build out) to determine adequacy of finished water storage based on current infrastructure capacity and the updated demand projections. Recommendations will be provided if additional storage capacity for either emergency, fire flow, or operational conditions is required.

#### Task 6 Deliverables

- » *Results of Storage Capacity Analysis to be included as part of Task 4 Presentation (Preliminary Existing Distribution System Evaluation Results for City comment and input)*

#### **Task 7: Water Treatment Plants Performance and Condition Assessments**

Consultant will review and adopt all deliverables produced by others in the “Emerging Contaminants Water Treatment Plant Upgrades – Drinking Water State Revolving Fund Planning Document”, also referred to as the “PFAS Study”, currently being completed by others.. Limiting factors as related to capacity and condition will be established through this Master Plan Update by Consultant. The baseline compiled in Subtask 3.3 and information gathered during condition assessment visits will be used to perform the capacity and condition evaluations. Planning level improvement recommendations that are consistent with the recommendations of the PFAS Study performed by others will be issued. The water supply component will not be evaluated, since a WSFWP 2025 Update is being developed concurrently under a separate work assignment.

##### **Subtask 7.1 – Inclusion of WTPs Process Performance Evaluation and Cost Estimates by Others**

Consultant will adopt treatment facility performance assessments and recommendations by others. As part of this work, Consultant will provide summaries of the following: sections of the “Emerging Contaminants Water Treatment Plant Upgrades – Drinking Water State Revolving Fund Planning Document”:

- Definition of treatment goals
- Evaluation of existing treatment process

- Alternative treatment technologies, necessary improvements for implementation, and conceptual-level layouts
- Capital and operating costs for each identified alternative

Potential planning level improvement/modification projects at the facilities identified by others will be included and programmed by the Consultant into the near-term (2030) or long-term (2040) CIP based on their relative importance to the City. Relative importance to the City will be discussed with staff during a progress meeting.

#### Subtask 7.2 – WTPs Long-Range Capacity Assessment

Evaluations of process capacity with respect to demand projections will be performed by the Consultant. The objective will be to establish the total firm and redundant capacity needed to sustain demand in the long term. Projects recommended by others that modify the plant capacity will be initially evaluated vs. the projected capacity requirement of a 20-year planning horizon. However, because the City's Consumptive Use Permit (CUP) addresses a long-range period (through 2065), overall process capacity will also be evaluated beyond the 20-year period. A specific demand that would trigger the exhaustion of firm capacity (or process redundancy) will be identified. Potential planning level recommendations for expansion beyond the 20-year horizon, if needed, will be provided but will not be reflected in the CIP.

#### Subtask 7.3 – WTPs Condition Assessment

The purpose of this subtask is to determine the condition and functionality of the existing facilities including major structures, major electrical components such as motor control centers (MCCs), variable frequency drives (VFD), and programmable logic controllers (PLCs); emergency power system and heating, ventilating, and air-conditioning (HVAC); and mechanical components such as major valves, major pumps, and chemical feed systems. Deficiencies will be noted for areas where such deficiencies may adversely impact treatment process performance, capacity, and remaining useful life. The evaluation will be performed using a numerical criterion that will cover condition and functionality.

For facilities that are planned to be decommissioned or phased out by the City within the next 5-year period per recommendation of the PFAS Study by others, condition will still be addressed by the Consultant. However, only projects to sustain operation and maintenance at an adequate level of service through decommission or phase-out will be identified and recommended. For facilities that are planned for decommission within a 10-year period, regular capital and R&R projects resulting from condition assessment will be identified, recommended, and scheduled within the 10-year CIP.

It is assumed that the City will provide an asset tree with the major assets classified under one of the process/mechanical, electrical, or structural groups listed above. Subject to the above considerations, the following activities will be completed during this subtask:

- Review structural condition of water-bearing structures and main process buildings.
- Review chemical feed and storage systems condition and capacities.

- Inspect and establish capacity of electric power supply and distribution systems such as main switchgear, motor control centers, and transformers.
- Review the condition and functionality of both treatment process and non-process major mechanical equipment (i.e., HVAC, plumbing, and fire suppression systems). This work effort will generally be limited to assets with an approximate monetary value of \$10,000 or greater.
- Assess the criticality and vulnerability of major plant components as it relates to the impact on treatment, plant reliability, pumping, and meeting the City's established level of service in the event of partial or complete failure of that component (asset).
- Develop planning level cost estimates for rehabilitation, repair, and replacement items determined from the facilities evaluation and condition assessment.

In Task 8, This information will be used in conjunction with recommendations for process modifications related to facility improvement and expansion contained in the PFAS Study by others, and with recommendations for the water distribution, pumping, and storage systems, to develop a prioritized CIP.

#### Task 7 Deliverables

- » *Summary of Facility Projects and Costs by others for City approval for inclusion in the Water Master Plan.*
- » *Presentation of Results of Long-Range Capacity and Condition Assessments for City input and comment.*

#### **Task 8 – CIP Development**

City-selected recommendations resulting from review of past studies by others and the analyses in Task 4 through Task 7 will be scheduled in order of priority. Priority will be assigned to transmission and distribution capital projects based on risk level, potential improvement in customer level of service, and/or potential operational cost savings or efficiencies.

Planning level cost estimates (Level 5) will be calculated for projects for which the City does not already have a budget. The cost development methodology will be discussed with the City at a progress meeting for consensus and City staff input. The City will provide its current water CIP and its recent Rate Study, which will be contrasted against projects compiled from past studies or proposed as part of the Consultant's analyses.

Projects in the resulting CIP will be classified into short-term (projects to complete in each of the first 5 years), medium-term (projects to complete in each of years 6 through 10), and long-term (projects to complete between year 11 and 20). Total capital expenditures of proposed and existing projects will be totaled per year for years 1 through 10, and capital expenditures will be shown as an aggregated amount for years 10 to 20. No cost escalation will be included. Projects identified beyond the 20-year will be listed but not included in the CIP, nor their cost estimated.

#### Task 8 Deliverables

- » *Presentation of Preliminary CIP Projects and Cost Estimating Methodology.*



## Task 9: Water Master Plan Update Report

The Consultant will prepare the Draft Water Master Plan 2025 Update Report based on information obtained during all previous tasks. The anticipated content of the report will be as follows:

- Table of Contents and Abbreviations
- Executive Summary
- Chapter 1 – Introduction
- Chapter 2 – Service Area and Facilities Overview
- Chapter 3 – Planning Framework
- Chapter 4 – Hydraulic Model Update and Calibration
- Chapter 5 – Water Distribution System Assessments and Scenario Analysis
- Chapter 6 – Potable Water Pipeline Replacement Assessment
- Chapter 7 – Storage and Pump Station Capacity Analysis
- Chapter 8 – Water Treatment Facilities Assessments
- Chapter 9 – CIP Development
- Chapter 10 – Summary and Conclusions
- Appendices

The Draft Water Master Plan 2025 Update Report will be provided to City staff for review and comment. The Consultant will attend a progress meeting to review comments.

The Consultant will incorporate the City's comments into the Water Master Plan 2025 Update report, at which point the final version of the WSFWP will be issued for approval and adoption.

### Task 9 Deliverables

- » *Draft Water Master Plan 2025 Update Report (electronic pdf)*
- » *Final WSFWP 2025 Update Report (electronic pdf, Five (5) Hard Copies)*

## PROJECT SCHEDULE

The contract's start date will be the day of the approval of the Task Authorization. The following table summarizes the proposed project schedule and constraints/dependencies. Although kickoff meeting and data collection will be started promptly after Task Authorization approval, Tasks 3 through 9 are expected to start advancing after week 8, based on the timing in which water demand projections (to be developed for the WSFWP 2025 Update project under a separate work authorization) will be available. Work related to WTP assessments may be completed in parallel or after distribution system analyses upon City request.



Milestone/Deliverable	Approx. No. of weeks after approval of Work Assignment
Kickoff Meeting and Start of Data Collection	1
City to Complete Data and Past Studies Collection	3
Task 3	
» <i>Data Request List Review by Carollo Completed</i>	4
» <i>Presentation with Water Distribution System Planning Framework (to be scheduled at the same time or after presentation of preliminary demand projection results for the WSFWP 2025 Update project, completed as part of a separate work authorization)</i>	8
» <i>Presentation of Findings from WTP Performance Data Compilation</i>	12
Task 4	
» <i>Updated and Calibrated Potable Water Hydraulic Model</i>	16
» <i>Presentation of Update and Calibration Results</i>	16
» <i>Presentation of Preliminary Existing Distribution System Evaluation Results for City comment and input (may be combined with the above)</i>	22
Task 5	
» <i>Presentation Preliminary Results – including POF and COF matrices and scores for City comment and input</i>	22
Task 6	
» <i>Results of Storage Capacity Analysis to be included as part of Task 4 Presentation</i>	22
Task 7	
» <i>Summary of Facility Projects and Cost by others for City approval for inclusion in the Water Master Plan</i>	16-18
» <i>Presentation of Results of Long-Range Capacity and Condition Assessments for City input and comment.</i>	18-20
Task 8	
» <i>Presentation of Preliminary CIP Projects and Cost Estimating Methodology.</i>	26
Task 9	
» <i>Draft Water Master Plan 2025 Update Report (electronic pdf)</i>	» 30
• Review by City (3 weeks)	• 33
» <i>Final Water Master Plan 2025 Update Report (electronic pdf)</i>	» 35

## COMPENSATION

We propose to conduct the requested work for the total lump sum fee of \$284,928.08. Breakdown by task is presented in the table below. Attachment A provides the level of effort estimated for each task and subtask.

Payment will be billed to the City based on Ordinance 2021-39 for Consulting/Professional Services between the City and Consultant for Continuing Contract for Engineering Services.

Task	Fee
Task 1: Project Management and Coordination	\$32,538.08
Task 2: Quality Management	\$19,608.00
Task 3: Planning Framework/Data Collection and Analysis	\$16,544.00
Task 4: Hydraulic Model Update, Calibration, Scenario Development, and Performance Assessments	\$61,304.00
Task 5: Potable Water Pipeline Replacement Assessment	\$21,632.00
Task 6: Storage Capacity Analysis	\$6,712.00
Task 7: Water Treatment Plants Capacity, Performance, and Condition Assessments	\$49,562.00
Task 8: CIP Development	\$32,100.00
Task 9: Water Master Plan Update Report	\$44,928.00
Total	\$284,928.08

Reimbursables are included in the above totals, and will be billed as follows:

- Project equipment, communication technology, and printing expenses (PECE) are to be reimbursed at \$14.00/hour.

# ATTACHMENT A

Water Master Plan 2025 Update

TASK NO.	Senior Professional	Lead Project Professional	Project Professional	Lead Project Professional	Project Professional	Assistant Professional (Plants)	Assistant Professional (Distribution)	Assistant Professional (Mechanical)	Project Professional (HVAC)	Project Professional (Structural)	Project Professional (Electrical & I&C)	Senior Technician (GIS)	Document Processing	Total Hours	Total Labor	Reimbursables (\$0.54/Mile)	PECE	Total Compensation
	Hourly Rates (Ordinance No. 2021-39)																	
	\$298	\$289	\$272	\$289	\$272	\$160	\$160	\$160	\$272	\$272	\$272	\$116	\$125			\$0.54	\$14	
<b>Task 1: Project Management and Coordination</b>																		
1.1 Project Management and Communication			32											32	\$8,704		\$448	\$9,152.00
1.2 Project Kickoff and Progress Meetings	4		28	8	8	12	28							88	\$19,696	\$2,458	\$1,232	\$23,386.08
														120	\$28,400	\$2,458	\$1,680	\$32,538.08
<b>Task 2: Quality Management</b>	24	20		20										64	\$18,712		\$896	\$19,608.00
														64	\$18,712		\$996	\$19,608.00
<b>Task 3: Planning Framework/Data Collection and Analysis</b>																		
3.1 Data Gathering						8	24							32	\$5,120		\$448	\$5,568.00
3.2 Water Distribution System Planning Framework			8				24							32	\$6,016		\$448	\$6,464.00
3.3 Review of Past Studies of Water Treatment Plant Operational Performance and				8		12								20	\$4,232		\$280	\$4,512.00
														84	\$15,368		\$1,176	\$16,544.00
<b>Task 4: Hydraulic Model Update, Calibration, Scenario Development, and Performance Assessments</b>																		
4.1 Water Model Update			4				32					16		52	\$8,064		\$728	\$8,792.00
4.2 Water Model Calibration (flow, pressure, fire flow)			32				60							92	\$18,304		\$1,288	\$19,592.00
4.3 Existing Water System Scenario Development and Performance Evaluations			32				42							74	\$15,424		\$1,036	\$16,460.00
4.4 Future Water System Scenario Development and Performance Evaluations			32				42							74	\$15,424		\$1,036	\$16,460.00
														292	\$57,216		\$4,088	\$61,304.00
<b>Task 5: Potable Water Pipeline Replacement Assessment</b>			8		36	20	32							96	\$20,288		\$1,344	\$21,632.00
														96	\$20,288		\$1,344	\$21,632.00
<b>Task 6: Storage Capacity Analysis</b>			4			24	8							36	\$6,208		\$504	\$6,712.00
														36	\$6,208		\$504	\$6,712.00
<b>Task 7: Water Treatment Plants Capacity, Performance (by others), and Condition Assessments</b>																		
7.1 Inclusion of WTPs Process Performance Evaluation and Cost Estimates by Others	2			8		12								22	\$4,828		\$308	\$5,136.00
7.2 WTPs Long Range Capacity Assessment		2		12		12								26	\$5,966		\$364	\$6,330.00
7.3 WTPs Condition Assessment	2			16	32	40		16	16	16	16			154	\$35,940		\$2,156	\$38,096.00
														202	\$46,734		\$2,828	\$49,562.00
<b>Task 8: CIP Development</b>																		
8.1 CIP Development			12	16	24	20	30	8	8	8	8			134	\$30,224		\$1,876	\$32,100.00
														134	\$30,224		\$1,876	\$32,100.00
<b>Task 9: Water Master Plan Update Report</b>																		
9.1 Draft Water Master Plan Report			16	8	8	32	68	4	4	4	4		40	188	\$33,744		\$2,632	\$36,376.00
9.2 Final Master Plan Report			8			12	24							44	\$7,936		\$616	\$8,552.00
														232	\$41,680		\$3,248	\$44,928.00
<b>Subtotal Hours</b>	<b>32</b>	<b>22</b>	<b>216</b>	<b>95</b>	<b>108</b>	<b>204</b>	<b>414</b>	<b>28</b>	<b>28</b>	<b>28</b>	<b>28</b>	<b>16</b>	<b>40</b>	<b>1260</b>				
<b>Subtotal Fee</b>	<b>\$9,536</b>	<b>\$6,358</b>	<b>\$58,752</b>	<b>\$27,744</b>	<b>\$29,376</b>	<b>\$32,640</b>	<b>\$66,240</b>	<b>\$4,480</b>	<b>\$7,616</b>	<b>\$7,616</b>	<b>\$7,616</b>	<b>\$1,856</b>	<b>\$5,000</b>		<b>\$264,830</b>	<b>\$2,458.08</b>	<b>\$17,640</b>	<b>\$284,928.08</b>