



Council Agenda Report

From: Dick McKinley, Public Works Director
Subject: Recycled Water Distribution Final Design
Date: March 20, 2018

Facts

1. In 2014, the City Council adopted a master plan to deliver recycled water from the planned Tertiary Treatment Facilities at the City's wastewater treatment plant to the east side of Paso Robles using a Recycled Water Distribution System.
2. Tertiary Treatment Facilities are currently being constructed at the Wastewater Treatment Plant and are expected to be completed in December 2018. These facilities will enable to the City to comply with stringent water quality requirements for the City's wastewater discharge and produce recycled water suitable for non-potable reuse.
3. In September 2016, the City Council authorized an agreement for the Preliminary Design of the Recycled Water Distribution System that would convey tertiary treated recycled water from Tertiary Treatment Facilities at the Wastewater Treatment Plant to urban users in the City, as far as Barney Schwartz Park, and allow recycled water to be used for agricultural irrigation. The City modified the scope of the project in September of 2017 to include a pipeline branch that would convey recycled water to the City's airport and surrounding areas.
4. In December 2017 a committee of City staff solicited written proposals from engineering firms and completed a qualifications-based selection process for the Final Design of the Recycled Water Distribution System. The process included solicitation and review of qualifications and proposals from professional engineering firms, and review of references for the most highly qualified firms. The selection committee determined that Carollo Engineers (Carollo), a professional engineering firm, was the most qualified and best fit for the final design project.
5. City staff negotiated a scope of work, fee, and schedule with Carollo, which are attached. Carollo's fee for this work is \$1,329,144, including a 10% design contingency. The recycled water distribution system, including a storage reservoir, is expected to cost approximately \$20 million. The total cost for preliminary design and final design is expected to be \$1,791,292, which is less than 10% of the total project cost estimate.

Options

1. Take no action;
2. Approve the attached resolution to authorize the City Manager to execute an agreement with Carollo Engineers for the final design of the Recycled Water Distribution System; or,
3. Amend or modify the above options.

Analysis and Conclusions

Carollo Engineers is a civil and environmental engineering firm based in Walnut Creek, California that specializes in planning and design of water, wastewater, and recycled water facilities. Carollo has recently

completed several recycled water projects with similar scope, has demonstrated understanding of the City's needs for the project, and has proposed an efficient and cost-effective approach to completing the required work. Carollo's fee for the final design was neither the highest nor the lowest of those proposed for the project, is consistent with the scope and complexity of the project, and is considered fair and competitive.

Staff recommends adoption of the attached Resolution No. 18-XXX, to authorize the City Manager to enter into an agreement with Carollo for an amount not to exceed \$1,329,144.00.

Option 1: Taking no action would defer the completion of the Recycled Water Distribution System Final Design.

Option 2: Authorizing the City Manager to enter into an agreement for the final design would allow staff to proceed with the preparation of design plans and specifications necessary for construction of the Recycled Water Distribution System.

Fiscal Impact

One-time costs for the Final Design is \$1,329,144. Design costs for were included in the City's adopted budget (6019101-54520-C0078).

Total construction costs for the recycled water distribution system are estimated to be \$20 million. Grants and low interest loans offered through the State Water Resources Control Board Water Recycled Funding Program are limited and may not be available for the project, however, the City continues to pursue possible funding and grants, and alternative funding sources. In November 2017, the City entered into an agreement with NHA Advisors, LLC to develop funding strategies and financing alternatives and structures for the Recycled Water Distribution System.

Recommendation

1. Approve Resolution 18-XXX authorizing the City Manager to enter into an agreement for design and preparation of bid documents for the Recycled Water Distribution System project with Carollo Engineers, in an amount of \$1,329,144, including a 10% contingency.
2. Authorize the City Manager and City Attorney to make minor modifications to the agreement, if necessary, remaining fully consistent with the Council's intent.

Attachments

1. Resolution 18-XXX
2. Negotiated Scope of Work, Fee, and Project Schedule

RESOLUTION NO. 18-XXX

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF EL PASO DE ROBLES
APPROVING AND AUTHORIZING EXECUTION OF AN AGREEMENT WITH CAROLLO
ENGINEERS FOR FINAL DESIGN OF A RECYCLED WATER DISTRIBUTION SYSTEM

WHEREAS, the City Council has adopted a master plan to deliver recycled water from the planned Tertiary Treatment Facilities at the City's wastewater treatment plant to the east side of Paso Robles using a Recycled Water Distribution System.; and

WHEREAS, the City Council authorized an agreement for the Preliminary Design of the Recycled Water Distribution System that would convey tertiary treated recycled water from Tertiary Treatment Facilities at the Wastewater Treatment Plant to urban users in the City, and allow recycled water to be used for agricultural irrigation; and

WHEREAS, a committee of City staff completed a qualifications-based selection process for the Final Design of the Recycled Water Distribution System and determined that Carollo Engineers was the most qualified and best fit for the project as it specializes in design of water, wastewater, and recycled water facilities; and

WHEREAS, City Staff negotiated a scope of work, fee, and schedule with Carollo Engineers for Final Design of the Recycled Water Distribution System in the amount of \$1,329,144, including a 10% design contingency; and

WHEREAS, the adopted budgets for the Recycled Water Distribution System includes design of the recycled water distribution system for Fiscal Years 2015/16 and 2016/17 (Budget No. 6019101-54520-C0078).

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF EL PASO DE ROBLES DOES HEREBY RESOLVE AS FOLLOWS:

Section 1. All of the above recitals are true and correct and incorporated herein by reference.

Section 2. The City Council hereby approves authorize the City Manager to execute a professional services agreement with Carollo Engineers for final design of the Recycled Water Distribution System, for an amount not to exceed \$1,329,144.

Section 3. Authorize the City Manager and City Attorney to make minor changes to the agreement fully consistent with overall Council direction.

Section 4. This Resolution shall take effect on the date approved by City Council.

APPROVED this 20th day of March, 2018, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

Steven W. Martin, Mayor

ATTEST:

Kristen L. Buxkemper, Deputy City Clerk

SCOPE OF WORK
CITY OF PASO ROBLES
RECYCLED WATER DISTRIBUTION SYSTEM FINAL DESIGN
MARCH 8, 2018

We have structured the following scope of work into three (3) separate phases:

- Preliminary design confirmation
- Final design
- Bidding Services

While we understand that construction-phase services will be required to complete the Project, we have assumed the scope of work and associated fee will be negotiated at a later date once the Project elements have been further defined.

TASK 1.0 - PROJECT MANAGEMENT

The purpose of this task is to establish and maintain effective project management and communication for the duration of the project.

1.1 Project Management Plan

Carollo will be responsible to lead and manage the efforts of the Project Team, including the Geotechnical Consultant, the Surveyor, and other subconsultants.

Carollo will develop a Project Management Plan to define critical elements of the project, and the metrics to measure successful completion of these elements. Carollo will develop the Project Management Plan defining work breakdown structures, budget requirements, schedule and milestone requirements, Quality Management requirements, and internal and external communication protocol. The Project Management Plan will be developed using standard Carollo Project Management tools.

DELIVERABLES:

- Draft and Final Project Management Plan (electronic version in PDF format).

1.2 Project Status Meetings

The City and Carollo will meet monthly to discuss progress and development of the Project. The meetings will be held remotely via conference call and key members of Carollo's team will participate. Participants will discuss outstanding or upcoming project issues. Carollo will prepare summaries of the progress meetings. A decision log will be maintained during the course of the meetings and updated monthly.

DELIVERABLES:

- Agenda and meeting minutes (electronic file in pdf format).
- Decision log distributed within seven (7) calendar days following each meeting (electronic file in pdf format).
- Summary of Action Items.

1.3 Kick-Off Meeting

The project Kick-Off Meeting will include the key members of the Project Team as necessary to discuss the Project Management Plan, to acquaint participants with the purpose of and expectations for the project, describe team member roles and responsibilities, describe project procedures, summarize scope and schedule, and review significant issues and project priorities. The primary focus will be to discuss primary project issues and needs with the Project Team, and define key implementation steps and confirm key schedule milestones.

Review of the existing hydraulic model is on the Final Design critical path. For this reason, Carollo will use the Kick-Off Meeting to discuss and confirm the hydraulic evaluation criteria used in the Draft PDR, and the criteria that will be used to complete the Hydraulic Model Review (Task 2.2).

DELIVERABLES:

- Agenda and meeting minutes (electronic file in MS Word and/or PDF).

1.4 Team Project Management

Carollo will lead and manage the efforts of the Project Team including subconsultants, update and manage the project schedule, and manage the project budget.

1.5 Quality Management

Carollo will implement the quality management plan established in the Project Management Plan, including assigning a quality management team and providing quality management reviews of all deliverable before being submitted to the City for review.

TASK 2.0 - PRELIMINARY DESIGN CONFIRMATION

The purpose of this task is to review the existing preliminary design concepts and recommendations, modify as necessary, and develop final design criteria and hydraulics to be used during final design.

2.1 Data Collection and Review

Carollo will collect and review information related to the Project provided by the City, including property descriptions, utility information, the Final Preliminary Design Report, hydraulic model, Black and Veatch Pump Station Design Memorandum, City comments on the preliminary design, and other relevant work completed to support the Preliminary Design. Carollo will also perform a site visit of the proposed alignment, tank, and creek discharge sites as part of the CAMP® Workshop.

2.2 Hydraulic Model Review

Carollo will review the hydraulic model to confirm and refine, as needed, system hydraulics and capacities at three phases of delivery, establish system curves, optimize pump, piping, and reservoir sizing, and confirm hydraulics if any alignment modifications are made.

The findings of the evaluation will be presented during the CAMP® Workshop with the goal of finalizing a recommendation during the meeting.

DELIVERABLES:

- Presentation summarizing the evaluation and initial recommendations (electronic file in MS PowerPoint and/or PDF).

2.3 Tanks and Pipeline Evaluation

Carollo will perform an evaluation of two alternative sites for a new reservoir, and three (3) reservoir options that will consider both capital and life-cycle costs, and system hydraulics. These options include:

- Prestressed concrete.
- Cast-in-place concrete.
- Welded steel.

The life-cycle cost comparison shall include initial construction cost, appropriate foundation requirements, cathodic protection costs, and costs for initial and continuing re-applications of interior and exterior coatings. The findings of the evaluation will be presented during the CAMP® Workshop with the goal of finalizing a recommendation during the meeting.

Carollo will also evaluate the tank configuration: above ground, partially buried, or buried.

Carollo will build upon the work completed in the PDR to confirm the evaluation and make final recommendations for pipe materials for 12-inch, 16-inch, and 24-inch diameter and piping with a diameter less than 12 inches. The Draft PDR recommended the City use either DIP or HDPE for the larger diameter piping and PVC for the small diameter piping based on a number of factors including, but not limited to, C-factor, corrosion potential, and complexity of installation. Additionally, construction methods to be used for the Huer Huero Creek crossing will be evaluated based on cost, permitting requirements, and schedule impacts. The findings and recommendations from the pipeline materials and construction methods evaluations will be presented during the CAMP® Workshop. The findings of the evaluation will be presented during the CAMP® Workshop with the goal of finalizing a recommendation during the meeting.

DELIVERABLES:

- Presentation summarizing the evaluation and initial recommendations (electronic file in MS PowerPoint and/or PDF).

2.4 Huer Huero Creek Discharge

Carollo will identify and discuss with the City anticipated NPDES permit conditions that will affect design of the discharge facilities. Carollo will confirm the concept of using temporary piping with low flow emitters, develop alternative configurations including provisions for dechlorination, as required, and garner City engineering and operations staff input on preferred design concept.

DELIVERABLES:

- Presentation summarizing the evaluation and initial recommendations (electronic file in MS PowerPoint and/or PDF).

2.5 Pump Selection

The recycled water pump station will need to accommodate a large range of flow and head conditions when discharging to various locations within the recycled water system and recirculating through the Recycled Water Storage Pond during periods of low demand. Carollo will conduct a Pump Selection Evaluation that will build-upon the Hydraulic Model Review (Task 2.2). The evaluation will establish the following to allow the Project to move directly into Final Design:

- Pump size(s) to accommodate the range of flow conditions confirmed in the Hydraulic Model Review (Task 2.2).
- The type(s) of vertical turbine pumps required to meet the range of flow conditions (i.e., high-head, mixed flow, and axial flow).
- The communication and control strategy for the pump station, tank and pond level settings, process and instrumentation narrative, and recommendations for SCADA integration.
- Future modifications or improvements to the pumping system or controls necessary to optimize the pumping system for future increased recycled water delivery.
- Assess the concrete structure to confirm suitability for pumping system recommended by Carollo.

DELIVERABLES:

- Presentation summarizing the evaluation and initial recommendations (electronic file in MS PowerPoint and/or PDF).

2.6 Data Acquisition/Metering Alternatives Analysis

Carollo will identify and evaluate alternatives for gathering and transmitting data including metering data. Alternatives will, at a minimum, include fiber optic and automatic remote meter reading/transmission. To determine the feasibility of a radio system, Carollo will perform software radio studies using the coordinates of each meter location. This will be licensed or unlicensed depending on the City's existing hardware. The evaluation will include preliminary costs for the alternatives for use in evaluating the alternatives.

ASSUMPTIONS:

- Does not include a comprehensive radio study, but does include a software radio study.

DELIVERABLES:

- Presentation summarizing the evaluation and initial recommendations (electronic file in MS PowerPoint and/or PDF).

2.7 CAMP® Workshop

To facilitate transition from the preliminary design phase to the final design phase of the Project, Carollo will facilitate a CAMP® Workshop. The workshop shall be used to gain consensus on critical-path elements and expedite the schedule to allow the design to proceed directly to the 60% Design Phase. The desired outcome will be a clear path forward for the final design phase.

A detailed agenda will be provided to the City two weeks in advance of the workshop to help the City identify the right attendees and prepare for Workshop discussions.

DELIVERABLES:

- Agenda, presentation material, and meeting minutes (electronic file in MS Word, MS PowerPoint, and/or PDF).

2.8 Project Confirmation Technical Memorandum

Carollo will prepare a Project Confirmation Technical Memorandum documenting the results of the Hydraulic Model Review, Tank and Pipeline Material Evaluation, Huer Huero Creek Discharge, and Pump Selection subtasks (Tasks 2.2, 2.3, 2.4, 2.5, and 2.6) and other discipline-specific design criteria discussed during the CAMP® Workshop (Task 2.7). The Project Confirmation Technical Memorandum will document the elements that were not previously established or differing from those documented in the PDR.

DELIVERABLES:

- Draft and Final Project Confirmation Technical Memorandum (electronic file in PDF format).

TASK 3.0 - DESIGN SUPPORT SERVICES

3.1 Surveying

3.1.1 New Aerial Mapping

Aerial mapping at 40 scale with 1-foot contours for the project alignment (200± foot wide strip) will be provided. The final design field survey will include the following elements:

- Trees (trunk diameter and type of tree).
- Rock outcroppings.
- Fence lines.
- Property lines/right of way (ROW)/easements.
- Boring locations.
- Utility manhole or valve box locations.
- Other buried, exposed, and overhead utility locations (telephone, gas, power, water, sewer, etc.).
- Power lines.
- Irrigation standpipes, vents, and valve.
- Rectified aerial orthophoto.
- Other features impacted by construction, (signs, mail boxes, etc.).

3.1.2 Supplemental Utility Surveys

Carollo's Surveying Subconsultant will perform field and office effort necessary to locate existing visible surface features not visible in the aerial photography will be surveyed and added to the aerial base map, which will be used to develop a Pothole Plan to verify actual depths and locations of buried facilities. Potholing is included in a latter subtask.

3.1.3 Conventional Field Survey

Carollo's Surveying Subconsultant will perform conventional field surveys at the Salinas River crossing, Highway 46 crossing, and potential reservoir sites (three [3] locations) to supplement the aerial base sheet with more detailed topographic data necessary to complete the final design effort.

3.1.4 Record Right of Way Data

Carollo/ Surveying Subconsultant will determine approximate right-of-ways (ROWS) and property lines within the mapping area will be determined based primarily upon record data, Assessor's parcel data, lines of occupation, and limited field investigation and/or surveys.

3.1.5 Easement Acquisition Support

Carollo will identify easements and/or property acquisition required for the project. Development of legal descriptions and plat maps for identified easements can be provided under optional Task 6. 3 at the direction of the City.

3.2 Geotechnical

3.2.1 Review of Existing Data

The Geotechnical Subconsultant will consult with the Project Team and City to coordinate project initiation, collect project information, and request that a map showing the layout of the improvements and pipeline alignment be provided for use in planning the field exploration program. The Geotechnical Consultant will also collect available geologic and geotechnical data from published maps and reports, such as the borings drilled in 2017 for the Paso Robles Airport Infrastructure project, for the existing WWTP, and previous geotechnical studies performed for public improvements along the alignment if available. Existing information obtained from the Project Team and City will be used to update the Draft Proposed Field Exploration Plan (Task 3.2.) for the project showing the locations of planned field explorations.

3.2.2 Coordination, Health and Safety, and Permits

The Geotechnical Subconsultant will coordinate the locations of field exploration with the Project Team and City relative to access and existing buried utilities or structures, and mark the locations along the alignment and contact Underground Services Alert (USA) to notify utility companies. The Geotechnical Consultant will also prepare a Draft and Final Health and Safety Plan for the field work, and procure an encroachment permit with the City. Field exploration will be coordinated with the drilling and traffic control subcontractors and procure well permits from the County of San Luis Obispo (County) where required. Borings for the Highway 46 pipeline crossing will be drilled outside of the Caltrans right-of-way and no encroachment permit with that agency will be required.

ASSUMPTIONS:

- The Geotechnical Subconsultant will not be responsible for locating utilities or buried structures or damages resulting from encountering unmarked or improperly marked utilities for the project.
- Any environmental studies, reports, or monitors required for this work will be provided by the City.
- The City will obtain any access agreements and/or permits for accessing drilling locations including the one boring planned on airport property and those planed on vineyard land for the storage tank.

DELIVERABLES:

- Draft and Final Health and Safety Plan (electronic file in PDF format).

3.2.3 Field Exploration Program

The field exploration program will consist of drilling and sampling at strategic locations along the alignment. The Geotechnical Consultant has determined the approximate locations and depth of the proposed borings for the pipeline alignment in the Draft Proposed Field Exploration Plan. The Draft Proposed Field Exploration Plan will be reviewed with the City during the Kick-Off Meeting (Task 1.3). A seven (7)-day effort will be provided to drill twenty (20) borings ranging in depth from 10 to 70 feet with a total depth of up to approximately 535 feet. One day of traffic control will be provided by the Geotechnical Consultant consisting of a lane closure with flagging for the boring locations along River Road, Wisteria Lane, and Union Road.

Mud rotary drilling will be used to advance two 70-foot deep borings at the Salinas River Crossing. During drilling, mud type, flow characteristics, and any loss in circulation will be noted to develop qualitative assessment of mud-rotary conditions for HDD. The Geotechnical Consultant will provide mud rotary drilling. These two borings will be completed as temporary monitoring wells for measuring of groundwater elevations.

The remainder of the borings (18) for the pipeline, other crossings and reservoir, will be drilled using hollow-stem augers. The Geotechnical Consultant will provide drilling of these borings. All borings will typically be sampled at 5-foot intervals by driving 2-inch or 3-inch split spoon samplers using Standard Penetration Test protocols or by pushing thin-walled (Shelby) tubes. The types and depths of the samples may be varied depending on subsurface conditions. Bulk samples will be collected from auger flights during drilling. Borings will be backfilled with bentonite cement grout, cement slurry and/or approved native fill in accordance with permit requirements. Borings drilled in roadway areas will be capped with rapid setting quickcrete. Excess spoils and drill fluid from the drilling will be disposed of by hauling off drill mud or spreading cuttings out on-site. The cost for disposal has been included.

Laboratory testing on selected samples collected from the drilling will be provided by the Geotechnical Consultant. Tests for classification, strength, corrosion, consolidation, swell, R-value, hydraulic conductivity, and compaction will be performed. The types and numbers of tests may vary depending on the results of the field exploration program.

DELIVERABLES:

- Draft and Final Proposed Field Exploration Plan (electronic file in PDF format).

3.2.4 Geotechnical Memorandum

The Geotechnical Consultant will prepare a Geotechnical Memorandum summarizing the main findings of the field exploration program identifying key geotechnical considerations that are expected to be evaluated for the Project. The memorandum will also present preliminary design considerations for the trenchless crossings and the water storage tank for use in the development of the Project Confirmation Technical Memorandum (Task 2.6). The technical memorandum will be submitted to the design team and the City for review.

DELIVERABLES:

- Geotechnical Memorandum (electronic file in PDF format).

3.2.5 Draft and Final Geotechnical Report

The Geotechnical Consultant will prepare the Draft and Final Geotechnical Report. The report will describe the project understanding, existing site conditions, work performed, and subsurface conditions encountered. The project understanding, work performed, a description of the subsurface conditions encountered, boring logs, laboratory test results, and graphics showing the site and boring locations, and interpreted subsurface profiles at each of the trenchless installation locations (Salinas River, Huer Huero Creek, and Highway 46) will also be provided. The report will provide conclusions and recommendations regarding:

- Geologic setting;

- Soil and groundwater conditions encountered;
- Potential for geologic hazards to impact the project such as from seismic shaking, faulting, and landslides based on review of published data and the need to mitigate hazards during design;
- Recommendations for design of the pipeline:
 - Trench detail for use with City standards and material and compaction requirements for pipe bedding, pipe zone material and trench backfill;
 - Foundation support for the pipe and subexcavation of the trench bottom, if needed;
 - Material and compaction requirements for bedding, pipe zone and trench backfill;
 - Suitability of the materials encountered in the borings for reuse as fill or backfill material;
 - Pipe buoyancy considerations relative to groundwater, flooding and liquefaction, if needed;
 - Existing pavement thicknesses encountered and pavement structural section(s) for trench patching;
 - Huer Huero creek outlet structures;
 - Soil moduli (E') for estimating pipe deflection;
 - Passive resistance, K_p and pipe-backfill friction to resist thrust along the pipe and for sizing thrust blocks, if needed;
 - Corrosion test data; and
 - Construction considerations regarding excavation characteristics of soil and rock encountered, temporary excavations, shoring requirements, and groundwater.
- The design of trenchless pipe installations at Salinas River, Huer Huero Creek, and Highway 46:
 - Subsurface conditions and suitability of using jack and bore, HDD, or microtunneling to complete the installation;
 - Ground conditions relative to groundwater, hard rock, presence of cobbles or boulder, heading stability, caving or running ground;
 - Preliminary gassy estimation per tunneling guidelines;
 - Jacking or thrust resistance for launching the pipes;
 - Monitoring requirements for settlement or heave; and
 - Frac-out potential and response planning.
- Recommendations for design of the tank:
 - Site preparation, grading, and drainage considerations for support of the tank;
 - Seismic data for use with the AWWA code;
 - Allowable inclination and erosion considerations for graded slopes;
 - Compaction and material requirements for imported fill and reuse of onsite soil;
 - Suitable foundation type(s) for the reservoir and pump stations based on subsurface conditions encountered;
 - Foundation design for ring-wall footings and interior column footings including allowable bearing pressures, minimum foundation widths and depths, estimated total and differential settlement considering static and seismic loads;
 - Lateral earth pressures for the design of site retaining walls or a buried tank if selected;
 - Passive resistance and friction coefficient for resistance to lateral loads;
 - Pavement structural section for an all-weather access road at the reservoir; and

- Construction considerations regarding shoring, dewatering, and need for subexcavation or grading to improve site conditions at the reservoir and constructability of structures.

DELIVERABLES:

- Draft and Final Geotechnical Report (electronic file in PDF format).

3.3 Trenchless Confirmation

3.3.1 Review Existing Information

The subconsultant will review the Geotechnical Memorandum and the Draft PDR drawings including the Draft Trenchless Crossing Evaluation by Staheli Trenchless Consultants. In addition, related project information will be reviewed including reference geotechnical reports for the City’s WWTP (e.g. Geotechnical Data Report – Paso Robles Wastewater Treatment Plant by Fugro Consultants dated March 23, 2011) and precedent construction records for past HDD crossings of the Salinas River in the City.

3.3.2 Assistance with the Field Exploration Program

The subconsultant will work with the Geotechnical Consultant to develop the Field Exploration Program (Task 3.2.3) at the three (3) trenchless undercrossings (e.g., depths of borings, sampling sequence, laboratory testing, groundwater monitoring well installation, etc.) to ensure that subsurface data is adequate for trenchless design and for use by the Contractor for bidding and construction. Based on the results of test borings, the subconsultant will provide recommendations, if needed, for supplemental subsurface investigation (e.g., test pits or oversize borings for sampling, measuring and testing cobbles and boulders, rock coring for bedrock, if encountered, etc.).

3.3.3 Trenchless Crossing Reconnaissance

The subconsultant will complete a reconnaissance of each of the three (3) trenchless crossing locations to get a firsthand view of site conditions and surface constraints to trenchless construction. This site reconnaissance will be done as part of the Field Exploration Program (Task 3.2.3) to review surface constraints to trenchless construction and the geotechnical investigation work plan at each of the trenchless crossing sites.

3.3.4 Review of the Draft Geotechnical Report

The subconsultant will review the Draft Geotechnical Report (Task 3.2.5) relative to the data provided for the three (3) trenchless undercrossings. The subconsultant will provide recommendations for additional geotechnical work, if needed (e.g., additional lab testing, groundwater monitoring, test pits, oversize borings, rock coring, etc.). A scope and fee for scour analysis of the Salinas River crossing are described under optional Task 6.2 and can be provided at the direction of the City.

3.3.5 Trenchless Design Summary Report

The subconsultant will prepare a Trenchless Design Summary Report (TDSR) for the Project’s three (3) trenchless undercrossings. The TDSR will include a summary of pertinent soil and groundwater conditions at each trenchless undercrossing location, based on the findings described in the Final Geotechnical Report (Task 3.2.5), including:

- Total and effective unit soil weights;
- Soil moisture contents;
- Soil grain size distributions (from 12-inch plus to 1 micron), soil plasticity (Atterberg limits), shear strength (soil c and phi angle), soil compressibility and soil permeability;
- Tunnel zone soil Standard Penetration Test, N-values;
- Soil abrasivity;
- Soil clogging potential;
- Design groundwater elevations;

- Tunnelman's Ground Classifications and anticipated tunnel zone soil behaviors;
- Tunnel zone bedrock, if encountered including bedrock formation, weathering, bedding, jointing, fracturing, hardness, unconfined compressive strength and abrasivity;
- Tunnel-face stability; and
- Mixed-face and change-in-face tunneling conditions.

DELIVERABLES:

- Trenchless Design Summary Report (electronic file in PDF format).

3.4 Potholing/Utility Confirmation

3.4.1 Site Walk and Preparation

The subconsultant will walk the job site with the City, coordinate USA activities, and obtain all required permits before commencing the potholing activities.

3.4.2 Potholing

The subconsultant will pothole to verify the depths and locations of utilities and record the information on the subconsultant's cut sheets. The subconsultant will provide traffic control as required to complete the potholing effort and haul all pothole mud offsite. All potholes (6-inch round) will be covered by steel pothole covers until restoration can be performed.

ASSUMPTIONS:

- A total of one (1) day of traffic control has been included for this task.
- A total of six (6) potholes in dirt and twelve (12) potholes in asphalt have been included in this scope of work.

DELIVERABLES:

- Pothole Cut Sheets (electronic file in PDF format).

3.4.3 Potholing Restoration

Following completion of the potholing activities, the subconsultant will fill all potholes with one (1) sack slurry cement backfill and repaved per City standards.

3.5 Permitting/Environmental Support

3.5.1 Coordination with CEQA Consultant

One (1) meeting is assumed for coordination purposes with the City's CEQA consultant. The purpose would be to provide the distribution system Final Design elements and review the project description and other information as needed. Twenty four (24) hours is assumed for this meeting and review effort. The meeting could be on the phone or in person as needed.

3.5.2 Permitting

Coordinate with permitting agencies including Caltrans, Army Corp of Engineers, California Fish and Wildlife, Regional Water Quality Control Board, the City, the County, and CalOSHA. Develop permit applications for review and submission by the City.

ASSUMPTIONS:

- The City will pay all permit fees.
- Plans and specifications required for permit submittals will be expedited. 90% plans will be developed for these areas during the 60% design task.

DELIVERABLES:

- Draft Permit Applications (electronic file in PDF format) (after 60% submittal).

- Final Permit Applications (after receiving City review comments).

3.6 Surge Analysis

3.6.1 Surge Analysis

The subconsultant will perform the following activities to support development of the surge analysis:

1. Extract lengths, diameters, and elevations from the alignment/plan and elevation drawings for the recycled water distribution system pipelines, recycled water pump station, and 1 MG reservoir. Calculate acoustic wavespeeds and Darcy-Weisbach friction factors for the pipelines and assign demands to the pipe junctions. Gather data (e.g., diameters, discharge coefficients, air volumes, etc.) from manufacturer literature and drawings associated with the pumps, and valves. Develop pump characteristics for the hydraulic transient analysis computer model using the pump performance curves developed for the 60 percent Design for the pumps at the recycled water pump station. Setup a pressure surge analysis computer model of the system including the recycled water pipelines, recycled water pump station, 1 MG reservoir, and demands.
2. Define the critical operating scenarios for the system. This will involve the definition of maximum and minimum flow rates and hydraulic grade lines, as well as facilities status (e.g., operating, idle, open, closed, etc.) for the primary function of the recycled water distribution system. Establish hydraulic grade line (HGL) elevations for the pipelines under steady state operation and static conditions at the recycled water pump station.
3. The subconsultant will use the above initial HGL elevations to perform pressure surge analysis simulations for the operation of the recycled water pump station. Simulations will include pump power failure and pump startup and close/open valve operation at up to two (2) system demands for the critical operating scenarios defined in the task above. Simulations will be performed for both peak hour demands and zero demands to ensure that surge control, if necessary, will provide satisfactory surge protection for the system under all demand conditions.
4. Evaluate the results (i.e., predicted maximum and minimum pressures) of the transient analysis simulations and determine whether surge control measures are required to protect the pipelines and pump station from adverse pressure transients (e.g., over-pressurization, vapor cavity formation, and large magnitude negative pressures) created by the loss of power and startup of the pumps at the recycled water pump station and close/open operation of the system demands described above.
5. If surge protection is deemed necessary in the above task, NHC will determine surge control measures (e.g., volume, and dimensions of pressurized surge tank; diameter and location of controlled venting vacuum relief valves; diameter and set point pressure of surge/pressure relief valves; diameter of pump station bypass; moment of inertia of flywheels; etc.) for the pipelines and the recycled water pump station. The surge control measures will be designed to ensure that the maximum pressures do not exceed the maximum allowable pressures for the system, and to eliminate the possibility of vapor cavity formation and large magnitude negative pressures in the pipelines following pump power failure and pump startup at the recycled water pump station. The results of the pressure surge analysis with the recommended surge protection improvements in place will also be provided. Recommendations for safely starting the pumps at the recycled water pump station and closing/opening the demands will also be provided.

3.6.2 Surge Analysis Report

A brief technical memorandum will be prepared that will include (1) a description of the pressure surge analysis modeling approach, (2) a description of the physical facilities, including a schematic showing the pressure surge analysis model, (3) component data and assumptions used for the analyses, (4) the results of the pressure surge analysis, including graphical plots of the maximum and minimum HGL envelopes and maximum allowable pressure along the pipelines, and plots of pressure head at the pump station and at significant locations in the

recycled water distribution system, etc., and (5) recommendations for surge control. Movies of pertinent pressure surge analysis simulations may be included at no additional cost to help illustrate the results of the analysis and effectiveness of the surge control recommendations.

Following quality assurance review, the subconsultant will provide a Draft and Final Surge Analysis Report. The recommendations will be presented to the City for review and agreed upon mitigation measures will be incorporated into the design.

DELIVERABLES:

- Surge Analysis Report (electronic file in PDF format).

TASK 4.0 - FINAL DESIGN

4.1 60% Design Documents

Following completion of the surveying effort and the results of the design CAMP® Workshop, Carollo will immediately begin preparation of the 60% Design Documents including plans, specifications, and cost estimate. The 60% design shall include the following components:

- Draft front-end documents (provided by Carollo or City)
- Draft civil site plans for the 1 MG reservoir
- Draft reservoir details
- Draft yard piping plan for the 1 MG reservoir
- Draft piping and instrumentation diagrams (P&IDs)
- Draft Piping plan and profile drawings
- Draft piping details
- Draft pump and piping layouts for the Recycled Water Pump Station
- Draft structural plans and details (reservoir and pump station)
- Draft electrical one-line drawings
- Draft control descriptions
- Draft control system architecture block diagram (SCADA)
- Draft instrument lists
- Draft details for point of connection for segments by others
- Draft turnout details, including mechanical, electrical, and instrumentation provisions
- Final drawing list
- Draft technical specifications sections for all divisions
- List of specific items requiring City decision
- Following delivery of the 60% Design Submittal, Carollo will incorporate comments received by the City into the drawing and specifications.

Plans required for permit applications (Caltrans, SAA, etc) will be completed to a 90% level to allow permit packages to be submitted and agency reviews to begin

DELIVERABLES:

- 60% Design Documents (five [5] hard copies of half-size drawings and specifications and electronic files in PDF format).
- 90% Design Documents for areas requiring permit applications

4.2 60% Cost Estimate

The purpose of this task is to prepare an updated cost estimate for the Project based on the 60% Design Documents. The cost estimate will be a Class 2 with an expected accuracy range from +15 percent to -5 percent.

DELIVERABLES:

- 60% Cost Estimate (electronic file in PDF format).

4.3 60% Design Workshop

Carollo will present the 60% Design Submittal and cost estimate for the Project to City staff. The objective of the workshop is to discuss changes from the Final Project Confirmation Technical Memorandum, and solicit City review comments.

DELIVERABLES

- Agenda and meeting minutes (electronic file in PDF format).

4.4 90% Design Documents

Following completion of the 60% Design Workshop, Carollo will immediately begin preparation of the 90% Design Documents including plans, specifications, and cost estimate. The 90% design shall include the following components:

- Final front-end documents
- Final civil site plans for the 1 MG reservoir
- Final structural plans and sections for the 1 MG reservoir
- Final yard piping plan for the 1 MG reservoir
- Final P&IDs
- Final piping plan and profile drawings
- Final pump and piping layouts for the Recycled Water Pump Station
- Final structural plans
- Final details
- Final electrical plan view for location of major equipment and control panels at the Recycled Water Pump Station
- Final electrical one-line drawings
- Final MCC layout and elevations
- Final control descriptions
- Final SCADA block diagram
- Final instrument lists
- Final control panel elevations
- Final technical specifications sections for all divisions
- List of specific items requiring City decision

DELIVERABLES:

- 90% Design Documents (five [5] hard copies of half-size drawings and specifications and electronic files in PDF format).

4.5 90% Cost Estimate

The purpose of this task is to update the cost estimate for the Project based on the 90% Design Documents. The cost estimate will be a Class 2 with an expected accuracy range from +15 percent to -5 percent.

DELIVERABLES

- 90% Cost Estimate (electronic file in PDF format).

4.6 90% Design Workshop

Carollo will present the 90% Design Submittal and cost estimate for the Project to City staff. The objective of the workshop is to discuss changes from the 60% Design Documents, and solicit City review comments.

DELIVERABLES

- Agenda and meeting minutes (electronic file in PDF format).

4.7 100% Design Documents

Carollo will incorporate comments from the City review of the 90% Design Documents into a final set of drawings and specifications. The final plans and specifications will be stamped and signed, and ready to be issued for bid.

ASSUMPTIONS

- City will reproduce the 100% Design Documents for bidding purposes.
- City will advertise the Project, and will be responsible for sale of bid documents.

DELIVERABLES

- 100% Design Documents (five [5] hard copies of half-size drawings and specifications and electronic files in PDF format).
- 100% Design Documents (one [1] copy of full-size final drawings and specifications stamped and signed).
- 100% Design Documents (one [1] electronic copy of the drawing files in AutoCAD and their corresponding plot configuration files).
- 100% Design Documents (one [1] electronic copy of the full and half size final drawings in PDF format, electronically stamped and signed).

4.8 Final Engineer's Estimate

The purpose of this task is to update cost estimates for the Project based on the 100% Design Documents. The cost estimate will be a Class 1 estimate with an expected accuracy range from +15 percent to -5 percent.

DELIVERABLES

- Final Engineer's Estimate (electronic file in PDF format).

TASK 5.0 - BIDDING SERVICES

5.1 Pre-Bid Meeting

Carollo will conduct one (1) on-site Pre-Bid Conference meeting during the bidding phase of the project and will prepare addenda and clarifications if necessary.

DELIVERABLES:

Agenda and meeting minutes (electronic file in PDF format).

5.2 Bidding Period Assistance

Carollo will assist the City during bidding by answering bidding Contractors' questions during the bid period, and preparing up to two (2) addenda, if needed.

DELIVERABLES:

- Addenda and associated re-issued drawings and specifications (electronic file in PDF format).

5.3 Bid Opening

Carollo will assist the City during bidding by attending the bid opening.

5.4 Bid Evaluation Assistance

Carollo will tabulate bid results and Contractor qualifications and make a recommendation to the City for award.

DELIVERABLES:

- Bid Evaluation Memorandum (electronic file in PDF format).

5.5 Conformed Contract Documents

Carollo will incorporate addenda items into the plans and specifications and provide the City and selected Contractor with conformed documents.

DELIVERABLES:

- Conformed Plans and Specifications (electronic file in PDF format).

TASK 6 - OPTIONAL TASKS

6.1 - Design of Transmission Main from N. River Road to Cuesta Property (approx. 3,200 LF)

This alignment was originally envisioned to be designed and constructed by the developer. In the event the developer cannot meet the schedule, and at the request of the City, Carollo will provide design services for 3,200 linear feet (LF) of recycled water pipeline through the River Oaks development.

6.1.1 - Preliminary Engineering

Review existing data including the hydraulic model to confirm sizing, alignment, construction method, and materials as described in Task 2 above.

6.1.2 - Survey

Aerial mapping at 40 scale with 1-foot contours for the project alignment (200± foot wide strip) will be provided for the additional pipeline segment (approx. 3,200 LF). The final design field survey will include the elements described in Task 3.1.1 above. Rectified orthophotos that cover the additional alignment will be provided. Supplemental ground survey will be conducted, as needed, to location existing surface utilities and features not visible in the aerial photography. This work will be included in the deliverables described about in Task 3.1. Our proposed fee for this work assumes that the survey work associated with this alignment will be conducted at the same time as the survey work for the project as described above.

6.1.3 - Geotechnical Investigation

An additional boring location will be included at the intersection of N. River Road and the new alignment to characterize the soils near the bluff and provide geotechnical recommendations specific to the area. Data collected and recommendations will be included in the deliverables as described above in Task 3.2. Our proposed fee for this work assumes that this boring will be performed at the same time as the fieldwork for the project as described above.

6.1.4 - Final Design

Develop 60, 90, and 100 percent design documents including plans, specifications, and cost estimates as described under Task 4 above.

ASSUMPTIONS:

- All fieldwork will be completed at the same time as the fieldwork for the rest of the project as described in Task 3 above.
- Development of design confirmation and final design documents will happen at the same time as the rest of the project as described in Tasks 2 and 4 above.

DELIVERABLES:

- Results of preliminary design efforts will be incorporated in the CAMP® workshop and documented in the Project Confirmation Technical Memorandum.
- Plans and specifications for this portion of the design will be included with the plans, specifications, and cost estimate deliverables identified under Task 4.

6.2 - Scour Analysis

The Engineer shall perform in-depth scour evaluation at the Salinas River pipeline crossing. The scour evaluation will be specifically focused on assessment of erosion and scour hazards associated with the river crossing along the proposed pipeline alignment, including:

- Channel erosion and scour (i.e. vertical channel changes) at pipeline crossing that may cause exposure of the installed pipeline;
- Lateral channel migration issues (i.e. horizontal channel changes) at channel crossing that may expose the pipe on either side of stream crossing; and

6.2.1 - Data Collection and Review

Carollo shall collect, organize and review available data which is pertinent to the scour evaluation of the Salinas River pipeline crossing. The data that will be required for the analysis includes:

- Any existing Scour Evaluation Report
- FEMA Flood Insurance Studies
- Existing Hydraulic and Hydrologic Models
- Historic Aerial Photographs.

This scope assumes that this information is available and can be either provided by the City or collected from other agencies. The fee does not include development of these items.

As part of the data collection effort, Carollo will determine if any computer based hydraulic/hydrologic models are presently available for the site and their validity with respect to current conditions and configurations for the channel. Typically, this information is in the form of a HEC-2 analysis, which if undertaken as part of the FEMA Flood Insurance Study, can be obtained from the California DEP Bureau of Flood Plain Management. In addition to the CADEP, existing hydraulic models from prior FEMA studies can be obtained from FEMA through their consultant.

6.2.2 - Field Reconnaissance

Carollo will perform a field reconnaissance of the Salinas River crossing site. At the crossing site, photographs will be taken to adequately document the site conditions. Information will be documented in a field sheet and will

include a general site description, photograph inventory, stream bank and bed soil characterization, hydrographic features, existing erosion hazards, a cross section and profile.

6.2.3 - Determination of Scour Analysis Variables

Carollo will determine the variables required to calculate the potential depth of scour and evaluate susceptibility of the existing channel and streambank to scour damage. The level of effort will depend on the availability of data needs identified in previous tasks. The information required for the analysis pertains to the following three categories:

1. Hydraulic/Hydrologic - Flood discharges, velocities, etc.
2. Survey - Channel configurations at crossing, upstream, downstream, etc.
3. Geotechnical - Available soil parameters, historic scour limits, etc.

For the crossing site, information based upon a hydraulic study of the waterway for various flood conditions is required for the scour analysis. It is assumed that there is an acceptable Hydrologic/Hydraulic model for the project site and; therefore, Carollo will be responsible for obtaining the prior study, performing a review and determining if any significant physical changes have occurred either along the waterway or in the watershed that would make the validity of the results questionable.

6.2.4 - Scour Depth Determination

Using the hydraulic model, Carollo will determine the maximum scour depth at the crossing location for the 10-year and 100 year 24-hour storm events. In addition, the channel lateral movement at crossing location will be evaluated.

ASSUMPTIONS

- City will provide all existing scour evaluation reports, flood insurance studies, hydraulic/hydrologic models, and historic aerial photographs.
- Flood discharges/velocities, and a hydrologic model are available and will not be measured/developed as part of this project.

DELIVERABLES:

- Field sheet with summary information from site visit
- TM documenting the results of the scour analysis
- Scour results will be considered in the Trenchless Design Summary Report.

6.3 - Develop Legal Descriptions and Plat Maps

Carollo's Surveying Subconsultant will develop legal descriptions and plat maps for identified easements. Legal descriptions and plat maps will be provided to the City for the City's use in negotiating and executing easements. Development of 10 legal descriptions and plat maps are included in this optional task.

ASSUMPTIONS:

- The City will negotiate all easement/property acquisition.

DELIVERABLES:

- Up to 10 signed legal descriptions and plat maps for use in the City's negotiations with property owners.

6.4 - Design of Data Transmission System

Carollo will design a fiber optic network to convey meter data for recycled water services adjacent to the recycled water transmission main and a radio network to convey meter data for remote recycled water meters. The design of the fiber optic system will include installation of the fiber and conduit in the recycled water trench, pairs of fiber to each meter/tank/pump station, equipment needed at each facility to be connected and at the plant (or other site) that will receive all of the fiber signals, and provisions and/or details needed for future connections to the fiber network. The design of the radio network will include hardware needed on the meters (and other facilities), and collector and repeater antenna. Carollo will also design and/or specify (as needed) software/hardware needed to integrate with the City's SCADA and billing systems. The design will include electrical and instrumentation drawings, typical details, specifications, and development of cost estimates.

ASSUMPTIONS:

- Fiber will be installed in the same trench as the recycled water pipeline.
- Connections are assumed to be at meter locations identified in the PDR, the reservoir site, and the pump station at the plant.

DELIVERABLES:

- Plans, specifications, and costs will be included in deliverables provided under Task 4.o.

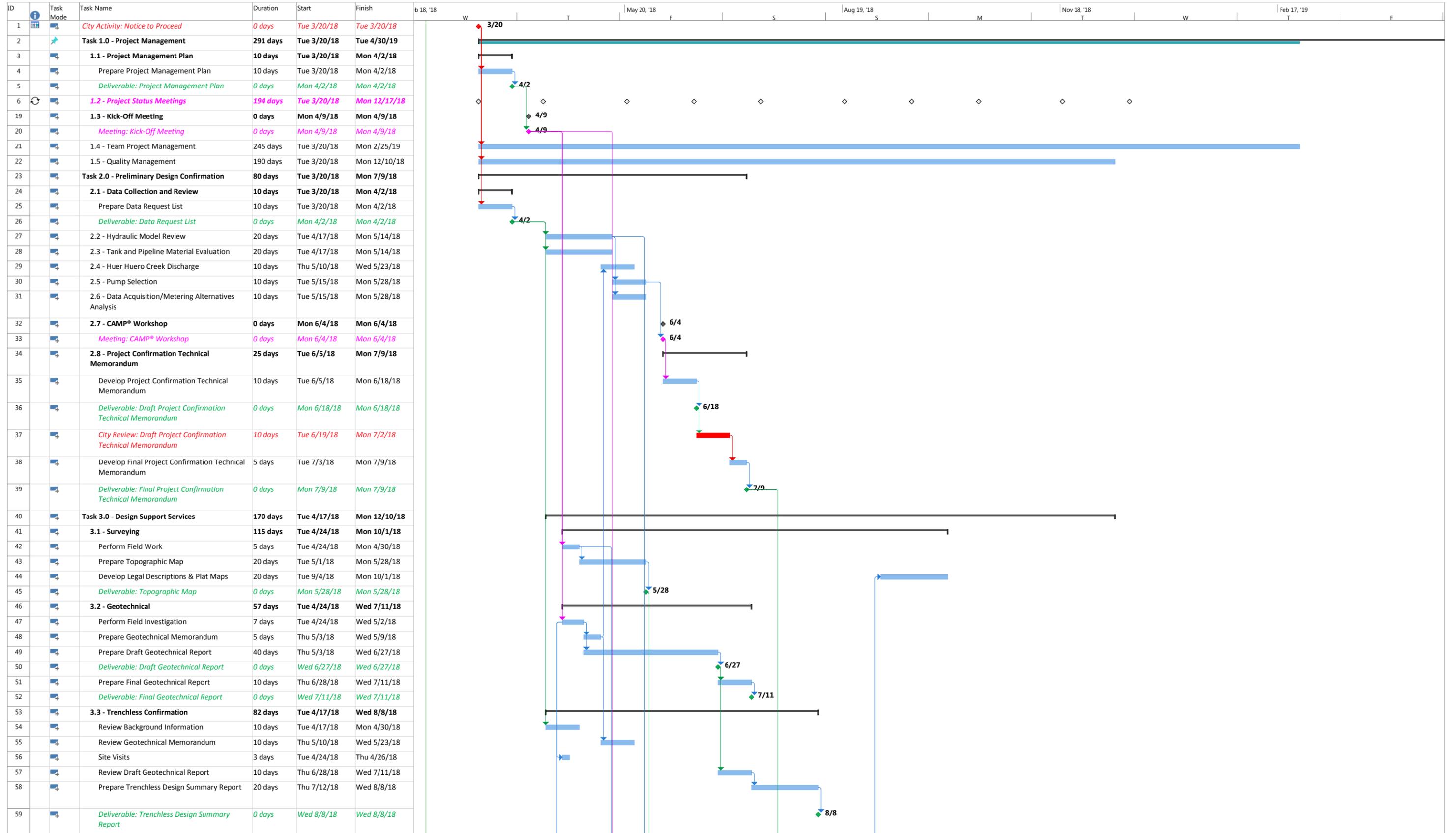
LEVEL OF EFFORT
CITY OF PASO ROBLES

RECYCLED WATER DISTRIBUTION SYSTEM
FINAL DESIGN

8-Mar-18

Tasks	Task and Sub-Task Description	KEY DESIGN STAFF										SUPPORT STAFF					Total Labor Hours	Subtotal Labor Cost	Subconsultants	Subconsultants	Subconsultants	Subconsultants	Subconsultants	Subconsultants	Total Labor Cost	PECE	Other Direct Costs Reimbursables (ODCs)	TOTAL PROJECT COSTS								
		PIC	QA/QC	PM	PUMP STATION	PIPELINE	RESERVOIR	CREEK DISCHARGE/ PERMITTING	STRUCTURAL/ CORROSION	ELECTRICAL/ I&C	HYDRAULIC MODELING	CONSTRUCT	ENGINEER SUPPORT	CAD LEAD	WP																					
		\$ 260.00	\$ 275.00	\$ 275.00	\$ 185.00	\$ 260.00	\$ 185.00	\$ 243.00	\$ 275.00	\$ 275.00	\$ 185.00	\$ 275.00	\$ 160.00	\$ 176.00	\$ 111.00																					
		Caases	Taylor	Prudhel	Fisher	Marshall	Peterson	Garvey/Shankel	Dadik	Carvalho	Orgill	Warriner	Assistant Professional	Senior Technician	Padilla			Yeh (Geotechnical)	Dave Mathy (Trenchless)	NCE (Surveying)	NHC (Surge)	MGE (Potholing)	1.1													
Task 1.0	Project Management	32	64	54	9	40	12	0	0	4	4	24	16	0	8	267	\$66,943	\$0	\$0	\$0	\$0	\$0														
1.1	Project Management Plan	2	0	2	0	4	0	0	0	0	0	0	8	0	0	16	\$3,390																			
1.2	Project Status Meetings	12	0	12	4	12	4	0	0	4	4	0	8	0	8	68	\$15,028																			
1.3	Kick-Off Meeting	6	0	8	5	8	8	0	0	0	0	0	0	0	0	35	\$8,245																			
1.4	Team Project Management	12	0	32	0	16	0	0	0	0	0	0	0	0	0	60	\$16,080																			
1.5	Quality Management	0	64	0	0	0	0	0	0	0	0	24	0	0	0	88	\$24,200																			
Task 2.0	Preliminary Design Confirmation	12	2	29	40	54	46	32	14	42	48	0	180	24	16	539	\$108,451	\$0	\$0	\$0	\$0	\$0														
2.1	Data Collection and Review	1	0	4	8	12	8	8	4	4	0	0	16	0	0	65	\$14,144																			
2.2	Hydraulic Model Review	1	0	1	0	0	0	0	0	0	24	0	0	0	0	26	\$4,975																			
2.3	Tank and Pipeline Evaluation	0	0	1	0	8	16	0	0	0	0	0	24	8	0	57	\$10,563																			
2.4	Huer Huero Creek Discharge	0	0	1	0	0	0	16	0	0	0	0	16	0	0	33	\$6,723																			
2.5	Pump Selection	1	0	2	12	2	2	0	8	8	8	0	24	0	0	67	\$13,640																			
2.6	Data Acquisition/Metering Alternatives Analysis	1	2	4	4	8	4	0	0	20	0	0	60	8	0	111	\$21,978																			
2.7	CAMP® Workshop	6	0	8	8	8	8	0	0	8	8	0	8	0	0	62	\$13,760																			
2.8	Project Confirmation Technical Memorandum	2	0	8	8	16	8	8	2	2	8	0	32	8	16	118	\$22,668																			
Task 3.0	Design Support Services	2	0	18	5	46	13	61	4	0	4	0	44	0	0	197	\$44,463	\$75,100	\$26,000	\$70,700	\$18,400	\$22,600														
3.1	Surveying	0	0	2	1	4	1	1	0	0	0	0	0	0	0	9	\$2,203			\$70,700																
3.2	Geotechnical	0	0	2	0	6	0	0	4	0	0	0	0	0	0	12	\$3,210	\$75,100																		
3.3	Trenchless Confirmation	0	0	2	0	8	0	0	0	0	0	0	4	0	0	14	\$3,270		\$26,000																	
3.4	Potholing/Utility Investigation	0	0	2	0	2	0	0	0	0	0	0	16	0	0	20	\$3,630					\$22,600														
3.5	Permitting/Environmental Support	2	0	8	0	16	8	60	0	0	0	0	24	0	0	118	\$26,780																			
3.6	Surge Analysis	0	0	2	4	10	4	0	0	0	4	0	0	0	0	24	\$5,370				\$18,400															
Task 4.0	Final Design	21	0	137	130	282	161	57	40	62	14	0	772	1,003	76	2,755	\$523,330	\$0	\$0	\$0	\$0	\$0														
4.1	60% Design Documents	2	0	52	58	95	60	20	16	20	8	0	300	402	40	1,073	\$200,711																			
4.2	60% Cost Estimate	1	0	1	1	2	1	1	0	0	0	12	0	0	0	19	\$3,588																			
4.3	60% Design Workshop	6	0	8	5	8	8	4	2	2	0	0	0	0	0	43	\$10,317																			
4.4	90% Design Documents	2	0	52	40	110	70	20	14	24	4	0	344	452	24	1,156	\$217,058																			
4.5	90% Cost Estimate	1	0	1	1	1	1	0	0	0	0	8	0	0	0	13	\$2,445																			
4.6	90% Design Workshop	6	0	8	0	8	0	4	0	0	0	0	0	0	0	26	\$6,812																			
4.7	100% Design Documents	2	0	13	24	58	20	8	8	16	2	0	100	150	12	413	\$79,955																			
4.8	Final Engineer's Estimate	1	0	1	1	1	1	0	0	0	0	8	0	0	0	13	\$2,445																			
Task 5.0	Bidding Services	2	0	16	17	24	8	4	8	12	0	0	16	68	8	183	\$37,673	\$0	\$0	\$0	\$0	\$0														
5.1	Pre-Bid Meeting	0	0	8	0	8	0	0	0	0	0	0	0	0	0	16	\$4,280																			
5.2	Bidding Period Assistance	2	0	4	4	8	4	2	4	4	0	0	8	8	8	56	\$11,442																			
5.3	Bid Opening	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5	\$925																			
5.4	Bid Evaluation Assistance	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4	\$740																			
5.5	Conformed Drawings	0	0	4	4	8	4	2	4	8	0	0	8	60	0	102	\$20,286																			
	TOTAL FEE	69	66	254	201	446	240	154	66	120	70	24	1,028	1,095	108	3,941	\$ 780,860	\$ 75,100	\$ 26,000	\$ 70,700	\$ 18,400	\$ 22,600														
Task 6.0	Optional Services	2	18	36	4	132	8	2	198	32	0	0	132	112	30	508	\$105,358	\$1,100	\$0	\$26,360	\$0	\$0														
6.1	Design of 3,200 lf of Transmission Main	2	0	8	0	28	0	0	0	0	0	0	48	52	2	140	\$27,054	\$1,100		\$3,860																
6.2	Scour Analysis	0	2	10	0	80	0	0	0	0	0	0	0	0	4	96	\$24,544			\$2,500																
6.3	Develop Legal Descriptions and Plat Maps	0	0	2	0	4	4	2	0	0	0	0	4	0	0	16	\$3,456			\$20,000																
6.4	Design of Data Transmission System	0	16	16	4	20	4	0	0	32	0	0	80	60	24	256	\$50,304																			

CITY OF PASO ROBLES
 RECYCLED WATER DISTRIBUTION SYSTEM FINAL DESIGN
 FEBRUARY 26, 2018



CITY OF PASO ROBLES
 RECYCLED WATER DISTRIBUTION SYSTEM FINAL DESIGN
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