MEETING AGENDA
for
PLANNING, RESOURCES AND OPERATIONS COMMITTEE

February 25, 2020 @ 3 pm
At Company Office 139 N. Euclid Avenue, Upland, CA

- **Call to Order**

1. Recognitions and Presentations:
2. Additions-Deletions to the Agenda:
3. Public Comments
   This is the time for any shareholder or member of the public to address the committee members on any topic under the jurisdiction of the Company, which is on or not on the agenda. Please note, pursuant to the Brown Act the Committee is prohibited from taking actions on items not listed on the agenda. For any testimony, speakers are requested to keep their comments to no more than four (4) minutes, including the use of any visual aids, and to do so in a focused and orderly manner. Anyone wishing to speak is requested to voluntarily fill out and submit a speaker's form to the manager prior to speaking.
4. Approval of Committee Meeting Minutes
   A. Regular Committee Minutes of November 26, 2019
5. Planning and Operational Issues:
   A. Statements of Proposal – Comprehensive System Master Plan and Asset Management Program
   B. Request for Proposals – Professional Design and Project Management Services for Multiple Capital Facility Projects
6. Planning and Operational Updates:
   A. Project Status Report/Project List
      Report on on-going projects
7. Basin Issues and Updates:
   - San Antonio Canyon Watershed – Verbal report
   - Chino Basin - Verbal report
   - Six Basins - Verbal report
   - Cucamonga Basin – Verbal report
8. Closed Session: None.
9. Committee's Comments and Future Agenda Items:
   This is the time for the Committee to comment and consider future agenda items relative to planning, water resources and operations of the company and its shareholders.

Adjournment:
The next regular PROC Meeting will be held on April 28, 2020 at 3:00 p.m.

NOTE: All agenda report items and back-up materials are available for review and/or acquisition at the Company Office (139 N. Euclid Avenue, Upland, CA.) during regular office hours, Monday through Thursday [7:00 – 11:30 & 12:30 – 5:00] and alternating Fridays [7:00 – 11:30 & 12:30 – 4:00]. The agenda is also available for review and copying at the Upland Public Library located at 450 N. Euclid Avenue.

POSTING STATEMENT: On February 20, 2020 a true and correct copy of this agenda was posted at the entry of the Company Office (139 No. Euclid Avenue), and on the public bulletin board at 450 N. Euclid Avenue (Upland Public Library), and on the Company website.

MINUTES OF THE SAN ANTONIO WATER COMPANY
PLANNING, RESOURCES, and OPERATIONS COMMITTEE
November 26, 2019

An open meeting of the Planning, Resources, and Operations Committee (PROC) of the San Antonio Water Company (SAWCo) was called to order at 3:00 p.m. on the above date at the company office located at 139 N. Euclid Avenue, Upland, California. Committee members present were Gino Filippi, Martha Goss, and Tom Thomas. Also in attendance were SAWCo's General Manager Brian Lee, Assistant General Manager Teri Layton, and Senior Administrative Specialist Kelly Mitchell. Mr. Filippi presided.

1. Recognitions and Presentations – None.

2. Additions-Deletions to the Agenda – None.

3. Public Comments – None.

4. Approval of Committee Meeting Minutes:
   A. ***Regular Committee Minutes of September 24, 2019*** – Mr. Thomas moved and Ms. Goss seconded to approve the meeting minutes of September 24, 2019 as presented. Motion carried.

5. Planning and Operational Issues:
   A. ***Request for Proposals – Comprehensive System Master Plan and Asset Management Program*** – Mr. Lee prepared a request for proposal (RFP) for a Comprehensive System Master Plan and Asset Management Program he hopes to release. The project will provide SAWCo with a list of all of its facilities, where they are at in their life cycle, and what the company should be spending on a yearly basis to ensure facilities are well maintained. A source waterloss risk review is included in the RFP.

   The cost estimate for the project is roughly $240,000 with $160,000 allocated to domestic and $80,000 allocated to irrigation.

   The Committee desired to bring the item to the Board at the Board Budget Workshop for their review and possible approval to release the RFP.

   Mr. Thomas requested incorporating language in the RFP to allow for meetings with the Committee.

   Mr. Thomas moved and Ms. Goss seconded to bring the item to the Board at the Board Budget Workshop for discussion and possible approval. Motion carried.

6. Planning and Operational Update -
   A. ***Project Status Report –***
   - ***Holly Drive Reservoir Phase II –*** Ninety percent complete design plans are being reviewed. This project will go to bid next year and is to be constructed next year.

- ***Reservoir 7 –*** Reroofing – The reservoir liner has been installed. Final inspection took place at the end of the previous week. Wash down, disinfection, and pressure reducing valve will be set shortly before the reservoir is put back in to service.
- ***Campus Avenue Waterline*** – The waterline is currently being installed. The majority of the work will be completed in December with the remaining work to be finished in January.
- ***Cucamonga Crosswalls –*** Repair of the damage from last year's rainy season is complete. Environmental mitigation will begin in the springtime.

7. Basin Issues and Updates
   - ***San Antonio Canyon Watershed –*** Ms. Layton reported a meeting is scheduled for the first part of December. The Committee will be discussing the Water Sanitary Survey with the consultant. Costs are shared with the City of Upland and the City of Pomona.

   - ***Chino Basin*** – Ms. Layton reported on an attempt by the Agricultural Pool to change the pooling amendment which included verbiage from the Peace II Agreement regarding the Appropriative Pool paying the Agricultural Pool's costs. There is a possibility of legal action being taken by the Appropriative Pool.

   - ***Six Basins*** – Mr. Lee reported the budget was approved at the most recent Board meeting. The Pomona Valley Protective Association (PVPA) has committed $150,000 towards the costs of projects in the basin. Operating Safe Yield remains at 13,000 acre feet (AF).

   - ***Cucamonga Basin*** – The Judgment has been reviewed in its entirety. TKE Engineering is now using the comments from all of the parties involved and combining them into one document. No meeting was held in November to allow TKE more time to compile the information.

8. Closed session: None.

9. Committee's Comments and Future Agenda Items: Mr. Lee noted the budget will drive the future agenda items for the PROC as there is an aggressive capital improvement plan for 2020.

Adjournment: –The meeting adjourned at 3:26 p.m.

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Assistant Secretary
Brian Lee

San Antonio Water Company
Incorporated October 25, 1882
Serving the original Ontario Colony lands

A REQUEST FOR PROPOSALS

TO PROVIDE CONSULTING SERVICES TO THE SAN ANTONIO WATER COMPANY

PROJECT TITLE:

COMPREHENSIVE SYSTEM MASTER PLAN AND ASSET MANAGEMENT PROGRAM

RESPONSE DUE BEFORE 3:00 PM

On February 11th, 2020

Introduction

The San Antonio Water Company is soliciting proposals from qualified firms to assist in developing a Master Plan / Asset Management Program for the Company's domestic and irrigation water systems.

The intent of the Comprehensive System Master Plan and Asset Management Program is to:

- Conduct a detailed study of both systems and recommend Capital Improvements,
- Prepare a detailed prioritization of Capital Replacements,
- Develop a comprehensive Capital Master Plan / Asset Management Program based on the findings of the Improvement and Replacement reviews, and
- Develop high-level review concerning loss-risk of water sources and possible alternatives to water supply in consideration of current sources (e.g. 100+ year-old tunnel) and projected regional environmental changes (i.e. global warming) or events (e.g. earthquakes / wildfires).

General Information

In 1882 Canadians George and William Chaffey purchased 8,000-acres of the Cucamonga Rancho, including the water rights, and established an irrigation colony which they named Ontario, in honor of their homeland. On October 25, 1882 they also established the San Antonio Water Company under the General Corporation Laws of the United States. Rancheria water rights established back in the 1700's were transferred to the Company to support the newly established irrigation colony. The brother's vision was to develop a Mutual Water Company whose members shared equally in the locally available water supply.

The brothers sold irrigation colony land in 10-acre blocks, primarily intended for the booming citrus industry. Along with the land, the brothers sold shares in the Company, one share for each purchased acre. Each shareholder was entitled to a portion of available local water, distributed equally by the company amongst all the shareholders. The Company was responsible for distributing water on a non-profit basis to the shareholders.

Since 1882 the San Antonio Water Company has consistently provided water service to its shareholders. Although the local citrus industry has largely disappeared, the Company maintains delivery to current shareholders utilizing the same successful 'per share' distribution plan established over 135 years ago.

The Company does not import any water. Instead we are dependent on our local San Antonio Canyon and Cucamonga Canyon watersheds and downstream groundwater basins.

Currently, our shareholders include most residents of the unincorporated area of San Antonio Heights, the Cities of Upland and Ontario, the Monte Vista Water District, local quarries and the proud heritage of remaining grove irrigators.

Annual shareholder water entitlements are established based on projected availability. For 2018, full water entitlement was established at 12,000 Acre Feet (AF). The table below shows how that 12,000 AF was divided among current shareholders, along with actual water delivered in 2018.

Shareholders	Shares	Annual Entitlement, Acre Feet per Year (AFY)	Delivered (AFY)
City of Upland	4,338.75	8,150	7,544
City of Ontario	295.25	555	359
Monte Vista Water District	329.75	619	405
Domestic Customers	625.25	1,174	1,259
Rock Company	36.25	68	384
Golf Courses	116.75	219	366
Grove Irrigators	87.25	164	53.32
Inactive Shares	559.75	1,051	0
Total shares	6,389	12,001	10,369

The Company provides water through two separate systems; domestic and irrigation.

The domestic system receives the majority of its water through the San Antonio tunnel. The tunnel is built into the head of the San Antonio Canyon about 90 feet below the ground surface. The tunnel consists of 5,400 feet of 36" concrete pipe and 600 feet of a six-foot square shaft built into the bedrock below the alluvium. Portions of the shaft are supported by redwood beams. There are ten access hatches spaced about 600 feet apart; three access hatches for the tunnel and six for the pipeline. Groundwater percolating through the alluvium collects in the tunnel and, after chlorination provides 4-log inactivation, is channeled into the Company's potable water system. Two wells supply the remainder of our domestic supply. Domestic water is distributed by six booster pump stations through 25 miles of pipeline to five reservoirs.

The domestic water system provides service to the San Antonio Heights, also known as our Basic Service Area. Consisting primarily of large residential lots, the Heights is an unincorporated area of San Bernardino County approximately 2.6 square miles in size located immediately north of the City of Upland. The Company provides water to individual residential lots through 1,200 domestic meters.

The irrigation system primarily receives water from surface water diversions in the San Antonio Canyon. Additional irrigation water is supplied through seven wells located in three groundwater basins; Cucamonga Basin, Six Basins and Chino Basin. Irrigation water is distributed by two booster pump stations through 21 miles of pipeline to three reservoirs.

The irrigation system provides service to the Company's 'extended' service area. Shareholders in the extended service area include municipal and private companies. A majority of the distributed

irrigation water is treated by municipal shareholders and then delivered to their customers as domestic water. The remaining irrigation water is used for farming, landscaping and commercial use (quarry).

The Company's most recent Master Plan was developed in 2017, along with the most recent hydraulic model of the domestic water system.

Project Scope of Services

Task 1 – Project Management

Provide overall project management services including:

- Quality assurance/ quality control
- Teleconferences and meetings at appropriate intervals to keep Company staff updated on progress and address any needed management level decisions.

Task 2 – Data Gathering and System Evaluation Criteria

The Company recognizes that a major upfront component of this project involves discovery tasks that will assist in developing a remaining scope of work. Consultant shall propose a mechanism to collaboratively work with staff to review, prioritize, sequence and implement dependent tasks.

Task 3 – Capital Improvement Program

Domestic Hydraulic Model

1. Review and modernize existing domestic hydraulic model.
2. Conduct flow tests within and throughout domestic system. Verify the hydraulic model adequately represents real-world operating conditions of the domestic system.

Irrigation Hydraulic Model

3. Develop an irrigation system hydraulic model based on existing facility map book information.
4. Conduct flow tests within and throughout irrigation system. Verify the hydraulic model adequately represents real-world operating conditions of the irrigation system.

Capital Improvement Projects Based on Modeling Results

5. Using the modernized and calibrated hydraulic models, identify weaknesses in the existing domestic and Irrigation systems in regard to flow (fire and peak day demand), pressure and/or storage. Determine what improvements could be made to increase/improve service. Company expects consultant to use two separate models, one for each system.
6. Develop an Engineer's Opinion of Probable Construction Cost, in 2020 dollars, for each facility/project proposed for improvement in subtasks 5.

Task 4 – Capital Replacement Program

1. Refine a comprehensive database of Company facilities and their metadata (e.g. age, material, size) from the Company's GIS system.
2. Aggregate existing facilities into groups based on location and similarity. The intent of this task is to develop a list of replacement projects that represents all Company assets.
3. Develop an Engineer's Opinion of Probable Replacement Cost, in 2020 dollars, for each facility/project identified in subtask 2.

Task 5 – Master Plan and Facility Asset Management Program

1. Using costs developed in tasks one and two and an 'industry standard estimated service life' for facilities, develop a theoretical yearly asset management budget that would ensure timely system improvements and that all facilities are replaced in a timely manner.
2. Review Company's revenue and operating expenses and develop a best-fit yearly total spending limit devoted to Capital replacement, in 2020 dollars.
3. Reconcile the difference between the spending limit in subtask 1 with the spending requirement in subtask 2.
4. Develop a review and ranking process whereby each facility can be assessed compared to like facilities. The intent of this task is to develop a replacement/improvement priority list that contains all Company facilities.
5. Using all of the information developed above, prepare a 10-year Capital Replacement Prioritization List and a 5-year Capital Replacement Program.

Task 6 – Source Water Loss-Risk Review

1. Provide a review of projected environmental changes (e.g. rainfall and temperature patterns) in the local area that are predicted to occur over the next twenty years. What is the future local water source outlook for the Company?
2. Provide a review of catastrophic failures that could potentially impact the Company's source water (e.g. wildfire, earthquake). Of particular concern is the Company's domestic source - the San Antonio Tunnel.
3. In consideration of the findings in subtask 1 and 2, develop alternative scenarios in which the Company can continue providing full yearly entitlement to shareholders. Alternatives to consider include:
    a. Staying-the-course. No change in operation.
    b. Strengthen or improve current source water facilities.
    c. Developing a conjunctive use program in one or more groundwater basins.
    d. Develop alternative water sources (e.g. Increase yield in local watersheds and/or connection to Metropolitan Water District)
    e. Consultant developed alternatives.

    How can the Company prepare for catastrophic impacts to source water and systems?

4. Develop high-level project scope and costs for each alternative considered in subtask 3.

Schedule

The Company anticipates the following timeline and key milestones for award of the project:

Proposal Due Date	February 11, 2020
Planning, Resource and Operations Committee (PROC) Review	February 25, 2020
Interview	TBD – If necessary
Board of Director's Approval	March 17,2020
Consultant's Notification	March 18, 2020

Proposal Requirements

The proposal shall not exceed 19 pages excluding resumes, cover letter, dividers, front and back covers. No other documents will be reviewed. Please do not submit additional material. Responses to this RFP shall be in the following order and shall include:

Executive Summary (2 pages maximum)

Summarize the contents of your firm's proposal in a clear and concise manner.

Firm Background and Experience (4 pages maximum)

Brief description of the firm and subconsultants, if any, including the size of the organization, location of offices and relevant capabilities and resources in relation to the project. This section should include:

I. Experience with developing master plans and asset management programs
II. Experience in water system planning.
III. Similar projects with other water companies or districts
IV. Firm's local experience
V. Procedures and/or policies associated with or related to work quality and cost control
VI. Management and organizational capabilities
VII. Verification of professional liability insurance for coverage of not less than $1,000,000.

Project Organization and Experience of the Project Team (2 pages maximum, not including resumes)

Proposing firm shall identify the team to be assigned to the project, by name, including at a minimum the principal, project manager, key staff and any subconsultants. Proposing firm shall describe the project team's qualifications and experience on projects related to this specific project. Proposing firm shall explain the project team's experience regarding all tasks associated with the scope of work. This section should include:

I. Describe proposed project organization, including identification and responsibilities of key personnel, including sub-consultants. Include only one- page resumes.
II. Describe the experience of the Project Manager and the experience that the proposed personnel have working on past projects as a team.
III. Describe project management approach to the work effort, locations where work will be done, responsibilities for coordination with the Company, and lines of communication necessary to maintain project on schedule.

Project Understanding and Approach (8 pages maximum)

Proposer shall demonstrate its preliminary understanding of the project by providing a clear and concise description of the project and major issues, based on the information provided in this RFP.

Proposer shall clearly define the tasks and activities necessary to meet the objectives outlined in the scope of work. This section should include:

I. Description of the tasks and activities, the methodology that will be used to accomplish them.
II. Description of the products that would result from each task and activity.
III. Identification of points of input and review with Company staff.
IV. Proposed project schedule identifying key tasks, their expected duration, and milestone dates.
V. Proposers are invited to suggest additional (optional) work tasks that could be performed in conjunction with or subsequent to the scope of work. Any such tasks are to be described as optional and the benefits of performing such tasks shall be described.

Past Projects (3 pages maximum)

Proposer shall provide project descriptions of up to three similar projects. Include the following information:

I. Owner contact name and phone number
II. Project team members
III. Project size and description

Proposed Total Professional Fee and Fee Schedule Submitted Under Separate Sealed Cover

Proposed fee shall not be the sole basis of award but will be used to evaluate the Consultant's understanding of the Scope of Work.

Include the hourly rates of all staff that will charge to the project.

Company expects to award a 'time and material, not to exceed' contract for Implementation.

Exceptions to this RFP

The Consultant shall certify that it takes no exceptions to this RFP including, but not limited to, the Professional Service Agreement (attached).

Evaluation Criteria

The evaluation criteria and the respective weights that will be given to each criterion are as follows:

a) 30% Understanding and approach to the work to be done
b) 20% Experience of firm with similar kinds of work
c) 30% Experience of staff for work to be done
d) 10% Overall clarity and presentation of Proposal
e) 5% Firm's Local Experience
f) 5% Proposed Project Fee

Selection Process and Schedule

Key senior staff and select Company Directors will independently review and rank each proposal. Based on an aggregate of those reviews, the Company will likely enter into negotiations with the top ranked firm. If there is no clear 'top ranked' firm, interviews may be scheduled.

At this time, the Company contemplates the use of a Time and Material Not to Exceed contract for the services requested. Negotiations will cover scope of work, contract terms and conditions, attendance requirements, and appropriateness of the proposed fee.

After negotiating a proposed agreement that is fair and reasonable the General Manager will present the contract to the Company's Board for authorization to execute a contract with the most responsive firm.

Related Documents

- Company standard Professional Service Agreement (attached)

Link for downloading available upon request

- 2017 Company Water Master Plan
- 2017 InfoWater Hydraulic Model
- Company's System Atlas (both domestic and irrigation)

The Company's GIS database is currently under development. The first iteration will be based on the Company's System Atlas. It is expected to be available in Spring 2020.

Interested proposers should immediately contact the Company to register for inclusion on the project distribution list. Revisions or supplemental information to this RFP will be issued through addenda by email and posted on the Company's website. Proposers are responsible for receipt of any and all addenda.

Submittal Requirements

One (1) executed original marked "ORIGINAL" in red ink and 6 copies of the Proposal shall be delivered, along with one electronic copy in PDF format on thumb drive. One single sealed Proposed Fee Estimate marked "FEE ESTIMATE – 2020 Master Plan" in red ink shall be submitted separate from the proposal. Proposals will not be accepted in any other format. Proposals will not be accepted by email, fax or verbally. The proposal shall be signed by an individual, partner, officer or officers authorized to execute legal documents on behalf of the Firm.

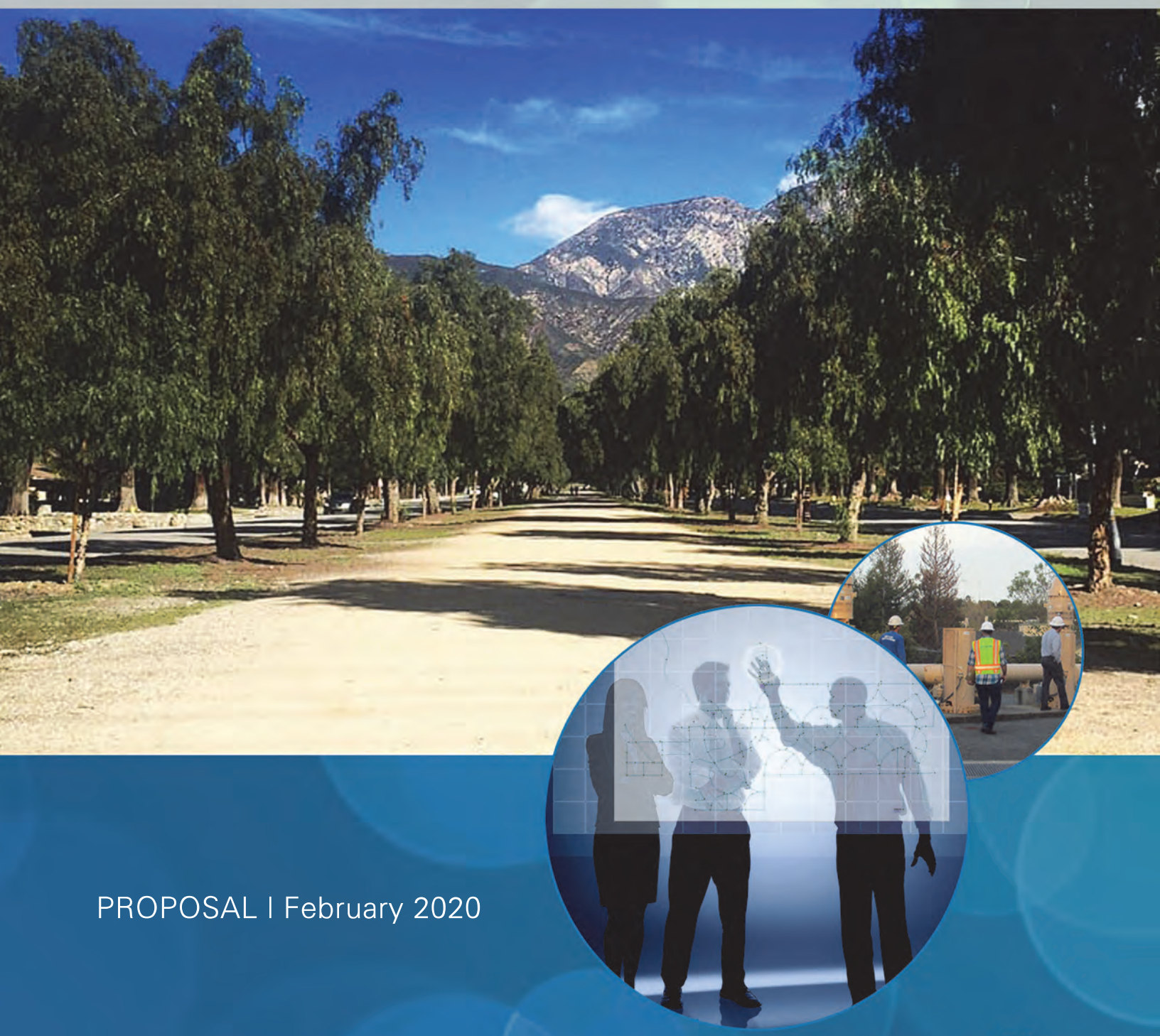
The Response Proposal must be received no later than **3:00 p.m.** local time, on or before **February 11th, 2020** at the office of:

PROPOSAL – 2020 Master Plan
San Antonio Canyon Water Company
139 North Euclid Avenue
Upland, CA 91786
Attn: Brian Lee

Failure to comply with the requirements of this RFP may result in disqualification. Questions regarding this RFP shall be submitted in writing to blee@sawaterco.com.

San Antonio Water Company

Comprehensive System Master Plan and Asset Management Program



PROPOSAL I February 2020

carollo
Engineers...Working Wonders With Water®

1 | Executive Summary

February 11, 2020

Brian Lee
San Antonio Canyon Water Company
139 North Euclid Avenue
Upland, CA 91786

Subject: Comprehensive Master Plan and Asset Management Program

Dear Mr. Lee,

Based on our discussions, review of your existing master plan and hydraulic model, other reference materials, and the Request for Proposal (RFP), we have developed a clear understanding of your project's objectives. We are excited about the opportunity to work collaboratively with San Antonio Water Company (SAWCO) to find tailored and defensible solutions relating to SAWCO's aging infrastructure and supply risks. We understand that the purpose of this project is to develop modernized models of the domestic and irrigation systems and integrate findings from the modeling analysis, supply risk assessment, and aging infrastructure review into a Comprehensive Master Plan (Plan) that serves as a forward thinking road map for the next decade.

Carollo Engineers, Inc. (Carollo) has assembled a team of skilled local master planning and asset management professionals that are a direct match for your project needs. Our team members have all successfully worked together on over 30 projects similar in complexity and challenges. The team is led by Graham Juby and Amy Martin who have spent a combined total of 35 years working on projects within the local region. As demonstrated in our proposal, we are available to meet your schedule and bring the following benefits to SAWCO:

- **Local Team of Master Planning and Asset Management Professionals.** The most important success factors for any project is the people that work on it. We offer an excellent team of both planning and asset management experts with a depth and breadth of knowledge necessary to deliver your project successfully. Our master planning and hydraulic modeling team members have a compelling collective record of over 260 projects completed. In addition, our team includes experts with a understanding of hydrogeology, structural analysis, and pipeline and tunnel rehabilitation projects, which will help provide confidence when identifying the right mix of solutions. Our team is led by our project manager and former San Antonio Height's resident, Amy Martin, who has managed both master planning and infrastructure projects in the region and maintains a connection to the local community. She is Carollo's Southern California Planning and Water Resources Manager and she provides an owner's perspective through her previous employment with the Inland Empire Utilities Agency (IEUA). Conveniently, her entire core planning team is within a 40-minute drive, which allows the team to meet on short notice to discuss findings and to work collaboratively with SAWCO staff.
- **Sound Relationships and Fresh Ideas.** Our team strives to build long-term and trusted relationships with the clients that we serve. We understand that SAWCO is looking for a planning team that can provide a fresh perspective, but also offers an understanding of the local region. Our team most recently completed Cucamonga Valley Water District's Master Plan and an update to the City of Upland's Master Plan. We can build upon our local knowledge to hit the ground running while minimizing the learning curve. We are excited about the opportunity to work closely with your team to deliver a Plan with the right mix of solutions to the problems that may keep you up at night.

- **Innovative Tools.** Carollo is known for its innovative ideas across the water sector. In addition to expertise with all typical hydraulic modeling platforms in the U.S. water sector, our team brings other innovative ideas and tools. For example, we will use remote pressure loggers to supplement the calibration data gathering to increase model accuracy. We also bring hands-on experience with the preparation of risk-based pipeline replacement programs with tools such as InfoAsset. Lastly, we can provide a dynamic electronic Capital Improvement Plan (CIP) tool that will provide the SAWCO with a living CIP that can be used for years to come.

We look forward to working side-by-side with you and building a long lasting relationship to help you achieve your vision and goals. Should you have any questions please do not hesitate to reach out to us at 714.593.5153 or amartin@carollo.com.

Sincerely,
CAROLLO ENGINEERS, INC.

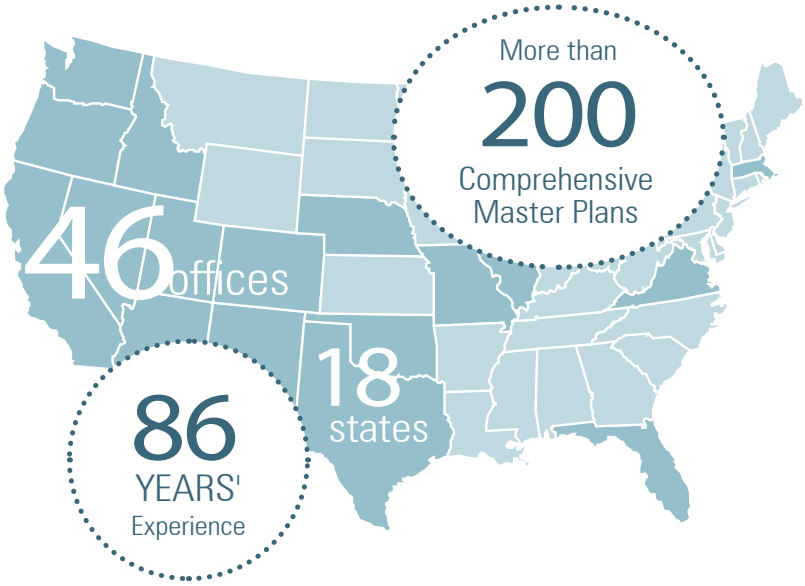
Graham Juby, PhD, PE
Vice President

Amy Martin
Project Manager

2 | Firm Background and Experience

FIRM BACKGROUND

Carollo is an environmental engineering firm specializing in the planning, design, and construction management of municipal water, wastewater, and reclaimed water facilities for 86 years. We currently maintain 46 offices across the nation and have more than 1,000 employees, including 450+ registered engineers. We are a full service company with the experience and qualified professionals to successfully manage projects of any size. Our staff include civil, sanitary, environmental, electrical, mechanical, chemical, structural, control system, and corrosion control engineers, as well as architects, planners, and specialists in other areas.



Master Planning

Carollo has established itself as a leader in the development of comprehensive master plans for cities and agencies facing a variety of complex issues. Our project team has completed multiple comprehensive master plans for many agencies in California. This experience allows us to deliver a high-quality master plant in an efficient manner.

CAROLLO HAS COMPLETED MORE MASTER PLANS IN CALIFORNIA THAN ANY OTHER FIRM

We have prepared comprehensive master plans for more than 200 municipal clients with service area populations from 5,000 to over 4 million. We have demonstrated our ability to successfully address complex technical, regulatory, and institutional issues to produce clear, cost-effective, and practical recommendations. Our projects range from small planning studies to comprehensive, regional master plans. In addition, our planning team typically coordinates with our asset management and condition assessment experts to provide an integrated CIP that can be used as a roadmap for years to come. In fact, our technical expertise, paired with proven asset management tools allow us to anticipate and meet specific client objectives. We have assisted with over 100 asset management projects across the country, which includes work concurrently completed during the development of master plans.

We have also assisted many of our clients with subsequent rate studies and prepared presentations/ attended many City Council and Board meetings to assist with the stakeholder outreach, public acceptance, and adoption process of the master plans.

Past Record of Performance

Carollo takes pride in continuing relationships that we have developed with our clients. On the following pages, we provide a list of both local projects and projects similar in complexity. We invite you to contact the individuals listed in our project references. They will be happy to attest to the quality of services and responsiveness provided by our team members.

Similar Projects & Local Experience

CLIENT/PROJECT	HYDRAULIC MODELING	SUPPLY ANALYSIS	CONDITION ASSESSMENT	COMPREHENSIVE CIP
Water System Master Plan, Antelope Valley-East Kern Water Agency	●	●	●	●
Integrated Water Master Plan (Water, Wastewater, and Recycled Water), City of Banning	●	●	●	●
Water Master Plan Study, City of Buena Park	●	●		●
Water and Wastewater Master Plans, City of Colton	●		●	●
Water System Master Plan, Cucamonga Valley Water District	●	●	●	●
Retail Zone & Wholesale Zone Water Master Plans, East Orange County	●	●	●	●
Water, Sewer, and Storm Drainage Master Plans, City of El Centro	●	●		●
Water Master Plan, City of Garden Grove	●	●		●
Water and Recycled Master Plan & 2018 Model Calibration, City of Glendale	●	●	●	●
Water, Wastewater, and Recycled Water Master Plans and Urban Water Management Plan, City of Hesperia	●			●
On-Call Recycled Water Modeling, Inland Empire Utilities Agency	●	●		
Wastewater Master Plan, Inland Empire Utilities Agency	●	●		●
Pomona, and Monte Vista Water District (Phase 1 & 2), Intertie Study Between IEUA,	●	●		
One Water LA 2040 Plan, City of Los Angeles	●	●		●
Hydraulic Model Development, Master Plan, and On-Call Support, Los Angeles World Airports	●		●	●
Water Master Plan, Mesa Water District	●	●	●	●
Water, Wastewater, and Recycled Water Master Plans, City of Oceanside	●	●	●	●
Water System Master Plan,City of Orange	●			●
Comprehensive Facilities Master Plan, Padre Dam Municipal Water District	●	●	●	●
Recycled Water Master Plan, City of Pomona	●	●		
Integrated Water Management Plan, City of Riverside	●	●		●
Water System Master Plan Update and Hydraulic Model for Fontana Water Company, San Gabriel Valley Water Company	●	●	●	●
Water System Master Plan Update and Hydraulic Model for the Los Angeles County Division, San Gabriel Valley Water Company	●	●	●	●
Water Supply Planning Study and Recycled Water System Assessment, City of Santa Barbara	●	●		
Water System Master Plan, City of Santa Maria	●			●
Water System Hydraulic Model, City of South Pasadena	●			
Six Basins Groundwater Recovery Project, Three Valleys Municipal Water District		●		
High Zone Water Evaluation, City of Torrance	●			
Water and Recycled Water System Assessment, University of California, Irvine	●			●
Water System Master Plan and Model Update, City of Upland	●			●
20-Year Comprehensive Water Master Plan, Victor Valley Water District	●			●
Hydraulic Modeling Project and Asset Management Plan Update North East Planning Study, Yorba Linda Water District	●			●

**Projects completed locally*

PROJECT MANAGEMENT PROCEDURES FOR WORK QUALITY AND COST CONTROL

At Carollo, planning is the cornerstone of project excellence. This philosophy is integral to our project management procedures for work quality and cost control. Graham Juby and Amy Martin will work together to develop a project management plan that will set this project on the course to success. This section details the five key areas that will be used guide the project through completion.

1. Planning of the Work

At the beginning of the project, a comprehensive work flow plan will be discussed with internal team members regarding the scope, schedule, and budget. The project objectives, critical milestone, and lines of communication will be established and discussed with SAWCO staff at the kick-off meeting. This plan will provide the team with a better understanding of the activities that must be grouped, delivered, and discussed at progress meetings. Our proposed work flow plan, schedule, and scope of work are presented in Section 4.

The work flow plan will be updated throughout the project on an as-needed basis to serve as a project management tool that allows the team to focus on providing an organized, seamless delivery of work efforts.

2. Timely and Effective Decision Making

SAWCO and Carollo must make decisions efficiently and effectively to stay on schedule and meet the designated budget. This project requires SAWCO's input and involvement, as well as Carollo's punctual response to requests and feedback. Our job is to provide SAWCO with the information needed so that timely decisions can be made.

The effectiveness of the decision process is based on answers to the following fundamental questions:

- What decision has to be made?
- When does the decision have to be made?
- Who are the decision makers?
- What information is needed to make the decision?
- How will that information be formatted to allow for a comprehensive understanding of the decision?
- What are the decision's cost and schedule?

Our effective decision making approach will be occur throughout the project and will include ongoing collaboration with SAWCO's staff. This process will also be used during key progress meetings where notes will be taken and action and decision items will be logged.

3. Staff Involvement

One of the most critical considerations is to identify who will be involved in the project and how much time they will contribute to the development of the comprehensive master plan. As previously mentioned, our work flow plan and schedule identify key deliverables, progress meetings, and SAWCO staff involvement throughout the project. Our success will be dependent on decisions made during key progress meetings, so attendance of those involved with the project is crucial. To provide staff with adequate time to review and provide important feedback, an agenda and associated draft documentation requiring review will be provided a week before the progress meeting.

4. Measuring Performance

Our project manager, Amy Martin, is responsible for and accountable to SAWCO to effectively manage our team's scope, budget, and schedule. She will submit monthly Project Management Reports, which update the status of the scope, budget, and schedule. Amy will also have conference calls and face-to-face progress meetings to update the project status and discuss any project issues/ concerns.

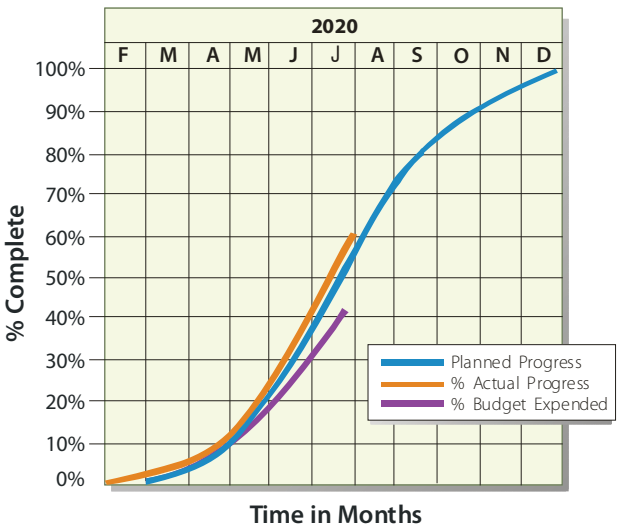
Monthly Progress Monitoring and Reporting

Project scope changes are tracked through the project decision log, which will be included in the monthly

progress reports. These items will be tracked using the date of identification, potential for budget or schedule impact, and required date of resolution. No work will be initiated on out-of-scope services, if any, without SAWCO's input and confirmation. Monthly progress reports will include a project "S" curve that graphically depicts the relationship between schedule, budget, and actual percent complete, allowing SAWCO to access the status of the project.

Earned value management (EVM) is used to analytically and accurately assess project budget, track schedule status, monitor progress, and take appropriate corrective action if required.

By using the EVM method, the status of the project budget and schedule are clear to both the management team member must simply inspect the "earned" value of the subtask. Establishing rigorous reporting procedures enables the management team to focus on developing solutions rather than searching for the source of the problem.

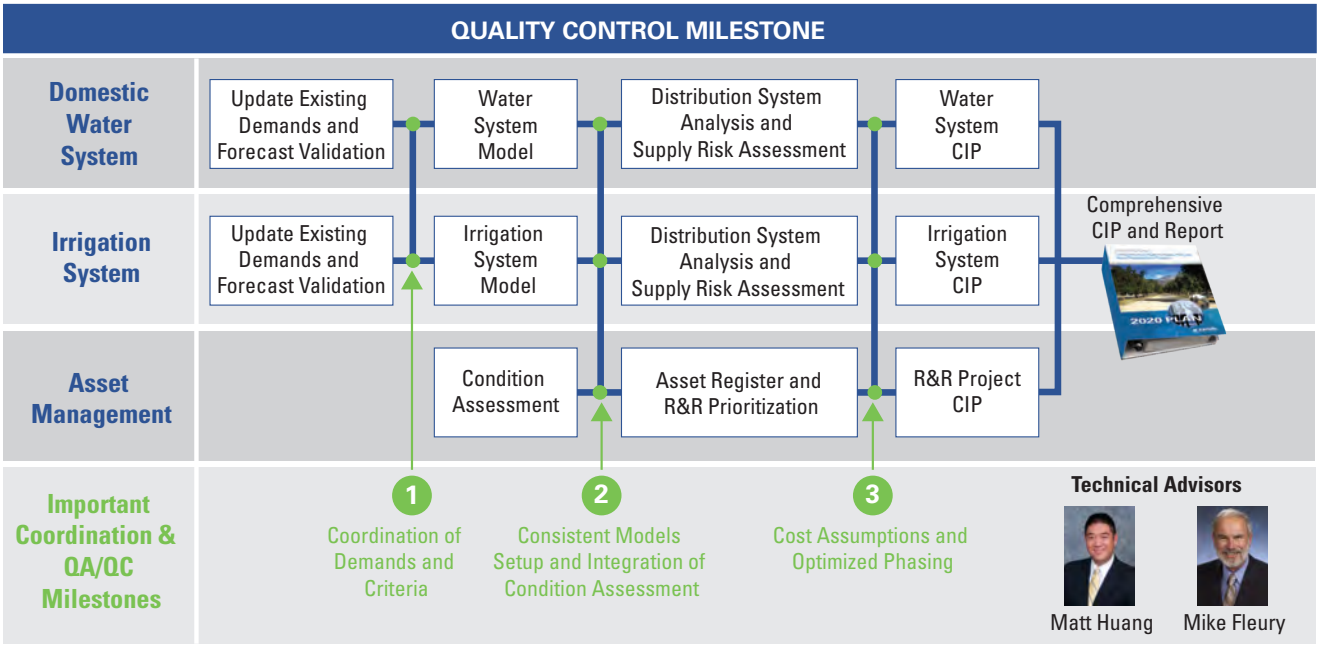


Monthly progress reports will include a project "S"-curve that graphically depicts the relationship between schedule, budget, and actual percent complete, allowing IEUA to access the status of the project.

5. Delivering Quality Service

To meet or exceed SAWCO's quality expectations, Carollo has assigned dedicated experts in both master planning and asset management to review draft deliverables at key project milestones, which efficiently delivers the work, if any, and maintains the project budget and schedule.

Matt Huang, a Principal Planning Engineer, will lead our quality control (QC) activities for hydraulic modeling, system analysis, and the supply risk assessments and Michael Fleury, the Regional Infrastructure Lead, will review condition assessment findings and provide input on the potential cause for the sedimentation buildup in the San Antonio Tunnel with cursory recommendations. The combined recommendations in the master plan will be reviewed by both Matt and Michael.



VERIFICATION OF INSURANCE

Carollo is able to provide meet the necessary liability insurance coverage.

3 | Project Organization and Experience of the Project Team

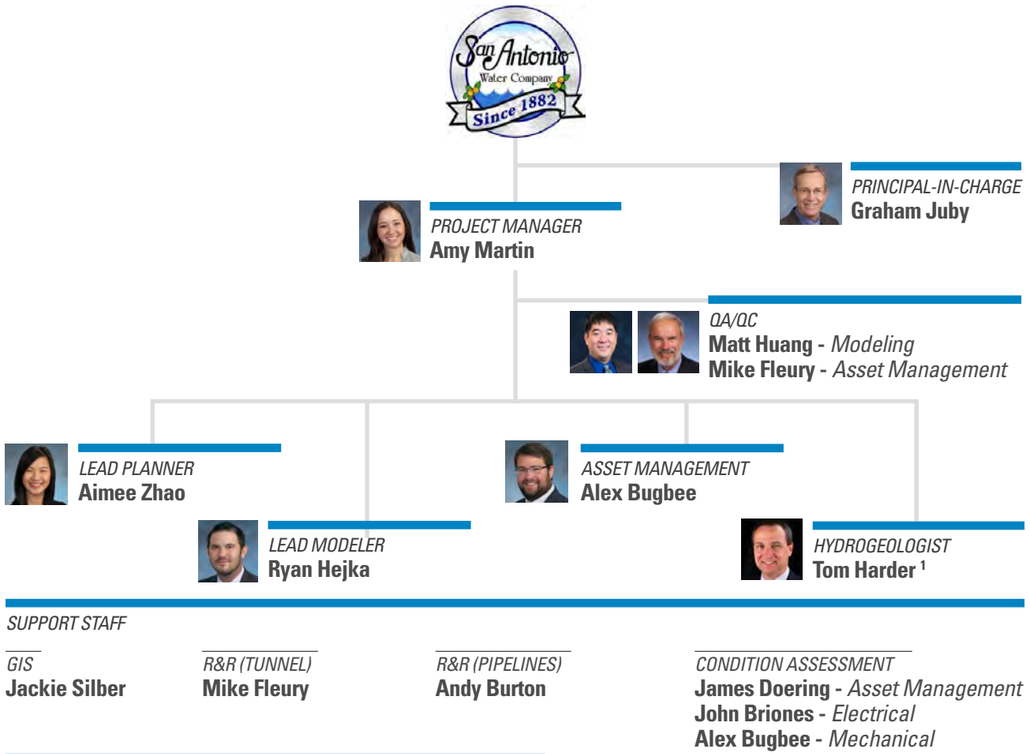
MASTER PLANNING AND ASSET MANAGEMENT EXPERTS

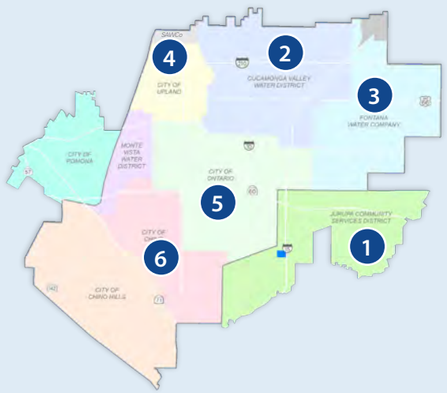
Carollo has assembled an experienced team that collectively has worked on more than 260 master plans, water resources studies, and hydraulic models. As shown in the organization chart below, we are proposing a relatively small but dedicated team. The key elements of the project will be led an expert in that respective area. We believe that this is the right size team for your project and our team members will be committed to your master plan from start to finish. Our team is led by our project manager, Amy Martin, who has managed both master planning and infrastructure projects in the region. As the Southern California Planning and Water Resources Manager Amy is accustomed to providing an owner's perspective through her previous experience and with her entire core planning team is located in Costa Mesa and Los Angeles, this allows the team to meet internally to discuss project progress, but also allows staff to meet with SAWCO on short notice to discuss findings. Our team also has the capability of screen sharing through WebEx, which allows experts in other offices to provide insight and feedback when needed.

Additionally, our team is supported by an organization with deep resources in all aspects of the water industry that allows us to quickly mobilize industry experts for specialty topics that may arise during the project, ranging from water treatment technologists and asset management analysts to financial planning experts.

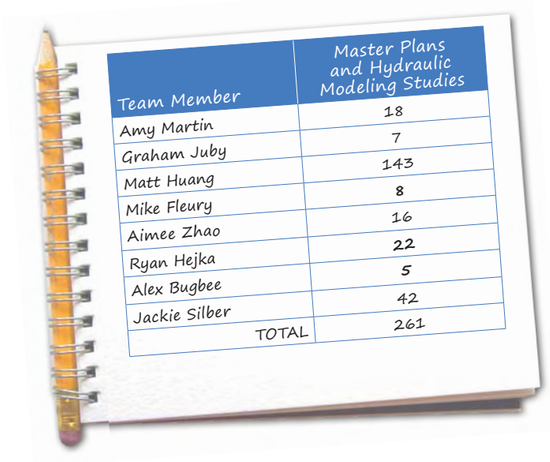
Staff Experience

CLIENT/PROJECT	TEAM MEMBERS						
	GRAHAM	AMY	MATT	AIMEE	RYAN	ALEX	TOM
LA County Division Water Master Plan, San Gabriel Valley Water Company		●	●	●	●		
Fontana Division Water Master Plan, San Gabriel Valley Water Company		●	●	●			
Water System Master Plan, Antelope Valley-East Kern Water Agency			●	●			
Integrated Water Master Plan (water, wastewater, recycled water), City of Oceanside		●		●	●	●	●
Water System Master Plan, Cucamonga Valley Water District			●	●	●		
Water and Recycled Water Master Plan, City of Glendale		●		●	●	●	
Integrated Water Master Plan (water,wastewater, recycled water), City of Banning		●	●	●	●		
Water and Wastewater Master Plans, City of Colton		●	●	●	●		
One Water LA 2040 Plan, City of Los Angeles		●	●	●	●		
Comprehensive Facilities Master Plan (water, wastewater, recycled water), Padre Dam Municipal Water District		●	●	●			
Campus Wide Master Plan (water and recycled water), University of California, Irvine	●	●		●	●		
Upland Master Plan and Update, City of Upland			●		●		
Intertie Project, Inland Empire Utilities Agency	●	●			●		●





1. 2016 & 2018 IEUA RW Intertie Feasibility Study (Phase 1 & Phase 2): MVWD, Pomona, and IEUA
2. 2017 CVWD Water System Master Plan
3. 2018 FWC Water System Master Plan
4. City of Upland Master Plan
5. 2013 Ontario Recovery Technical Report
6. City of Chino Master Plan



Team Member	Master Plans and Hydraulic Modeling Studies
Amy Martin	18
Graham Juby	7
Matt Huang	143
Mike Fleury	8
Aimee Zhao	16
Ryan Hejka	22
Alex Bugbee	5
Jackie Silber	42
TOTAL	261

Our Team Is Ready to Hit the Ground Running

Our team's successful working relationship translates into smooth project execution, building on each team member's strengths, and a collaborative team spirit! We will be available to kick-off SAWCO's project by March 2020 and look forward to collaborating with your team to deliver a master plan that you can use as a roadmap for the next decade. Key team leads were assigned to perform the core tasks listed in the RFP, which include a **Planning Lead (Aimee Zhao)** that will perform the supply risk assessment and assist with coordinating key deliverables for the preparation of the master plan report, a **Lead Modeler (Ryan Hejka)** that will develop modernized models of the domestic and irrigation systems that will be used to perform system analysis, an **Asset Management Lead (Alex Bugbee)** that will coordinate field activities for the condition assessment and provide recommendations for the replacement needs of infrastructure based on age and risk, and a **Hydrogeologist (Tom Harder)** that will review potential alternatives to improve production at the Six Basin wells. The core team will be supported by experts in GIS, structural analysis, pipeline risk assessments, and infrastructure rehabilitation. Brief biographies of our team members are provided below, followed by one-page resumes of key team members.

PRINCIPAL-IN-CHARGE | Graham Juby

Graham brings 36 years of proven experience in the planning and design for water and wastewater treatment facilities, which includes over 30 years managing projects in the Chino Basin and surrounding region. He is an expert in advanced treatment processes that provide cost effective and environmentally conscious solutions to a variety of water quality issues. In addition, he has led the development of similar planning projects with the core team assembled for this master plan. As a hands-on principal-in-charge, Graham will be responsible for providing technical input when needed, maintaining the project resource levels, overall QA/QC, and making sure SAWCO's needs are met.

PROJECT MANAGER | Amy Martin

Amy Martin is Carollo's Southern California Planning and Water Resources Manager and brings over 13 years of engineering project management experience in both the public and private sector. She joined Carollo in May 2014 and has lead the development of over 30 master plans and hydraulic modeling projects for projects throughout Southern California, which match the size and complexity of SAWCO's master plan. Prior to joining Carollo, Amy managed large scale treatment and infrastructure projects ranging between $30 million to over $100 million at Inland Empire Utilities Agency. She was involved in projects from planning through design and construction. She is able to leverage her experience in the public sector when developing practical solutions for CIP development. Her technical experience also includes recycled water infrastructure, wells, groundwater recharge, wastewater treatment plants, construction management, cost estimating, and permitting.

QA/QC - Modeling | Matt Huang

Matthew Huang has completed over 100 master planning and hydraulic modeling projects and is an expert in potable and recycled water distribution system modeling. He brings a broad base of experience, which includes water quality, water and wastewater treatment, water and sewer infrastructure, water resources, and wastewater system modeling and master planning. Matt also has a project management background that includes several large scale planning and design projects in ten states and seven foreign countries.

QA/QC – Asset Management | Mike Fleury

Mike Fleury, in his 47 years of experience, directed facility planning, preparation of studies and designs, value engineering and services during and after construction on a number of civil engineering projects, including new facilities, additions, condition assessments/rehabilitation of aqueducts and interceptors, renovations to existing wastewater treatment plants and water reclamation facilities, interceptor and transmission main systems, water storage and pumping facilities. He is considered a national expert in pipelines and related hydraulics having served on over 30 large value engineering studies across the United States.

Education

PhD Engineering, University of Pretoria, South Africa, 1995

BS Eng Hons Water Utilization Engineering, University of Pretoria, South Africa, 1992

BS Hons Biomedical Engineering, University of Cape Town, South Africa, 1985

BS Chemical Engineering, University of Cape Town, South Africa, 1982

Licenses

Civil Engineer, California

Professional Engineer, Texas, South Africa

Professional Affiliations

American Society of Civil Engineers

American Water Works Association

International Water Association

South African Institute of Chemical Engineers

Water Environment Federation

Water Institute of Southern Africa (Fellow)

Graham J.G. Juby, Ph.D., P.E.

Dr. Graham Juby, a vice president with Carollo Engineers, has 36 years of proven experience in planning, testing, and process design for water and wastewater treatment facilities. He has focused on advanced treatment processes to provide cost-effective and environmentally conscious solutions to a variety of water quality issues. His experience includes water system planning and groundwater treatment with the application of ozone, granular activated carbon (GAC), biological filtration, ion-exchange and disinfection. His experience also includes several fast track and alternative delivery projects.

→ Project manager for the Design-Build Colored Water Treatment Project, in the role of the Owner's Engineer, for the Mesa Water District, California. The project involved the preliminary design (approximately 30-percent design) and preparation of design-build bid documents and specifications for a new treatment facility to remove natural color from groundwater using ozone and BAC. The project included pre-qualification of design-build teams as well as pre-qualification of major equipment manufacturers. The plant was commissioned in 2000.

→ Project manager for the review of design-build bid documentation for the 5.9-mgd Carson Regional Water Recycling Plant for the West Basin Municipal Water District, California. The project was a design/build project for the production of high-quality water for industrial use from Title 22 feed water.

→ Technical lead for the Progressive Design-Build Hi Desert Water District, California Wastewater Treatment Plant Project. Carollo was selected as the Owner's Advisor for this $30 M progressive Design/Build project. Led the preparation of the approximately 5-percent design project technical requirements. Provided input and comments to selected D/B Team's 30, 50 and 70-percent design submittals. Duties also included leading the preparation of the Title 22 Engineering Report to obtain approval from the California Division of Drinking Water (DDW) for recharge of plant effluent. Project construction was completed in 2019.

→ Principal-in-charge for the Evaluation of PFOA and PFAS Removal for the City of Corona, California. The City had detected per- and poly-fluoroalkyl substances (PFAS) in some of their wells. The scope of work included planning and on-site bench scale testing to determine the efficiency of removal of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) with ion-exchange resin and GAC.

→ Technical advisor for the ongoing PFAS Treatment Systems Planning Study for the Orange County Water District (OCWD), California. This project involves planning and siting studies for PFAS treatment facilities for ten agencies that pump water from the OC Groundwater Basin, incorporating 66 impacted wells.

→ Principal-in-charge for the 2019 Water System Master Plans for East Orange County Water District, California. The master planning effort included a 20-year outlook for both the wholesale and retail zones for the District.

→ Principal-in-charge for the 2014 Water System Master Plan for Mesa Water District, California. This involved demand projections, water supply analysis, hydraulic model update and calibration, extensive field condition assessment, and development of an optimization model. In addition, 2 miles of non-destructive pipeline testing was done.

→ Principal-in-charge for the 2011 Stormwater Master Plan for the City of Torrance, California. The project included development of a Storm Water Quality Management Plan with the capability to model various land use and storm water Best Management Practices.

→ Technical advisor for a master planning study for the City of Redlands, California. The project involved an evaluation of water sources and water demands for the City, as well as evaluation of the regulatory issues facing the operation of the Horace Hinckley surface water treatment plant.

Education

BS Civil Engineering, California State Polytechnic University, Pomona, 2007

Professional Affiliations

WateReuse Association

Water Environment Federation

Amy N. Martin

Amy Martin joined Carollo in May 2014. She is Planning and Water Resources Manager for Southern California and has over 13 years of engineering project management experience in both the public and private sector. She has managed large-scale recycled water infrastructure projects, feasibility reviews, database development projects, and coordinated with multiple owners and agencies. In addition, she has managed multi-disciplinary teams on master planning, hydraulic modeling, and asset management projects ranging in size and complexity.

Comprehensive Master Planning

→ Assistant project manager and planning lead for the Cucamonga Valley Water District, California, 2017 Water Master Plan. This project included demand forecasting, supply planning, groundwater quality impacts to wells, and InfoWater hydraulic model update and calibration using SCADA and pressure logger data. Condition assessments were performed on key facilities and findings were combined in a capital improvement program (CIP) and water master plan report.

→ Assistant project manager and project engineer for the City of Glendale's 2016 Water Master Plan. This project includes potable and recycled water demand forecasting, water supply analysis, hydraulic model updates for the water and recycled water systems using H_2OMap. In addition, the infrastructure upgrades for the existing and future systems, including fire flow capacity upgrades. Condition assessments were performed at key facilities and an end of useful life was used to identify replacement needs. The findings were combined in a capital improvement program (CIP) and water master plan report.

→ Lead planner for the 2018 Water System Master Plan for the San Gabriel Valley Water Company (Fontana Water Company & LA County Division). This project consists of the preparation water demand projections, supply analysis, water quality and treatment recommendations, storage and pump station analysis, update and calibration of a hydraulic models in WaterGEMS, and site assessments for key facilities. The Capital Improvement Plan is supplemented by detailed project justifications that will be presented to the California Public Utilities Commission for the 2018-2022 General Rate Case.

→ Technical reviewer for the East Orange County Water District (EOCWD) 2015 Water Master Plans for the Wholesale and Retail Zones. This project includes water demand forecasting for EOCWD's wholesale and retail customers, hydraulic model update, hydraulic modeling analysis, emergency system analysis, pipeline condition assessment, age-based pipeline replacement analysis, CIP development, and preparation of a comprehensive master plan report. The update of the 2015 Draft Master Plans was completed in 2019 when final client comments were received.

Water Resources Planning

→ Project Manager and planning lead for the Phase 1 (2016) and Phase 2 (2018) Recycled Water Feasibility Study to increase the region's water supply. Interconnections between the City of Pomona, Monte Vista Water District, and Inland Empire Utilities Agency were evaluated to develop water supply alternatives that would provide regional water supply benefits. As part of this evaluation, seasonal flow data from multiple supply sources with varying water quality was analyzed, regulatory permit impacts were reviewed, groundwater impacts were evaluated, and advanced treatment alternatives were assessed. The final selected alternatives were analyzed utilizing InfoWater hydraulic models.

→ Water demand and flow forecasting task lead for the City of Los Angeles, California, One Water LA 2040 Plan. The Plan is a collaborative effort of the LA Sanitation (LASAN) and LA Department of Water and Power (LADWP) that takes a holistic approach to consider all types of water as "One Water." The Plan will guide the City with strategic and multibillion dollar decisions to make LA a more water resilient and sustainable City.

Education

MS Civil and Environmental Engineering, Stanford University, 1999

BS Applied Ecology, University of California, Irvine, 1998

Licenses

Professional Engineer, Oregon, Washington

Civil Engineer, California

Professional Affiliations

American Society of Civil Engineers

American Water Works Association

Matthew M. Huang, P.E.

Matthew Huang is an expert on water and recycled water hydraulic modeling and master planning, but also has a broad base of experience in water and recycled water planning, design and construction. His background includes many large planning and design projects, with projects in fourteen states and seven foreign countries. In addition, Mr. Huang has experience with a number of specialized computer programs, including InfoWater, H2OMAP, H2ONET, InfoSewer, InfoSWMM, InfoWorks WS, WaterGEMS, GoldSim, WEAP, and ArcView GIS, as well as a number of database, programming, scheduling, and spreadsheet programs. He is a member of AWWA's Engineering Modeling Applications Committee and is currently on a team developing a book on model calibration for AWWA.

→ Project engineer for San Gabriel Valley Water Company's two water system master plans, for their Los Angeles County Division and for the Fontana Water Company. Mr. Huang served as the hydraulic modeling lead for this fast-paced project, completing two water system master plans within a five-month period. This project was in preparation for San Gabriel's rate case to the CPUC, providing project justifications for use in the rate case.

→ Senior hydraulic modeler for the Cucamonga Valley Water District's Water Master Plan, California. He performed the hydraulic model calibration and evaluation of the water system. CVWD developed in house their first all pipe model, and Mr. Huang was responsible for calibrating the model, and used the model to evaluate the water system under existing and buildout demand conditions. One of the most significant parts of the modeling included a reliability evaluation of the system, with key facilities and pipelines out of service.

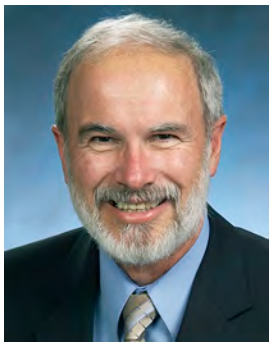
→ Technical review for Water Master Plan and Hydraulic Modeling Study for the City of Colton, California. Carollo performed a hydraulic evaluation for the City of Colton. Mr. Huang provided technical assistance on the hydraulic modeling, reservoir, and booster pump sizing for the master plan.

→ Project manager/technical lead for Inland Empire Utilities Agency On-Call Recycled Water Modeling, Chino, California. In this three year contract, Mr. Huang is serving as the lead hydraulic modeler for all of IEUA's recycled water hydraulic modeling needs. He is responsible for responding to client requests, determining hydraulic modeling needs to be performed, and leading the team to perform the hydraulic modeling tasks. Tasks performed included model calibration, sizing of new pipelines and pump stations, modifications to operational approaches, impacts of new development on the water system, and surge/transient evaluations.

→ Project manager and the technical lead for the City of Chino Water and Recycled Water Master Plan Update for the Edgewater Development, California. This project updated the City's existing master plan to include a proposed development located in an area proposed to be annexed to the City of Chino. The project included hydraulic model updates and a development of a master plan.

→ Task leader for the City of Ontario Water and Recycled Water Master Plan, California. Evaluated the existing potable water system, as well as development of potable and recycled water for a proposed development with an estimated 100,000 population. Directed a team performing the demand forecast and projection, hydraulic model development and calibration, and the hydraulic system evaluation for the potable water system.

→ Technical lead for the Recycled Water Master Plan for the City of Upland, California. His involvement included verification of existing recycled water demands, development of a hydraulic model, and recommendations for proposed recycled water system infrastructure including pipelines, reservoirs, booster stations, and off-site wastewater treatment facilities. An economic evaluation was performed to evaluate the most cost-effective recycled water system, ending with a Capital Improvement Program.



Education

BSCE Civil Engineering, University of Vermont, 1972

Licenses

Civil Engineer, Nevada

Professional Engineer, Texas, Florida, Colorado, Arizona, New Mexico

Certification

Certified, Confined Space Entry and Inspection

Professional Affiliations

American Public Works Association Member

American Society of Civil Engineers Member

American Academy of Environmental Engineers, Board Certified Environmental Engineer

American Water Works Association Member

California Water Environment Association Wastewater Collections Committee

SAVE International

Water Environment Federation (Reuse Committee Member)

Western Coalition of Arid States

Michael A. Fleury, P.E., BCEE

Mike Fleury, in his 47 years of experience, directed facility planning, preparation of studies and designs, value engineering and services during and after construction on a number of civil engineering projects, including new facilities, additions, condition assessments/rehabilitation of aqueducts and interceptors, renovations to existing wastewater treatment plants and water reclamation facilities, interceptor and transmission main systems, water storage and pumping facilities. He is considered a national expert in pipelines and related hydraulics having served on over 30 large value engineering studies across the United States.

Condition Assessment/ Rehabilitation Design

→ Project manager for the condition assessment and rehabilitation pre-design for 26 miles of 21 to 84-inch aqueduct pipeline for the Weber Basin Water Conservancy District, Utah. Risk of failure was evaluated in terms of criticality and vulnerability. Multiple technologies for internal and external pipe inspection were evaluated and utilized to determine pipe condition and risk of failure. Internal inspection technologies utilized included non-tethered leak detection, high-speed digital 3D video scanning, sonar, CCTV, in-pipe ground penetrating radar, and personnel-entry pipe inspection. External inspection included pH testing, alkalinity testing, chloride testing, sulfate testing, hammer sounding, electrical continuity testing, and ultrasonic thickness testing. Pressure and flow testing was also conducted to calibrate two existing Venturi flow meters and to validate and calibrate the hydraulic model. Carollo provided recommendations for pipeline rehabilitation and repair.

→ As a subconsultant to Halcrow Inc., Project manager for the Enhanced and Alternative Methods and Technologies for Assessment of the Los Angeles Aqueduct Project for LADWP. The project includes the internal review of the system infrastructure, and LADWP'S Capital and Operation and Maintenance Programs: External review of the inspection and remediation processes of other agencies, and alternative methods of system assessment. As part of this task, an aerial review and spot check visual inspection was performed on the first and second aqueducts from Los Angeles to the Owens Valley some 340 miles. In addition, a one-day risk workshop was held to assess the eighty-one segments based on criticality and probability of failure. The workshop was beneficial in prioritizing the segments for pilot evaluations with sophisticated technologies that will be deployed while the aqueducts are in service or during a planned shutdown.

→ Pipeline and hydraulics value engineering team member on the $65 million Shaft 4 connection between Catskill and Delaware Aqueducts preliminary design for the Office of Management and Budget, in conjunction with the New York City Department of Environmental Protection. The project included a new connection to the gravity Catskill Aqueduct to permit 275 mgd of water to be delivered from the higher pressure Delaware Aqueduct.

→ Project manager for the Condition Assessment and Emergency Rehabilitation Design and Construction Project for Victor Valley Wastewater Reclamation Authority, Victorville, California. Carollo investigated 30,000 linear feet of a 27-inch interceptor consisting of vitrified clay pipe (VCP) and steel pipe using CCT and sonar technology. The investigation revealed a failed lining within a steel pipe beneath a three-track railroad spur that was installed without a casing sleeve. Carollo prepared a fast-tracked cured-in-place pipe (CIPP) design based on E-80 loading, and the project was successfully constructed with an ultraviolet (UV) cured CIPP installation.

→ Project manager for the Indian River, Florida, North County Force Main Condition Assessment. This project consisted of a Phase 1 condition assessment of the 8-mile 24-inch North County Force Main, including ultrasonic thickness testing at air valve sites.

Education

MS Environmental Engineering, University of California, Irvine, 2014

BS Earth and Environmental Sciences, University of California, Irvine, 2011

Aimee Zhao

Aimee Zhao joined Carollo in March 2015 as an environmental engineer. Her experience encompasses supply planning, hydraulic modeling, ArcGIS, capital improvement program planning, and master planning. Her project experience includes:

Master Planning & Supply Planning

→ Supply planning lead and staff engineer for the 2016 Water Master Plan for Cucamonga Valley Water District, California. This ongoing project includes potable water demand forecasting, Infowater hydraulic model updates, hydraulic model calibration using SCADA, and development of customer specific diurnals. In addition, the infrastructure upgrades for the existing and future systems will be evaluated and the findings will be combined in a capital improvement program (CIP) and water master plan report.

→ Staff engineer and hydraulic modeler for the 2016 Water Master Plan for the City of Glendale, California. This project includes potable and recycled water demand forecasting, water supply analysis, hydraulic model updates for the water and recycled water systems using H_2OMap. The findings were combined in a capital improvement program (CIP) and water master plan report.

→ Supply and demand forecasting lead for the 2018 Water Master Plan for San Gabriel Valley Water Company (Fontana Water Company and Los Angeles Division). The project includes potable water demand forecasting, Infowater hydraulic model development and calibration, and supply analysis. Infrastructure upgrades for the existing and future system were evaluated and included in a capital improvement program (CIP) and report. Project justifications were developed for the near-term (4-year) CIP and presented as part of the general rate case.

→ Project engineer for the Water and Recycled Water Master plan for UC Irvine, California. The project includes the creation of water system and recycled water system models, as well as a blueprint for additional facilities for UC Irvine to handle their projected growth and development on campus. This is the first water and recycled water master plan for UC Irvine.

→ Project Engineer for the East Orange County Water District (EOCWD) 2015 Water Master Plans for the Wholesale and Retail Zones. This project includes water demand forecasting for EOCWD's wholesale and retail customers, hydraulic model update, hydraulic modeling analysis, emergency system analysis, pipeline condition assessment, age-based pipeline replacement analysis, CIP development, and preparation of a comprehensive master plan report. The update of the 2015 Draft Master Plans was completed in 2019 when final client comments were received.

→ Project engineer for on-call water system modeling for the City of Santa Barbara, California. As part of this on-call contract, various modeling studies were conducted related to the new desalination plant. Each study was summarized in separate technical memoranda. Studies completed to date include: 1) Energy Optimization Study for various production scenarios; 2) Extreme Drought Analysis with various supply options; and 3) Transmission Main analysis to serve Montecito Water District.

Water Resources Planning

→ Planner for the Orange County Water District PFAS Planning Study (ongoing). This project involves coordination with local water producers within the Orange County Basin to identify conceptual level treatment alternatives with consideration to groundwater supply impacts.

→ Staff engineer and GIS lead for the Phase 1 (2016) and Phase 2 (2018) Recycled Water Feasibility Study to increase the region's water supply. Interconnections between the City of Pomona, Monte Vista Water District, and Inland Empire Utilities Agency were evaluated to develop water supply alternatives that would provide regional water supply benefits. The final selected alternatives were analyzed utilizing InfoWater hydraulic models.

Education

BS Civil Engineering, California State Polytechnic University, Pomona, 2012

Licenses

Engineer-in-Training, California

Software Expertise:

InfoWater

ArcGIS

H_2OMAP

Mike Urban

Water GEMs

InfoSewer

InfoSWMM

AutoCAD

Hydraulic Modeling/Master Planning Experience:

30 Potable Water Models

7 Recycled Water Models

3 Stormwater Models

1 Wastewater Model

10 Model Training Seminars

Ryan M. Hejka, E.I.T.

Ryan Hejka is a civil engineer with seven years of professional experience. He is specialized in water and recycled water system hydraulic modeling and master planning projects and is skilled in the use of a wide variety of hydraulic modeling packages including InfoWater, H_2OMAP, Mike Urban, and Water GEMs. He has analyzed or calibrated almost 50 hydraulic models. In addition, he has extensive experience with ArcGIS and proficient in multiple programming languages that he utilized to build several customized water optimization models and tools for water agencies. Most recently he has expanded his planning experience into design projects where he has engineered the design of reservoirs, pump stations, and pipelines. His experience includes:

Comprehensive Master Planning

→ Assistant project manager and hydraulic modeling lead for the City of Upland, Reservoir and PRV Replacement. This project included demand forecasting, supply planning, H_2OMAP hydraulic model update. Several alternative locations were modeled for a new PRV system as well as hydraulic analysis and planning for two separate reservoir outages.

→ Lead modeler for the City of Glendale's 2016 Water Master Plan. This project includes potable and recycled water demand forecasting, water supply analysis, hydraulic model updates for the water and recycled water systems using H_2OMap. In addition, the infrastructure upgrades for the existing and future systems, including fire flow capacity upgrades. Condition assessments were performed at key facilities and an end of useful life was used to identify replacement needs. The findings were combined in a capital improvement program (CIP) and water master plan report.

→ Lead modeler for the 2018 City of Glendale hydraulic model conversion and calibration from H_2OMAP to InfoWater. Ryan coordinated the data and filed testing as well as the calibration and conversion of the hydraulic model. Ryan has been assisting the City with training and model related questions over the past 4 years.

→ Lead modeler for the 2018 Water System Master Plan for the San Gabriel Valley Water Company (Fontana Division). Ryan updated and calibrated the Fontana Division hydraulic models in WaterGEMS. He also led the development of the FoCapital Improvement Plan which used the developed hydraulic model to assist with project justifications

→ Task engineer for the Mass Balance Model for the One Water LA 2040 Plan, California. This project looks at the integration of all of the City's water assets. He was responsible for the development of a custom mass balance planning model that tracks all major flows in the City of Los Angeles which included a cost module and was utilized in the alternative's analysis of the One Water LA 2040 Plan.

→ Staff engineer for the Water and Recycled Water Master plan for UC Irvine, California. The project includes the creation of water system and recycled water system models from AutoCAD maps, as well as a blueprint for additional facilities for UC Irvine to handle their projected growth and development on campus.

→ Staff engineer for system-wide hydraulic model development for the Metropolitan Water District of Southern California. Carollo assisted in the development, calibration, and validation of four separate hydraulic models that collectively cover Metropolitan's entire conveyance system. The models were developed from existing GIS data in Mike Urban modeling software.

→ Staff engineer for the 2016 Water Master Plan for the City of Colton, California. This project included water demand forecasting, hydraulic model development and EPS calibration using field fire flow testing. Existing and future system analysis was conducted to develop a CIP including a rehabilitation and replacement program. The findings were presented in a comprehensive water master plan report that was developed in conjunction with the 2016 Sewer Master Plan.

Education

BS Mining Engineering, Pennsylvania State University, 2009

Licenses

Engineer-in-Training, Pennsylvania

Alexander T. Bugbee, E.I.T.

Alexander Bugbee is a lead analyst in Carollo's Financial Management Group with eight years of experience asset management and utility rates and financing. His primary expertise includes assisting water and wastewater agencies develop asset management plans, rehabilitation and replacement programs, financial and econometric analyses, as well as compiling and analyzing the necessary background data. He has completed work for several dozen agencies, cities, and special districts throughout California and the western US.

His combined experience in engineering and financial analyses benefits the project team by providing an asset management strategy that considers infrastructure needs along with financial capacity and feasibility to develop a truly implementable plan.

→ Site assessment lead and analyst for the Water and Recycled Water Master Plan for the City of Glendale, California. He led an assessment of selected water facilities including pump stations, wells, treatment facilities, and reservoirs. He the utilized the results of the site assessments to develop an asset rehabilitation and replacement program, which he then incorporated into a funding and connection fee analysis aimed at creating an implementable CIP strategy based on a series of priority based project phasing options.

→ Site assessment lead and analyst for the Asset Management Plan for the Yorba Linda Water District, California. He coordinated and led mechanical and structural condition assessments of the district's water systems and developed an asset registry, valuation, and risk assessment. The final component of the project incorporated the valuation and risk assessment into a CIP plan and financial feasibility analysis to test the impact of the asset management plan on the district's finances.

→ Site assessment lead and asset management analyst for the Waterworks Facilities Assessment and Cost of Service Study for the City of Simi Valley, California. He coordinated and led mechanical and structural condition assessments of the City's water utility that included wells, pump stations, reservoirs, and treatment facilities. This information was used along with other records to develop an asset condition registry, a rehabilitation and replacement program, and a CIP which was later incorporated into a cost of service analysis.

→ Site assessment lead and analyst for the Public Works Integrated Master Plan for the City of Oxnard, California. He coordinated and led mechanical and structural condition assessments of the City's water and wastewater systems. The results of the condition assessments were used to develop a risk prioritzed master plan CIP for the water and wastewater facilities. He later incorporated the CIP into a cost of service analysis aimed at providing funding for the extensive rehabilitation and replacement needs.

→ Site assessment lead and analyst for the Pump Station Master Plan for the Union Sanitary District, Union City, California. He coordinated and led mechanical, structural, and electrical condition assessments of the District's high capacity wastewater pump station and force main system. The results of the physical assessments were used in conjunction with a hydraulic evaluation to develop an asset management and replacement plan for the pump stations and forced mains systems.

→ Site assessment lead and asset Management Analyst for the Water Master Plan Update for the City of West Sacramento, California. He led mechanical, structural, and electrical assessment of the City's 58 MGD capacity surface water treatment plant. He the utilized the results of the site assessments along with additional condition data for the City's pump station and reservoir sites to assist in the development of an asset rehabilitation and replacement program.

Education

MGIS, Penn State University, 2017

BA Geography, California State University, Northridge, 2001

AA Geology, Pasadena City College, 1997

Certifications

Certified Geographic Information Systems Professional (GISP), Geographic Information Systems Certification Institute, 2012

Jackie M. Silber, GISP

Jackie Silber is a geographic information systems (GIS) lead with more than 19 years of professional experience in GIS and technical training. Her experience includes geospatial GIS analysis for water resource planning, environmental remediation sampling, and demographic forecasting projects. Her GIS skills focus on geodatabase design and optimization, manipulation and conversion of projections, CAD and KML to GIS conversion, spatial analysis, automation of repetitive analysis using Model Builder and Python, and creation of cartographic figures.

Relevant Project Experience

→ GIS specialist for the San Gabriel Valley Water Company Water System Master Plan Update, California. In addition to developing figures illustrating system deficiencies, Ms. Silber also developed a Python script to loop through an 11 million record table and sum the total water demands for every customer.

→ GIS specialist for the City of Banning, California. As part of the Integrated Master Plan, Ms. Silber developed figures representing the existing recycled water system as well as the proposed non-potable reuse system.

→ GIS specialist for the University of California, Irvine, Recycled Water System Analysis and Capital Improvement Program. Ms. Silber worked with hydraulic modelers to illustrate future system pressure deficiencies and pipeline velocities.

→ GIS specialist for the City of Medford, Oregon Sanitary Sewer Master Plan. To help the City anticipate future needs, Ms. Silber, developed figures illustrating the locations of high I/I due to sewer trunk line deficiencies. Also investigated existing and future land use changes per parcel as part of a wastewater capital charge per equivalent residential unit analysis.

→ GIS specialist for the Hillsborough County, Florida Capital Improvement Program. As part of the on-call potential Septic Replacement/Water Line Extension Program, Ms. Silber performed geospatial analysis to determine the number of septic parcels within wellhead protection and high hazard coastal areas. Additionally, produced figures of wastewater facilities and parcels served by current infrastructure.

→ GIS specialist for a Long-Range Wastewater Management Plan for the City of Renton, Washington. As part of the pipe risk approach, Ms. Silber developed an ArcGIS-based criticality and vulnerability model. The model identified and prioritized critical assets in close proximity to key infrastructure or that are susceptible to failure.

→ GIS specialist for the Los Angeles County Waterworks District 29, California, Water System Master Plan. Compiled and developed a water infrastructure geodatabase and geocoded the water billing data to correlate metered usage data with parcels. Using current land use and future zoning parcel data, analyzed water demands for private customers. Also created pressure zones and allocated commercial demands for fire flow in InfoWater.

→ GIS specialist for the Stormwater Capture BMP Site Suitability Analysis for the Upper San Gabriel River Enhanced Watershed Management Program, California. Using a uniform grid, performed a multi-criteria decision analysis of valued and binary constraints to identify potential stormwater BMP sites in the Watershed as part of the Los Angeles County MS4 Permit Compliance. The constraints were scored and weighted to rank the locations. Iterative tasks such as classifying the locations were automated using python scripts.

→ GIS specialist for the Mission Creek and Garnet Hill Subbasins Water Management Plan for the Coachella Valley Water District, Desert Water Agency, and Mission Springs Water Districts, California. As part of a collaborative groundwater replenishment program, analyzed population and other demographic projections and mapped the watersheds and multi-habitat conservation areas.

Education

MS Civil Engineering, University of Pittsburgh, 2015

BS Biology, Allegheny College, 2010

Licenses

Professional Engineer, Pennsylvania

LEED Accredited Professional Building Design + Construction

Certification

NASSCO Pipeline, Manhole, and Lateral Assessment and Certification Program

Professional Affiliations

American Society of Civil Engineers

Pennsylvania Water Environment Association

Water Environment Federation

Andrew Z. Burton, P.E., LEED AP

Andrew Burton is a lead analyst with Carollo Engineers' Utility Advisory Services and Strategic Management Group. He has more than 9 years of combined experience in the fields of engineering consulting and research. Andy's work concentrations are in the areas of water and wastewater infrastructure asset management and data analytics. His expertise includes asset register and hierarchy development, risk analyses, renewal modeling, GIS, and data visualization. He is one of Carollo's condition assessment leads, responsible for efforts to assess facilities, collection systems, and plan for future work. Andy's combination of experience in asset management, analytics, and planning helps to apply innovative solutions to unique challenges.

→ Technical lead for the San Gabriel Valley Water Company, California, Fontana Water Division Company Water System Master Plan Update. Andy led the development a of risk-based prioritization model and capital improvement plan for a 700-mile water distribution and transmission pipeline network in San Bernardino County. The project included an existing demand analysis, development of peaking factors and future demand projections through year 2045, water supply analysis, water quality analysis, groundwater treatment recommendations, storage and pump station analysis, and field condition assessments for the system's 38 plant sites. The update was completed within an aggressive 6-month schedule to meet the California Public Utilities Commission compliance deadline.

→ Technical lead for the San Gabriel Valley Water Company, California, Los Angeles County Division Water System Master Plan Update. Andy led the development of a risk-based prioritization model and capital improvement plan for a 580-mile-long water distribution and transmission pipeline network in Los Angeles County. The project included an existing demand analysis, development of peaking factors and future demand projections through year 2045, water supply analysis, water quality analysis, groundwater treatment recommendations, storage and pump station analysis, and field condition assessments for the system's 32 plant sites. The update was completed within an aggressive 6-month schedule to meet the California Public Utilities Commission compliance deadline.

→ Technical lead for the InfoAsset™ Planner Implementation, Cape Fear Public Utility Authority, North Carolina. Andy is currently leading the data review and model setup for the water distribution and sewer pipeline replacement and rehabilitation model for the Authority's sewer system. The project will include the review of CCTV data and the integration into a geospatial modeling software to be used to assess the condition of the pipelines. He will be responsible for the setup of the model, producing results, and training Authority staff on the use of the model.

→ Technical lead for the Asset Reliability Assessment and Financial Plan Project for the City of Simi Valley, California. Andy supported the development of the overall asset management program for the City's wastewater treatment plant and collection system. The project included complete asset inventory, condition assessment of aboveground assets, geographic information system (GIS)-based analyses of belowground assets, risk-based assessments for probability and consequence of failure, asset valuation, rehabilitation and replacement (R&R) capital improvement program development, and a financial plan including proposed rate adjustments.

→ Lead analyst for the Asset Management Plan for Water Supply, Treatment, and Storage Facilities, Mount Pleasant Waterworks, South Carolina. Under this service task order, Andy developed an asset inventory for the water supply, treatment, and storage facilities; incorporate condition assessment data for the assets; and evaluate criticality and risk using an asset management approach that was be customized based on the preferences of Mount Pleasant Waterworks.

→ Project engineer for the Asset Management Plan Project for the Yorba Linda Water District, California. Andy supported the development of the overall asset management program for the District's complete water and sewer assets. The project included complete asset inventory, condition assessment of aboveground assets, geographic information system (GIS)-based analyses of belowground assets, risk assessments for probability and consequence of failure, rehabilitation and replacement (R&R) program development, and funding analyses.

Education

MS Civil Engineering, University of California, Berkeley, 1994

BS Civil Engineering, University of California, Irvine, 1993

Licenses

Structural Engineer, California, Oregon

Professional Engineer, Colorado

Civil/Structural Engineer, Washington

Civil Engineer, California

Professional Affiliations

American Institute of Steel Construction

Earthquake Engineering Research Institute

James A. Doering, P.E., S.E.

James Doering, a registered structural and civil engineer, is Carollo's structural lead engineer in Southern California. He manages the production of construction documents for large and small projects. He has experience in structural analysis, design, seismic retrofit, rehabilitation, review, and assessment for a variety of structures, such as reservoirs, tanks, channels, basins, wastewater and water treatment facilities, pump stations, operations & maintenance facilities, and process buildings.

→ Structural engineer for the Del Rio Tank Project for the City of Modesto, California. The project involved the design of a pump station and a 0.3-MG welded steel tank. Performance specifications and drawings were prepared for an AWWA D100 tank.

→ Structural engineer for the design of a project for the City of Sanger, California, that included a 0.75-MG AWWA D100-11, welded steel, potable water storage tank and supporting pumping and well treatment facilities.

→ Structural engineer for the Inlet Conduit and Rapid Mix Systems project for the Metropolitan Water District of Southern California. The project included design of a 12-foot by 12-foot concrete conduit transition for water conveyance from a 144-inch diameter steel pipe to a 13-foot by 15-foot concrete conduit.

→ Structural engineer for the 3.1-million gallon stormwater tank at the San Diego International Airport (Lindbergh Field). The design-build project included a circular, buried, cast-in-place concrete tank supported on auger-cast piles with secant pile shoring.

→ Structural engineer for the Seismic Evaluation of Sunset Reservoir No. 1 for Pasadena Water and Power, California. The project involved the seismic/structural evaluation of a 5.6 million gallon, elliptical-shaped reservoir with hopper bottom and wood-framed roof originally constructed in 1888. Operational strategies, rehabilitation/retrofit, and replacement alternatives were considered.

→ Structural engineer for the Structural Evaluation of Peters Canyon Reservoir for East Orange County Water District in Orange, California. The project involved the structural evaluation of a 6.0-MG, rectangular hopper-bottom cast-in-place concrete reservoir with a wood-framed roof.

→ Structural engineer for the Southern Delivery System Water Treatment Plant Raw Water Tank for the City of Colorado Springs, Colorado. The project involved the design of a 10-MG circular prestressed concrete tank that will store raw water for processing at the water treatment plant.

→ Structural engineer for the Industrial Tank 13 Project for the City of Modesto, California. The project involved the design of a pump station and a 4.0-MG prestressed concrete reservoir with a flat roof.

→ Structural engineer for the Reservoirs Assessment Project for the City of Redlands, California. The project involved the visual assessment and structural evaluation of four buried and partially buried concrete reservoirs.

→ Structural engineer for the 2016 Water Master Plan for Cucamonga Valley Water District in Rancho Cucamonga, California. Completed assessments of 10 steel water storage tanks and numerous pump stations and wells. Vulnerabilities were identified by conducting both site visits and performing cursory structural analyses.

→ Structural engineer for the 2014 Waterworks Facilities Assessment for the City of Simi Valley, California. Completed assessments of more than 50 steel water storage tanks and numerous pump stations. Vulnerabilities were identified by conducting both site visits and cursory structural analyses.

→ Structural engineer for the 2013 Historic Storm Drain Analysis Project for the City of Redlands, California. The project involved the visual assessment and structural evaluation of 5 of the City's buried concrete/cobblestone stormwater conduits, totaling in excess of 5,000 lineal feet. Recommendations were made, repair plans and specifications were subsequently prepared.

Education

BS Electrical Engineering, California State University, Sacramento, 1986

Licenses

Electrical Engineer, California, Utah

Professional Affiliations

Institute of Electrical and Electronics Engineers

- PES/IAS Orange County Joint Chapter, 2012-2013 Chairman

National Fire Protection Association

International Society of Automation

John G. Briones, P.E.

John Briones, is a principal electrical and instrumentation & controls engineer with Carollo in the Orange County office. He has 32 years of experience in the design and construction management of power, instrumentation, control, communication, and security systems for water and wastewater facilities. He has designed projects to meet required state and national standards including California Code of Regulations (CCR) Title 8: Electrical Safety Orders, Hazardous Locations; CCR Title 24: Energy Efficiency Standards, and National Fire Protection Association (NFPA) 820: Standard Fire Protection in Wastewater Treatment and Collection Facilities. His experience follows:

Planning

→ Lead electrical engineer for the San Elijo Asset Management Study for the San Elijo Joint Powers Authority, California. The study included a complete review of the electrical system configuration of the main wastewater facility as well as two off-site reservoir/pump station facilities. The study involved the identification of potential electrical single points of failure, as well as upgrade recommendations to improve power reliability.

Pump Stations

→ Lead electrical design engineer for the Wasatch County Water Efficiency project for the Central Utah Water Conservancy District, Utah. The project involved the design of seven pump stations, including over 2,400 horsepower of pump loads. In addition, the project included a radio telemetry system to allow remote monitoring of each pump station.

Reservoirs

→ Lead electrical design engineer, construction services, and field inspection for a water quality analysis and chemical feed system design for the Twin Oaks Reservoir for the Vallecitos Water District, California. The project included construction of two new 26-million-gallon reservoirs. A Disinfection/Control Building will be constructed to house sodium hypochlorite and aqua ammonia. Provisions will also be made at the building for the future installation of hydrofluorosilic acid and corrosion inhibitor chemical feed systems. The design of the chlorine and aqua ammonia feed systems will consist of chlorine ton container handling, chlorinators, scrubbers, two aqua ammonia storage tanks, and four metering pumps for each chemical. This will result in a very flexible system that allows the District to operate under several disinfection strategies including feed of one or both chemicals into incoming, exiting, and/or recirculation flow streams.

Water Treatment

→ Project electrical engineer for the Imperial Headgates Facility and Weir Pond Rehabilitation Project for the Orange County Water District, California. The project will replace the existing river inlet trash rack screening system, including the upgrading of the existing Control and Generator Buildings.

→ Project electrical engineer and construction services for the Twin Lakes and Carlton Square Disinfection Facilities project for the Southern Nevada Water Authority, Nevada. The project added new chemical disinfection facilities at two separate sites. The design required the upgrading of the existing power systems and interfacing with the client's supervisory control and data acquisition (SCADA) system.

→ Lead electrical design engineer for the Jensen Filtration Plant's Aqua Ammonia Relocation project for the Metropolitan Water District of Southern California. The project added a new aqua ammonia tank farm that included containment facilities for the tanks and for unloading chemical trucks. In addition, a new remote terminal unit (RTU) was added and integrated with the existing plant's computer system. He provided the project's design for power, controls, and instrumentation, including the development of the process and instrumentation diagrams (P&IDs).

THOMAS E. HARDER

Principal Hydrogeologist

EDUCATION

B.S., Geology. California State Polytechnic University - Pomona, 1990

M.S., Geology with Honors. Emphasis in Hydrogeology, California State University – Los Angeles, 1995

PROFESSIONAL REGISTRATIONS

California Professional Geologist (No. 6512)

Certified California Hydrogeologist (No. 588)

PROFESSIONAL AFFILIATIONS

National Ground Water Association

Groundwater Resource Association of California

Watereuse Association

During his 30 years of professional experience, Mr. Harder has provided technical direction and management for some of the largest water resource projects in southern California, including the Chino Desalter Well Field Design and Construction, the Kern Water Bank, and the Mojave Water Agency's Regional Recharge and Recovery Project. His expertise spans a wide range of hydrogeological disciplines, including regional groundwater basin analysis, perennial yield (i.e. safe yield), artificial recharge, groundwater management, groundwater models, contaminant hydrogeology, and water wells.

PROFESSIONAL EXPERIENCE

2008 to Present: *Principal Hydrogeologist*, Thomas Harder & Co.; Anaheim, California

1998 to 2008: *Senior Geohydrologist*, Geoscience Support Services, Inc.; Claremont, California

1997 to 1998: *Principal Hydrogeologist, Geosciences Department Manager*, Parsons Engineering Science; Pasadena, California

1989 to 1997: *Senior Geologist*, Harding Lawson Associates; Irvine, California

TECHNICAL COMMITTEE PARTICIPATION

2016 - Present: Metropolitan Water District of Southern California Regional Recycled Water Recharge Scientific Advisory Panel

2011 to 2016: Kern Fan Monitoring Committee – Groundwater Model Technical Advisory Subcommittee

2010 to 2013: Chino Basin Recharge Master Plan Steering Committee

2009 to 2012: Chino Basin Watermaster Appropriative Pool and Advisory Committee

2003 to Present: Big Bear Lake Department of Water Groundwater Management Technical Review Team

2002: Chino Basin Subsidence Technical Committee

4 | Project Understanding and Approach

PROJECT UNDERSTANDING & APPROACH

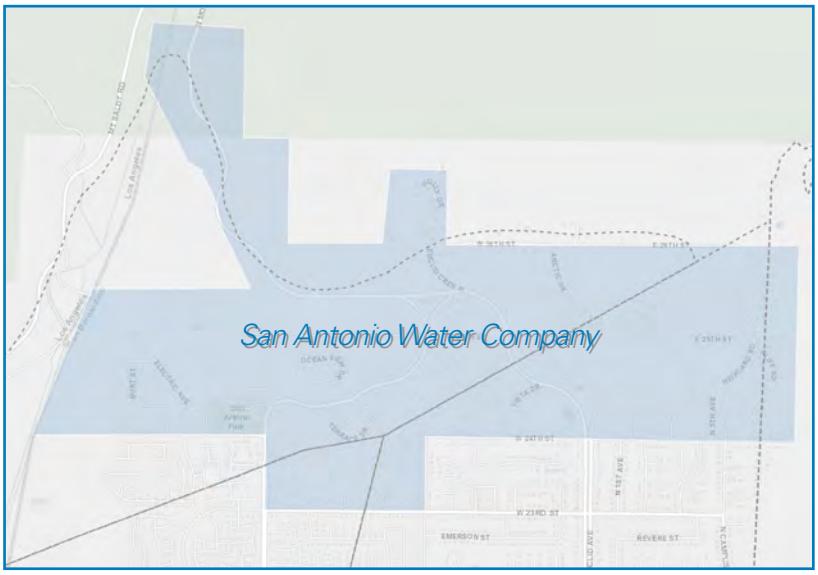
San Antonio Water Company (SAWCO) has recognized the need to prepare a Comprehensive Master Plan (Plan) and Asset Management Program that provides strategic guidance and practical recommendations that address SAWCO's water distribution and water supply needs through the planning year of 2030. This Plan needs to consider SAWCO's aging infrastructure, capacity driven improvements, and risks associated with supply source outages (i.e. San Antonio Tunnel). The various Plan recommendations need to be integrated into a prioritized capital improvement plan (CIP) that fits within a practical budget and serves as a roadmap for years to come.

Based on discussions with SAWCO staff and the review of the existing hydraulic model and planning reports, individual distribution system needs have been identified in isolation with low confidence in the modeling tools used to perform the system analysis. Now it's time to take a step back and look at the entire service area needs to define optimized solutions for capital investments using tools that provide confidence for defensible decision making.

The map below illustrates just a few of the important questions and key objectives that need to be addressed with this project.

In addition, a Workflow Plan, Schedule, and Detailed Scope of Work have been developed to demonstrate how the project tasks will be achieved by the end of 2020. In addition, a variety of optional task ideas to enhance the project have been identified, which are listed as Task 8 in the detailed scope of work.

Our team is able to achieve the objectives outlined through the following success factors:



The purpose of this project is to take a comprehensive look at the entire service area needs to define optimized solutions for capital investments using tools that provide confidence for defensible decision making.

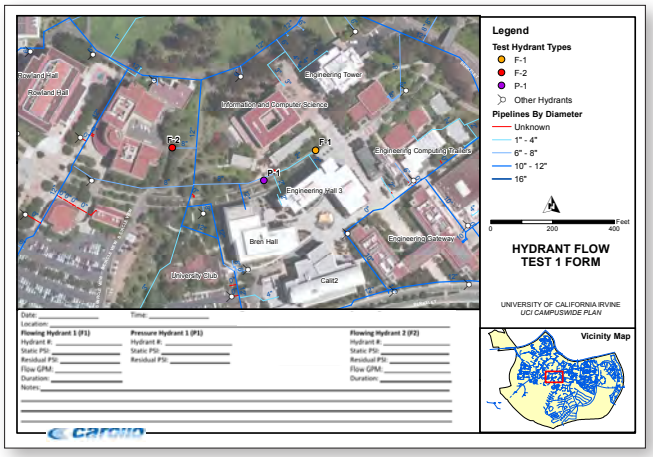
Key Objectives of the Project

- Modernize Hydraulic Models
- Identify Supply Outage Risks
- Prepare Forward Thinking Roadmap
- Develop Asset Replacement Timeline
- Integrate Supply Risks and Asset Replacement Needs
- Review Future Growth
- Identify Solutions for Six Basin Wells
- Consider Catastrophic Impacts
- Options to Remove Sediment from Tunnel
- Review Interconnections with CVWD & Upland
- Minimize Water Age in Reservoirs

1. Local Team of Planning and Asset Management Professionals. Our core team leaders bring a long history of working within the local region. We are able to leverage our recent knowledge from the master plans completed for Cucamonga Valley Water District and the City of Upland to hit the ground running and meet the 2020 project completion date outlined in the schedule. Our team also provides in-depth knowledge in comprehensive master planning, hydraulic modeling, and asset management. In addition, our team includes Carollo's Regional Infrastructure Lead (Michael Fleury) that can provide a fresh perspective to the concerns relating to the sedimentation buildup and reliability of the San Antonio Tunnel, which is one of SAWCO's primary supply sources. Michael is an expert in rehabilitation design and has successfully completed similar projects throughout the United States.

Our team brings a long history of working together in the region and has an in-depth knowledge of local supply challenges.

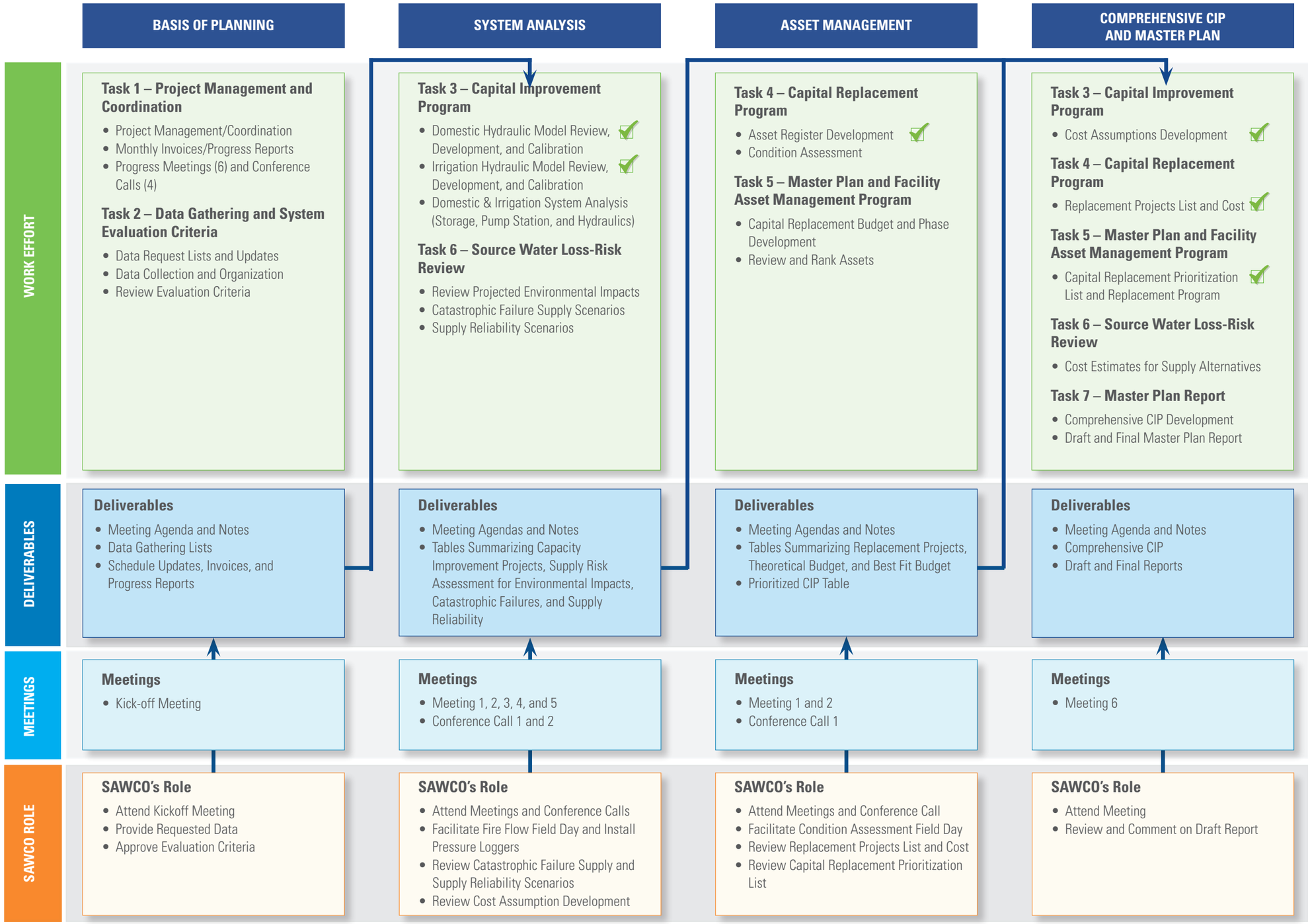
2. Accurate Model Development and Calibration for Defensible Decision Making. We have reviewed the existing hydraulic model and understand SAWCO's desire to develop a modern tool that can be used for defensible decision making. Our proven model development and calibration process will be used when preparing your domestic and irrigation models using InfoWater Pro. The calibration process includes 1) Developing a calibration plan, which outlines field gathering activities and data requirements to conduct EPS calibration. 2) Performing a Macro-Calibration to compare initial modeling results to typical system pressures and water level fluctuations to confirm that results are within right ballpark. 3) extended period simulation (EPS) Calibration to adjust facility controls to obtain a model that accurately mimics system operations over an extended 24-hour period.



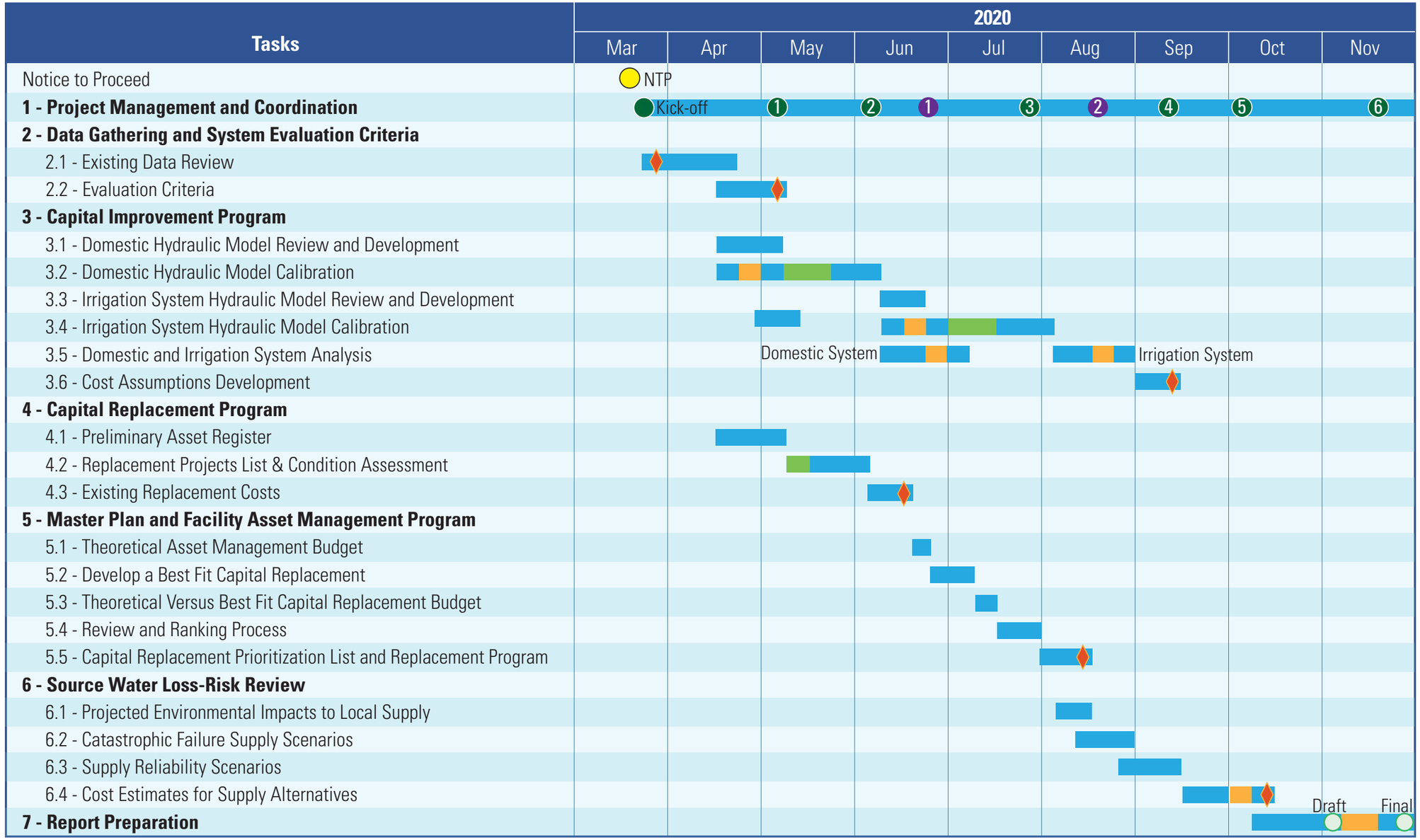
Accurate model calibration starts with a good Calibration Plan. We will prepare a detailed plan with site-specific maps to record field data and notes.

3. Proper Alignment of QA/QC Milestones Results in Sound Master Plans. Based on our extensive experience in developing comprehensive master plans, we know where tasks should be coordinated to deliver a sound and consistent Plan and CIP. This coordinated effort minimizes the risk of substantial re-do work that could result in schedule delays. In addition, all deliverables go through Carollo's document processing for grammar read-through. The QA/QC technical milestone are identified in the proceeding Workflow Plan and QA/QC table in Section 2.

Work Plan


BASIS OF PLANNING
SYSTEM ANALYSIS
ASSET MANAGEMENT
COMPREHENSIVE CIP AND MASTER PLAN
WORK EFFORT
Task 1 – Project Management and Coordination
• Project Management/Coordination
• Monthly Invoices/Progress Reports
• Progress Meetings (6) and Conference Calls (4)
Task 2 – Data Gathering and System Evaluation Criteria
• Data Request Lists and Updates
• Data Collection and Organization
• Review Evaluation Criteria
Task 3 – Capital Improvement Program
• Domestic Hydraulic Model Review, Development, and Calibration
• Irrigation Hydraulic Model Review, Development, and Calibration
• Domestic & Irrigation System Analysis (Storage, Pump Station, and Hydraulics)
Task 6 – Source Water Loss-Risk Review
• Review Projected Environmental Impacts
• Catastrophic Failure Supply Scenarios
• Supply Reliability Scenarios
Task 4 – Capital Replacement Program
• Asset Register Development
• Condition Assessment
Task 5 – Master Plan and Facility Asset Management Program
• Capital Replacement Budget and Phase Development
• Review and Rank Assets
Task 3 – Capital Improvement Program
• Cost Assumptions Development
Task 4 – Capital Replacement Program
• Replacement Projects List and Cost
Task 5 – Master Plan and Facility Asset Management Program
• Capital Replacement Prioritization List and Replacement Program
Task 6 – Source Water Loss-Risk Review
• Cost Estimates for Supply Alternatives
Task 7 – Master Plan Report
• Comprehensive CIP Development
• Draft and Final Master Plan Report
DELIVERABLES
Deliverables
• Meeting Agenda and Notes
• Data Gathering Lists
• Schedule Updates, Invoices, and Progress Reports
Deliverables
• Meeting Agendas and Notes
• Tables Summarizing Capacity Improvement Projects, Supply Risk Assessment for Environmental Impacts, Catastrophic Failures, and Supply Reliability
Deliverables
• Meeting Agendas and Notes
• Tables Summarizing Replacement Projects, Theoretical Budget, and Best Fit Budget
• Prioritized CIP Table
Deliverables
• Meeting Agenda and Notes
• Comprehensive CIP
• Draft and Final Reports
MEETINGS
Meetings
• Kick-off Meeting
Meetings
• Meeting 1, 2, 3, 4, and 5
• Conference Call 1 and 2
Meetings
• Meeting 1 and 2
• Conference Call 1
Meetings
• Meeting 6
SAWCO ROLE
SAWCO's Role
• Attend Kickoff Meeting
• Provide Requested Data
• Approve Evaluation Criteria
SAWCO's Role
• Attend Meetings and Conference Calls
• Facilitate Fire Flow Field Day and Install Pressure Loggers
• Review Catastrophic Failure Supply and Supply Reliability Scenarios
• Review Cost Assumption Development
SAWCO's Role
• Attend Meetings and Conference Call
• Facilitate Condition Assessment Field Day
• Review Replacement Projects List and Cost
• Review Capital Replacement Prioritization List
SAWCO's Role
• Attend Meeting
• Review and Comment on Draft Report
LEGEND
Quality Control Milestone

Schedule



LEGEND

- Project Meetings
- Conference Calls
- Milestone Deliverables
- Chapters and Report
- Carollo Tasks
- Field Visits
- SAWCO Review

DETAILED SCOPE OF WORK

The scope of services that are proposed align with the primary scope of work tasks listed in the RFP. Subtask numbering various from what is listed in the RFP. Task 7 was added for report development and Task 8 was added for proposed optional scope enhancement tasks. Key approaches that either supplement the scope or describe our methodology and assumptions are provided under each respective task. ***We welcome the opportunity to discuss and negotiate this scope of work with you, if we are selected for this project.***

Task 1 – Project Management & Coordination

Task 1.1 – Project Management & Coordination

This task consists of managing the project team to track time, budget, schedule work elements accomplished, work items planned for the next period, and budget needed to complete the project. This task also includes the preparation of monthly progress reports. The effort of this task is based on an eight-month project duration.

Task 1.2 – Quality Assurance/Quality Control

Carollo will perform QA/QC procedures and identify milestones and technical reviewer responsibilities for key deliverables throughout the project.

Task 1.3 – Progress Meetings & Conference Calls

Carollo will coordinate and attend up to six (6) in-person status meetings at SAWCO's office. An agenda, notes, and action and decision log will be prepared for each meeting. In addition, Carollo will coordinate up to two (2) one hour conference calls via WebEx with SAWCO staff to discuss the project status and to address potential issues. The effort of this task is based on a seven-month project duration.

Deliverables for Task 1: Agendas, Meeting Notes, Action & Decision Log, and Monthly Progress Reports

Task 2 – Data Gathering & System Evaluation Criteria

Task 2.1 – Existing Data Review

A data collection list will be prepared to track the status of requests regarding information received from SAWCO's staff, which will be provided at the kick-off meeting. Data that may be requested and reviewed consist of relevant planning documents and studies, facility operation and maintenance (O&M) records, existing condition assessment reports, GIS maps and databases, facility as-built drawings, and information provided by staff, to verify size, condition, and sizing parameters of the existing system.

Task 2.2 – Evaluation Criteria

The existing water system sizing and evaluation criteria will be reviewed and compared with industry standards to assess recommendations on revisions to these criteria. The criteria will be used for system analysis and infrastructure sizing. The criteria will consist of demand peaking factors, system pressures, pipeline velocities, pipeline head loss, fire flows, pump stations, and storage. Since the domestic and irrigation systems serve different purposes, a set of criteria will be provided for each system for the planning horizon (or Year 2030).

Deliverables for Task 2: Data Collection List and Evaluation Criteria Tables

Task 3 - Capital Improvement Program

Domestic Hydraulic Model

Task 3.1 – Domestic Hydraulic Model Review & Development

Carollo will use the 2020 GIS database to develop a pipeline network in the latest version of InfoWater Pro modeling software. Carollo will use the tools in InfoWater Pro to check connectivity and configuration of the pipelines imported into the hydraulic model. Topography data provided by SAWCO will be used to allocate ground elevations to model nodes. Additionally, the water supply source locations, reservoirs, booster pump stations, and PRVs will be modeled. Facility data will be copied from the existing model and verified with current data provided as part of Task 2. System controls will be input such that the model can run for a 24-hour extended period simulation (EPS).

Historical monthly billing records will be geocoded by meter location and allocated in the model. Diurnal curves will be developed based on existing field data for each pressure zone. If data is not available, then a standard curve will be used from a neighboring agency. Future demands for the 10-year planning horizon will be estimated based on discussions with SAWCO staff. For budgeting purposes, up to 24 hours have been included to update future demands. The model will include demand sets for Existing Average Day Demand (ADD), Existing Maximum Day Demand (MDD), Future ADD, and Future MDD.

Task 3.2 – Domestic Hydraulic Model Calibration

An EPS model calibration will be performed, which will mimic system operations over an extended 24-hour

period. Up to six (6) fire flow testing sites may be performed in a one day field visit. In lieu of a fire flow calibration, static pressure points can also be taken throughout the system using up to six (6) remote pressure loggers. SCADA output in 15-minute intervals or hourly intervals for reservoirs, pump stations, and inflows from supply connections. The model results will be compared with the field results, with calibration performed to AWWA M32 standards. A calibration plan will be prepared to summarize data needs and field activities.

Irrigation Hydraulic Model

Task 3.3 – Irrigation System Hydraulic Model Review & Development

The same scope of work listed under Task 3.1 will be used to complete the model review and development for the irrigation system. Our assumption is that the 2020 GIS database development will include the irrigation system. The only variation is the development of diurnal curves, which will include the top five (5) customers on the system.

Task 3.4 – Irrigation System Hydraulic Model Calibration

The same scope listed under Task 3.2 will be used to complete the model calibration. In addition, the use of the pressure loggers will be discussed with SAWCO prior to project kick-off to confirm that there are available locations to install the devices.

Capital Improvement Projects Based on Modeling Results

Task 3.5 – Domestic & Irrigation System Analysis

Storage & Pump Station Analysis

A storage and pump station mass balance (using a spreadsheet model) will be used to evaluate capacities within each zone under existing demand conditions for the domestic and irrigation system.

Hydraulic System Analysis

The hydraulic model will be used to evaluate system pressures and pipeline velocities under the following conditions: ADD, Peak Hour Demand (PHD), and MDD with Fire Flow (domestic system only). The hydraulic model will be used to identify areas that do not meet the minimum pressure, velocity, or fire flow requirements. If any pressure, velocity, or fire deficiencies are identified, the model will be used to identify and size improvements to meet the criteria. Carollo will first discuss the proposed recommendations with staff and then incorporate improvements in a separate hydraulic model scenario. For budgeting purposes, it is assumed that there will not be more than 10 fire flow improvement projects for the domestic system.

Task 3.6 – Cost Assumptions Development

Planning-level V unit construction costs for potable water infrastructure components will be developed. These unit costs will reflect the most current (year 2020) market conditions in the region. In addition, a table with typical contingency and mark-up cost factors will be prepared. The cost development and amortization assumptions will be discussed and finalized with the SAWCO staff prior to the development of the CIP. These cost assumptions will be used to develop costs for the capacity improvements identified under Task 3 and will be used for the proceeding tasks. Since the improvement projects identified may overlap with asset replacement and supply projects, project phasing will occur in the comprehensive CIP.

Deliverables for Task 3: Table summarizing capacity improvement projects and cost estimating assumptions

Task 4 - Capital Replacement Program

Task 4.1 – Preliminary Asset Register

Carollo will develop an asset register using the 2020 GIS data, or other sources provided. An initial grouping of assets into preliminary classes tailored to SAWCO's above ground and below ground infrastructure will be performed. It is anticipated that the preliminary register will include, but is not limited to, pipelines, PRVs, pump stations, reservoirs, and wells.

Task 4.2 – Replacement Projects List & Condition Assessment

Carollo will utilize a comprehensive approach to identify replacement needs combining typical useful life estimates for each asset with asset condition, serviceability, and functionality to determine the Evaluated Remaining Useful Life (EvRUL) and Economic Remaining Useful Life (EcRUL). These key parameters will be used along with industry standard guidelines, Carollo's internal discipline-specific experience, and institutional knowledge to determine the optimal renewal options (rehabilitate, replace, or retire) as well as project timing.

A one (1) day condition assessment will be conducted at key facilities to gain a better understanding of the system and to identify possible existing deficiencies that may require future correction. The field visit will include a lead field inspector, structural engineer, and hydrogeologist. In addition, a cursory review of video inspections and documentation will be performed to provide potential solutions to remove sedimentation in the San Antonio

Tunnel and minimize sedimentation build up in the future. For budgeting purposes, up to 16 hours will be included to perform this analysis.

Task 4.3 – Existing Replacement Costs

Prepare cost estimates for asset replacement projects using cost assumptions from Task 3.

Deliverables for Task 4: Table summarizing replacement projects and cost estimates

Task 5 – Master Plan and Facility Asset Management Program

Task 5.1 – Theoretical Asset Management Budget

A theoretical yearly asset management budget will be developed that considers timely system improvements and replacements.

Task 5.2 – Develop a Best-Fit Capital Replacement

Carollo will work with SAWCO to phase projects within a budget that best-fits the spending limit for capital replacements using 2020 cost estimates.

Task 5.3 – Theoretical Versus Best-Fit Capital Replacement Budget

Quantify the difference between the theoretical versus the best-fit budget and provide a brief description to account for the difference.

Task 5.4 – Review & Ranking Process

Carollo will develop a vulnerability and criticality score for each asset in the asset register. The risk score for each asset will be calculated and assigned a risk category (e.g. low, medium, high). Using this information, Carollo will determine the assets having the greatest impact on SAWCO's ability to meet its service obligation to its customers. Where applicable, this analysis will incorporate risk mitigation factors and system resiliency. This will be added to the risk register. This will help with prioritizing replacement/improvement projects.

Task 5.5 –Capital Replacement Prioritization List and Replacement Program

Using the information developed as part of Task 2, Task 3, and Task 4, a comprehensive 10-year capital improvement plan (CIP) and 5-year capital program project list will be developed. The projects will be summarized in tabular format by project ID, facility type, and by type of customers served (existing or future). We will prioritize all projects and develop a schedule to implement the improvements on an annual basis. The timing of CIP projects will be based on risk factors and other project triggers, such as capacity deficiencies.

Maps depicting the recommended system improvement projects will be prepared. Improvements will be annotated with project IDs that correspond with the project IDs in the report and comprehensive CIP table.

Deliverables for Task 5: Table summarizing replacement projects, Theoretical Budget Table, Best-Fit Budget Table, and a Prioritized CIP Table

Task 6 – Source Water Loss-Risk Review

Task 6.1 – Projected Environmental Impacts to Local Supply

Using the most recent drought data, a determination of yield of the various water supplies will be identified in combination with projected environmental changes. A critical drought period will be selected with input from staff. This data will be used to predict supplies over the next twenty years.

Task 6.2 – Catastrophic Failure Supply Scenarios

Up to three (3) catastrophic supply scenarios will be performed to identify supply deficiencies. Each scenario will identify the number of days that the system can operate without interruption under Minimum Day Demand (MinDD), ADD, and MDD conditions. Potential scenarios include the outage of the San Antonio Tunnel, outage of wells in the Cucamonga Basin due to water quality, and outage of key facilities during a wildfire.

Task 6.3 –Supply Reliability Alternatives

Up to four (4) supply alternative scenarios will be developed to promote supply reliability within the service area. The alternatives developed will be compared to the Stay-the-Course option. Alternatives may include improving the wells in Six Basins to maximize production, constructing an intertie with Cucamonga Valley Water District, constructed an imported water connection, and constructing new wells to provide redundancy. The alternatives developed will consider the impacts related to catastrophic supply outages identified under Task 6.2 and potential failures due to aging assets (primarily wells) that are beyond their useful life. The four (4) alternatives will modeled to identify system impacts.

Task 6.4 – Cost Estimates for Supply Alternatives

Cost estimates will be prepared for the four (4) alternatives identified. The selected alternatives will be integrated into the comprehensive CIP.

Deliverables for Task 6: Tables summarizing the Supply Risk Assessment for Environmental Impacts, Catastrophic Failures, and Supply Reliability Projects with Cost Estimates

Task 7 – Report Preparation

Task 7.1 – Draft Report

Carollo will compile the work conducted in previous tasks into master plan that provides clear rationale for identifying, justifying, prioritizing, and costing the recommended improvements. Carollo's draft report will summarize the assumptions, analysis criteria, report findings, and recommendations of SAWCO's system facilities evaluations. It is assumed that the data and word files from the 2017 Master Plan will be used to develop the Comprehensive Master Plan.

Anticipated chapters of the master plan include: 0) Executive Summary, 1) Introduction, 2) Land Use and Demands, 3) Existing System, 4) Evaluation Criteria, 5) Supply Analysis, 6) System Analysis, 7) Asset Management, 8) Capital Improvement Plan, and appropriate appendices.

Three hard copies and one electronic copy in Adobe Acrobat format of the Draft Master Plan Report will be submitted for review and comments.

Task 7.2 – Final Report

SAWCO's comments on the Draft Master Plan Report will be reviewed and incorporated into the Final Master Plan Report. Three (3) hard copies and one electronic copy will be provided in Adobe Acrobat format.

Task 8 – Optional Tasks

The scope of work and fee estimate for the optional tasks can be negotiated upon selection.

Task 8.1 – Develop Hydraulic Profiles

Develop hydraulic profile in AutoCAD and display individual pump units, pumping capacities, well production capacities, reservoir volumes, PRV settings, and other critical operational details to enhance the visual summary of SAWCO's distribution and irrigation systems. This will be included as a figure in the Report.

Task 8.2 – Water Conservation Estimates

Historical customer billing data will be analyzed by customer class of existing customers and then estimate the impacts of additional water conservation measures (AB 1668 and SB 606) and other water conservation programs. A water conservation envelope will be created to depict the range of water conservation potential and how that impacts the overall demand forecast. The results can be integrated into the 2020 Urban Water Management Plan (UWMP) and compared with the projected supply impacts under Task 6.1.

Task 8.3 – Future Land Use Demand Projections

Update the demand projections based on the review of existing land use types within the service area.

Task 8.4 – Temporary Flow Meters

Up to five (5) temporary flow meters will be installed to increase model accuracy. This may be beneficial on the irrigation system where atypical demands can significantly impact local hydraulics during peak usages.

Task 8.5 – Water Age Analysis

Modify the model for a long model run simulation (typically one month). A benchmark water age analysis will be performed to evaluate how water age can be improved through operational adjustments or improvement projects.

Task 8.6 – Dynamic CIP Tool

A dynamic planning tool will be developed, which provides a complete summary of all CIP projects. Proposed projects are each identified in separate worksheets, complete with a project summary, project need or trigger, cost, and phase. Individual project sheets will be rolled into a summary table.

Task 8.7 – San Antonio Tunnel and Associated Pipeline Condition Assessment

A condition assessment of the tunnel and associated 36-inch concrete pipe will be performed utilizing CCTV robotic inspection utilizing the access hatches. The tunnel may be a candidate for manned inspection, based on the results of the CCTV. Prior to manned inspection a safety plan will be developed for the required confined space entry.

Entry would be with a structural engineer, senior condition assessment expert, and SAWCO staff. Data that is obtained from the CCTV and manned entry will be assessed to provide a technical memorandum. Included in the technical memorandum will be recommendations going forward, to help provide viability of this system.

EXCEPTIONS TO RFP

We take no exceptions, but would like to add language reflected in our last contract.

5 | Past Projects

WATER AND RECYCLED WATER MASTER PLAN & MODEL CALIBRATION

City of Glendale

The City of Glendale is located approximately 7 miles northeast of downtown Los Angeles. The water system serves approximately 250,000 residents within a service area of 31 square miles. The system is relatively complex, with the potable and recycled water systems consisting of 397 miles of water mains, 33 reservoirs, 30 pump stations, 14 wells, 2 treatment plants, 12 chlorination facilities, and 6 water quality monitoring stations. Water is pumped in stages from reservoirs in the lower (south end) into the higher (north end) zones. The service area is divided into seven major pressure zones. Due to the wide variation in service elevations, pumping stations are needed to lift water from the lower zone to the next higher elevation.

The City of Glendale Water and Power Department (GWP) retained Carollo to develop their 2016 Water and Recycled Water Master Plan, which built upon the initial hydraulic models that Carollo assisted in developing in 2009. The project included potable and recycled water demand forecasting, water supply analysis, hydraulic modeling, hydraulic system analysis, development of a pipeline replacement program, and a field condition assessment of critical water facilities. The findings of this project were used to develop a detailed CIP and master plan report with a 2040 planning horizon. A cursory financial rate impact study was also included as part of this project.

In 2018, GWP requested Carollo to convert the hydraulic model from H20Map into InfoWater. The model was then calibrated and training was provided to staff. An updated system analysis was performed and the results were compared to the analysis performed in the 2016 Master Plan.

CLIENT REFERENCE

Raja Takidin, PE
Senior Engineer
P: 818.548.2107

Graciela Zapata, EIT
Civil Engineering Associate
P: 818.548.3972

COMPLETION DATE

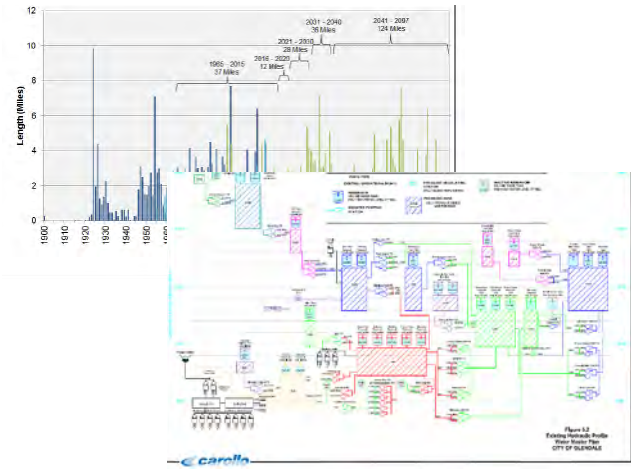
2016

PROJECT TEAM MEMBERS

Ryan Hejka (Hydraulic Modeler),
Matt Huang (Lead Modeler),
Amy Martin (Project Engineer)
Aimee Zhao (Staff Engineer),
Alex Bugbee (Asset Management)

PROJECT SIZE

$250,900



With consideration to GWP's annual budget, a comprehensive and prioritized CIP was developed using a combination of results from hydraulic modeling analysis, supply analysis, and remaining useful life for aging infrastructure.

Relevant Experience :

- ✓ **Hydraulic Modeling & Calibration**
- ✓ **System Analysis**
- ✓ **Supply Analysis**
- ✓ **Asset Age Analysis and Condition Assessment**
- ✓ **Comprehensive Master Plan & CIP**

HIGHLIGHTS

- Hydraulic Model Update with new GIS, which involved removing several miles of abandoned pipeline in the model.
- Comprehensive condition assessment and remaining useful life analysis was utilized to rank and prioritize projects in the CIP.

WATER MODEL CALIBRATION

Cucamonga Valley Water District

Cucamonga Valley Water District's (CVWD's) service area includes the City of Rancho Cucamonga, portions of the Cities of Upland, Ontario and Fontana, and some unincorporated areas of San Bernardino County. CVWD serves a population of approximately 200,000 customers within a 47 square mile area, which includes a complex distribution system with eight large pressure zones, five smaller subzones, 22 pump stations, and 35 storage reservoirs. Since CVWD experienced a lot of new growth and demand changes over the last decade, an update to the master plan was requested.

This master plan project included potable water demand forecasting, a supply analysis that analyzed the impacts of only using local supply sources, InfoWater hydraulic modeling updates and calibration, and identification of existing and future system deficiencies. A system reliability analysis was performed to identify areas that would benefit from redundancy, and recommendations for existing and future improvement projects with associated cost estimates were made. A comprehensive conditions assessment and the preparation of a report that summarized the results and recommendations was also included.

Upon completion of the master plan, CVWD retained Carollo to perform model training, review developer impacts due to changes in projected demands, and provide assistance for Proposition 68 Grant preparation.

CLIENT REFERENCE

Praseetha Krishnan
Associate Engineer Cucamonga Valley Water District
P: 909.987.2591

COMPLETION DATE

2017

PROJECT TEAM MEMBERS

Amy Martin (Assistant PM & Project Engineer), Aimee Zhao (Staff Engineer & Supply Analysis Lead), Matt Huang (Hydraulic Modeler), James Doering (Structural Analysis/ Condition Assessment), Jackie Silber (GIS)

PROJECT SIZE

$200,000

Relevant Experience :

- ✓ Hydraulic Model Update & Calibration
- ✓ System Analysis
- ✓ Supply Analysis
- ✓ Maximizing Existing Wells
- ✓ Condition Assessment
- ✓ Reliability/Outage Scenario Analysis
- ✓ Master Plan & CIP

Table 8.4 Future Pump Station Analysis without Imported Supply
Water System Master Plan
Cucamonga Valley Water District

Discharge Pressure Zone	Future MDD (gpm)	Total Required Capacity (gpm)	Future Firm Capacity (gpm)	Existing Capacity Balance (gpm)	Recommendation	Proposed PS Capacity (gpm)	Proposed PS Capacity (hp)
8	200	200	670	470	N/A	N/A	N/A
7	54	255	1,081	826	N/A	N/A	N/A
6 & 6A	3,646	3,901	4,400	499	N/A	N/A	N/A
6C	619	619	3,571	2,952	N/A	N/A	N/A
5	4,553	8,454	8,485	31	N/A	N/A	N/A
5C	1,178	1,797	2,780	983	N/A	N/A	N/A
5D	24	24	2,792	2,768	N/A	N/A	N/A
4	10,112	20,387	20,490	103	N/A	N/A	N/A
3	16,405	32,422	27,480	-4,942	2 new pumps at PS 2A (1,400 gpm each)	2,800	250
					Replace PS 2 (4 pumps at 3,000 gpm)	12,000	1,000
3A	593	4,963	9,667	4,704	N/A	N/A	N/A
2	17,954	34,357	33,147	-1,210	New pump at PS 1B-2	3,025	800
					2 Wells at Site 2A (2,500 gpm each)	5,000	
					Well 22 Treatment	2,024	
1	6,409	19,331	14,492	-4,839	1 Well at Site 1C	2,500	
Res 1B	N/A	N/A	N/A	N/A	2 Wells at Site 1B (1,488 gpm each)	2,976	
Total	**61,747**	**126,711**	**129,055**	**2,344**	**N/A**	**27,349(1)**	

Notes:
(1) The detailed pump station evaluation is included in Appendix E. Wells at Reservoir 1B are not included in the total proposed capacity.

Carollo will build upon local knowledge to identify potential intertie alternatives to improve supply reliability within SAWCO's service area.

HIGHLIGHTS

- A supply analysis was performed to identify system impacts with and without the use of imported water.
- The calibrated model was used to run reliability scenarios to identify areas within the system that would benefit from redundancy.

ASSET MANAGEMENT PLAN (AMP)

Yorba Linda Water District

CLIENT REFERENCE
Anthony Manzano, PE
Senior Project Manager
Yorba Linda Water District
P: 714.701.3000

COMPLETION DATE
2017

PROJECT TEAM MEMBERS
James Doering (Structural Field Assessments), Alex Bugbee (Asset Management)

PROJECT SIZE
$112,000

Relevant Experience :
- ✓ **Condition Assessment**
- ✓ **Asset Management**

The District was transitioning out of a period of new facilities construction and into the long-term management of its existing water and wastewater infrastructure. The service area is mostly built out and projects to increase capacity and cost effectively strengthen system resiliency are being completed. The District's focus was on replacing and rehabilitating its existing water and wastewater infrastructure in the most efficient way. With limited resources available for capital projects, this AMP update served to realign the District's priorities for sustainable management of its infrastructure. With this 2017 AMP update, Carollo is again collaborating with District staff to build upon the foundation from the last AMP that our team developed in 2010. Using Innovyze® InfoMaster to conduct the analysis, Carollo leveraged existing asset records, identified gaps, and conducted field assessments with mobile data collection tools to determine the condition and remaining life of its entire asset portfolio. This information is being used in InfoMaster to develop a risk-based assessment that will produce a prioritized list of near-term projects and long-term funding needs to sustain the infrastructure.

HIGHLIGHTS

- Developed a strategy for optimizing life cycle costs, maintaining service levels, and meeting anticipated regulatory requirements.
- Providing an asset inventory/risk assessment using a "best management" approach to produce an asset classification system, condition assessment results, remaining useful life estimates, and risk scores.

carollo

Engineers...Working Wonders With Water®

San Antonio Water Company
Comprehensive System Master Plan and Asset Management Program 2020
Statement of Proposal Ranking Sheet

Proposing Company: **Carollo**

Reviewer: _____ Date: _____

Criteria	Score
Understanding and approach to the work to be done	_____ / 30 points
Experience of firm with similar kinds of work	_____ / 20 points
Experience of staff for work to be done	_____ / 30 points
Overall clarity and presentation of Proposal	_____ / 10 points
Firm's Local Experience	_____ / 5 points
Total Points	_____ / 95 points

Please write notes or comments in each proposal! Noting weaknesses and strengths help consultants understand how proposals were scored and improve for next time.

Each reviewer's criteria points will be averaged into a final criteria score. Then all averaged criteria scores will be added together for each proposal to come up with a proposal score.

Proposed Fee counts for 5 points and will be added after all qualification-based reviews have been averaged. Given that there are only two proposals, the lowest fee will score 4 points and the highest fee will score 2 points. The fee points are intended to break a tie, understanding that if the two highest ranked firms are within a couple points of each other, the lowest fee would prevail as the best value.

Item 5A

PROPOSAL TO PROVIDE CONSULTING SERVICES FOR

COMPREHENSIVE SYSTEM MASTER PLAN AND ASSET MANAGEMENT PROGRAM

WSC
WATER SYSTEMS CONSULTING, INC.

FEBRUARY 11, 2020

MR. BRIAN LEE

General Manager
San Antonio Water Company
139 North Euclid Avenue
Upland, CA 91786

PROPOSAL FOR THE

Comprehensive System Master Plan and Asset Management Program

WATER SYSTEMS CONSULTING, INC.

9375 Archibald Avenue, Suite 200,
Rancho Cucamonga, CA 91730
P: (909) 483-3200
F: (909) 354-3482

DEAR MR. LEE,

Water Systems Consulting, Inc. (WSC) is pleased to present this proposal to provide consulting services to the San Antonio Water Company (SAWCo) for the Comprehensive System Master Plan and Asset Management Program. This procurement provides an exciting opportunity for SAWCo to develop a functional and defensible Master Plan that guides system optimization and resiliency. WSC is passionate about delivering our brand of high-quality, client-focused service to SAWCo. Our business strategy relies on outperforming our client's expectations and building true partnerships that outlast any single project.

WSC began working with SAWCo in 2019 on its System Mapping and GIS Database Project. Our proposed Project Manager, Kirsten Plonka, and team member, Spencer Waterman, are leading this project. Through WSC's role on those efforts, Kirsten and her team built strong relationships with SAWCo staff and a thorough understanding of SAWCo's water system and its unique conditions and constraints.

Based on our understanding of the project, our approach is tailored around these key success factors:

Prioritize projects that reduce risk and promote resilience for supply sources. Our expert team of engineers and planners will evaluate future supply scenarios including loss of supply from the San Antonio Tunnel and alternative supply outlooks, while understanding the risks and uncertainties associated with climate change, future regulations, and natural disasters.

Produce a comprehensive Asset Management Program for continued reliable system operation. We will use our understanding of your system to apply proven desktop tools combined with system maintenance best practices to develop an asset database and a comprehensive list of replacement and rehabilitation needs over the next 10 years.

Develop a practical and defensible master plan that provides a roadmap for the future. The Comprehensive System Master Plan and Asset Management Program will guide SAWCo's annual planning and rate structure for the next 5 to 10 years. WSC's team will make it an adaptable guide with defensible projects to support SAWCo's planning efforts.

WSC certifies it takes no exceptions with the RFP. However, WSC has an existing Professional Service Agreement with the SAWCo and respectfully requests SAWCo consider using the same terms and conditions for this project. We are confident that we can quickly and efficiently reach mutually agreed upon terms.

If you have questions about any aspect of this proposal, please feel free to contact WSC's proposed Project Manager, Ms. Kirsten Plonka, at (858) 397-2617, ext. 304 (kplonka@wsc-inc.com) or WSC's proposed Principal in Charge, Ms. Laine Carlson, at (909) 483-3200, ext. 201 (lcarlson@wsc-inc.com). Thank you again for your consideration, and we look forward to your response.

SINCERELY,
WATER SYSTEMS CONSULTING, INC.

KIRSTEN PLONKA, PE
PROJECT MANAGER

LAINE CARLSON, PE
PRINCIPAL IN CHARGE

EXECUTIVE SUMMARY

WSC's team of master planning experts have the experience and understanding to deliver on a Comprehensive System Master Plan and Asset Management Program, while providing a high level of responsiveness and quality. Our proposed project manager, Kirsten Plonka, and members of the team have worked with SAWCo and will leverage that experience to streamline our work and deliver an actionable plan that is supported by clear data and a comprehensive view of SAWCo's domestic and irrigation systems.

SAWCo has been proactive about moving forward with the Capital Improvement Program (CIP) from the previous Water Master Plan for the domestic and irrigation water systems. SAWCo is currently creating a new Geographical Information System (GIS) database with new information (e.g. age, material, size, maintenance history, etc.) that will allow for improved master planning and capital facility replacement planning. Therefore, SAWCo is seeking to update the Water Master Plan to support capital planning and asset management programs considering factors that were not included in the previous Water Master Plan analysis.

Our approach will incorporate SAWCo-specific expertise to develop a comprehensive planning document and a dynamic hydraulic modeling tool. Unique elements of our approach are included below.

A collaborative approach to project management engages the team at the right times

WSC's team understands the importance of communication, aligning work efforts, efficient data gathering, and keeping the team working toward a unified goal. Our approach will include monthly meetings and continuous quality control to avoid miscommunications and engage the right reviews at the right times.

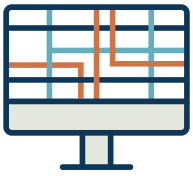
Streamlined data gathering and system evaluation criteria saves staff time and resources

Our team is familiar with SAWCo's systems and will use this knowledge to be efficient when using staff time during data collection. WSC will streamline data gathering, establish evaluation criteria, and capture staff knowledge to seamlessly move through this part of the project.

A new model informs the development of a reliable CIP

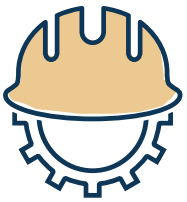
WSC will develop a new model linked to GIS to simplify future updates and will construct the domestic and irrigation systems within the same model for continuity. The models will be set up so SAWCo can run "what if" scenarios as supply and storage alternatives are developed in the future.

WHY SELECT WSC?



We Understand Your System

We Are Asset Management Experts



We Bring An Operator's Perspective

We Plan For System Resiliency

We Have A Systematic Approach to Project Management and Quality Control

Establishing a routine replacement program proactively avoids customer impacts and service interruptions

WSC understands the importance of establishing a routine replacement program for aging assets and recommends an analysis of the distribution system facilities age and expected useful life to quantify the replacement liability facing SAWCo.

A functional Master Plan allows for unique asset management strategy

WSC will develop a yearly asset management budget and flexible CIP that encompasses all system assets and allows SAWCo to replace vital facilities in a timely manner. We will also provide an easy to read report with sufficient data to support projects, including rip and run sheets.

Evaluating source water risks early advances proactive resiliency planning

WSC will evaluate how high impact, high probability risks will affect future water source availability for SAWCo. Of particular concern is the vulnerability of the San Antonio Tunnel because it is SAWCo's least expensive supply source with significant capacity. Considering supply risks, WSC will develop alternative supply scenarios where SAWCo can continue to provide a full yearly entitlement to its shareholders.

Meet Your Project Manager

KIRSTEN PLONKA

Kirsten has over 17 years of experience leading and developing water master plans, and has worked on more than 25 hydraulic models. She is currently leading the development of SAWCo's System Mapping and GIS Database project and will leverage this experience to successfully deliver a functional Comprehensive System Master Plan and Asset Management Program.

KEY OPPORTUNITIES

Through our partnership and previous work with SAWCo, we have identified several Key Success Factors that we believe will maximize the value of the Water Master Plan.

KEY SUCCESS FACTOR	WSC BENEFIT
Prioritize projects that reduce risk and promote resilience for supply sources	Our expert team of engineers and planners will evaluate future supply scenarios, including loss of supply from the San Antonio Tunnel and alternative supply outlooks, while understanding the risks and uncertainties associated with climate change, future regulations, and natural disasters.
Produce a Comprehensive Asset Management Program for continued reliable system operation	We will apply proven desktop tools combined with system maintenance best practices to develop an asset database and a comprehensive list of replacement and rehabilitation needs over the next 10 years. We will leverage our understand your system through our development of the GIS database and review of related asset data.
Deliver a practical and defensible Comprehensive System Master Plan that provides a roadmap for the future.	The Comprehensive System Master Plan and Asset Management Program will guide SAWCo's annual planning and rate structure for the next 5 to 10 years. The Water Master Plan will need to be an adaptable guide with defensible projects to support SAWCo's financial planning and infrastructure management efforts.

WSC has been a partner to SAWCo by guiding the development and organization of much of the data needed for the Water Master Plan update. Our approach will incorporate SAWCo-specific expertise to streamline a comprehensive planning document and a dynamic hydraulic modeling tool.

FIRM BACKGROUND AND EXPERIENCE

WSC IS YOUR PREMIER WATER MASTER PLANNING CONSULTING FIRM

WSC is a civil and environmental engineering firm that specializes in master planning. We are a people-centric enterprise, thriving and growing from a philosophy that people come first, and we aim to foster an environment of next-generation thinkers and professionals.

Our expert staff includes nearly 60 skilled employees working from eight offices in California and the Pacific Northwest, including our local office in Rancho Cucamonga. We serve investor-owned utilities, cities, counties, special districts, and regulatory agencies throughout California and Oregon.

Our team's professional expertise allows WSC to approach SAWCo's Comprehensive System Master Plan and Asset Management Program from a holistic perspective that will result in a clear and defensible plan to address predicted needs for system optimization and resiliency. WSC's team includes GIS database, hydraulic modeling, asset management, and project management experts who have successfully delivered water master plans together throughout California.

Through our GIS work with SAWCo and our work throughout the region, WSC understands the nuances of your water distribution system and will be able to work quickly and efficiently. Together, proposed project manager, Kirsten Plonka, and her team will work collaboratively with staff to deliver a Comprehensive System Master Plan and Asset Management Program that is functional and guides system optimization and resiliency.

WSC verifies it possesses liability insurance for coverage of at least $1,000,000.

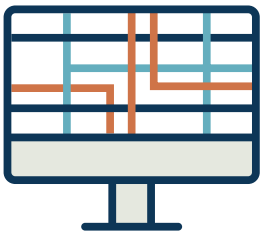
WSC OFFICE LOCATIONS:

- Rancho Cucamonga, CA
- San Diego, CA
- San Luis Obispo, CA (Headquarters)
- Wildomar, CA
- Orange County, CA
- Camarillo, CA
- Folsom, CA
- Portland, OR

GET TO KNOW US:

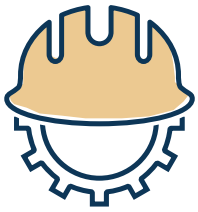
- WSC has worked on **18** Master Plans in the past decade.
- WSC has been recognized as a **Best Place to Work** three consecutive years by Inc. Magazine.
- We are an S-Corporation and Certified Small Business with the State of California and a Certified Minority Business Enterprise with the CPUC Supplier Clearinghouse.
- WSC is working on the **SAWCo's System Mapping and GIS Database** project.
- **Expect WSC**: Personalized Service. Sustainable Solutions. Exceptional Value.

FIVE REASONS TO SELECT WSC



We Understand Your System

WSC is developing SAWCo's GIS database and system atlas. Through this work, Kirsten and her team have developed valuable insight into the unique conditions and constraints that SAWCo faces. This work seamlessly feeds into the Comprehensive System Master Plan and allow us to efficiently update the hydraulic model.



We Bring An Operator's Perspective

Several of our team members, including our proposed project manager, have worked in the public sector and have been responsible for implementing master plans. We know that nobody knows your system like you do, which is why we will actively engage key operators and management staff in the master planning process through workshops and timely communication.

We Are Asset Management Experts

WSC's team has completed numerous asset management and CIP deliverables through our master planning efforts. For the City of Pismo Beach, WSC developed a prioritized CIP using an adaptive asset management approach. WSC identified a phased replacement schedule to address the highest risk pipe based on anticipated end of useful life and other ranked risk criteria. This approach resulted in a CIP that reduced risk while fitting in the City's annual budget.

We Have A Systematic Approach to Project Management and Quality Control

WSC uses an integrated project management and accounting system, Ajera, to manage project progress and budget in real time. We use earned value management to identify discrepancies between planned and actual progress, allowing corrective measures to be implemented early to prevent cost overruns and schedule delays. We also use a combination of working sessions and technical, formatting, and readability reviews throughout the project. Reviews include high-level working sessions focused on overall strategy and identification of innovative approaches, and detailed reviews of calculations, drawings, and technical writing to avoid errors.

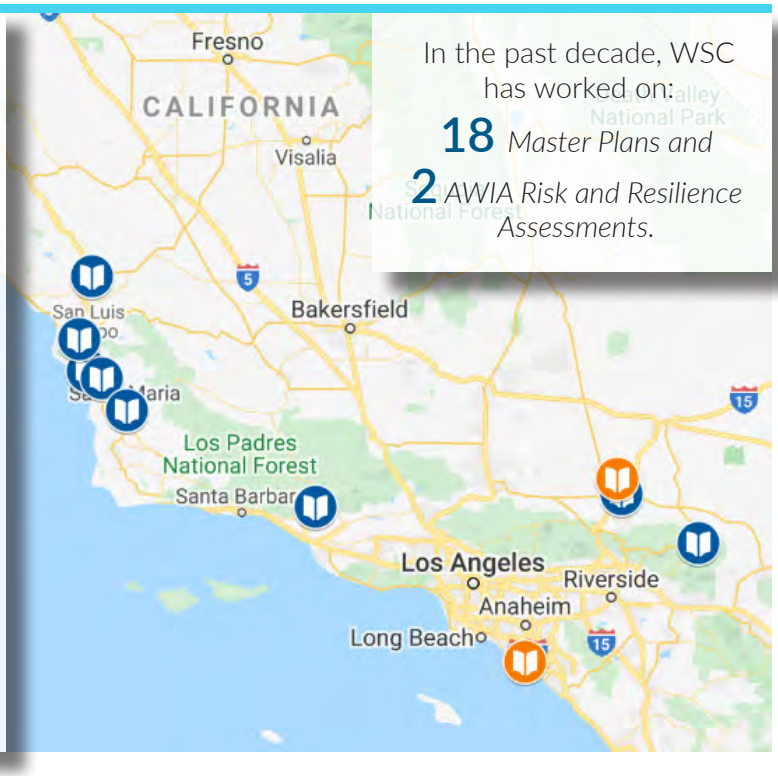
We Plan For System Resiliency

We understand the need for resilient, sustainably managed water systems that are built for the future and can be maintained while minimizing risk from potential hazards. WSC's team has performed risk assessments for our clients for scenarios including seismic resiliency, climate change, and infrastructure reliability. We are also performing America's Water Infrastructure Act (AWIA) Risk and Resilience Assessments (RRA) and Emergency Response Plans (ERP) for two of our California clients. Proposed Project Manager, Kirsten Plonka, and three additional WSC staff have completed the AWIA Certificate Program.

WE ARE WATER MASTER PLANNING EXPERTS

WSC brings considerable experience developing master plans for water utilities throughout California and will leverage that experience by efficiently integrating past work into this project. Our approach typically revolves around four primary objectives:

- Create a plan to reflect the unique aspects of the client and their long-term goals.
- Optimize the use of water, energy, human, and financial resources.
- Communicate the benefits of the plan to both internal and external customers.
- Deliver on expectations that are clearly understood and endorsed by all stakeholders.



In the past decade, WSC has worked on:

18 *Master Plans and*

2 *AWIA Risk and Resilience Assessments.*

RECENT WATER MASTER PLANS

Client	Status	Supply & Demand Forecast	Hydraulic Model	Capacity Evaluation	Risk Management	Asset Management	Capital Improvement Plan
Oak Lodge Water Services District	Ongoing	X	X	X	X	X	X
California American Water Monterey District	Completed	X	X	X		X	X
City of Victorville	Completed, AWIA RRA in Progress	X	X	X	X	X	X
City of Pismo Beach	Final Draft Submitted	X	X	X		X	X
Big Bear City Community Services District	Completed	X	X	X		X	X
Casitas Municipal Water District	Completed	X	X	X		X	X
City of Paso Robles	Completed	X	X	X	X	X	X
City of Arroyo Grande	Completed	X	X	X	X	X	X
City of Santa Maria	Completed	X	X	X	X	X	X

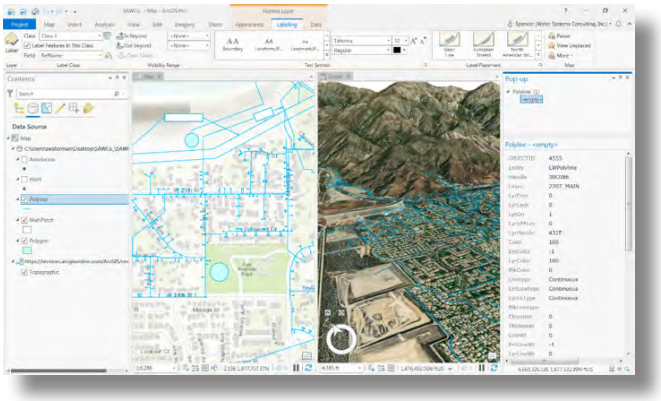
FIRM'S LOCAL EXPERIENCE

SYSTEM MAPPING AND GIS DATABASE

SAN ANTONIO WATER COMPANY, UPLAND, CA

WSC began working with SAWCo in 2019 on the System Mapping and GIS Database project. WSC is delivering a cost-effective GIS database developed in a pragmatic way to consolidate multiple data sources into a comprehensive repository that can be leveraged for multiple every-day and long-term uses. The system map will be accessible to SAWCo staff to quickly look up system information, link to relevant data from other systems, and position the system map for updates that can be incorporated into a hydraulic model for long-term master planning.

Kirsten Plonka and team member, Spencer Waterman, are leading this project and have a clear understanding of SAWCo's water systems. Together, they will deliver a valuable, long-term tool that will be critical in developing the Comprehensive System Master Plan. The two can leverage this experience to seamlessly transition into this project and provide value-added service and expertise.



REGIONAL EXPERTISE

WSC understands the regional water supply challenges that SAWCo faces. Members of WSC's team have experience tackling these issues working on projects within the Santa Ana Watershed, Chino Basin, and throughout San Bernardino County including:

- **Regional Recycled Water Concept Study,** San Bernardino Valley Municipal Water District
- **Regional Urban Water Management Plan,** San Bernardino Valley Municipal Water District
- **Santa Ana River Conservation and Conjunctive Use Project,** San Bernardino Valley Municipal Water District
- **Water Master Plan,** Big Bear Community Services District
- **Sewer Master Plan,** Big Bear Community Services District
- **Replenish Big Bear Program Management,** Big Bear Regional Wastewater Agency
- **Water System Improvement Program,** Big Bear Lake Department of Water and Power
- **Chino Basin Preliminary Design Report,** Inland Empire Utilities Agency

WE ARE YOUR LOCAL AWIA RESOURCE

It is becoming increasingly important for water agencies to possess defensible, well thought out, and adaptable resiliency and emergency preparedness documents. WSC has assembled a highly qualified team including four AWIA certified staff.

Kirsten knows the AWIA process and is serving as project manager for two AWIA RRAs and ERPs for the City of Victorville and Mesa Water District. Our streamlined approach to this required planning process provides our clients value by reducing the impact on staff resources and combining planning efforts where there is an opportunity.

WSC's AWIA deliverables will: facilitate compliance with AWIA requirements; identify security practices for operations and management; improve resilience for water and wastewater systems; support emergency planning; and inform cybersecurity practices.

PROJECT ORGANIZATION AND EXPERIENCE OF PROJECT TEAM

MEET THE WSC TEAM

WSC's team is functionally organized to take advantage of the strengths of our expert staff within a streamlined structure to provide a high level of responsiveness and quality.

WSC's proposed Project Manager, Kirsten Plonka, has experience working with your staff and will serve as the primary point of contact for this project. Kirsten has more than 17 years of experience in water system planning, and her extensive experience in the public sector allows her to approach this project from an owner's perspective.

She will be supported by a highly qualified team which includes WSC Vice President and Principal in Charge, Laine Carlson, who has more than 15 years of experience leading master planning projects. WSC's proposed QA/QC engineer, Jeroen Olthof, is a nationally recognized expert in hydraulic modeling and asset management.

Together, they will lead WSC's comprehensive team that includes the key staff listed in the organizational chart below. WSC confirms the availability and commitment of the key staff assigned to this project.

Resumes containing team members' qualifications and experience on water master plan and asset management projects are included in Appendix A.

WSC OFFICE LOCATIONS

[1] Rancho Cucamonga, CA

[2] San Diego, CA

[3] San Luis Obispo, CA

PRINCIPAL IN CHARGE

[1]Laine Carlson, *PE*

PROJECT MANAGER

[2]Kirsten Plonka, *PE, AWIA*

QA / QC

[2]Jeroen Olthof, *PE, MS, MBA*

DEPTH OF RESOURCES

Hydraulic Modeling
[3]Heather Freed, PE, MS
[2]Antonia Estevez-Olea, PE, MS

Supply and Storage
[3]Spencer Waterman

Condition-based Assessment
[1]Christopher Deiter, PE

***AWIA Lead**
[3]Haley Lehman, AWIA, CCST

Engineering Support/ Cost Estimating
[1]Aaron Morland

**Optional task*

MEET YOUR PROJECT MANAGER

KIRSTEN PLONKA, PE

Ms. Plonka brings more than 17 years of experience in the planning, design, and management of water, wastewater and recycled water systems. She specializes in water master planning, including Capital Improvement Plans and developing Asset Management Programs. Her expertise includes project management, hydraulic modeling, feasibility studies, and infrastructure and water resource planning studies. She has developed more than 25 hydraulic models and brings a strong understanding of SAWCo's systems. In addition, she has completed Vulnerability and Risk Assessments for multiple public utilities in California.

Kirsten has worked with each of WSC's proposed team members on master planning projects. This experience together allows the team to work efficiently together, saving SAWCo time and money. Kirsten's approach to project management and maintaining a high level of cooperation and service includes:

- Developing a detailed workplan and schedule
- Establishing clearly defined roles and responsibilities early
- Providing clear and frequent communication
- Using the right data management and collaboration tools

QUALIFICATIONS

Education

BS, Civil Engineering, California Polytechnic State University, San Luis Obispo

Registrations/Certificates

PE - Civil, CA No. 70746
AWIA Certified

"As a former water district employee, I put myself in my client's shoes and imagine how I can help them succeed. I work to apply innovative tools and approaches to inform my work and respect Company staff's valuable time."

HERE'S WHAT OUR CLIENTS ARE SAYING

"The team at WSC has done a great job thus far listening to our input and identifying points of concern with our system. I would definitely consider them a front runner in selecting for future master plan work."

Jason Rice, PE, District Engineer, Oak Lodge Water Services

"WSC expertly prepared our Master Plans. I have been extremely impressed with their high level of competency and ability to work effectively and interactively with staff. WSC's assessment and modeling of our systems has been exemplary. I really enjoy working with staff at WSC, I know I will always get a prompt, insightful, and trustworthy response."

Ms. Teresa McClish, Community Development Director, City of Arroyo Grande

PROJECT UNDERSTANDING AND APPROACH

PROJECT UNDERSTANDING

San Antonio Water Company (SAWCo) has consistently provided water service since 1882 to its shareholders, which include residents in unincorporated San Antonio Heights, the cities of Upland and Ontario, the Monte Vista Water District, local quarries, golf courses, and citrus grove irrigators using local water sources. SAWCo has been proactive about moving forward with the CIP from the previous Water Master Plan for the domestic and irrigation water systems. Additionally, SAWCo is currently creating a new Geographical Information System (GIS) database with new information (e.g. age, material, size, maintenance history, etc.) that will allow for improved master planning and capital facility replacement planning. Therefore, SAWCo is seeking to update the Water Master Plan to support capital planning and asset management programs considering the following factors that were not included in the previous Water Master Plan analysis:

- Like that of all water agencies, SAWCo's infrastructure has continued to age, and SAWCo needs to plan for future investments to rehabilitate and replace infrastructure as it reaches the end of its useful life. The new GIS can aid in the creation of a comprehensive asset database and Asset Management Program.
- SAWCo relies entirely on local water sources that are vulnerable to climate change, natural disasters, and other uncertainties and risks. A source risk analysis is needed to understand supply resilience and what projects are needed to maintain local supply and keep the San Antonio Tunnel operational to meet annual entitlement for shareholders.
- SAWCo is looking for ways to optimize the domestic and irrigation systems and maintain high levels of service as future demands come online, projects are constructed, and supply sources change due to local conditions. With well calibrated hydraulic models, SAWCo can run "what-if" scenarios to evaluate future changes in the systems and predict outcomes in the models prior to making changes in the field. The new GIS data can be used to build more accurate and detailed hydraulic models, thereby increasing confidence in model results.
- SAWCo needs a long-term and defensible Asset Management Program that can be used for annual planning and support any needed rate changes. Careful prioritization will give SAWCo a clear path for which projects to start first. The Water Master Plan needs to provide the "why" necessary in justifying capital improvement projects and rate setting.

This set of challenges requires an updated Comprehensive System Master Plan and Asset Management Program to provide a complete evaluation of the SAWCo water systems and produce a comprehensive list of improvements needed to maintain safe and reliable water service into the future.

KEY OPPORTUNITIES

Through our partnership and previous work with SAWCo, we have identified several Key Success Factors that we believe will maximize the value of the Comprehensive System Master Plan and Asset Management Program.

KEY SUCCESS FACTOR	WSC BENEFIT
Prioritize projects that reduce risk and promote resilience for supply sources	Our expert team of engineers and planners will evaluate future supply scenarios including loss of supply from the San Antonio Tunnel and alternative supply outlooks while understanding the risks and uncertainties associated with climate change, future regulations, and natural disasters.
Produce a Comprehensive Asset Management Program for continued reliable system operation	We will apply proven desktop tools combined with system maintenance best practices to develop an asset database and a comprehensive list of replacement and rehabilitation needs over the next 10 years. We understand your system through our development of the GIS database and review of related asset data.
Deliver a practical and defensible Water Master Plan that provides a roadmap for the future.	The Comprehensive System Master Plan and Asset Management Program will guide SAWCo's annual planning and rate structure for the next 5 to 10 years. The Water Master Plan will need to be an adaptable guide with defensible projects to support SAWCo's financial planning and infrastructure management efforts.

PROJECT APPROACH

TASK 1 – PROJECT MANAGEMENT

KEY STAFF – KIRSTEN PLONKA, JEROEN OLTHOF, LAINE CARLSON: DURATION – 12 MONTHS

WORK PRODUCTS: Project Administration Plan (updated monthly), decision logs, meeting agendas, and minutes.

REQUIRED INPUT FROM SAWCO: Monthly check-in calls with SAWCo Project Manager and scheduling for meetings.

SUMMARY OF WORK:

Following the Notice to Proceed, WSC will prepare a Project Administration Plan (PAP) template including a project schedule, a work breakdown structure with budgets for each task and subtask, a data request register, and a decision log. A draft version will be submitted prior to the project kickoff meeting, where any comments on the template will be discussed and resolved. The kickoff meeting will be used to establish key success factors. The PAP will be updated monthly and provided to the SAWCo Project Manager ahead of a monthly check-in meeting. QA/QC reviews will be conducted by experienced WSC staff on all work products throughout the duration of the project.

UNIQUE APPROACH:

Monthly Meetings with Documentation Avoids Miscommunications. WSC has developed a unique monthly report template that effectively serves as the PAP, and has been proven to be successful in achieving clients' key success factors within the contractual budget and schedule. The two-page report summarizes all outstanding action items (including data requests), spending to date and estimates to complete each task and subtask, a summary of work completed in the previous month and of work to come in the next month, and an agenda of discussion items. A draft report is provided ahead of each monthly meeting to serve as an agenda, and any updates or key decisions are documented immediately afterwards in a final report. A living decision log and updated schedule will be attached to the PAP report. Kirsten Plonka used this approach to successfully manage the Big Bear Community Services District Water Master Plan, and the project was completed under the original budget.

Continuous Quality Control Engages the Right Reviews at the Right Times. WSC's QA/QC lead, Jeroen Olthof, is an experienced water master planner who will oversee a combination of working sessions, modeling checks, technical editing, formatting, and readability reviews to engage different levels of review throughout the process. Reviews include high-level working sessions focused on overall strategy and identification of innovative approaches, and detailed reviews are conducted on calculations, drawings, cost estimating, and technical writing to avoid errors.

TASK 2 – DATA GATHERING AND SYSTEM EVALUATION CRITERIA

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED: DURATION – 2 MONTHS

WORK PRODUCTS: Data request log, kickoff meeting agenda and minutes, and design and evaluation criteria.

REQUIRED INPUT FROM SAWCO: Assistance in gathering and providing data.

SUMMARY OF WORK:

In parallel with the development of the PAP template, as described in Task 1, WSC will prepare a preliminary data request for review and discussion at a kickoff meeting with SAWCo staff. Interviews with SAWCo employees will be conducted to identify operational status, settings, and any known deficiencies in the system, and preferred system evaluation criteria that are not dictated by current regulatory requirements.

WSC will actively engage key staff in the master planning process through workshops, interviews, and review of draft recommendations. Leveraging their experience and knowledge of the water system will result in the development of a valuable and realistic Asset Management Program.

UNIQUE APPROACH:

Focused Data Gathering. WSC is currently working with SAWCo to create a user-friendly GIS mapping interface and a GIS database tied to SAWCo's asset management data. WSC is very familiar with SAWCo's systems and can help to identify and clarify critical data that needs to be field verified. This knowledge will allow for efficient use of SAWCo staff time during data collection. WSC built the GIS database with modeling in mind to minimize the need for connectivity updates during model construction.

Establish Evaluation Criteria. WSC will leverage evaluation criteria used in the previous Water Master Plan and will update criteria to meet current regulatory requirements and generally accepted engineering standards. We can use our knowledge of SAWCo's system to provide a recommendation for evaluation criteria not subject to regulations that is tailored to SAWCo's needs while incorporating your design and construction standards.

Capture Staff Knowledge. Nobody knows your system like you do. SAWCo managers and operators have the best knowledge of the current condition of the various water system facilities and specific problem areas that should be prioritized to minimize service interruptions and costly repairs. Some of this knowledge may not be well documented, so it is critical to actively engage key operators in the master planning process through workshops, interviews, and review of draft recommendations. Leveraging their experience and knowledge of the water system will contribute to the development of a valuable and realistic CIP. WSC has an established relationship with SAWCo staff making this a seamless part of the water master plan process.

TASK 3 – CAPITAL IMPROVEMENT PLAN

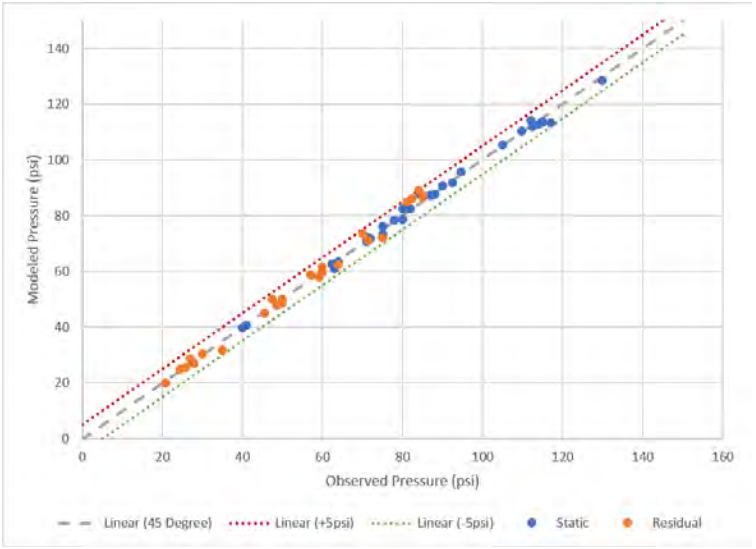
KEY STAFF – KIRSTEN PLONKA, SPENCER WATERMAN, HEATHER FREED: DURATION – 4 MONTHS

WORK PRODUCTS: Fire-Flow Testing Plan, calibrated hydraulic model, model calibration report, and list of recommended capital projects and cost estimates.

REQUIRED INPUT FROM SAWCO: Review of Fire-Flow Testing Plan, field verification of hydrant locations, and assistance in operating hydrants during model verification. Review and input on recommended capital projects.

SUMMARY OF WORK:

WSC will review and update the existing domestic water system hydraulic model, or develop a new model, as discussed below. WSC will create a new irrigation system hydraulic model, based on SAWCo-provided data described in Task 2, using Innovyze's InfoWater software program. Demand scenarios for each model will be created for average and maximum day and minimum and peak hour using diurnal curves, peaking factors, and water meter billing information. Demand sets will also be projected over the next 10 years based on system growth and planned developments.



Data collected during hydrant testing with SAWCo staff and SCADA records will be used to calibrate the hydraulic models under steady state and EPS conditions. WSC will document the calibration process for SAWCo review resulting in models with a high level of confidence.

A Fire Flow Testing Plan will be developed identifying locations for fire flow and pump tests to target critical areas of the two distribution systems. WSC will work with SAWCo staff to conduct field testing and compare collected data to model results. Pump curves and pipeline friction factor assumptions will be adjusted in the models with a calibration target of model results within 10 percent of observed values. SCADA data will be used to calibrate the Extended Period Simulation (EPS). If any areas are encountered where calibration cannot be achieved through reasonable adjustments to the models, WSC will provide lists of possible partially closed valves or other potential causes for field crews to investigate further. A model calibration technical memorandum will be prepared, and calibration results will be presented during a model review workshop.

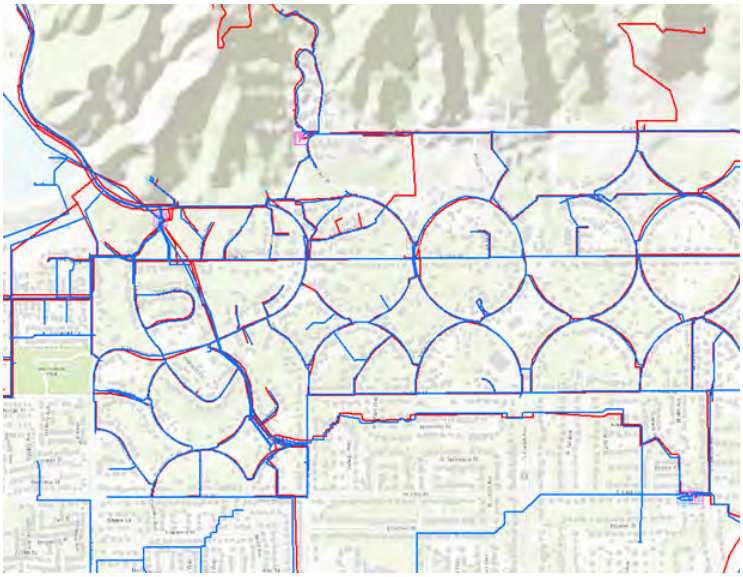
The hydraulic models will be used to evaluate the capacity of the domestic and irrigation systems under peak hour demands and during a fire occurring with maximum day demands, and any deficiencies will be identified. Current and future demand sets will be applied. System improvement recommendations will be developed using model results and SAWCo input. WSC will prepare planning level costs for each recommended project.

UNIQUE APPROACH:

A New Model Linked to GIS will Simplify Future Model Updates. The existing domestic system model was built using older CAD data and does not align with the recently constructed GIS database. WSC can create a new domestic system hydraulic model that is linked to the new GIS data. Benefits of creating a new model based on the GIS data include a more accurate representation of the system and reduced effort for future model updates through the InfoWater GIS Gateway Tool. Much of the information stored in the existing model, including tank operating levels, pump curves and operating controls, and valve settings can be extracted and easily transferred into a new GIS-based model.

Construct the Domestic and Irrigation Systems within the Same Model for Continuity. Because the domestic and irrigation systems are not connected, the two models can be built in separate model databases. However, if SAWCo would prefer to maintain the hydraulic models in a single database, both models can be built in the same file and run simultaneously, or query sets used to toggle on and off each system so they run independently. WSC recently built the Ojai System and Casitas Water System hydraulic model within the same database with similar functionality. We look forward to working with you to determine the best strategies for model development to fit SAWCo's needs.

Preliminary Calibration for Targeted Fire Flow Testing. WSC will conduct an initial calibration of the models using SCADA data. Results will be used to help identify hydrant locations for field testing, and a draft hydrant testing plan will be developed incorporating industry best practices. WSC will then meet with field staff to discuss and confirm the timing and locations of all tests to be performed and methodology used. Optimizing the field testing plan with operations input will allow WSC to calibrate the model while avoiding significant burdens on field staff time.



SAWCo's new GIS database, shown as the blue pipes, was superimposed with the existing domestic system model, shown as the red pipes. There are several discrepancies between the two data sets. WSC recommends constructing a new domestic system model based on the more accurate GIS data. This will also benefit SAWCo in the long term with easy future model updates.

Identify System Modification to Improve Resiliency and Optimize Operations: The models will be set up to allow SAWCo to run "what if" scenarios as supply and storage alternatives are developed in the future. Operational efficiencies will be analyzed to determine if existing pressure zone boundaries are adequate, and if pressure-reducing valves or variable frequency drives can improve the level of service and/or save energy. Additional scenarios with increased system looping will also be evaluated to reduce system vulnerabilities and improve resiliency. By running those scenarios and fully flexing the "what if" scenarios, WSC can partner with SAWCo to identify improvements that optimize the systems and reduce energy consumption, while protecting high water quality and reliability. WSC can use the hydraulic models in conjunction with the condition-based replacement plan to assess the best combination of strategies to improve system resiliency and maximize return on financial investment in the systems. WSC's scope includes modeling up to three "what-if" scenarios to improve resiliency and system operations, and we look forward to working with SAWCo to determine the best scenarios for SAWCo's needs.

TASK 4 – CAPITAL REPLACEMENT PROGRAM

KEY STAFF – KIRSTEN PLONKA, CHRISTOPHER DEITER, HEATHER FREED, AARON MORLAND: DURATION – 3 MONTHS

WORK PRODUCTS: Asset database and long-term replacement needs projection for pipes, storage tanks, pumps, wells, and pressure reducing valves.

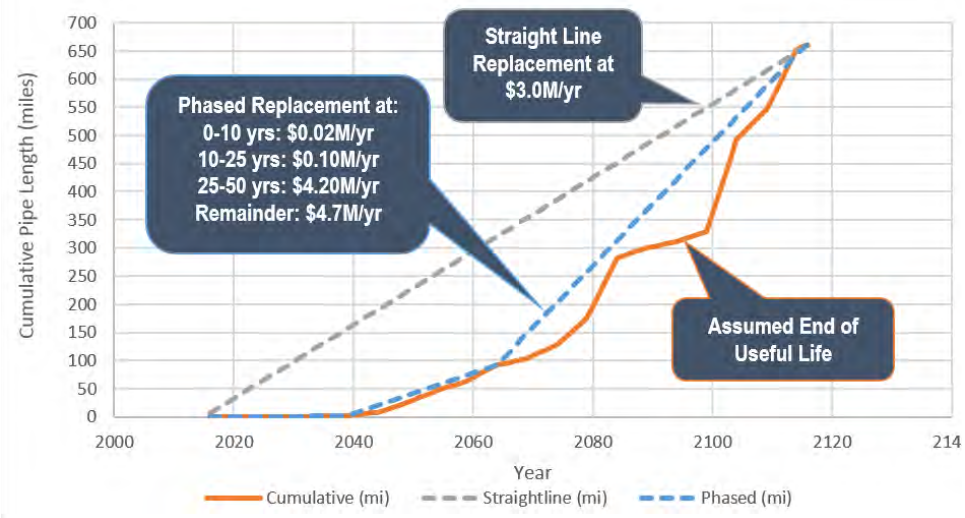
REQUIRED INPUT FROM SAWCO: Review of recommendations and discussion.

SUMMARY OF WORK:

A GIS-based asset database will be developed to track system assets including pipes, storage tanks, pumps, wells, and pressure reducing valves. Remaining useful life for SAWCo assets will be evaluated, and projected rehabilitation and replacement needs will be provided along with cost estimates.

UNIQUE APPROACH:

WSC understands the importance of establishing a routine replacement program for aging assets so that they can be replaced proactively to avoid accumulating a backlog of replacement needs that could lead to service interruptions and/or sudden and significant financial impacts to customers. To help SAWCo establish an appropriate rate of replacement, WSC has developed a long-term asset replacement tool that analyzes the distribution system facilities age and expected useful life to quantify the replacement liability facing SAWCo. An example of this tool's output shown below uses SAWCo's input on the expected useful life of pipe material in your service area and evaluates how many feet of pipe will need to be replaced on an average annual basis over the next 50+ years to maintain the distribution system in safe and reliable operating condition.



WSC will prepare a long-term replacement needs projection for SAWCo's pipelines based on pipe age and material to help establish defensible long-term rehabilitation rates to maintain the system in its current condition. A similar approach could be used to develop replacement rates for tanks, pumps, wells, and pressure reducing valves. We will seek input from SAWCo staff on which projects should be prioritized to develop a realistic and flexible Asset Management Program.

TASK 5 – MASTER PLAN AND FACILITY ASSET MANAGEMENT PROGRAM

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED, AARON MORLAND: DURATION – 4 MONTHS

WORK PRODUCTS: Draft and Final Master Plans, asset database, calibrated hydraulic models, and GIS shapefiles.

REQUIRED INPUT FROM SAWCO: Review of draft and final reports.

SUMMARY OF WORK:

WSC will develop a yearly asset management budget that encompasses all system assets. WSC will work with SAWCo to compare recommended the annual asset management budget to the available asset management budget based on SAWCo's revenue and operating expenses. To the extent possible, the team will reconcile the difference between the recommended annual spending limit and the available spending limit to develop a 5-year Capital Replacement Program.

The Program will prioritize identified capital projects based on a ranking and review process that includes like facilities and recommended construction dates. Projects will include existing capacity and level of service deficiencies, abandonments, repairs or replacements at end of useful service life, and future capacity deficiencies caused by growth. Based on this prioritization, WSC will develop a 10-year Capital Replacement Prioritization List.

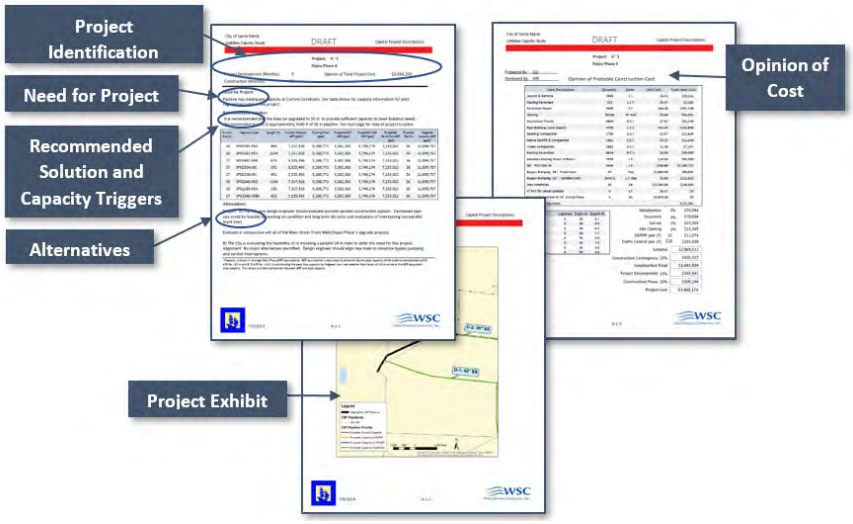
A draft Water Master Plan will be prepared summarizing the results of Tasks 2 through 6. Review comments will be compiled into a table, with preliminary responses provided. WSC will lead a review meeting to discuss and resolve comments. Resolution of comments will be addressed, and a Final Water Master Plan will be prepared, along with final versions of the condition assessment database.

UNIQUE APPROACH:

Easy to Read Reports with Sufficient Data to Support Projects. WSC prides ourselves on easy to read reports that allow readers to quickly comprehend the key information that supports the planning process. Information is conveyed in clear charts, figures, and tables to the maximum extent possible. Each graphic must be sufficiently clear to stand alone without excessive explanation, allowing the Master Plan to serve as an ongoing public outreach tool for communicating SAWCo activities.

Rip and Run Sheets. WSC will create individual "Rip and Run" project sheets for the first $10 million in projects identified in the CIP. These project sheets will include essential information on each of the proposed projects. WSC has used these sheets in several recent CIPs and management, engineering and operations staff alike have expressed their appreciation for this ready and useful reference. The figure provides an example of how WSC recommends the project sheets of the CIP be presented.

WSC has developed a database-driven tool to cost-effectively prepare these resources. Each "Rip and Run" sheet includes a description of the project, an estimated capital cost, and a map showing the project location. Because the cost estimates are prepared directly within the tool database, there is minimal need for re-entry of information or potential transcription errors. The project description sheets are included in the appendix of the master plan and can be used to initiate pre-design for selected improvements.



WSC's database-driven approach allows efficient production of "Rip and Run" sheets for each CIP project that clearly and concisely present important project information. They will include capacity triggers for relevant projects to enable SAWCo to adaptively manage the CIP and construct facilities as they are needed, rather than on a set timeline.

TASK 6 – SOURCE WATER LOSS- RISK REVIEW

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED, HALEY LEHMAN: DURATION – 2 MONTHS

WORK PRODUCTS: Prioritized list of supply source risks and uncertainties, results of alternative supply scenarios, and supply source recommendations.

REQUIRED INPUT FROM SAWCO: Review of recommendations and discussion.

SUMMARY OF WORK:

WSC will define and prioritize risks and uncertainties that may affect SAWCo's water supply sources, including but not limited to climate change related rain and temperature changes, water quality degradation, wildfires, earthquakes, and regulatory changes. The team will evaluate how high impact, high probability risks will affect future water source availability for SAWCo. Of particular concern is the vulnerability of the San Antonio Tunnel to these risks, as this is SAWCo's major supply source with significant capacity. Considering supply risks, WSC will develop alternative supply scenarios where SAWCo can continue to provide a full yearly entitlement to its shareholders, including but not limited to: (1) Baseline, do nothing scenario, (2) fortify existing supply sources, (3) develop a conjunctive-use program in one or more groundwater basins, and (4) develop an alternative water supply source.

UNIQUE APPROACH:

Optional Task: Inspection and Condition-Based Recommendations for the San Antonio Tunnel.

SAWCo's San Antonio Tunnel is a critical supply source that provides a significant portion of SAWCo's water. The tunnel is over 100 years old, and it may require maintenance in the near term to continue providing reliable high quality water to SAWCo. We recommend working with a geotechnical engineer to perform an in-depth data review and inspection of the tunnel and develop a condition-based rehabilitation plan if the analysis shows the tunnel is the most vulnerable supply source. We can work with SAWCo to develop the scope for this task if it is justified from the alternatives analysis.

Optional Task: Analysis on Re-establishing a Met Connection.

District Staff have indicated that SAWCo may have had a connection to Metropolitan Water District (MWD) in the past. Since SAWCo does not have current records of the connection, WSC can research the past connection in regards to location and supply options if it was reestablished as a supply source. Currently, portions of SAWCo's irrigation system runs parallel to MWD's raw water Rialto Pipeline, where a connection can be made to supplement non-potable demands. Additionally, potable imported water from MWD may be available through the Agua de Lejos Water Treatment Plant owned by Water Facilities Authority or through an exchange with one of its member agencies.

Optional Task: America's Water Infrastructure Act

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED, HALEY LEHMAN: DURATION – 12 MONTHS

WORK PRODUCTS: Workshop agenda and minutes, Risk and Resilience Assessment, Emergency Response Plan

REQUIRED INPUT FROM SAWCO: Participation in workshops.

SUMMARY OF WORK:

On October 23, 2018, America's Water Infrastructure Act (AWIA) was signed into law. AWIA Section 2013 requires community (drinking) water systems serving more than 3,300 people to develop or update risk and resilience assessments (RRA) and emergency response plans (ERP). The law specifies the components that the RRAs and ERPs must address and establishes deadlines by which water systems must certify completion of the RRA and ERP to the U.S. Environmental Protection Agency (USEPA). Because SAWCo serves a population greater than 3,301, the RRA deadline is June 30, 2021, and the ERP deadline is six months after RRA submission, but no later than December 30, 2021.

Kirsten is one of four AWWA certified Utility Risk and Resilience engineers at WSC. The team's training and experience enables them to provide a streamlined process, including combining meetings to minimize staff time and costs, and simplifying the gap analysis portion of the project by providing information requests early. Kirsten is managing two AWIA projects and is dedicated to supporting clients through the process with minimal effort required by staff.

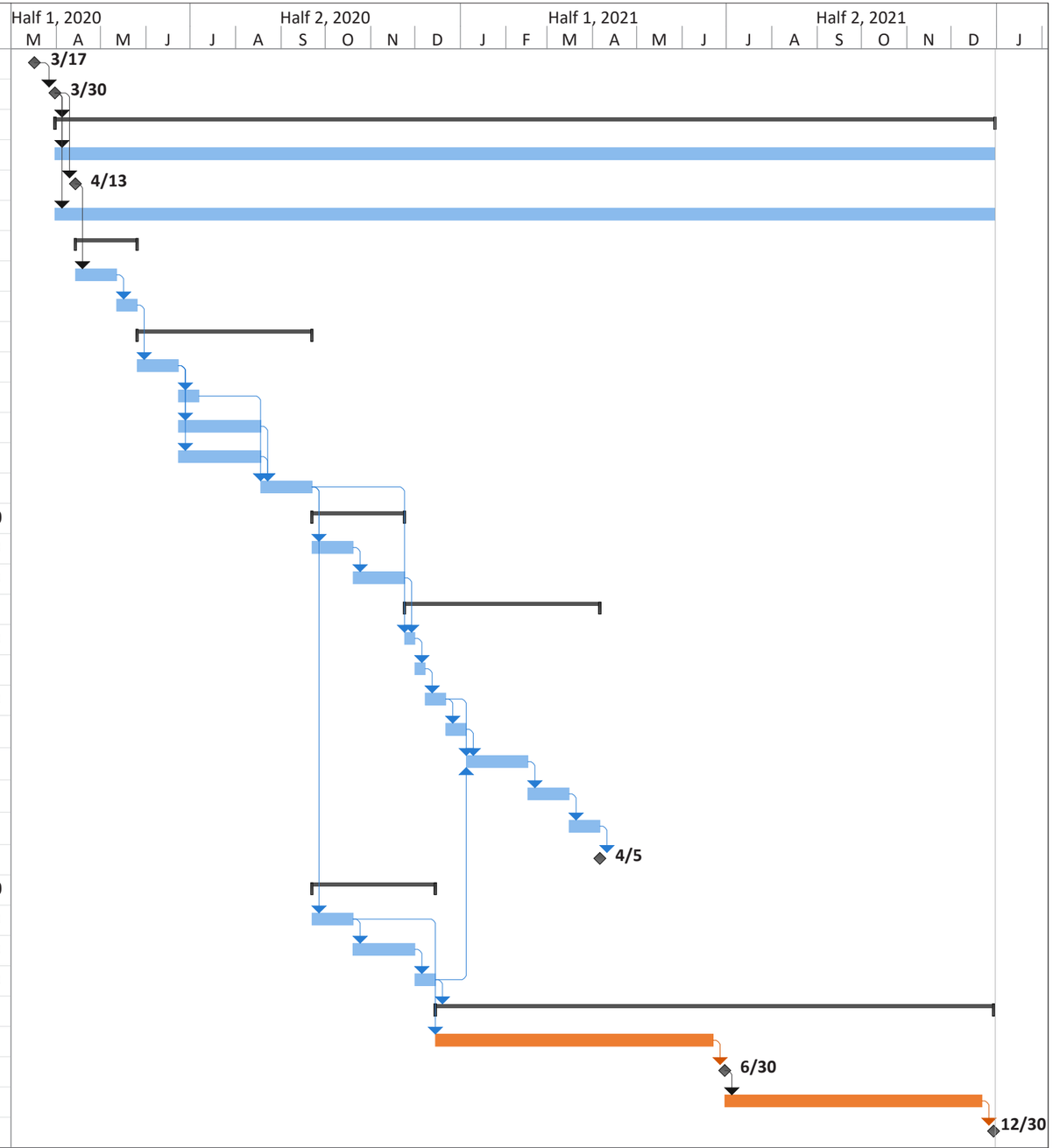
Typically, the AWIA process begins with an analysis of SAWCo's existing documentation for completeness, accuracy, and applicability to the current AWIA standards. WSC can significantly reduce the time required to perform this task by using the data collected in Task 2 above.

Additionally, Task 6 touches on many of the areas required by AWIA. This means that WSC can elaborate upon the work completed in that task to perform the RRA in accordance with AWIA requirements.

Upon completion of the RRA, WSC will prepare the ERP. Development of the ERP will be tailored to SAWCo's needs, but also aligned with local and state partners' existing plans. This effort will provide a valuable tool for ongoing emergency planning as well as meet the EPA's AWIA requirement.

SCHEDULE

ID	Task Name	Duration	Start	Finish
1	Board Approval	0 days	Tue 3/17/20	Tue 3/17/20
2	Notice to Proceed	0 days	Mon 3/30/20	Mon 3/30/20
3	**Task 1: Project Management**	**458 days**	**Tue 3/31/20**	**Thu 12/30/21**
4	Project Administration	458 days	Tue 3/31/20	Thu 12/30/21
5	Kickoff Meeting	0 days	Mon 4/13/20	Mon 4/13/20
6	QA/QC	458 days	Tue 3/31/20	Thu 12/30/21
7	**Task 2: Data Gathering and Water System Evaluation**	**30 days**	**Tue 4/14/20**	**Mon 5/25/20**
8	Data Request/Review and District Time to Provide Data	20 days	Tue 4/14/20	Mon 5/11/20
9	Establish Design and Evaluation Criteria	10 days	Tue 5/12/20	Mon 5/25/20
10	**Task 3: Capital Improvement Plan**	**85 days**	**Tue 5/26/20**	**Mon 9/21/20**
11	Evaluate Existing and Projected Water Demands	20 days	Tue 5/26/20	Mon 6/22/20
12	Water System Storage and Supply	10 days	Tue 6/23/20	Mon 7/6/20
13	Domestic System Model Update and Calibration	40 days	Tue 6/23/20	Mon 8/17/20
14	Irrigation System Model Update and Calibration	40 days	Tue 6/23/20	Mon 8/17/20
15	Evaluation System Capacity and Develop Capital Improvements	25 days	Tue 8/18/20	Mon 9/21/20
16	**Task 4: Capital Replacement Plan**	**45 days**	**Tue 9/22/20**	**Mon 11/23/20**
17	Develop Asset Database	20 days	Tue 9/22/20	Mon 10/19/20
18	Evaluate R&R Needs and Replacement Projects	25 days	Tue 10/20/20	Mon 11/23/20
19	**Task 5. Master Plan and Facility Asset Management Program**	**95 days**	**Tue 11/24/20**	**Mon 4/5/21**
20	Prioritize Recommended Projects	5 days	Tue 11/24/20	Mon 11/30/20
21	Develop Annual Spending Budgets	5 days	Tue 12/1/20	Mon 12/7/20
22	Prepare 10-Year Replacement List and 5-Year Capital Replacement Program	10 days	Tue 12/8/20	Mon 12/21/20
23	Prepare Rip and Run Sheets	10 days	Tue 12/22/20	Mon 1/4/21
24	Draft Master Plan	30 days	Tue 1/5/21	Mon 2/15/21
25	District Time to Review Draft Master Plan	20 days	Tue 2/16/21	Mon 3/15/21
26	Final Master Plan	15 days	Tue 3/16/21	Mon 4/5/21
27	Submit Final Master Plan	0 days	Mon 4/5/21	Mon 4/5/21
28	**Task 6: Source Water Loss Risk Review**	**60 days**	**Tue 9/22/20**	**Mon 12/14/20**
29	Evaluate and Prioritize Supply Source Risks	20 days	Tue 9/22/20	Mon 10/19/20
30	Evaluate Future Supply Alternatives	30 days	Tue 10/20/20	Mon 11/30/20
31	Provide Supply Risk Recommendations	10 days	Tue 12/1/20	Mon 12/14/20
32	**OPTIONAL TASK: AWIA RISK ASSESSMENT**	**272 days**	**Tue 12/15/20**	**Thu 12/30/21**
33	AWIA Risk Assessment- Update Risk and Resilience Assessment (RRA)	135 days	Tue 12/15/20	Mon 6/21/21
34	SAWCo RRA Due Date	0 days	Wed 6/30/21	Wed 6/30/21
35	AWIA Risk Assessment- Emergency Response Plan	125 days	Wed 6/30/21	Tue 12/21/21
36	SAWCO Emergency Response Plan Due Date (6 months after RRA is submitted)	0 days	Thu 12/30/21	Thu 12/30/21



Project: SAWCo WMP
Date: Tue 2/4/20

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	Manual Progress
Summary	Inactive Task	Duration-only	Finish-only	

PAST PROJECTS

WATER MASTER PLAN AND CONDITION ASSESSMENT

BIG BEAR CITY COMMUNITY SERVICES DISTRICT, BIG BEAR, CA

WSC developed the District's 2017 Water Master Plan Update. WSC conducted site visits and captured operator knowledge to document and address the maintenance and replacement needs of the water system. WSC prepared a detailed analysis of the District's infrastructure and conveyance system, considering age and expected useful life. By the completion of the master plan, a comprehensive CIP was developed that will be used to set annual budgets, establish rates and fees, prioritize improvements, and proactively prepare for the future needs of customers. This included showing how the projected funding needs could be translated into increase revenue requirements, connection fees, and rate adjustments.

WSC performed condition assessments on the District's wells, reservoirs, and booster pump stations; and developed a flexible evaluation toolset to provide a defensible Rehabilitation and Replacement Plan for the water system facilities. WSC recommended an approach for rehabilitation and replacement of aging infrastructure and provided capital project budget recommendations and detailed project cost opinions.

WSC completed the project under budget while maintaining consistent communication with the District throughout the project. WSC was flexible on scope to meet the District's needs, which included expanding their CIP from 10 years to 20 years to meet annual spending goals and recommending a portion of the scope which could be repeated on future projects to save the District money.

OWNER'S REFERENCE:

Mr. Jerry Griffith, PE
Water Department Superintendent
(909) 584-4008

PROJECT COSTS:

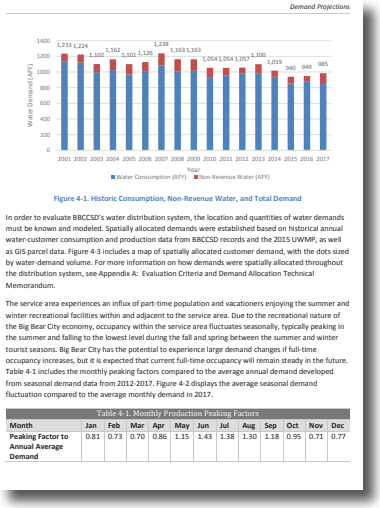
$183,584

PROJECT SIZE:

Big Bear City Community Services District (BBCCSD) owns and operates Big Bear City's potable water system that serves approximately 6,100 residential and commercial connections within the City through a network of 82 miles of water distribution and transmission mains, six booster stations, 11 vertical wells, two natural springs, two slant wells, and four storage reservoirs—all supplied by local groundwater.

PROJECT TEAM:

Kirsten Plonka (Project Manager), Jeroen Olthof (QA/QC), Heather Freed (Project Engineer), Spencer Waterman (Supply and Demand)



Demand Projections

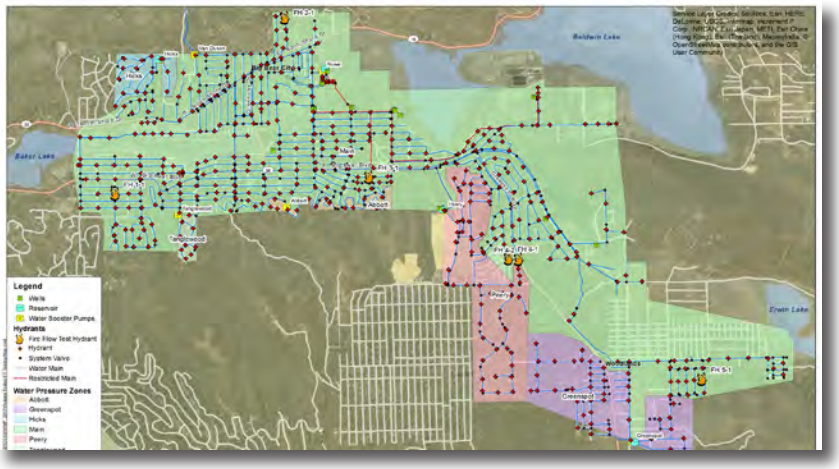
Figure 4-1. Historic Consumption, Non-Revenue Water, and Total Demand

In order to evaluate BBCCSD's water distribution system, the location and quantities of water demands must be known and modeled. Spatially allocated demands were established based on historical annual water-customer consumption and production data from BBCCSD records and the 2015 UWMP, as well as GIS parcel data. Figure 4-3 includes a map of spatially allocated customer demand, with the dots sized by water-demand volume. For more information on how demands were spatially allocated throughout the distribution system, see Appendix A: Evaluation Criteria and Demand Allocation Technical Memorandum.

The service area experiences an influx of part-time population and vacationers enjoying the summer and winter recreational facilities within and adjacent to the service area. Due to the recreational nature of the Big Bear City economy, occupancy within the service area fluctuates seasonally, typically peaking in the summer and falling to the lowest level during the fall and spring between the summer and winter tourist seasons. Big Bear City has the potential to experience large demand changes if full-time occupancy increases, but it is expected that current full-time occupancy will remain steady in the future. Table 4-1 includes the monthly peaking factors compared to the average annual demand developed from seasonal demand data from 2012-2017. Figure 4-2 displays the average seasonal demand fluctuation compared to the average monthly demand in 2017.

Table 4-1. Monthly Production Peaking Factors

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Peaking Factor to Annual Average Demand	0.81	0.73	0.70	0.86	1.15	1.43	1.38	1.30	1.18	0.95	0.71	0.77



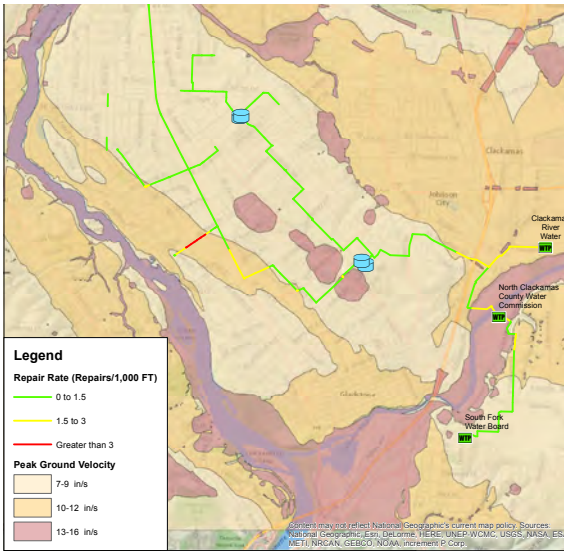
WATER MASTER PLAN AND RISK ASSESSMENT

OAK LODGE WATER SERVICES DISTRICT, OAK GROVE, OR

WSC is developing a Waster Master Plan Update to address the District's aging infrastructure needs and help managers plan for future investments to rehabilitate and replace infrastructure as it reaches the end of its useful life. WSC is revising the District's CIP with updated cost estimates to aid with prioritizing improvements. The CIP is designed to provide flexibility for growth while clearly defining improvements and the cost to provide the desired level of service. The update includes developing an accurate hydraulic model of the distribution system.

WSC is conducted a seismic risk assessment of the existing water system and preparing a seismic mitigation plan encompassing a 50-year planning horizon. WSC identified that the District was vulnerable to seismic outages, contamination, and potential curtailments within the Clackamas River, which serves as the District's sole supply source. WSC facilitated a collaborative approach with neighboring agencies to identify emergency interconnections that will provide access to Bull Run and groundwater supply alternatives.

WSC prepared conceptual designs for infrastructure facilities required for each alternative. Conceptual designs include approximate extents for pipeline upsizing or new pipeline installations, pumping head requirements, pressure control valves, and metering required. WSC developed planning level capital and annual operating costs for each alternative, and incorporated them into the CIP analysis. WSC provided recommendations for the District to pursue an emergency intertie and is preparing an Emergency Supply Chapter to be included in the Water Master Plan.



OWNER'S REFERENCE:

Mr. Jason Rice, PE,
District Engineer
(503) 353-4202

PROJECT COSTS:

$225,784

PROJECT SIZE:

The District provides water to approximately 28,000 residents and commercial customers in unincorporated western Clackamas County. The District service area covers more than 6.4 square miles. The water system facilities include existing supply sources, interconnections, pressure zones, storage reservoirs, pump stations, distribution piping, pressure reducing valve stations, and supervisory control and data acquisition.

PROJECT TEAM:

Kirsten Plonka (Project Engineer), Jeroen Olthof (Hydraulic Modeling Lead), Heather Freed (Modeling), Spencer Waterman (Supply and Demand)

WATER MASTER PLAN

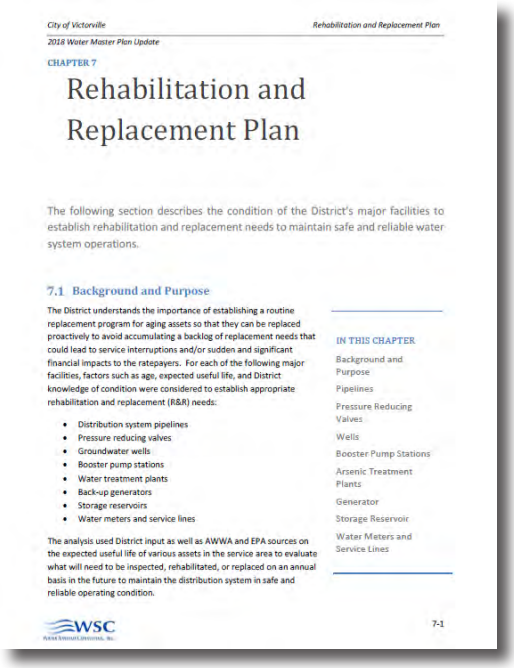
CITY OF VICTORVILLE, VICTORVILLE, CA

WSC prepared a Water Master Plan Update for the City that addressed both hydraulic capacity deficiencies and rehabilitation and replacement needs driven by aging infrastructure. The plan presented planning-level estimates of required capital spending each year based on system inventory and expected remaining useful life values.

The Master Plan resulted in a comprehensive 10-year CIP that clearly identifies funding requirements for infrastructure upgrades. The projects were identified based on hydraulic capacity and long-term replacement needs, and were phased so that the total annual spending matched the City's targets. WSC prepared a summary of expected spending needs for capacity-driven improvements and a condition-driven asset management strategy.

WSC's team used the updated hydraulic model, with a close linkage to the District's GIS database, to identify potential capacity constraints and evaluate potential improvement alternatives. WSC continues to provide water distribution system hydraulic model updates, calibration, and maintenance services to the City on an as-needed basis.

WSC has also been selected to perform an AWIA RRA and ERP. Subtasks include gap analysis, asset and threat characterization, consequence analysis, and a presentation to the Board of Directors. WSC has defined clear expectations and a realistic schedule to meet the mandated RRA and ERP deadlines.


City of Victorville — Rehabilitation and Replacement Plan
2018 Water Master Plan Update
CHAPTER 7
Rehabilitation and Replacement Plan
The following section describes the condition of the District's major facilities to establish rehabilitation and replacement needs to maintain safe and reliable water system operations.
7.1 Background and Purpose
The District understands the importance of establishing a routine replacement program for aging assets so that they can be replaced proactively to avoid accumulating a backlog of replacement needs that could lead to service interruptions and/or sudden and significant financial impacts to the ratepayers. For each of the following major facilities, factors such as age, expected useful life, and District knowledge of condition were considered to establish appropriate rehabilitation and replacement (R&R) needs:
- Distribution system pipelines
- Pressure reducing valves
- Groundwater wells
- Booster pump stations
- Water treatment plants
- Back-up generators
- Storage reservoirs
- Water meters and service lines
The analysis used District input as well as AWWA and EPA sources on the expected useful life of various assets in the service area to evaluate what will need to be inspected, rehabilitated, or replaced on an annual basis in the future to maintain the distribution system in safe and reliable operating condition.
IN THIS CHAPTER
Background and Purpose
Pipelines
Pressure Reducing Valves
Wells
Booster Pump Stations
Arsenic Treatment Plants
Generator
Storage Reservoir
Water Meters and Service Lines
WSC
7-1

OWNER'S REFERENCE:

Mr. Victor Fajardo, PE
Senior Civil Engineer
(760) 243-6311

PROJECT COSTS:

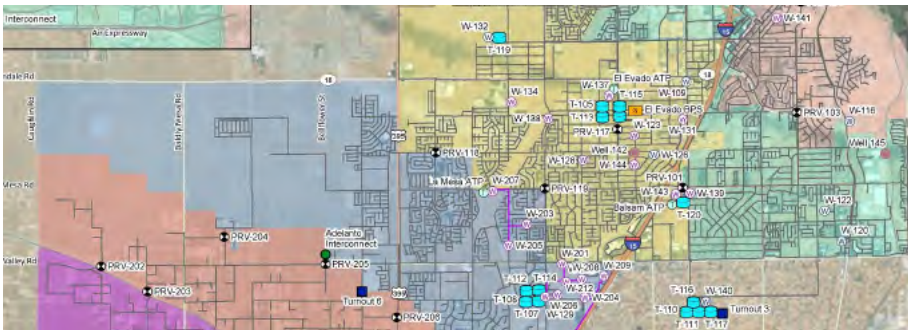
$396,055

PROJECT SIZE:

The District owns and operates a potable water system that includes approximately 700 miles of pipeline, 33 active groundwater wells, four pump stations, 24 active storage reservoirs and 25 active pressure reducing valve stations within an 85-square mile service area.

PROJECT TEAM:

Laine Carlson (Project Manager), Kirsten Plonka (Technical Support), Christopher Deiter (QA/QC), Jeroen Olthof (Hydraulic Modeling Lead), Spencer Waterman (Supply and Demand), Aaron Morland (Engineering support)



APPENDIX A: RESUMES

Kirsten L. Plonka, PE

Education
BS, Civil Engineering, California Polytechnic State University, San Luis Obispo

MS, Management, Colorado State University, Global Campus (in-process)

MS, Organizational Leadership, Colorado State University, Global Campus (in-process)

Professional Registrations
Professional Engineer – Civil, California, No. C70746

Professional Affiliations / Certifications
American Society of Engineers

American Public Works Association

Engineers Without Borders (former Southern California State Representative)

Potable Reuse Advisory Committee, San Diego County Water Authority

Advanced Water & Wastewater Modeling Certified by Innovyze & Bently

Publications

"Health Effects Study on Potable Water Reuse", A&WMA

Industry Recognition

2013 Outstanding Water Project of the Year from Region 9 ASCE, Award of merit for San Diego Section ASCE for Pala Mesa Tank

Professional Experience

Ms. Plonka has more than 17 years of experience serving as both a consultant and District Engineer. Her planning experience includes effective use of existing data, understanding of future demands and impacts on water systems, hydraulic modeling, asset management programs, risk assessments, and CIP development. She is familiar with the region, SAWCo staff, and stakeholders through her work on the GIS geodatabase and system mapping. Her extensive experience in the public sector allows her to approach projects from an owner's perspective and plan and design projects that are implementable and user-friendly.

Professional Project Experience

Water Master Plan and Condition Assessment, Big Bear City Community Services District, Big Bear City, CA. Project Manager. Conducted site visits and leveraged operator knowledge to document and address the maintenance and replacement needs of the current water system. Prepared detailed analysis of the District's infrastructure and conveyance system, as well as considered age and useful life. By the completion of the master plan, a comprehensive CIP will be developed that will be used to set annual budgets, establish rates and fees, prioritize improvements, and proactively prepare for future needs.

Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. Project Engineer. Preparing a Master Plan Update which will consider future water service commitments and build-out, including both area-specific water quality needs and system operations and maintenance priorities. WSC is conducted a seismic risk assessment on the existing water system and preparing a seismic mitigation plan encompassing a 50-year planning horizon. The update includes development of an asset database to capture and track condition data for individual assets within the water system. The final update will include a capital improvement program.

Water Master Plan and Condition-Based Assessment, Casitas Municipal Water District, Ojai, CA. Project Manager. Conducted a condition-based assessment and developed a Water Master Plan for the new owner of the Ojai water system. Tasks included developing opinions of probable cost for recommended projects, and evaluating production and consumption data to develop projections and recommend improvements necessary to maintain a safe and reliable level of service. Developed, calibrated, and utilized hydraulic model of the system in conjunction with GIS datasets to improve system operations and CIP development. Evaluated the capacity of the existing water system and identified improvements to meet demands, including fire flow, of the current and future population.

Waster Master Plan Update, City of Pismo Beach, Pismo Beach, CA. Technical Advisor. Provided technical reviews for Master Plan Update that included the development of a CIP to support budget planning, adaptive management, and build scenarios for future growth and development. The update included creating a new hydraulic model consistent with the City's GIS mapping to improve confidence in system changes and fire flows. The plan included a prioritized project list and detailed cost estimates to replace infrastructure.

City of Victorville, 2018 Water Master Plan, Victorville, CA. Technical Advisor. Prepared a master plan to address both hydraulic capacity deficiencies and rehabilitation and replacement needs driven by aging infrastructure. The project included hydraulic modeling using InfoWater to evaluate capacity limitations, planning-level estimates of required capital spending each year based on system inventory and expected remaining useful life values, and a comprehensive 10-year Capital Improvement Plan.

Laine E. Carlson, PE

Education
BS, Civil Engineering, California State Polytechnic University, Pomona, CA

Professional Registrations
Professional Engineer - Civil, California, No. C72424

Certifications
SWRCB Registered T2 Water Operator #34907

SWRCB Registered D2 Water Operator #41981

Professional Affiliations
American Water Works Association, Member

California Water Environment Association, Member

Professional Experience

Mrs. Carlson has over 15 years of experience working for a public utility and as a consulting engineer, focusing on water, wastewater, and recycled water systems. Her experience includes project management, construction administration, capital improvement planning, hydraulic analysis, water and wastewater master planning, pipeline design, pump station design and analysis, and water standard development. She has developed an intimate understanding of how a water and sewer utility operates and the challenges they face. Her experience has enabled her to identify and analyze initial project concepts, prepare construction documents, and monitor construction of the project through completion.

Representative Projects

City of Victorville, 2018 Water Master Plan, Victorville, CA. Project Manager. Prepared a master plan to address both hydraulic capacity deficiencies and rehabilitation and replacement needs driven by aging infrastructure. The project included hydraulic modeling using InfoWater to evaluate capacity limitations, planning-level estimates of required capital spending each year based on system inventory and expected remaining useful life values, and a comprehensive 10-year Capital Improvement Plan.

City of Pismo Beach, 2015 Water Master Plan & UWMP Update, Pismo Beach, CA. Deputy Project Manager. Performed an update of the City of Pismo Beach 2004 Water Master Plan. Created and calibrated an all-pipes, spatially allocated demand hydraulic model of the City's water distribution system using Bentley's WaterGEMS software. Used the hydraulic model to evaluate capacity limitations for current and future buildout scenarios and opportunities to optimize operations. Developed condition based-replacement plans for aging infrastructure and an updated CIP project list to prepare the City for budget planning.

San Bernardino Valley Municipal Water District, 2015 Regional Urban Water Management Plan, San Bernardino, CA. Project Manager. The 2015 Regional UWMP was developed with the participation of 10 local agencies. For the 2015 Regional UWMP, WSC collaborated and collected data from all agencies to update water supply and demand projections through 2035 based on changes since the 2010 UWMP, and compliance with SB7. Additionally, new requirements were addressed, such as distribution system losses reporting as part of demand and digital submittal through DWR's new templates and submittal database.

City of Victorville, On-Call Water Modeling, Victorville, CA. Project Manager. Providing staff support services for hydraulic water modeling and development planning. Converted the City's existing hydraulic model to GIS based InfoWater and updated the model to include projects completed since it was developed in 2009. Performing general model review and calibrating a previously un-calibrated portion of the model. Providing on-call modeling analysis of the existing system to help the City make informed decisions regarding potential changes to the system. Preparing Feasibility Studies and Water Supply Assessments as needed to support the City's review and conditioning of proposed development projects.

Chino Basin Program, Inland Empire Utilities Agency, Chino, CA. Pipeline Distribution System Lead. Leading the conveyance system portion of the preliminary design report for the Chino Basin Program which will create a new, drought-resistant supply to the region. Through effective partnerships with State Water Project Contractors, the California Department of Water Resources and the California Department of Fish and Wildlife, the project will develop new water supplies that will be stored in the Chino Basin Water Bank for ecological benefit in the Bay-Delta watershed.

Jeroen Olthof, MS, MBA, PE

Education
MBA, USC

MS, Civil Engineering, University of Washington

BS, Civil Engineering, University of Colorado Boulder

Professional Registrations
Professional Engineer - Civil, California, No. C58597

Professional Engineer – Civil, Oregon, No. C94671

Articles
San Diego's Recipe for Overflow Reduction, Public Works, June, 2004.

Capacity Assurance Sets Stage for CMOM Success, Waterscapes, Vol. 13, No. 2, May, 2002

Presentations
Management of Sewers in Environmentally Sensitive Areas, ASCE Pipelines Conference, San Diego, CA 2004

Lessons Learned in San Diego's Collection System Assessment Program, Water Environment Federation (WEF) Collection Systems Conference, Austin, TX, June, 2003

Automated Decision Tools for Sewer Collection System Assessment, California Water Environment Association Conference (CWEA), Ontario, CA, 2003

Improved Collection System Management Using GIS, Water Environment Federation Technology and Exposition Conference (WEFTEC), Chicago, IL, October, 2002

An Incremental Approach to GIS and Floodplain Mapping, Floodplain Management Association Conference, Sacramento, CA, September, 2000

A Hydrogen Sulfide Screening Tool Within GIS, WEFTEC

Professional Experience

Mr. Olthof has more than 25 years of engineering experience. He is a nationally recognized expert in the application, adaptation, and use of databases, GIS, and modeling technology to solve problems related to water systems. His experience includes master planning, condition assessment, water supply and demand analysis, system optimization, and hydraulic modeling and analysis. He has completed more than 30 Master Plans and over 125 hydraulic modeling projects in California, including hydraulic modeling lead for the Ojai Water System Master Plan and the Casitas System Hydraulic Model. He has also developed condition assessment programs and decision algorithms to support capital improvement planning and maintenance optimization.

Representative Projects

Ojai Water System Master Plan and Condition-Based Assessment, Casitas Municipal Water District, Ojai, CA. Hydraulic Modeling Lead. Led the modeling portion of a condition-based assessment and Master Plan for the new owner of the Ojai water system. Tasks included developing, calibrating, and utilizing hydraulic model of the system in conjunction with GIS datasets to improve system operations and CIP development. Evaluating the capacity of the existing water system and identifying improvements to meet demands, including fire flow, of the current and future population.

2018 Water Master Plan, City of Victorville, Victorville, CA. Hydraulic Analysis Lead. Preparing a master plan that will address both hydraulic capacity deficiencies and rehabilitation and replacement needs driven by aging infrastructure. The project includes hydraulic modeling using InfoWater to evaluate capacity limitations, planning-level estimates of required capital spending each year based on system inventory and expected remaining useful life values, and a comprehensive 10-year Capital Improvement Plan.

Waster Master Plan and Condition Assessment, Big Bear City Community Services District Big Bear, CA. QA/QC. Provided oversight for the 2017 Water Master Plan Update and comprehensive CIP. Performed condition assessments on wells, reservoirs, and booster pump stations; and developed a flexible evaluation toolset that will provide a defensible Rehabilitation and Replacement Plan for their water system facilities. Recommended an approach for rehabilitation and replacement of aging infrastructure and provided capital project budget recommendations and detailed project cost opinions. The project was completed under budget while maintaining consistent communication with the District throughout the project. Expanded the CIP from 10 years to 20 years to meet annual spending goals and recommending a portion of the scope which could be repeated to save costs.

Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. Hydraulic Modeling Lead. Preparing a Master Plan Update considers future water service commitments and build-out, including area-specific water quality needs and system operations and maintenance priorities. The project includes constructing a new model from the GIS database, hydrant testing, and calibration of the completed model prior to using it to identify and evaluate system improvements. Supply, demand, and storage data will be analyzed, projections developed, and recommendations made to address system deficiencies. The update includes development of an asset database to capture and track condition data for individual assets within the water system. The final update will include a CIP.

Heather Freed, PE, MS

Education
MS, Civil and Environmental Engineering, Cal Poly, San Luis Obispo

BS, Environmental Engineering, Cal Poly, San Luis Obispo

Professional Registrations
PE – Civil, CA, No. 89406

Professional Experience

Ms. Freed is a Professional Engineer specializing in water master planning and capital improvement development. She has experience evaluating various hydraulic measures including headloss through pipes, hydraulic jumps, and groundwater pumping. Her knowledge also includes groundwater contamination, water chemistry and water quality measurements, physio-chemical and biological water and wastewater treatment, and climate change and energy intensity analysis.

Representative Projects

Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. Staff Engineer. Preparing a Master Plan Update which will consider future water service commitments and build-out, including both area-specific water quality needs and system operations and maintenance priorities. The project includes constructing a new model from the District's GIS database, hydrant testing, and calibration of the completed model prior to using the model to identify and evaluate system improvements. Supply, demand, and storage data will be analyzed, projections developed, and recommendations made to address system deficiencies. The update includes development of an asset database to capture and track condition data for individual assets within the water system. The final update includes a CIP.

Big Bear City Community Services District, 2017 Water Master Plan and Condition Assessment, Big Bear City, CA. Staff Engineer. Prepared a detailed analysis of the District's infrastructure that will result in a Master Plan which includes a comprehensive Capital Improvement Program. Performed infrastructure condition assessments, developing a defensible Rehabilitation and Replacement Plan and identifying high-priority projects.

Casitas Municipal Water District, Ojai System Condition Based Assessment and Water Master Plan, Ojai, CA. Staff Engineer. Conducted a condition-based assessment and developed a Water Master Plan for the new owner of the Ojai water system. Tasks included developing opinions of probable cost for recommended projects, and evaluating production and consumption data to develop projections and recommend improvements necessary to maintain a safe and reliable level of service. Developed, calibrated, and used hydraulic model of the system in conjunction with GIS datasets to improve system operations and CIP development. Evaluated the capacity of the existing water system and identified improvements to meet demands, including fire flow, of the current and future population.

City of Pismo Beach, Water Master Plan Update, Pismo Beach, CA. Staff Engineer. Performed an update of the City of Pismo Beach 2004 Water Master Plan. Created and calibrated an all-pipes, spatially allocated demand hydraulic model of the City's water distribution system using Bentley's WaterGEMS software. Used the hydraulic model to evaluate capacity limitations for current and future buildout scenarios and opportunities to optimize operations. Developed condition based-replacement plans for aging infrastructure and an updated CIP project list to prepare the City for budget planning.

California American Water, Monterey District, 2018 Comprehensive Planning Study and Condition Based Assessment, Monterey County, CA. Engineering Support. Updated the California American Water Monterey County water distribution system Comprehensive Planning Study. Built and calibrated a hydraulic model with over 600 miles of pipelines and 50 pressure zones to evaluate system capacity and operations. Evaluated system condition based on asset data and site inspection reports. Developed a comprehensive CIP list for future rate studies.

Antonia Estevez-Olea, PE, MS

Education
MS, Environmental Management, University of San Francisco, San Francisco

BS, Environmental Engineering, California Polytechnic State University, San Luis Obispo

Professional Registrations
Engineer in Training, No 150536

PACP, MACP, & LACP, No. U-0818-0703001316

Professional Affiliations
American Society of Civil Engineers (ASCE) Pipeline

WateReuse

Water Environment Research Federation (WERF)

Publications

Estevez-Olea, A. (2015). Life Cycle Assessment of Reclaimed Water for Potable and Nonpotable Reuse in California. (Master's Project). University of San Francisco, San Francisco.

Professional Experience

Ms. Estevez-Olea is a professional engineer with over three years of experience in stormwater, wastewater, and recycled water, as well as water resource management. Her experience in water and wastewater asset management includes the development of a pipeline prioritization model to identify and prioritize water mains in need of rehabilitation for the California American Water Monterey County District. She has also supported two sewer rehabilitation projects for the City of Santa Barbara. She is PACP, MACP, and LACP certified, and is the upcoming treasurer of the ASCE Pipeline San Diego Chapter.

Representative Projects

California American Water Monterey County District, Comprehensive Planning Study (CPS) and Condition Based Assessment (CBA). Monterey, CA. Project Engineer. Assisted CAW with the development of the CPS and CBA reports by managing/compiling assets inventories and assessing site conditions and analyzing large datasets to evaluate customer and water demands and water supplies reliability. Developed the 2018 buried assets Pipeline Prioritization Model to identify and prioritize water mains in need of replacement.

Replenish Big Bear. Big Bear, CA. Deputy Project Manager. Managing the Replenish Big Bear program by conducting program administration, coordinating with the project team to complete preliminary engineering for treatment upgrades and distributions lines. Leading the regulatory effort to obtain the necessary permits to implement project. Tracks program status, budget, and schedule.

Big Bear City Community Service District (BBCCSD), Sugarpine Lateral Replacement. Big Bear, CA. Project Engineer. Coordinated the regulatory efforts to complete an emergency lateral replacement project in a streambed. Reviewed proposed rehabilitation strategies.

City of Santa Barbara, Sewer Main Rehabilitation Projects. Santa Barbara, CA. Project Engineer. Assisted the City by conducting site visits, reviewing CCTV videos and maintenance history, and managing defect data to recommend rehabilitation strategies for their fiscal year 2018 and 2019 sewer main rehabilitation projects. Conducted vendor outreach to evaluate rehabilitation technologies to address site-specific issues. Provided support in the development of design plans and specifications.

City of Oceanside, Local Limits and Total Dissolved Solids (TDS) Study. Oceanside, CA. Project Engineer. Supported the City with the development of a Technically-Based Local Limits (TBLL) report for their two wastewater treatment plants. Prepared a TDS Management Study to assist the City in evaluating potential impacts of future modifications to its water, wastewater and recycled water systems. Assed the feasibility of using an abandoned pipeline to rehabilitate for brine disposal.

Monterey Regional Water Pollution Control Agency (MRWPCA), Local Limits Evaluation and Monitoring Plan. Monterey, CA. Project Engineer. Supported the Project Manager with data management for the 2016 Local Limits Evaluation by compiling and formatting local limits data (i.e., regulated and non-regulated dischargers, influent, treatment processes, effluent, and biosolids data). Reviewed the final local limits evaluation report and used the results to develop a monitoring plan for the new sources of influents that will enter the Regional Treatment Plant.

Spencer J. Waterman

Education
BS, City & Regional Planning, California Polytechnic State University, San Luis Obispo

Certifications
American Water Works Association, California-Nevada Section, Water Use Efficiency Practitioner Grade 1, Certificate # 1714

Professional Affiliations
American Water Works Association, Member

Professional Experience

Mr. Waterman is an experienced planner who has completed more than 50 technical planning studies, including the supply and demand evaluation for Ojai Water System Master Plan. He has served in an integral role on over 15 master plans and is the lead author or technical advisor for more than 30 Urban Water Management Plans. He has experience utilizing GIS to spatially allocate water demands and develop maps, evaluating water supply scenarios, and providing water use efficiency and conservation services.

Representative Projects

San Antonio Water Company, System Mapping and GIS Database, Ontario, CA. Project Manager. WSC will deliver a cost-effective GIS database that is developed in a pragmatic way to consolidate multiple data sources into a comprehensive repository that can be leveraged for multiple every-day and long-term uses. The system map will be accessible to SAWCo staff to quickly look up system information, link to relevant data from other systems, and position the system map for updates that can be incorporated into a hydraulic water model for long-term master planning.

City of Victorville, 2018 Water Master Plan, Victorville, CA. Staff Planner. Preparing a master plan that will address both hydraulic capacity deficiencies and rehabilitation and replacement needs driven by aging infrastructure. The project includes hydraulic modeling using InfoWater to evaluate capacity limitations, planning-level estimates of required capital spending each year based on system inventory and expected remaining useful life values, and a comprehensive 10-year Capital Improvement Plan.

Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. Supply and Demand. Preparing a Master Plan Update which will consider future water service commitments and build-out, including both area-specific water quality needs and system operations and maintenance priorities. The project includes constructing a new model from the District's GIS database, hydrant testing, and calibration of the completed model prior to using the model to identify and evaluate system improvements. Supply, demand, and storage data will be analyzed, projections developed, and recommendations made to address system deficiencies. The update includes development of an asset database to capture and track condition data for individual assets within the water system.

Big Bear City Community Services District, 2017 Water Master Plan and Condition Assessment, Big Bear City, CA. Supply and Demand. Prepared a detailed analysis of the District's infrastructure that will result in a Master Plan which includes a comprehensive Capital Improvement Program. Performed infrastructure condition assessments, developing a defensible Rehabilitation and Replacement Plan and identifying high-priority projects.

Water Master Plan Update, City of Pismo Beach, Pismo Beach, CA. Supply and Demand. Developed demand factors using spatial allocation and evaluation criteria in support of the master plan. The update included a CIP to support budget planning, adaptive management, and build scenarios for future growth and development. The update also included creating a new hydraulic model consistent with the City's GIS mapping to improve confidence in system changes and expected fire flows.

Christopher Deiter, PE

Education
BS, Civil Engineering, California State Polytechnic University, Pomona, CA

Professional Registrations
Professional Engineer - Civil, California, No. 80618

Professional Affiliations
American Society of Civil Engineers, Member

Inland Counties Water Association, Member

American Water Works Association, Member

WateReuse, Member

Professional Experience

Mr. Deiter has 10 years of experience in civil engineering specializing in water, recycled water, and wastewater systems and has 5 years of construction experience for various municipal water projects throughout the Southern California area. His engineering experience includes pipeline design, water storage reservoir design, water treatment system design, pump station analysis and design, hydraulic analysis, and water master planning. Mr. Deiter's experience allows him to proficiently identify and analyze initial project concepts, analyze solutions, prepare construction documents, and provide construction support activities to clients.

Representative Projects

City of Victorville, 2018 Water Master Plan, Victorville, CA. QA/QC. Prepared a master plan to address both hydraulic capacity deficiencies and rehabilitation and replacement needs driven by aging infrastructure. The project included hydraulic modeling using InfoWater to evaluate capacity limitations, planning-level estimates of required capital spending each year based on system inventory and expected remaining useful life values, and a comprehensive 10-year Capital Improvement Plan. The projects were identified based on hydraulic capacity and long-term replacement needs, and were phased so that the total annual spending matched the City's targets.

Coachella Water Authority, Water Master Plan, City of Coachella, CA. Mr. Deiter was in charge of the project preparing all master planning calculations, growth projections, water system analysis, H20Net water modeling, and CIP preparation. The water modeling included development of existing water system model from scratch to identify possible system deficiencies along with projected growth of the City's water system which aids in future CIP planning.

Big Bear Lake Department of Water and Power, Sawmill Well Pumping Plant, Big Bear, CA. Project includes well equipment and all related appurtenances for a 350 gpm well, including construction of a CMU building with a metal roof, all related site improvements, and installation of a 635 LF 6-inch water pipeline and electrical service connection. Mr. Deiter is in responsible charge of all construction management services including contract management, progress payments, scheduling, submittal review and approval, and coordination with BBLDWP Inspectors.

Eastern Municipal Water District, Watson Road/Juniper Flats Road Waterline, Menifee, CA. Project consisted of approximately 6,500 linear feet of 24" and 4,500 linear feet of 18" CML&C steel waterline. Mr. Deiter was responsible for utility research, alignment design, connection detail design, piping thickness calculations and drawing production utilizing three-dimensional design capabilities and AutoCAD Civil 3D.

Coachella Water Authority, Supplemental Water Supply Program and Fee Study, City of Coachella, CA. Mr. Deiter was in responsible for the study. The Study investigated population projections and historical annual consumption factors, reviewed CWA's water resources and CVWD agreements, calculated future annual consumption factors, and established the Supplemental Water Supply Charged based on land used for the City.

Aaron Morland, EIT

Education
BS, Environmental Engineering, California Polytechnic University, San Luis Obispo, CA (In Progress, expected June 2019)

Professional Registrations
Engineer-in-Training - Environmental, California, No. 166372

Professional Experience

Aaron Morland is an Engineer-in-Training with environmental engineering experience focused on water systems, wastewater treatment systems, sewer hydraulic analysis and mater planning, distribution and collection system design, and funding support. Aaron has provided cost estimation services on several projects and has worked with team members on projects within the Santa Ana Watershed.

Representative Projects

Cayucos Sanitary District, 2017 Sewer System Management Plan Audit, Cayucos, CA. Staff Engineer. Audited the Cayucos Sanitary District Sewer System Management Plan (SSMP) for compliance with State and Regional Water Board Waste Discharge Requirements. Identified additional areas of the SSMP to update due to construction of a new Water Reclamation Facility. Drafted a Technical Memorandum to summarize the audit and provide guidelines for the District to update their SSMP.

Big Bear Area Regional Wastewater Agency, Sewer System Management Plan Audit Workshop, Big Bear City, CA. Staff Engineer. Auditing the Big Bear Area Regional Wastewater Agency Sewer System Management Plan for compliance with State and Regional Water Board Waste Discharge Requirements. Preparing and presenting an interactive SSMP audit workshop to the Agency to identify deficiencies in the existing SSMP and effficiently gather operations information for the update. Leveraging our time with the Agency's through the workshop to determine the most cost and time-efficient process to update the SSMP as a team.

City of Paso Robles, Airport Area Infrastructure Improvements, Paso Robles, CA. Assistant Engineer. Assisted in the design of 7,500 feet of 12-inch and 16-inch water distribution piping, 5,100 feet of 16-inch recycled water distribution piping, 3,400 feet of 6-inch sewer force main, and 8,200 feet of 8-inch to 12-inch sewer main to support future growth around the Paso Robles Airport. Designed segments of gravity sewer, developed cost opinions for sewer and water main replacements, discovered and minimized utilities conflicts, and located existing sewer laterals and water services for plan sets.

City of Paso Robles, Main West Tank Design, Paso Robles, CA. Assistant Engineer. Assisted in the preliminary design of a 4 million-gallon (MG) partially buried pre-stressed concrete tank to replace the existing 4 MG reservoir that had reached the end of its useful life. Assisted in drafting the preliminary design report sections on the tank fill and outlet piping network, connections with the existing well field and distribution system, site security, and drainage.

Big Bear Area Regional Wastewater Agency, Replenish Big Bear Lake Alternative Analysis, Big Bear City, CA. Assistant Engineer. Evaluated brine management solutions for waste brine from the reverse osmosis (RO) units at the proposed Replenish Big Bear recycled water facility. Calculated evaporation pond effectiveness, land requirements, conveyance feasibility, and cost opinions for ponds in the Big Bear Area and Lucerne Valley. Analyzed feasibility of using evaporation and crystallization on RO brine to achieve zero liquid discharge and reduce brine conveyance and disposal costs.

Haley Lehman, CCST, AWIA

Education
BS, Mechanical Engineering, University of California, Merced

Graduate Certificate, Project Management, Pennsylvania State – In Progress

Certifications
Level 1 ISA Certified Control System Technician

America's Water Infrastructure Act: EL265 - Utility Risk and Resilience Certificate Program

Affiliations
Project Management Institute, Member

International Society of Automation, Member

Institute of Electrical and Electronics Engineers, Member

Women in Technology International, Member

California Water Environment Association, Member

Professional Experience

Ms. Lehman is a Level 1 Certified Control System Technician with five years of experience developing and maintaining complex digital solutions for water and wastewater treatment, storage, and delivery systems. She is the lead researcher in WSC for America's Water Infrastructure Act (AWIA) Section 2013 and has completed the AWIA EL265 – Utility Risk and Resilience Certificate Program. The certification provides a foundation for supporting water utilities' development of an all-hazards approach to risk and resilience management. The Program included courses on Facilitating Compliance with America's Water Infrastructure Act of 2018, Security Practices for Operations and Management, Risk and Resilience of Water and Wastewater Systems, Emergency Planning, and Cybersecurity in the Water Sector.

Representative Projects

Risk and Resilience Assessment and Emergency Response Plan, Mesa Water District. Project Engineer. WSC has been selected to perform an AWIA RRA and ERP for Mesa Water District. Mesa Water serves a population greater than 100,000. Subtasks include gap analysis, asset and threat characterization, consequence analysis, and a presentation to the Board of Directors. WSC has defined clear expectations and a realistic schedule to meet the RRA and ERP deadlines.

City of San Luis Obispo, SCADA System Evaluation, San Luis Obispo, CA. Control System Expert and Project Manager. Evaluated several SCADA System Platforms across several criteria established by the City of San Luis Obispo. Held vendor interviews and participated in product demonstrations.

City of San Luis Obispo, Water Distribution SCADA Upgrade, San Luis Obispo, CA. Control System Technician. Constructed a reliable, robust, and efficient SCADA system capable of future expansion of the Whale Rock Reservoir delivery system and the City's Water Distribution System. Upgrade work included replacing or repairing pump stations, tanks, pressure reducing valves, control valves, and flow, pressure, and power meters.

Big Bear Area Regional Wastewater Agency, SCADA Upgrade, Big Bear, CA. Control System Expert and Project Manager. Developed project specifications and supporting documentation for the Big Bear Area Regional Wastewater Agency (BBARWA) Facility SCADA System Upgrade. Upgrade included PLC Components, SCADA System HMI Upgrades, integration of new Belt Press Filter equipment, and other integration.

City of San Luis Obispo, Water Resource Recovery Facility Upgrade, San Luis Obispo, CA. Control System Technician. Assisted in delivering a water resource recovery facility that provides economic, social and environmental value to the community. Increased capacity to meet flows and loads under dry and wet weather conditions. Replaced aging infrastructure, modified process facilities, and met new discharge permit requirements.

City of San Luis Obispo, Wastewater Collections Lift Station SCADA Upgrade, San Luis Obispo, CA. Control System Technician. Provided programmable logic controller, power, and cabling upgrades to four of the City's wastewater collection sites: the Airport Lift Station; Silver City Lift Station; Prefumo Lift Station, and Poly Flowmeter. PLC upgrade involved making communication system with compatible with other Allen Bradley SCADA systems.

WSC
WATER SYSTEMS CONSULTING, INC.

CONTACT

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Fax: (909) 354-3482

ExpectWSC.com

San Antonio Water Company
Comprehensive System Master Plan and Asset Management Program 2020
Statement of Proposal Ranking Sheet

Proposing Company: **Water System Consulting**

Reviewer: _____ Date: _____

Criteria	Score
Understanding and approach to the work to be done	_____ / 30 points
Experience of firm with similar kinds of work	_____ / 20 points
Experience of staff for work to be done	_____ / 30 points
Overall clarity and presentation of Proposal	_____ / 10 points
Firm's Local Experience	_____ / 5 points
Total Points	_____ / 95 points

Please write notes or comments in each proposal! Noting weaknesses and strengths help consultants understand how proposals were scored and improve for next time.

Each reviewer's criteria points will be averaged into a final criteria score. Then all averaged criteria scores will be added together for each proposal to come up with a proposal score.

Proposed Fee counts for 5 points and will be added after all qualification-based reviews have been averaged. Given that there are only two proposals, the lowest fee will score 4 points and the highest fee will score 2 points. The fee points are intended to break a tie, understanding that if the two highest ranked firms are within a couple points of each other, the lowest fee would prevail as the best value.

San Antonio Water Company
Incorporated October 25, 1882
Serving the original Ontario Colony lands

A REQUEST FOR PROPOSALS

TO PROVIDE CONSULTING SERVICES TO THE SAN ANTONIO WATER COMPANY

PROJECT TITLE:

PROFESSIONAL DESIGN AND PROJECT MANAGEMENT SERVICES FOR MULTIPLE CAPITAL FACILITY PROJECTS

RESPONSE DUE BEFORE 3:00 PM

ON March 20, 2020

Introduction

The San Antonio Water Company is soliciting proposals from qualified firms to assist in the design and construction of multiple capital facility projects for the 2020 calendar year.

The Company has seven pipeline replacement projects with a combined budget of $1.38M scheduled for the 2020 calendar year:

Project	Priority
• Reservoir 9 Pipeline Replacement ($488k budget)	1
• Frankish Tunnel Pipeline Repair and Meter Install ($50k budget)	2
• Cliff near Euclid Crescent and Cliff ($280k budget)	3
• Viewpoint, Canyon View to Campus ($276k budget)	4
• Linda, North of 24th ($134k budget)	5
• Primrose, North of 25th ($105k budget)	6
• Glendale Road between Mountain and Park ($42K Budget)	7

Each project is more-fully described on its attached budgetary project sheet. The Company anticipates bidding each project separately at the time that project's design is completed. At Consultant's recommendation, the Company will consider combining select projects for bidding to achieve expediency or value. A key consideration of award will be the consultant's ability to multitask design commitment and complete the projects in a timely fashion. Company will require a commitment from consultant to work expediently toward having all projects under individual construction contracts by December 31, 2020.

The Company proposes to retain a single consultant to design replacement pipelines for the above projects project, as well as construction management services, including bidding support and construction inspection. Lacking sufficient staff bandwidth, the Company is expecting 'cradle to grave' consulting services for the above project. Consultant's Proposal shall include all seven projects. Individual project proposals will not be considered.

All distribution and transmission mains shall be designed in accordance with CA-DDW Waterworks Standards. All material, appurtenances, installation and testing procedures shall comply with ASTM and/or AWWA standards, as well as the Company's water system construction standards.

General Company Information

In 1882 Canadians George and William Chaffey purchased 8,000-acres of the Cucamonga Rancho, including the water rights, and established an irrigation colony which they named Ontario, in honor of their homeland. On October 25, 1882 they also established the San Antonio Water Company under the General Corporation Laws of the United States. Rancheria water rights established way back in the 1700's transferred to the Company in support of the newly

established irrigation colony. The brother's vision was to develop a Mutual Water Company whose members shared equally in the locally available water supply.

The brothers sold irrigation colony land in 10-acre blocks, primarily intended for the booming citrus industry. Along with the land, the brothers sold shares in the Company, one share for each purchased acre. Each shareholder was entitled to a portion of available local water, distributed equally by the company amongst all the shareholders. The Company was responsible for distributing water on a non-profit basis to the shareholders.

Since 1882 the San Antonio Water Company has consistently provided water service to its shareholders. Although the local citrus industry has largely disappeared, the Company maintains delivery to current shareholders utilizing the same successful 'per share' distribution plan established over 135 years ago.

The Company does not import any water. Instead we are dependent on our local San Antonio Canyon and Cucamonga Canyon watersheds and downstream groundwater basins.

Currently, our shareholders include most residents of the unincorporated area of San Antonio Heights, the Cities of Upland and Ontario, the Monte Vista Water District, local quarries and the proud heritage of remaining grove irrigators.

The Company provides water through two separate systems; domestic and irrigation.

The domestic system receives the majority of its water through the San Antonio tunnel. The tunnel is built into the head of the San Antonio Canyon about 90 feet below the ground surface. The tunnel consists of 5,400 feet of 36" concrete pipe and 600 feet of a six-foot square shaft built into the bedrock below the alluvium. Portions of the shaft are supported by redwood beams. There are ten access hatches spaced about 600 feet apart. Groundwater percolating through the alluvium collects in the tunnel and, after chlorination, is channeled into the Company's potable water system. Two wells supply the remainder of our domestic supply. Domestic water is distributed by six booster pump stations through 25 miles of pipeline to five reservoirs.

The domestic water system provides service to the San Antonio Heights, also known as our Basic Service Area. Consisting primarily of large residential lots, the Heights is an unincorporated area of San Bernardino County approximately 2.6 square miles in size located immediately north of the City of Upland. The Company provides water to individual residential lots through 1,200 domestic meters.

The irrigation system primarily receives water from surface water diversions in the San Antonio Canyon. Additional irrigation water is supplied through seven wells located in three groundwater basins; Cucamonga Basin, Six Basins and Chino Basin. Irrigation water is distributed by three booster pump stations through 21 miles of pipeline to four reservoirs.

The irrigation system provides service to the Company's 'extended' service area. Shareholders in the extended service area include municipal and private companies. A majority of the distributed irrigation water is treated by municipal shareholders and then delivered to their customers as

domestic water. The remaining irrigation water is used for farming, landscaping and commercial use (quarry).

Project Scope of Services

Task 1 – Project Management

Provide overall project management services including:

- Preparing a proposed schedule for each project and an overall schedule for entirety of consultant's work related to this contract.
- Teleconferences and meetings at appropriate intervals to keep Company staff updated on progress and address any needed management level decisions.
- Quality assurance/ quality control
- Present recommendations for Company selection regarding material selection, scheduling, etc.

Task 2 – Preliminary Design Phase for each project

- Prepare preliminary design phase documents consisting of final design criteria, preliminary drawings, outline specifications and preliminary cost estimate.
- Provide necessary field surveys, topographic and utility mapping for design purposes. Utility mapping will be based upon information obtained by consultant from utility owners and field locates.
- Furnish one review copy of the preliminary design phase documents and any other deliverables to Company
- Review and revise preliminary design phase documents based on Company comments.

Task 3 – Environmental Phase for each project

- Review each project and make a recommendation to Company for appropriate CEQA requirements. Because they are pipeline replacements within disturbed roadways, Company anticipates 'categorical exemptions' for all projects.
- Prepare appropriate CEQA documentation and filings as necessary.

Task 4 – Final Design Phase for each project

- Prepare final drawings, specifications and cost estimate indicating the scope, extent and character of the work to be performed and furnished by Contractor. Consultant will field locate, as necessary, existing utilities to determine crossing and connection points.
- As an agent of Company, consultant shall obtain permits or approvals from appropriate governmental authorities having jurisdiction to review or approve the final design of the project. Traffic control and pavement restoration is overseen by either County of San Bernardino or City of Upland, depending on each individual project location.

- Represent the Company in consultations with such authorities and revise the drawings and specification in response to directives from said authorities.
- Prepare and furnish bidding documents (plans, specifications and estimate) for review by the Company, its legal counsel and regulatory agencies.
- After revising the bidding documents in accordance with comments and instructions from Company, Consultant shall provide one reproducible copy and one electronic copy of all documents in their native format (Word, AutoCAD, etc.), as well as one full document set copy in Adobe Acrobat PDF format.

Task 5 – Bidding Phase for each project

- Coordinate advertising and obtaining bids for the work and maintain a record of prospective bidders to whom project documents have been issued.
- Coordinate any pre-bid conferences.
- Respond to Contractor's Prebid Request for Information (RFI) through appropriate bidding addenda as necessary to correct, clarify or change the bidding documents.
- Coordinate bid opening and review bids for acceptability of prime contractor, subcontractors, supplies and other individuals and entities proposed by prospective contractors.
- Review and advise the Company on the acceptability of substitute materials and equipment proposed by contractor during the bidding or negotiating phase.
- Prepare a bid evaluation sheet showing each bidder and their respective line item bids, along with a total proposed bid price for each bidder.
- Advise Company regarding which bidder was the 'lowest responsible bidder'.
- After Company Board awards contract the Consultant shall coordinate construction contract execution and assemble construction contract documents.

Task 6 – Construction Phase for each project

- Provide appropriate field oversight (inspection services) of construction activity to ensure contractor's compliance with contract and permits.
- Provide appropriate material testing, including soil compaction testing, to ensure contractor's compliance with contract and permits.
- Issue necessary clarifications and interpretations of the contract documents as appropriate to the orderly completion of contractor's work.
- Review and organize any shop drawings, samples and other information which contractor is required to submit to ensure conformance with contract documents and compatibility with design.
- Respond to Contractor Requests for Information (RFI) through appropriate addenda as necessary to correct, clarify or change the contract documents.
- Coordinate progress payments with contractor and forward a recommendation to Company for processing, along with appropriate contractor paperwork.
- At the appropriate completion of work, Consultant shall prepare necessary paperwork to close out project

Proposal Schedule

The Company anticipates the following timeline and key milestones for award of the project:

Proposal Due Date	**March 20, 2020**
Board Award - @ special meeting	March 31, 2020
Consultant's Notification	April 1, 2020

Proposal Requirements

The proposal shall not exceed 19 pages excluding resumes, cover letter, dividers, front and back covers. No other documents will be reviewed. Please do not submit additional material. Responses to this RFP shall be in the following order and shall include:

Executive Summary (2 pages maximum)

Summarize the contents of your firm's proposal in a clear and concise manner.

Firm Background and Experience (4 pages maximum)

Brief description of the firm and subconsultants, if any, including the size of the organization, location of offices and relevant capabilities and resources in relation to the project. This section should include:

I. Experience with domestic water system design and construction services
II. Similar projects with other water companies or districts
III. Firm's local experience
IV. Procedures and/or policies associated with or related to work quality and cost control
V. Management and organizational capabilities
VI. Verification of professional liability insurance for coverage of not less than $1,000,000.

Project Organization and Experience of the Project Team (2 pages maximum, not including resumes)

Proposing firm shall identify the team to be assigned to the project, by name, including at a minimum the principal, project manager, key staff and any subconsultants. Proposing firm shall describe the project team's qualifications and experience on projects related to this specific project. Proposing firm shall explain the project team's experience regarding all tasks associated with the scope of work. This section should include:

I. Describe proposed project organization, including identification and responsibilities of key personnel, including sub-consultants. Include only one-page resumes.
II. Describe the experience of the Project Manager and the experience that the proposed personnel have working on past projects as a team.
III. Describe project management approach to the work effort, locations where work will be done, responsibilities for coordination with the Company, and lines of communication necessary to maintain project on schedule.

Project Understanding and Approach (8 pages maximum)

Proposer shall demonstrate its preliminary understanding of the project by providing a clear and concise description of the project and major issues, based on the information provided in this RFP.

Proposer shall clearly define the tasks and activities necessary to meet the objectives outlined in the scope of work of Task III. This section should include:

I. A statement committing the necessary resources to work expediently toward having all projects under construction contract by December 31, 2020.
II. Description of the tasks and activities, the methodology that will be used to accomplish them.
III. Description of the products that would result from each task and activity.
IV. Identification of points of input and review with Company staff.
V. Proposed project schedule identifying key tasks, their expected duration, and milestone dates. Schedule shall consider individual project priority and Company's desire to get each project bid and constructed as soon as possible.
VI. Proposers are invited to suggest additional (optional) work tasks that could be performed in conjunction with or subsequent to the scope of work. Any such tasks are to be described as optional and the benefits of performing such tasks shall be described.

Past Projects (3 pages maximum)

Proposer shall provide project descriptions of up to three similar projects. Include the following information:

I. Owner contact name and phone number
II. Project team members
III. Project size and description

Proposed Total Professional Fee and Fee Schedule Submitted Under Separate Sealed Cover

Proposed fee shall not be the sole basis of award but will be used to evaluate the Consultant's understanding of the Scope of Work.

Include the hourly rates of all staff that will charge to the project.

Fee schedule shall show design and construction effort broken down by specific capital project (7 projects total), then combined into a total proposed fee. Company expects to award a 'time and material, not to exceed' contract.

Exceptions to this RFP

The Consultant shall certify that it takes no exceptions to this RFP including, but not limited to, the Consultant Services Agreement (attached).

Evaluation Criteria

The evaluation criteria and the respective weights that will be given to each criterion are as follows:

a) 30% Understanding and approach to the work to be done
b) 30% Experience of firm with similar kinds of work
c) 20% Experience of staff for work to be done
d) 10% Overall clarity and presentation of Proposal
e) 5% Firm's Local Experience
f) 5% Proposed Project Fee

Selection Process and Schedule

The Company will enter into negotiations with the top ranked firm. At this time, the Company contemplates the use of a Time and Material Not to Exceed contract for the services requested. Negotiations will cover scope of work, contract terms and conditions, attendance requirements, and appropriateness of the proposed fee.

After negotiating a proposed agreement that is fair and reasonable the General Manager will present the contract to the Company's Board for authorization to execute a contract with the most responsive firm.

Related Documents

- Seven Budgetary Project Sheets (attached)
- Company standard Professional Service Agreement (attached)

Submittal Requirements

One (1) executed original marked "ORIGINAL" in red ink and 6 copies of the Proposal shall be submitted. One single sealed Proposed Fee Estimate marked "FEE ESTIMATE – 2020 CIP" in red ink shall be submitted separate from the proposal. Emailed proposals will not be accepted. Submit one electronic copy of the proposal in PDF format. The Response shall be signed by an individual, partner, officer or officers authorized to execute legal documents on behalf of the Firm.

The Response Proposal must be received no later than **3:00 p.m.** local time, on or before **March 20th, 2020** at the office of:

PROPOSAL – 2020 CIP
San Antonio Canyon Water Company
139 North Euclid Avenue
Upland, CA 91786
Attn: Brian Lee

Failure to comply with the requirements of this RFP may result in disqualification. Questions regarding this RFP shall be submitted in writing to blee@sawaterco.com.