



March 14, 2018

Ms. Shannon Ponitz, P.E.
Utilities Engineering Manager
City of Daytona Beach
Utilities Department
125 Basin Street
Daytona Beach, FL 32114

**Subject: Scope of Services for a Twenty-Year Water Master Plan
Contract No. 0517-3440-TT
Work Authorization No. 1 in the Amount of \$162,016.11**

Tt # 200BP Daytona Beach

Dear Ms. Ponitz:

Tetra Tech is pleased to provide this scope of services for professional services for a Twenty Year Water Master Plan. The Scope of Services is provided in Attachment A which includes a project schedule and details on compensation.

If this Scope of Services is acceptable to you, please issue a Purchase Order to Tetra Tech under Continuing Professional Services Contract 0517-3440-TT Work Authorization No. 1 in the amount NOT TO EXCEED \$162,016.11. This quote is effective for 90 days.

As always, we appreciate this opportunity to provide services to the City. Should you have any questions, you can reach me via e-mail or cell phone (407) 353-3714.

Sincerely,

Tetra Tech

A handwritten signature in blue ink, appearing to read 'Andrew T. Woodcock', written over a white background.

Andrew T. Woodcock, P.E., M.B.A.
Senior Project Manager

Attachments

ATW/ab/BP DB/Water MP/Ponitz 031418

C: Nichole Lloyd, PE
Anke Backer, Tetra Tech

ATTACHMENT A

SCOPE OF SERVICES

CITY OF DAYTONA BEACH, FLORIDA 20-YEAR WATER SYSTEM MASTER PLAN

I. PROJECT BACKGROUND

The City of Daytona Beach's (City) last Water Master Plan was completed in 2006. The plan analyzed the then existing system, developed 20-year water demand projections, and utilized a hydraulic model to assist in identifying capital improvements to meet growth in the system. Since that time the water system has been impacted by numerous factors including reduced growth from the 2008 recession, the subsequent rebounding growth, new development patterns and changes in the water supply.

At this time the City desires a new Master Plan that evaluates the existing system, updates demand projections using BEBR and other growth assumptions and develops a capital improvement program to address future water demands.

II. PHASE 1 – PROJECTIONS/EXISTING SYSTEMS

The Projections/Existing System Phase will describe and evaluate the existing systems, and identify the quantity of service projected at the five (5), ten (10), fifteen (15) and twenty (20) year planning horizons.

1.01 Project Kickoff Meeting. A kickoff meeting will be held within two weeks of award to introduce the team members on both the City and Tetra Tech's (TT) side, identify points of contact, and define roles and responsibilities. Prior to the meeting TT will prepare a data request for information not already provided but necessary for the project. The status of the data request will be discussed at the kick off meeting as well as the project schedule.

1.02 Project Status Meetings. TT will provide progress reports to the City on a monthly basis in conjunction with monthly invoices. TT will meet with the designated City staff every month to update the City on the status of the project. At a minimum, the TT project manager will attend the meeting with additional TT staff, as necessary, depending on the focus of the activities for the period. TT will prepare the meeting agenda and sign in sheet for all meetings and provide a summary of the meeting minutes within one week. At a minimum, the status meeting agenda will include:

- Status of work completed to date.
- Key findings.
- Work anticipated for the upcoming month.
- Problems/obstacles identified during the reporting period.
- Outstanding Issues.

- Review of the project schedule.

1.03 Data Collection. TT will collect, coordinate and organize data and various documents to develop the background information needed for the planning effort. To the extent TT has already received this data in conjunction with other projects, additional copies will not be necessary. Data sources are expected to include:

- Minimum five (5) years of monthly operating reports.
- Supervisory Control and Data Acquisition (SCADA) data for the water treatment facility at a minimum of one (1) hour timestamps.
- Operational protocols, reports, and maintenance records.
- Existing Forcemain hydraulic and water quality model.
- Existing geospatial information system (GIS) shapefiles and/or geodatabase of the potable water system and include at a minimum water main diameters and materials.
- Water high service, and booster pump curves.
- Record drawings for recent projects not incorporated in the City's current GIS information.
- Design reports and permitting documents pertaining to water treatment facilities.
- Aerial photographs and tax maps.
- USDA SCS Soils Maps.
- FEMA Flood Maps.
- Comprehensive plans for Daytona Beach and Volusia County.
- Existing and future land use maps for Daytona Beach and Volusia County.
- Current permits associated with the system.
- Potable water customer billing data, identifying each customer's class and meter size, for a minimum period of 12 months.

1.04 Potable Water Projections. TT will rely upon water demand projections developed for the City's Consumptive Use Permit Modification as the basis for the Master Plan. The projections will be adjusted if necessary to reflect any recent changes in development trends in the City.

1.05 Capacity Analysis. TT will review the existing potable water treatment and supply facilities and evaluate the ability of the system to meet the projected demands. The evaluation criteria will be a combination of the requirements of FDEP, SJRWMD, industry standards and other criteria developed uniquely for the City of Daytona Beach.

- 1.06 Regulatory Review.** TT will summarize existing and proposed regulatory requirements that will affect the water system. The regulations will be compared to the current water quality and any deficiencies or concerns will be identified and addressed in the capital program.
- 1.07 Draft Submittal and Review.** TT will prepare a Technical Memorandum that presents the data analysis, maps, and projections and submit four (4) copies of the documents to the City for review and comment. The memorandum will take the form of sections that will ultimately be included in the Master Plans. This review will be used by the City to verify the completeness of the data and maps and to review the projections prior to any planning work.
- 1.08 Review Meeting.** TT will attend a review meeting addressing the draft submittal and will record and distribute meeting minutes of said meeting.
- 1.09 Draft Technical Memorandum Revisions.** TT will incorporate the City's review comments into the maps and projections.

III. PHASE 2 – HYDRAULIC MODELING

- 2.01 Modeling Software Review.** TT will prepare a memorandum to guide the City's decision in determining which hydraulic modeling software would best meet the City's needs. The review will summarize the major modeling software products available in the marketplace, describing the major features of the software and providing a budgetary level cost estimate of a software package that would meet the City's needs.
- 2.02 Data Collection and Hydraulic Model Review.** TT will provide a list of data required for hydraulic modeling that will include (at a minimum) the most recent data listed above in Phase 1.03. TT will compare the existing Forcemain model to construction plans for planned infrastructure, as-builts for storage facilities or the best available information to develop the model. Tetra Tech will conduct a model review workshop with City to examine the Model's water main layout, connectivity, and infrastructure data.
- 2.03 Hydraulic Model Development.** TT will utilize the City's existing Forcemain Model as the basis for new hydraulic model development. The existing model will be converted/imported to the selected modeling platform, including all nodes, links, and demands. It is our understanding that the existing model includes all potable water distribution system piping identified in the City's GIS data including piping recently constructed or currently under construction, which are not included in the City's GIS data. TT will perform quality control activities to check model input such as diameters, elevations, pump curves and controls as proper model inputs.
- 2.04 Demand Development, Allocation and Scenario Management.** TT will develop and allocate historical potable water meter demands to model nodes, using the City potable water meter billing data, to simulate typical flow and pressure throughout the system. Demands will be based on the most recent year of potable water meter records. Allocation will be performed in a simple, fluid process using the demand allocator module.

TT will develop model evaluation criteria based on the City's and engineering and design standards for its systems. TT will create four (4) steady state scenarios and 1 extended period simulation to represent the City's existing system.

1. Average Day Demand (ADD)
2. Maximum Day Demand (MDD)
3. Maximum Day Demand + Fire Flow (MDD+FF)
4. Peak Hour Demand (PHD)
5. Water Age and Chlorine Concentration Analysis.

Model scenarios define the set of input conditions under which model runs are executed (average day, peak hour conditions, etc.). Existing operational procedures and protocols will be determined based on City staff and incorporated into the model to represent the System conditions. City staff will be interviewed to gather specific information used for input into the model including pressure, level and time based controls and control points. The existing operational procedures and protocols will be incorporated into the model via logical controls (as required). The result of these efforts will be a structurally verified model ready for output comparison to field data (calibration).

2.05 *Water Quality Model Calibration.* TT will develop a calibration protocol which will define calibration process to calibrate the water quality model and conduct a pre- and post-calibration meeting with City staff. Water quality sampling data was collected during the original Forcemain water quality model development. This data will be used for calibrating the new hydraulics/water quality model. TT will summarize, analyze, and compare the water quality data to the model output. TT will adjust model inputs to within established criteria as reasonable, and document results in a calibration memorandum.

2.06 *Planning Horizon Scenario Evaluations.* With a calibrated Model, TT will utilize the scenarios listed in Phase 2.04 to determine the system's ability to supply the projected demands at each planning horizon (five-year, ten-year, fifteen-year and twenty-year). The steady state scenarios will effectively and efficiently size infrastructure to meet the City's engineering and design standards throughout the System. These standards will be utilized to identify facility improvements needed within the water distribution system to supply projected demands. TT will provide the City with an electronic copy of the model as a deliverable for this task.

2.07 *Hydraulic Model Training Services.* Tetra Tech will provide up to two days of training to City staff on the hydraulic model and model software. Tetra Tech will prepare all training materials and will use the model developed for the City as the platform for training.

2.08 *Draft Submittal and Review.* Tetra Tech will prepare a draft Technical Memorandum that presents the data analysis, maps, and projections and submit four (4) copies of the documents to the City for review and comment. The memoranda will take the form of sections that will ultimately be included in the Master Plans.

2.09 Review Meeting. Tetra Tech will attend a review meeting addressing the draft submittal and will record and distribute meeting minutes of said meeting.

2.10 Draft Technical Memorandum Revisions. Tetra Tech will incorporate the City's review comments into the draft Technical Memorandum.

IV. PHASE 3 – CAPITAL PROGRAM

The Capital Program will identify the projects required to meet the goals of the Master Plans. Tasks included in the Capital Program Phase include:

3.01 Identify Facility Requirements. Facility requirements will include a detailed list of storage, treatment, pumping, transmission, and distribution facilities required to effectively convey service to end users previously identified as well as any requirements for interconnects with neighboring utilities. The facility requirements will be based on the results from the hydraulic modeling and the capacity evaluation. The requirements will be developed for the 5-year, 10-year, 15- year and 20-year planning horizons and will include a description of each project and opinion of probable cost.

3.02 Prioritization of Improvements. TT will prioritize the identified improvements for both new and existing facilities and provide dates for improvements as necessary to meet system demand. The prioritization will develop a CIP for the 5-year, 10-year, 15- year and 20-year planning horizons. The prioritization will also include a ranking of projects based on identifying projects that will provide the greatest increase for the least amount of capital expenditure while also considering non-cost factors. The CIP for the planning horizons will also include a set of events that will trigger the initiation of the projects.

3.03 Draft Submittal and Review. TT will prepare a draft Technical Memorandum summarizing the Capital Program and submit four (4) copies of the document to the City for review and comment. The memorandum will take the form of the sections that will ultimately be included in the Master Plans.

3.04 Review Meeting. TT will attend a review meeting addressing the draft submittal and will record and distribute meeting minutes of said meeting.

3.05 Draft Technical Memorandum Revisions. TT will incorporate the City's review comments into the draft Technical Memoranda.

V. PHASE 4 – REPORT PREPARATION

4.01 Report Preparation. TT will submit four (4) copies of a report combining the final Technical Memoranda for each Phase for review by the City and will subsequently meet with the Staff to discuss the documents. The report will be revised pursuant to the City's comments and four (4) copies of each of the final reports will be submitted to the City along with electronic versions of the various models and documents.

VI. SCHEDULE

A tentative schedule for major milestones in the project is presented on the following page:

Deliverable	Days After Notice to Proceed
1. Projections/Existing System Tech Memo	60
2. Hydraulic Modeling Tech Memo	120
3. Capital Program Tech Memo	180
4. Submit Draft Report	200
5. Submit Final Report	230

VII. COMPENSATION

The total time and materials, not to exceed fee for the services described above is \$162,016.11 and is summarized in the Table below and in Exhibit A. TT will invoice City monthly.

Phase	Compensation
1. Projections/Existing System	\$35,808.21
2. Hydraulic and Water Quality Modeling	\$66,074.52
3. Capital Program	\$48,326.46
4. Report Preparation	\$10,834.92
Other Direct Costs	\$972.00
TOTAL T&M NTE	\$162,016.11

VIII. EXCLUSIONS

The following tasks are specifically excluded from this Scope of Services:

1. Preparation of grant or loan applications.
2. Preparation of ordinances or resolutions and attendance at meetings or hearings other than those specifically described herein.
3. Preparation of any groundwater models.
4. Evaluation of alternative water sources.
5. Expert witness testimony.
6. Land use planning and annexation analysis.
7. Budget preparation assistance.
8. Extended period simulations of the hydraulic models.
9. Meetings with regulatory agencies.



Exhibit A

Labor Plan

5 Resource

Potable Water Master Plan

Potable Water 20-Year Planning Period Evaluations

Submitted to: City of Deltona Beach

Contract Type: T&M

Bill Rate >

Proj Area >

**Total
Labor Hrs**

Sr. Project Manager	Engineer V	Engineer II	Sr. GIS Analyst	Sr. Project Administrator
185	250	750	114	30

Pricing by Resource

Project Phases / Tasks

100 Project Management

101 Project Kickoff

102 Project Status Meetings

103 Data Collection

104 Potable Water Projections

105 Capacity Analysis

106 Regulatory Review

107 Draft Submittal and Review

108 Review Meeting

109 Memorandum Revisions

200 Hydraulic Modeling

201 Modeling Software Review

202 Data Collection and Hydraulic Model Review

203 Hydraulic Model Development

204 Demand Development, Allocation and Scenario Management

205 WQ Model Calibration

206 Planning Horizon Scenario Evaluations

207 Hydraulic Model Training Services

208 Draft Submittal and Review

209 Review Meeting

210 Memorandum Revisions

300 Capital Program

301 CIP Development

302 Prioritization of Improvements

303 Draft Submittal and Review

304 Review Meeting

305 Memorandum Revisions

400 Report Preparation

401 Report Submittal and Review

500 Direct Costs

501 Travel (15 trips at 120 miles each \$0.54/mi)

Totals

Labor Rate Esc.	Labor	Subs	Travel	Mat'l's & Equip	ODCs	Task Pricing Totals
0.00%	161,044.11	-	972.00	-	-	162,016.11
	35,808.21	-	-	-	-	35,808.21
	2,309.46					2,309.46
	7,859.16					7,859.16
	2,505.06					2,505.06
	1,177.02					1,177.02
	7,698.00					7,698.00
	3,551.31					3,551.31
	8,498.52					8,498.52
	626.58					626.58
	1,583.10					1,583.10
	66,074.52	-	-	-	-	66,074.52
	1,873.05					1,873.05
	3,340.38					3,340.38
	3,434.76					3,434.76
	6,604.62					6,604.62
	21,011.91					21,011.91
	17,144.94					17,144.94
	3,384.00					3,384.00
	7,071.18					7,071.18
	626.58					626.58
	1,583.10					1,583.10
	48,326.46	-	-	-	-	48,326.46
	21,012.72					21,012.72
	12,577.14					12,577.14
	12,526.92					12,526.92
	626.58					626.58
	1,583.10					1,583.10
	10,834.92	-	-	-	-	10,834.92
	10,834.92					10,834.92
	-	-	972.00	-	-	972.00
	-	-	972.00	-	-	972.00
	0.00%	161,044.11	-	972.00	-	162,016.11