



Professional Engineering Services Proposal

Town of Johnstown
Water Treatment Plant Expansion Design
February 2021

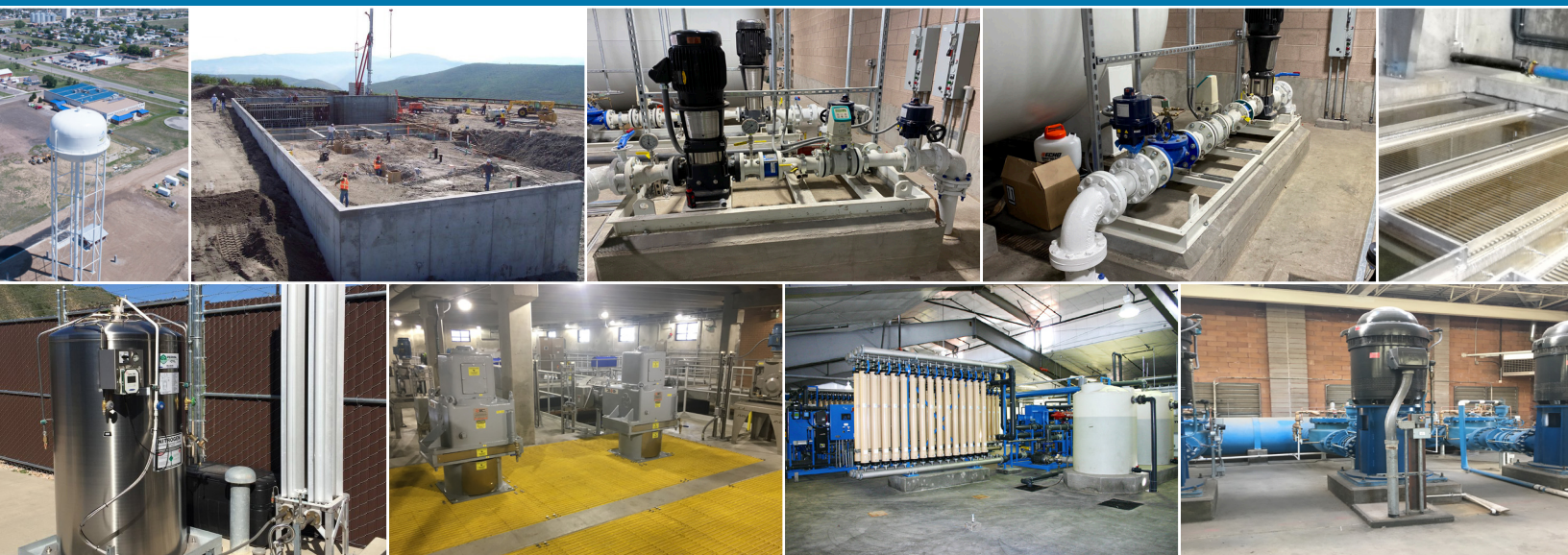




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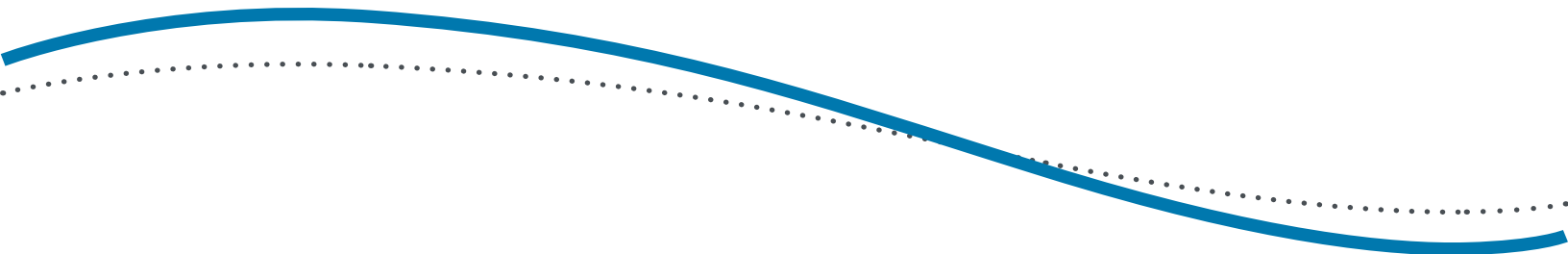
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Marco Carani
Director of Public Works
Town of Johnstown
450 South Parish Avenue
Johnstown CO, 80534

February 5, 2021

**RE: Letter of Transmittal
AQUA/SKM Professional Engineering Services Proposal for Expansion Design of
the Johnstown Water Treatment Plant Expansion 5 to 10 MGD**

Dear Marco,

Thank you for the opportunity to provide our proposal for the Expansion Design of the Town of Johnstown Water Treatment Plant. AQUA Engineering (AQUA) will engage and collaborate with the Town's staff and Ramey Environmental Compliance to develop a cost-effective and timely expansion project to address hydraulic and treatment capacity constraints and seasonal taste and odor issues. Our approach will emphasize the value of your existing facility, and we will design a plant that is easy to operate and maintain, that addresses current water quality concerns and prepares you for future expansions. We are an excellent fit for this project and will provide you and the Town with:

- ✓ Experience and capacity to deliver a high-quality project
- ✓ Our Dedicated "A-Team" staff made up of a combination of our in-house engineering disciplines, including electrical/controls engineering
- ✓ Innovative and cost-effective solutions to optimize the value of the existing WTP facilities
- ✓ A commitment to an aggressive completion schedule with the goal of achieving construction Substantial Completion by summer 2022

Experience and Capacity

AQUA has the engineering resources and experience to deliver this project. AQUA was founded in 1991 and has been delivering water and wastewater facility projects for 29 years. We are a full-service team of over 70 people and have all of the core wastewater engineering and construction management disciplines "in-house" including process design, civil, structural, mechanical, and system integration, controls, and electrical (ICE) engineering. AQUA's affiliate SKM has provided system controls engineering for multiple water treatment plants across the USA, including the Salt Lake City, UT WTP.

We assure the Town that we have the available technical staff and resources for not only this project, but also to continue our level of service and standard of care on the ongoing Low Point WWTP Expansion Project. We note that the "Johnstown Water Team" staff who will work on this project include additional AQUA staff members that are not involved in the Town's WWTP project with AQUA.

Dedicated A-Team includes Principals and Senior Engineers.

As shown on our fee estimate and staffing plan, AQUA Principal Engineers/firm owners Bob Frchetti,

Darin Hawkes, and Ryan Pack will be actively involved on the Johnstown Water Team. In addition, our Project Manager and Lead Engineer will be Brian Daw. Brian has over 26 years of water treatment facility planning, design, and construction expertise and experience. Brian recently led the project management and engineering design for the City of Boulder's 40 MGD Betasso WTP Capital Improvements Project and the City of Westminster's Semper 65 MGD High Service Pump Station Reliability Project (while with his prior firm). Thus, Johnstown and REC will work hand-in-hand with AQUA's dedicated "A-Team" engineering staff and leadership.

Innovation and Cost-Effective Solutions

AQUA Engineering has a reputation and successful history of delivering cost-effective and innovative projects. In preparing our proposal, we developed preliminary engineering concepts and evaluated a variety of technologies and potential solutions. We are comfortable with the traditional approaches to expand capacity and address taste and odor; such as membrane or conventional filtration to increase plant capacity, and ozone/AOP, GAC, or UV/AOP for taste and odor treatment. We have already assessed conceptual layouts and costs for these established approaches and are prepared to review these with the Town during the alternative evaluation phase of the project.

However, we are also open-minded to consider alternative and innovative approaches to increase treatment capacity and address taste and odor. One such approach is ceramic ultrafiltration with advanced coagulation technology. As part of our preliminary technology assessment, we identified a technology provider/manufacturer named Purifics that can potentially address pre-treatment, taste and odor control, and expanded filtration capacity with one innovative process. (www.purifics.com) We received a detailed proposal from Purifics along with supporting information of its performance in comparison with polymeric membranes. We believe this innovative approach should be considered further with adequate demonstration testing before further consideration. This pilot testing would need to be done early in the project and extend into the summer to evaluate effectiveness under challenging raw water quality conditions.

Commitment to a Substantial Completion Goal of Summer 2022

We have developed a collaborative CMAR project delivery plan to reach project substantial completion by July 2022 – just in time for increased demand and in advance of most taste and odor issues.

Conclusion

AQUA is uniquely qualified for this project. We are already invested and engaged in the preliminary design and eager to continue.

Please contact either Bob Frachetti at (303) 995-7800 or Brian Daw at (303) 249-7510 with any questions about our qualifications or our concept ideas. We encourage you to contact our references.

Sincerely,



Bob Frachetti, P.E.
Principal



Brian C. Daw, P.E.
Project Manager | Lead Engineer



Section 1

Identification of Proposer



The AQUA Engineering Group

We are the AQUA Engineering Group, an assembly of over 70 highly-qualified professionals unlike any other. We provide innovative engineering solutions for public and private sector markets nationwide. Our clients look to us for our quality services and our outstanding ability to effectively and efficiently solve complex engineering challenges that achieve sustainable results. AQUA is made up of a team of experienced engineering professionals, leaders, and associates who are experts in their disciplines and fully committed to helping our clients accomplish their project goals while protecting the environment and enhancing the quality of life for the people in our communities. We seek out opportunities to work with others who share our vision for success and promise to give you the best engineering experience possible on every project. Together, we can create a bright and prosperous future.



AQUA Engineering (AQUA) provides innovative engineering, operations, and construction solutions to clients nationwide. Since 1992, we have served the public and private sector. AQUA's proven experience demonstrates our capacity and stability to deliver projects that are sustainable and operable. Our team consists of experienced professionals, designers, programmers, technicians, and associates who are capable of solving your needs and are fully committed to your success.

533 W 2600 S Suite 275
Bountiful, UT 84010
801.299.1327

5325 S Valentia Way
Greenwood Village, CO 80111
720.667.1250



SKM Engineering (SKM) was founded in 1989. SKM provides sound and proven electrical, instrumentation and control (EI&C) engineering, along with dependable and prompt service at the best value. The SKM team has the knowledge, training, and hands-on experience required to meet EI&C needs for your facilities. They apply a unique and fresh perspective and are recognized by clients for their ability to solve challenging technical problems quickly with simple and cost effective solutions. SKM provides services for over 100 clients throughout the US and Canada with offices in Utah and Colorado.

533 W 2600 S Suite 25
Bountiful, UT 84010
801.677.0011

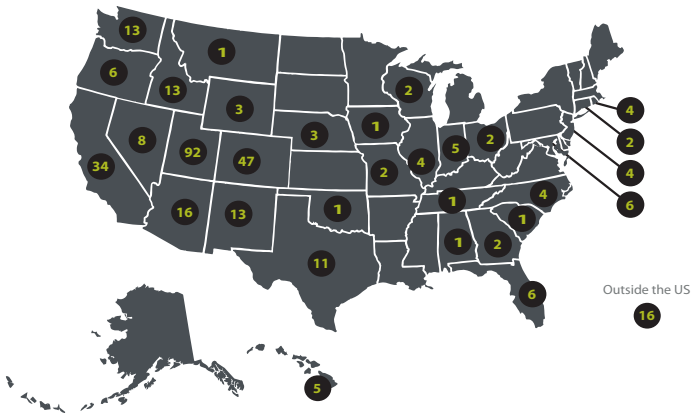


Aqua Environmental Services, Inc. (AES) is a division of the AQUA Engineering group, which provides operations consulting, start-up and commissioning services, and instrument calibration to many public and private sector clients. AES has developed a loyal base of clients in need of assistance with contract operations, small turnkey projects, facility management projects, and systems troubleshooting. With its low overhead, AES is able to offer services to many clients that would be difficult to provide with in-house staff, or in the case with small systems, with what would be costly full-time employees.

89 Monarch Dr
Bountiful, UT 84010
801.694.9106

Extensive Project Experience Relative to Your Needs

Over the years, we have worked on major design and engineering projects that have given us valuable experience with the processes and technologies necessary for completing work effectively and efficiently. We are honored by the trust and confidence our clients have in us and look to extend our track record of success in developing new facilities and in improving the performance of existing facilities for many years to come. On each and every project, we demonstrate our ability to provide excellent engineering services that make a difference for our clients and communities.



AQUA Group Project Sites

History of Excellence

Numbers often speak louder than words. We will bring you success in your projects, as we have with hundreds of our clients across the nation. By designing systems and facilities that perform at the highest level, we can promise you results and unmatched service satisfaction.

AQUA got to where it is today by consistently delivering excellent engineering results that made a difference for our clients and communities. We have created a culture that fosters success and have redefined what it means to be experts in design and engineering.

Proven Ability to Achieve Results

For nearly 3 decades, AQUA has helped clients, big and small, complete thousands of infrastructure engineering and community projects. We are recognized as the top engineering solutions provider because of how well we are able to solve unique project challenges, stay on-schedule and within budget, and achieve innovative and lasting results.



MRW Signal Hill WTP



Colorado River Resort WTP



Blanding WTP



Wasatch Resource Recovery



Tooele Solar Drying



Wolf Creek Water

Project Team Contact Information

Person	Role	Office	Email	Phone
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Subconsultant Identification**Galloway**

5265 Ronald Reagan Blvd., Suite 210 Johnstown, CO 80534
P: 970.800.3300 | www.gallowayus.com



Galloway's mechanical team consists of the most knowledgeable, dedicated and talented individuals in the industry who truly care about your success. We offer thoughtful, creative design solutions for building systems – from alternative energy solutions and life-cycle costing, to construction load analysis. Through the use of both AutoCad and Revit BIM format, we provide design, engineering and energy modeling to support LEED certification, EPA Energy Star designation and ASHRAE 90.1 compliance requirements. Additional services include building audits, code compliance and peer review.

Personnel Contact Information

*Address information found at the top of firm introductions

Person	Role	Office	Email	Phone
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Eidos Architects

5400 Greenwood Plaza Boulevard, Greenwood Village, CO 80111
 P: 720.200.0630 | www.eidosarch.com



Eidos Architects provides complete architectural services to our clients from the start of programming for your facility through completion of construction and building occupancy. We also act as a team leader and project manager for our clients throughout their project, and as a collaborative team we bring the vision of our clients to a successful design solution that responds to the sometimes complex and varied needs of a project. We take pride in being good listeners and being responsive to our clients throughout the project process and meeting their needs within the constraints of their time schedules and budget.

Our clients want to be able to visualize their buildings before they are built and reach a better understanding of design concepts. We are continuously updating our 3D modeling capabilities to serve as a design tool and create more realistic and accurate presentations. We can also provide clients with physical models for display. Clients feel that our 3D models and movie animations help their fundraising efforts and simplify communications throughout a project.

Personnel Contact Information

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Person	Role	Office	Email	Phone
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Altura Land Consultants

6950 S. Tucson Way, Unit C Centennial, CO 80012
 P: 720.488.1303 | www.altalandsurveying.com



Altura Land Consultants offers a wide range of Professional Land Surveying services, serving large and small projects alike. Our staff of licensed surveyors will work with you from the beginning of your project providing consultation to determine your needs and will be there all the way to the end providing the necessary services.

Personnel Contact Information

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SECTION 1 | IDENTIFICATION OF PROPOSER

Kumar & Associates

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P: 303.742.9700



Kumar & Associates, Inc. (K+A) is an employee-owned consulting engineering firm providing professional and technical services in the areas of geotechnical engineering, environmental sciences, engineering geology, and construction observation and materials testing. The firm was established in 1989 and has a current staff of more than 150 professional engineers and geologists, environmental scientists, engineering technicians, and support personnel. Our offices are located in Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs, and Summit County, Colorado.

Personnel Contact Information

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Kahuna

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P: 303.451.7374 | www.kahunausa.com/



Kahuna’s Laser Scanning and Modeling Team specializes in supporting engineers and asset managers with BIM model data and reality capture. With roots in the energy infrastructure industry, Kahuna understands the value behind precise data in a timely and cost-effective manner. Our expertise and knowledge of geospatial survey technology and Revit/ 3D modeling software allows us to supplement your current scan team, or provide a full suite of laser scanning, point cloud, Revit and 3D modeling services.

Personnel Contact Information

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Section 2

Project Overview & Approach

SECTION 2 - PROJECT OVERVIEW AND APPROACH

Project Overview & Approach

Our team considered the Town's goals shared in the RFP and during the pre-submittal conference and reviewed related information to develop our understanding of the key project issues and develop our approach to working with the Town to plan, design and construct a successful project.

Our approach is based on our preliminary analysis of available information and cumulative experience along with initial coordination with treatment process equipment manufacturers. Based on our analysis and their input, we identified proposed improvements and their general design basis best suited to improve treated water quality to meet the Town's level of service goals.

AQUA will provide the Town of Johnstown (the Town) with a practical and cost-effective solution to meet the following objectives:

- ✓ Increase the WTP's rated treatment capacity to 10 to 12 million gallons per day (mgd) by increasing its' filtration capacity and pathogen removal (disinfection) capabilities.
- ✓ Develop and implement a taste and odor (T&O) control project.
- ✓ Increase the capacity for the Lonetree Raw Water Pump Station and transmission main.
- ✓ Plan for future capacity expansions and other opportunities to improve treatment performance and finished water quality.
- ✓ Reach Construction Substantial Completion for both the filtration upgrades and taste and odor facilities by Summer 2022.



Of these objectives, schedule is perhaps the most challenging. With this in mind, AQUA has already started preliminary engineering and has consulted with numerous equipment suppliers, contractors, and CDPHE. We understand the critical path elements required to complete the project by Summer 2022 and have developed an aggressive project delivery schedule. The schedule considers minimal time allowances for preliminary engineering and technology selection, regulatory reviews, equipment selection and procurement, equipment lead times, Final Design and CDPHE approval, and construction/ commissioning. Our schedule is based on a collaborative and coordinated effort between all involved parties that includes:

- Using a construction management at-risk (CMAR) delivery approach to allow on-site construction to start in 2021, in advance of equipment delivery. We will work with the Town to onboard a qualified CMAR contractor as soon as possible (April 2021) to participate in the preliminary and final design phases - with the intent of beginning strategic on-site construction activities starting in late fall 2021 to prepare for equipment delivery in early 2022 -with installation and commissioning occurring from January 2022 to July 2022.
- Working collaboratively with CDPHE to submit and obtain approval of long lead equipment so this equipment can be ordered earlier in the project schedule. This will involve a separate equipment package submittal to CDPHE for review and approval in advance of the typical Final Design submittal for construction approval.
- Preselect and order long lead process equipment as soon as CDPHE approves the equipment design criteria. We have been advised that filtration equipment lead times are at 20 weeks from purchase order, and taste and odor control equipment (such as ozone generators) lead times were quoted to be as long as 24 to 26 weeks. Thus, pre-selection of equipment along with an early submittal to CDPHE for approval, and timely purchase by the Town is required to meet a Summer 2022 completion date.

SECTION 2 | PROJECT OVERVIEW & APPROACH

A detailed schedule is included in Section 6.

Introduction

We look forward to working with the Town to deliver a successful project that will upgrade and improve water treatment capabilities and improve customer satisfaction with the Town's drinking water. The AQUA Team will collaborate with the Town and your operations specialist, Ramey Environmental Compliance (REC), to identify, evaluate and select preferred alternatives for meeting the Town's level of service goals and improve potable water quality while considering the Town's unique considerations, needs and preferences.

To demonstrate our engineering and construction experience, the following sections highlight our:

- ✓ Understanding of the Town's goals.
- ✓ Technical Approach to partnering with the Town to provide for the informed selection of preferred WTP improvements; and
- ✓ Proposed Project Task Workflow outlining our Scope of Services and the Deliverables that will provide the Town with a roadmap for selecting and implementing WTP improvements.

We also outline value-added services that AQUA can offer the Town, including using CMAR as an alternative project delivery method and performing hydraulic modeling to verify distribution system capacity and responses during high demand periods.

Your project is an excellent fit for our team, and we will provide the Town with the experience, enthusiasm and expertise to successfully identify and implement a practical approach meeting the Town's expectations for a successful project. Our experience allows us to deliver an efficient and cost-effective scope and associated fee, and our innovative ideas will bring value to the Town's decision-making and budgeting for both capital costs and operations and maintenance costs.

Project Understanding

AQUA has reviewed the RFP document, the Town's latest Water System Master Plan (2015) and studied available facility design drawings to inform our approach. We also visited the WTP and reviewed operations with public works staff during the pre-submittal conference. We have a solid understanding of the existing facility and needs for the expansion project.

Figure 1 provides a general overview of the Town's water treatment system that highlights the WTP's processes along with the general project considerations summarized in the following paragraphs. We used general engineering assumptions to develop a "Hydraulic and Treatment Capacity Evaluation" to highlight the capacity constraints through the WTP processes shown in Figure 1. The Evaluation reflects the estimated "gap" (in mgd) which highlight key project considerations along with water quality factors as the initial basis for identifying the needed improvements to meet the Town's project goals:

- The Lonetree and Johnstown Reservoirs supply the Town's WTP and are subject to algal blooms and T&O occurrences that give rise to customer complaints during the high demand periods in the spring and summer. Geosmin and 2-methylisoborneol (MIB) concentrations have been observed by the Town to occur in excess of 100 ng/L. The project is to include a long-term strategy for managing T&O occurrences originating from algal blooms. Possible solutions include source water management approaches at the reservoirs and treatment process upgrades.
- The Lonetree Raw Water Pump Station currently provides a total capacity of



SECTION 2 | PROJECT OVERVIEW & APPROACH

4.7 mgd (4.3 mgd firm capacity) for transferring raw water from the reservoir to the WTP. An existing 16-inch diameter, 10.6-mile transmission main conveys raw water to the WTP. The pump station and transmission capacity must be increased to provide a total capacity of 10 to 12 mgd to convey raw water to the expanded WTP.

- The Johnstown Reservoir Raw Water Pump Station and transmission main provides additional raw water supply capacity up to 6.7 mgd. Additional capacity for the pump station is not anticipated as part of the project.
- The existing pretreatment dissolved air flotation (DAF) process consists of two (2) 5-mgd trains that routinely produce settled water turbidity of 0.5 NTU or less. Re-rating the DAF to provide an approved 12 mgd capacity may be possible based on discussions with the manufacturer's representative and CDPHE drinking water engineers.
- Two (2) mixed media filters provide a firm capacity of 3.1 mgd (with one filter out of service) and total capacity of 6.2 mgd. The filters were recently retrofitted with new anthracite coal, silica sand and garnet sand media and have historically produced reliable filtered water turbidity levels below 0.3 NTU. Filtration capacity will need to be increased to meet the Town's 10 to 12 mgd rated WTP capacity goal. Firm filtration capacity will need to be designed based on one filter being out of service (e.g., for backwashing) to achieve the firm rated capacity and meet redundancy requirements outlined in the CDPHE Potable Water Design Criteria.
- Sodium hypochlorite and sodium hydroxide are added to the filtered water wetwell below the existing filters for disinfection and pH adjustment, respectively. The DAF and mixed media filter processes provide removal credits of 2-log Cryptosporidium, 2.5-log Giardia and 2-log virus log reduction values (LRV) for meeting Colorado Primary Drinking Water Regulations. Chlorine disinfection currently provides an additional 0.5-log Giardia and 2-log virus LRV to meet regulatory requirements and may only need to provide for virus LRV with the proposed upgrades to the WTP.
- The high service pump station in the Filter Building transfers chlorinated filtered water into two (2) 750,000-gallon aboveground steel tanks (clearwells) that are operated in parallel to provide disinfection contact time for Giardia and viruses. The clearwells are estimated to provide 0.5-log Giardia LRV when operated at a minimum water level of 35 to 40-ft at a WTP flow of 6.2 mgd. The project will need to consider options for increasing disinfection capacity up to a maximum day flow of 12 mgd.
- Finished water is then routed from the clearwells to the Distribution System Pump Station which consists of two (2) 125-hp East Zone pumps and two (2) 250-hp West Zone pumps. With no storage tanks located in either Zone, the pumps are designed to meet instantaneous demand during peak hour events and fire flow requirements. The West Zone pumps can augment flow to the East Zone through a PRV along the common pump station discharge header to provide some additional capacity to the East Zone. The Town is designing a new elevated tank in the East Zone to provide additional storage and is evaluating operations of the existing North Tank to cycle its operational volume and minimize stagnation. With the increased demand in the system, the East Zone pumps will need to be replaced or expanded to provide adequate capacity.



SECTION 2 | PROJECT OVERVIEW & APPROACH

a utility's WTP filtration capacity is rated at a maximum flow equal to its available filtration capacity with a single filter out of service, e.g., an "n+1" design. Interconnects are not typically relied on to offset the need for the WTP to be designed with suitable capacity to meet maximum day or peak hour demands in the Town's case. Our filtration solutions are intended to provide a maximum rated treatment capacity to meet the Town's maximum day demand based on CDPHE design policy.

As illustrated in Figure 1, the hydraulic and treatment capacity constraints outlined above provide the Town with a general overview of the limiting factors to be addressed during the project or in the near future.

Technical Approach

AQUA will design the Project improvements based on our collective treatment and facility experience, state-of-the-industry engineering practices and the professional standard of care consistent with the requirements of CDPHE's Policy 5 – Design Criteria for Potable Water Systems. In summary, AQUA's preliminary process design will expand the WTP to have a rated maximum daily flow capacity of 10 to 12 mgd of treatment capacity for meeting water quality, taste and odor and disinfection requirements. The specific rated treatment capacity will be confirmed upon review of the historical flow and raw water quality records provided by the Town.

Based on our review of the existing WTP design criteria, we have identified major project elements to inform the Town with our technical approach. Figure 2 illustrates options we've identified as potential improvements to manage T&O occurrences, increase filtration capacity, increase disinfection capacity and provide other potential value-added improvements.

The preliminary technical design alternatives we've developed will provide the Town with an updated, reliable, and resilient facility designed to meet challenging water quality conditions and accommodate future expansion. We've performed preliminary process calculations for sizing the proposed facilities and unit processes, and we are confident in the feasibility of the alternatives for meeting the Town's goals once water quality data can be provided by the Town. We also propose to prepare project enhancements that are not specifically requested in the RFP that help with meeting the desired capacity requirements.

Our conceptual designs are based on using existing facility infrastructure where advantageous and maximizing the functionality of the existing site features in anticipation of future expansions. Specifically, in addition to the filtration approaches requested in the RFP to expand the facility using conventional media filtration or pressure membrane microfiltration, we are suggesting that the Town consider two (2) additional membrane technologies.

We propose to evaluate the following treatment processes for the expansion of filtration capacity, managing T&O compounds and providing necessary disinfection to achieve adequate LRV for pathogens

Filtration Capacity Expansion: WTP filters serve as the primary barrier to pathogens in the source water. CDPHE design policy requires that the capacity of the filters be designed considering one filter out of service. Both conventional and membrane filtration are successfully used to meet the regulatory requirements for removing pathogens. For the Town's project, the following filter technologies are suitable for increasing the WTP's treatment capacity from 6.2 mgd up to 12 mgd:

- ✓ Conventional Media Filtration
- ✓ Pressure Membrane Micro/Ultrafiltration (MF/UF)
- ✓ Membrane Gravity UF
- ✓ Ceramic Membrane UF



Pressure membrane modules provide a compact footprint in comparison with conventional media filters.

Membrane filtration provides the advantage of a more compact footprint than conventional media filters. The compact footprint allows for installing a higher filtration capacity at the WTP or possibly reusing the existing filter basins to meet the Town’s treatment capacity goals.

Of particular interest, we have contacted a ceramic membrane system manufacturer, Purifics, that has successfully piloted and designed their system for similar applications. Their continuous ultrafiltration (CUF) system anecdotally is capable of removing algae, reducing total organic carbon (TOC) and mitigating T&O issues. The design consists of an integral coagulant rapid-mix tank following by a ceramic ultrafiltration membrane, without the need for pretreatment flocculation and sedimentation (i.e., DAF). In challenge pilot testing, the unit exhibited 4 times the flux rate of polymeric membranes and greater TOC removal. While the supporting data is favorable, T&O compound removal was not directly tested, and we are uncertain if additional treatment is needed to reduce MIB and geosmin levels. **The manufacturer offered to arrange for a pilot unit to be delivered within 2 to 4 weeks. AQUA is prepared to coordinate a pilot-testing plan if the Town would like to consider this technology.**



Ceramic membranes have been demonstrated to operate at flux rates of 250 gfd compared with 30 to 40 gd for polymeric membranes.

For a general comparison of the relative footprints of each filtration option, Figures 3-1 and 3-2 illustrate preliminary building sizes and their general arrangement on the WTP site. The membrane gravity UF system is proposed to be installed in the existing filter building, potentially lessening total project costs by reusing the existing filter cells. The capacity of the gravity UF filters may be limited to the lower end of the Town’s preferred capacity, though the addition of planned storage in the distribution system and the membranes’ pathogen removal capabilities may reduce the needed filtration capacity.

T&O Compound Control: Taste and odor occurrences regularly occur in the summer months when reservoir turnover is occurring, water temperatures increase, and sunlight increases. Algae releases geosmin and MIB that are the primary algal metabolites contributing to T&O complaints. Algal blooms also result in the release of cyanotoxins that are becoming a more prevalent water quality concern. These compounds are not currently regulated but are subject to CDPHE’s health advisory requiring public notice of their potential health impacts in drinking water. The following treatment processes are proposed for the Town’s consideration:

- ✓ Reservoir Surface Mixers
- ✓ Intermediate Ozone Addition
 - ✓ Ultraviolet (UV) Advanced Oxidation Process (AOP)
 - ✓ Granular Activated Carbon (GAC)



Treatment at the WTP using ozone, UV or GAC can successfully eliminate T&O compounds as well as be used to treat cyanotoxins. Ozone and UV also have the added benefit of providing disinfection LRV credits for Cryptosporidium, Giardia and viruses. As noted above, source water management practices such as using surface mixers may be an option to improve the water quality at the Town’s reservoirs – we understand that the Town shares storage rights with other users, and this option may not be feasible.

Figure 3-3 illustrates the relative footprints for implementing ozone, UV and GAC at

the WTP site. Final locations will depend on the selected filtration option, with the goal to integrate the selected process into the WTP process train by taking advantage of existing structures and considering future capacity expansion of the WTP.

Disinfection Capacity: Removal and/or inactivation of pathogens is required to meet Safe Drinking Water Act treatment technique requirements, e.g., pathogen LRV. **The selection of the filtration and T&O treatment processes will contribute to removing pathogens and allow the Town to optimize its onsite storage in the Clearwell Tanks or consider options for locating additional storage in the distribution system and reduce congestion on the WTP site.** The following options outline how the Town can achieve required primary pathogen disinfection/removal:

- ✓ Membrane MF/UF provides 2.0-log LRV for *Cryptosporidium* and 3.0-log LRV for *Giardia*
- ✓ Ozone in addition to treating T&O compounds provides LRV credits for *Cryptosporidium*, *Giardia* and virus inactivation
- ✓ UV AOP in addition to treating T&O compounds, provides LRV credits for *Cryptosporidium*, *Giardia* and virus inactivation
- ✓ Chlorination provides adequate LRV credits for virus

Table 4.1 - Log removal compliance credit for membrane filtration

<i>Giardia lamblia</i>	3.0 - Log
<i>Cryptosporidium</i>	3.0 - Log
Viruses	no credit granted

CDPHE Policy 5 allows for membranes to be rated with up to 3-log removal for Crypto and Giardia, reducing the Town’s disinfection/inactivation requirements to 4-log virus which can be achieved in the existing Clearwell Tanks.

Based on the planned filtration expansion and the T&O treatment options, the proposed improvements will provide multiple barriers to pathogens and will achieve the necessary disinfection/removal to meet water treatment regulations. Ozone provides a robust barrier against pathogens, T&O, and other emerging contaminants including cyanotoxins. UV AOP doses to remove geosmin and MIB are greater than those required to achieve pathogen disinfection. GAC filtration is less operator-friendly due to its relatively quick exhaustion resulting from the strong uptake of organics including geosmin and MIB, and regular replacement or regeneration costs. GAC is recommended only to be considered as a polishing process downstream of either ozone or UV but is not necessary to meet treatment goals.

Discussion of Preliminary Design Concepts

The following information provides a brief review of our preliminary design concepts to illustrate how the treatment options presented above can be applied to the Town’s goals. The discussion is organized to reflect the Town’s water system from raw water sources through to the distribution system pump station. Figure 4 provides a general schematic of the proposed treatment improvements outlined below. Figures 3-4 and Figure 4 provide a general site arrangement and process schematic of the proposed treatment improvements outlined below.

Lonetree Reservoir and Raw Water Pump Station

- We acknowledge that there are hydraulic pumping and transmission capacity limitations for the pump station to provide up to 12 mgd of flow. We look forward to working with the Town to review the pump station conditions, evaluate the existing transmission main alignment and prepare a practical design to convey the required flow from the reservoir to the WTP.
- Our team includes conveyance engineers supported by civil, structural, electrical and controls engineers and designers that have completed similar projects.

Johnstown Reservoir and Raw Water Pump Station

- Surface-mounted mixers can be used to destratify the reservoir water column and improve water quality conditions to mitigate algal blooms.



SECTION 2 | PROJECT OVERVIEW & APPROACH

- One manufacturer, SolarBee, has installed surface mixers in a Loveland, Colorado reservoir and the case study indicates a reduction in cyanobacteria and geosmin levels over the previous 4 years.
- Surface mixers can be solar-powered or submerged mixers fitted with air hoses to induce mixing along the thermocline in the reservoir. The mixing action assists with maintaining dissolved oxygen levels throughout the water column, encouraging “good” algae to grow and mitigating algal blooms that result in the release of geosmin, MIB and cyanotoxins.

Dissolved Air Flotation

- The DAF system provides a rated capacity of 10 mgd. Based on discussions with CDPHE drinking water engineers and with the manufacturer’s representative, the DAF system could be re-rated to a higher capacity.
- Re-rating can be based on results and observations of DAF performance at other utilities with similar water quality.
- Another option is to consider the manufacturer’s floc recirculation upgrade for increasing the rated capacity up to 12 mgd.

T&O Control

- Based on review of the project flows and elevated geosmin/MIB concentrations between 100 and 200 ng/L, ozone provides a reasonable multi-barrier approach to T&O control along with DAF. While DAF will remove the algal cells, the ozone will target the dissolved geosmin and MIB, and organic compounds including cyanotoxins.
- Combined with membrane or conventional filtration, ozone provides a multi-barrier approach to pathogen inactivation/removal at relatively lower doses than required for removing geosmin and MIB.
- Relatively short ozone contact times provide efficient disinfection and removal of organic compounds allowing for a relatively small footprint of the ozone contact basin (OCB). The dynamics of ozone injection require deep OCBs of 16-ft to 18-ft to provide efficient ozone transfer into the water. The demolition of the existing clarifiers will provide for a ready excavation to construct the OCBs.
- Adjacent to the OCB will be an ozone generator building designed to house the ozone generators.
- Generator options include modular generators and larger vessel generators. It is anticipated that ozone would be injected year-round, but it can also be turned off for periods of the year with appropriate preparation.
- The addition of the ozone equipment will merit a review of the existing emergency generator and evaluation of a new site-wide generator or daisy-chained electrical system to provide sufficient emergency power to continue producing potable water.

Membrane Gravity Filter

- As a cost-management approach for the project, installing membrane gravity filter modules into the existing filter cells would provide cost savings for the project. The membranes would double the filtration capacity in the footprint of the existing cells. In addition, the cells could be split into 4 total filters giving the Town flexibility for backwash sequencing and operating less equipment to meet production during low demand periods.
- The filter basement and gallery would be used to install ancillary equipment to the membrane system, i.e., air compressor and air blowers used for backwash.
- For the intermittent cleaning of the membranes using sodium hypochlorite or caustic soda, the existing bulk tanks will need



SECTION 2 | PROJECT OVERVIEW & APPROACH

to be evaluated for supplying sufficient chemicals for the intermittent cleaning of the membranes.

- Replacing or adding new high-service pumps is necessary to augment the two (2) existing 2,600-gpm pumps to provide sufficient capacity for conveying up to 12 mgd to the clearwells from the filtered water wetwell.
- Separate chemical feed systems would be co-located with existing chemical feed pumps to maintain primary disinfection and pH adjustment in the clearwells.

Disinfection Clearwells

- The two (2) clearwells are sufficient for providing 4-log virus inactivation at low water levels of 15-ft or higher. With the addition of ozone and/or membrane filtration, the LRVs for Cryptosporidium and Giardia can be met without chlorine contact time.
- The noted disinfection capacity for virus only will provide the Town more operating flexibility for managing storage in the system without the risk of not meeting disinfection contact-time requirements.

Distribution System (DS) Pump Station

- The East DS pumps are currently undersized for meeting the estimated peak hour demand in the East Zone. The existing pumps, flow rates, operating pressures and motors can be used to identify potential pump upgrades or replacement options to meet current and future system demands.

SCADA | Electrical

- Our in-house team of over 20 electrical engineers and SCADA experts will work with the Town's integrator and process equipment and technology providers to ensure the facility has a modern SCADA system.
- Facility electrical system will be upgraded to incorporate additional electrical and equipment loads.

Project Plan

Our Project Plan includes a discussion of our collaborative project management approach to team with Town. The following detailed Table of our proposed Scope of Services and Deliverables demonstrates the elements of our approach.

The main Tasks in our Project Plan are:

1. Project Initiation and Coordination
2. Alternatives Evaluation
3. Preliminary Design Progress (CMAR, Basis of Design Report, Equipment Pre-Selection and Pre-Purchase, and 30% drawings)
4. 60% Design Progress (Final Draft Basis of Design Report and 60% drawings)
5. Final Design (Construction Plans & Specs) and CDPHE Construction Approval Application
6. Construction Management and Engineering (with As-Built Documentation) [Future Task]

Key elements of our Project Plan are highlighted below along with other value-added services:

- **Collaborative Communication and Workshops.** AQUA believes in interactive and collaborative communication. We thus propose to have at least monthly project meetings or workshops. The frequency and agenda for these meetings will depend on where we are in the project implementation process.
- **Technical Memorandums.** We propose to prepare Technical Memoranda during the planning and preliminary engineering phases of the project to document alternative evaluations, recommendations, and decisions. These memoranda will be the foundation for the Basis of Design Report and the Final Design.
- **Alternative Project Delivery.** AQUA understands the Town's desired schedule to complete construction

“ASAP” Bob and AQUA have helped other communities meet the desired schedule by using a Construction Manager at Risk (CMAR) project delivery method. Our value-added services under this task would be to guide the Town through the process of advertising for and selecting a qualified CMAR contractor. Our services would include preparing and administering a public CMAR RFP and selection process, and also providing a tested standard CMAR-Owner Agreement to the Town.

AQUA and particularly Bob Frchetti and Brian Daw are very experienced with and embrace alternative and integrated project delivery methods and value the timely project participation of a qualified general contractor as part of the design process. This appreciation for the value of an integrated owner-engineer-contractor team was learned first-hand during Bob Frchetti’s direct experience as a General Contractor and his years as Resident (Field) Engineer. Brian also has direct experience leading integrated project delivery teams. Bob and AQUA have a significant track-record of over 20 successful design-build and CMAR projects.

- **Cost Estimating and Constructability Review.** In recognition of the constructability and cost-estimating expertise of a qualified general contractor, we also offer the Town the value-added additional service for including an experienced General Contractor as a subcontractor to the AQUA team. Their input would provide the Town and AQUA early feedback on constructability, work sequencing, and scheduling; and more accurate construction cost estimates. AQUA has multiple relationships with contractors that will be leveraged should this approach be desired.
- **Hydraulic Modeling.** AQUA also recommends a hydraulic modeling effort to verify the impact of the storage tank currently under design on the firm (and total) capacity to be used for the WTP expansion. Combined with the proposed ozone and membrane filtration improvements, the new storage tank will provide operational storage for meeting peak hour demands along with the existing two (2) storage tanks at the WTP and reduce the instantaneous demand to the distribution system pump station and WTP. This “smoothing” of the production rate at the WTP will be beneficial for sizing distribution pumps and maintaining consistent operations at the WTP.

Scope of Services and Deliverables

Comments and Clarifications to the Scope, Schedule, and Fee

1. All customary WTP predesign and design engineering services including Civil, Architectural, Structural, Process, Mechanical/HVAC, Electrical, and Instrumentation and Controls are provided. Geotechnical and Survey Services are also included.
2. We will base the design drawings and associated basis of design report on the results of Task 200 – Alternatives Evaluation.
3. Bidding and Construction Phase Services: We have NOT included bidding assistance or construction phase services as a part of this proposal. Upon completion of the design we anticipate proposing for the addition of these services to our scope and fee. This approach allows the Town and AQUA to better assess the level of service required based on the final configuration of the WTP, the complexity involved with its construction, the type of bidding and construction delivery method selected and the costs associated with the level of service that is desired.
4. Permitting or CDPHE review fees are not included.

AQUA is open to modifying the Scope of Services to meet the Town’s need.

Our proposed Scope of Services and associated Deliverables are presented on the following page as a Task Workflow exhibit.

1

2

3

4

5

6

Outline of typical construction phase engineering and field services

Task 100 Project Initiation/Coordination

Key Tasks

Review Existing WTP Operations & Process Performance

- Develop general understanding of WTP operations, existing systems and equipment, and water quality (WQ) characteristics
- Review available WQ data and identify potential data gaps for sampling by Town

Facilitate Project Kickoff Meeting

- Review existing WTP operations and conditions
- Brainstorm the Town's objectives and critical success factors
- Identify the Town's desired level of service
- Identify key operational goals and constraints

Prepare TM #1 – Project Goals & Existing Conditions Summary

- Outline project objectives, level of service, operational goals, and critical success factors
- Summarize results of operations and treatment process reviews

Coordinate Project Activities

- Conduct regular progress meetings with the Town to review activities, schedule, and key findings; exchange ideas; coordinate activities; and identify issues/concerns to be addressed
- Maintain Action Items and Decision Logs to summarize key responsibilities and decisions during the project
- Monitor project scope, schedule and budget, and coordinate with team to proactively manage progress
- Collaborate with the Town to identify projects issues/concerns and modify tasks, deliverables and schedule to meet the Town's expectations
- Prepare monthly progress reports and invoices

QAQC (*All Tasks)

- Review deliverables for conformance with project requirements and industry standards

Deliverables

- Project Kickoff Meeting Agenda and Summary Notes
- Technical Memo #1 – Project Goals and Existing Conditions Summary
- Decision & Action Item Logs
- Monthly Project Updates and Invoices

Task 200 Evaluate Alternatives

Key Tasks

Conduct Draft Basis Site Visits & Data Reviews

- Inventory existing treatment processes, equipment and ancillary systems
- Record visual observations and collect field data, e.g., motor nameplate, pump capacities, switchgear capacity
- Identify data gaps to obtain from Town
- Prepare treatment and hydraulic capacity evaluation
- Collaborate with the Town staff to identify process alternatives
- Coordinate with the Town to solicit technology demonstrations by interested manufacturers
- Coordinate bench-/pilot-scale testing requirements to establish design criteria treatment equipment
- Conduct field investigations (site feature survey, subsurface geotechnical investigation, 3D LiDAR survey, subsurface utility survey, etc.)

Evaluate Alternatives

- Develop process schematics, flow balances, treatment performance and conceptual layouts
- Review proposed alternatives with the Town to receive input and brainstorm potential solutions to concerns/issues
- Develop planning level opinion of probable construction costs (OPCC) [AACE Class 5] and operational costs
- Prepare TM #2 – Alternatives Evaluation with summary of alternatives considered and relative advantages of each

Workshop No. 1

- Present alternatives for review with Town
- Facilitate the Town's ranking of alternatives using weighted evaluation criteria and select preferred alternative
- Discuss implementation of preferred alternative(s)

Deliverables

- Site Visits
- Site Survey / 3D Facility Model of Existing Filter Building
- Geotechnical Design Report
- TM #2 – Alternatives Evaluation
- Workshop No. 1 Agenda and Summary Notes
- TM #2 Review Comment and Responses

Task 300 Preliminary Design

Key Tasks

CMAR Procurement

- Prequalify contractors to respond to a CMAR request for proposals (RFP)
- Prepare and advertise RFP
- Evaluate proposals and make recommendation for selecting CMAR
- Assist Town with CMAR award letter

Draft Basis of Design Report (BDR)

- Develop design criteria summary for the evaluated filtration and T&O processes
- Summarize proposed and preferred alternatives incorporated in the project
- Define operational and equipment design criteria for evaluated equipment
- Prepare summary permit matrix for coordinating phasing and regulatory reviews, i.e., CDPHE construction approval, grading permit, building permit

Prepare 30% Progress Design Package

- Solicit quotes and submittals from equipment vendors
- Preselect filtration and T&O equipment manufacturers
- Develop preliminary progress drawings of proposed improvements including site layouts, equipment arrangements, building elevations, electrical one-line diagrams, and process diagrams
- Prepare table of contents for specifications in CSI format
- Update OPCC (AACE Class 4)
- Submit package to the Town for review
- Submit preselected equipment packages and design criteria to CDPHE for review/approval

Workshop No. 2a

- Review filtration equipment quotes and recommendation of filtration supplier
- Select filtration supplier/equipment

Workshop No. 2b

- Review T&O equipment quotes and recommendation of T&O process
- Select T&O supplier/equipment

Pre-Purchase Selected Equipment

- Assist with development of pre-purchase contracts for selected equipment

Deliverables

- CMAR - RFP, Evaluation and Award
- 30% Design Progress Review Package
- Workshops No. 2a and 2b Agendas and Summary Notes
- Preselected equipment packages.
- Equipment Pre-Purchase (by Town)

Task 400 60% Progress Design

Key Tasks

Prepare 60% Progress Design Package

- Coordinate with Town to incorporate Town's Contract for Construction and other Division 0 specifications in CSI format
- Respond to the Town's 30% review comments
- Advance the design drawings to the 60% design progress level
- Compile draft technical specifications for major equipment, e.g., for purchase by CMAR
- Update BDR with specific engineering design criteria for structures, equipment and other design features included in the project
- Submit package to the Town for review

Workshop No. 3

- Conduct review meeting to present preliminary site plan, facility layouts, and discuss key issues and receive direction from the Town
- Present detailed progress plans for improvements including treatment process equipment, building sections, and electrical equipment
- Review OPCC estimates and budgetary quotes from manufacturers
- Discuss overall implementation plan for constructing project and sequencing of work

Finalize BDR

- Respond to the Town's Draft BDR comments
- Submit draft Final BDR to the Town for review
- Facilitate introductory meeting with the Town and CDPHE to review proposed improvements, project schedule and applicable design criteria
- Respond to technical comments provided by CDPHE

Deliverables

- 30% Design Review Comment-Response Log
- Draft Final BDR
- 60% Design Progress Review Package

Task 500 Final Design

Key Tasks

Prepare Final Design Package

- Respond to the Town's 60% review comments
- Provide final updates to and finalize BDR
- Finalize design drawings
- Finalize technical specifications
- Submit final design review package to the Town for review
- Incorporate the Town's final design review comments after Workshop No. 4 into the final plans and specifications
- Prepare final plans and specifications for Issue for Bid release to CMAR

Prepare CDPHE Construction Approval Application

- Prepare Construction Approval Permit application for submitting to CDPHE
- Compile hard and electronic copies for authorization by the Town and submittal to CDPHE

Workshop No. 4

- Conduct review meeting to discuss remaining issues and receive direction from the Town
- Review implementation plan for constructing project and sequencing of work

Deliverables

- 60% Design Review Comment-Response Log
- CDPHE Meeting Summary Notes
- Final BDR
- Final Design Progress Review Package
- CDPHE Construction Approval Permit Application
- Issue for Bid Contract Documents, plans and specifications

Task 600 Construction Services

Key Tasks

Construction Engineering Services

- Facilitate preconstruction conference with Town, AQUA, and CMAR team
- Coordinate with the Town to manage electronic construction records
- Facilitate bi-weekly progress meetings
- Review CMAR's monthly pay apps and redline markups to Contract Documents
- Review shop drawing submittals/materials testing results
- Clarify contract documents as needed
- Review & respond to CMAR RFI/PCO
- Prepare recommended FO and WCDs for Town
- Incorporate above responses/changes to the contract into Change Orders

Field Services

- Onsite RPR to monitor/observe work conforms to Contract
- Regular engineering site visits to observe construction progress and
- Review CMAR and manufacturer start-up and training activities
- Operational overview for training and start-up

Construction Closeout

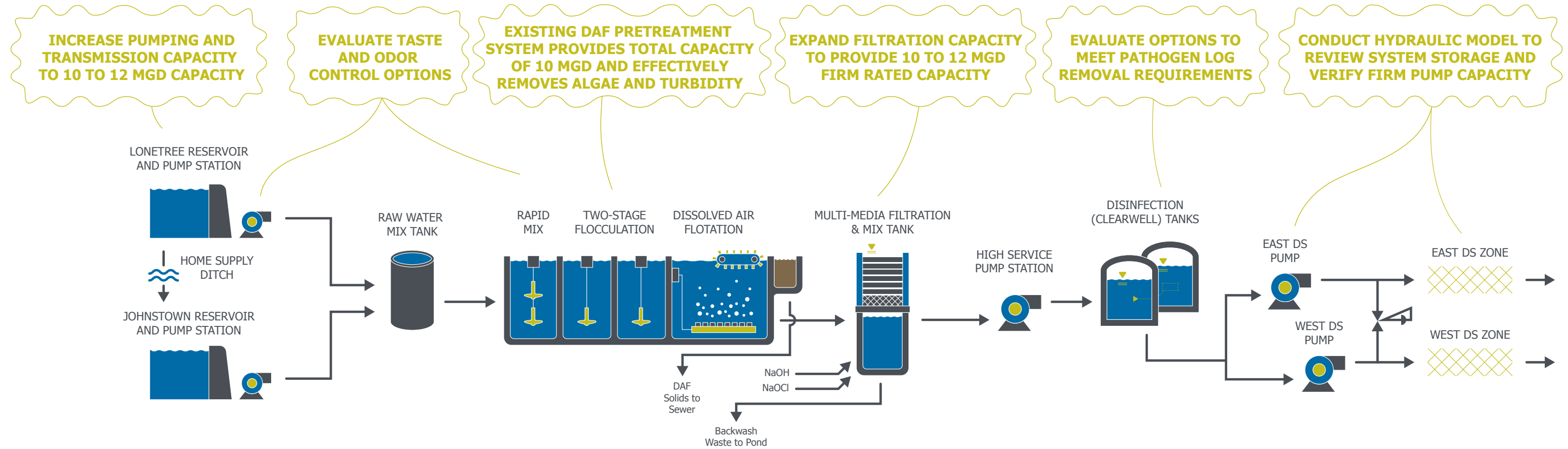
- Conduct punch list review
- Conduct final completion walkthrough to resolve final punch list
- Prepare record drawings
- Conduct warranty and performance reviews of work
- Prepare performance review memoranda for Town

Deliverables

- Pay Application Reviews
- Submittal Review Comments
- RFI and PCO Response
- FO, WCD and CO for Town's authorization
- RPR and Engineering Observation Reports
- Substantial/Final Completion Punch Lists
- Warranty Review Visits and Memos

Figure 1 - WTP Expansion Considerations

GENERAL PROJECT CONSIDERATIONS



HYDRAULIC/TREATMENT CAPACITY EVALUATION

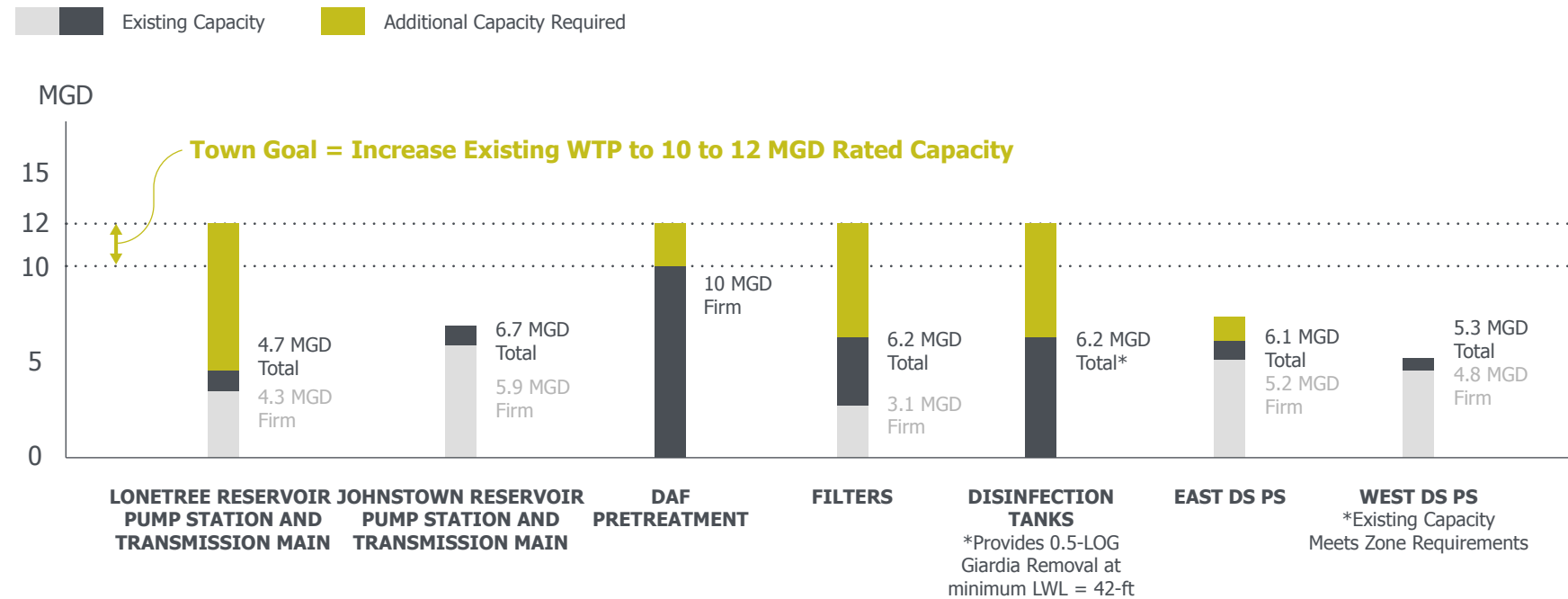
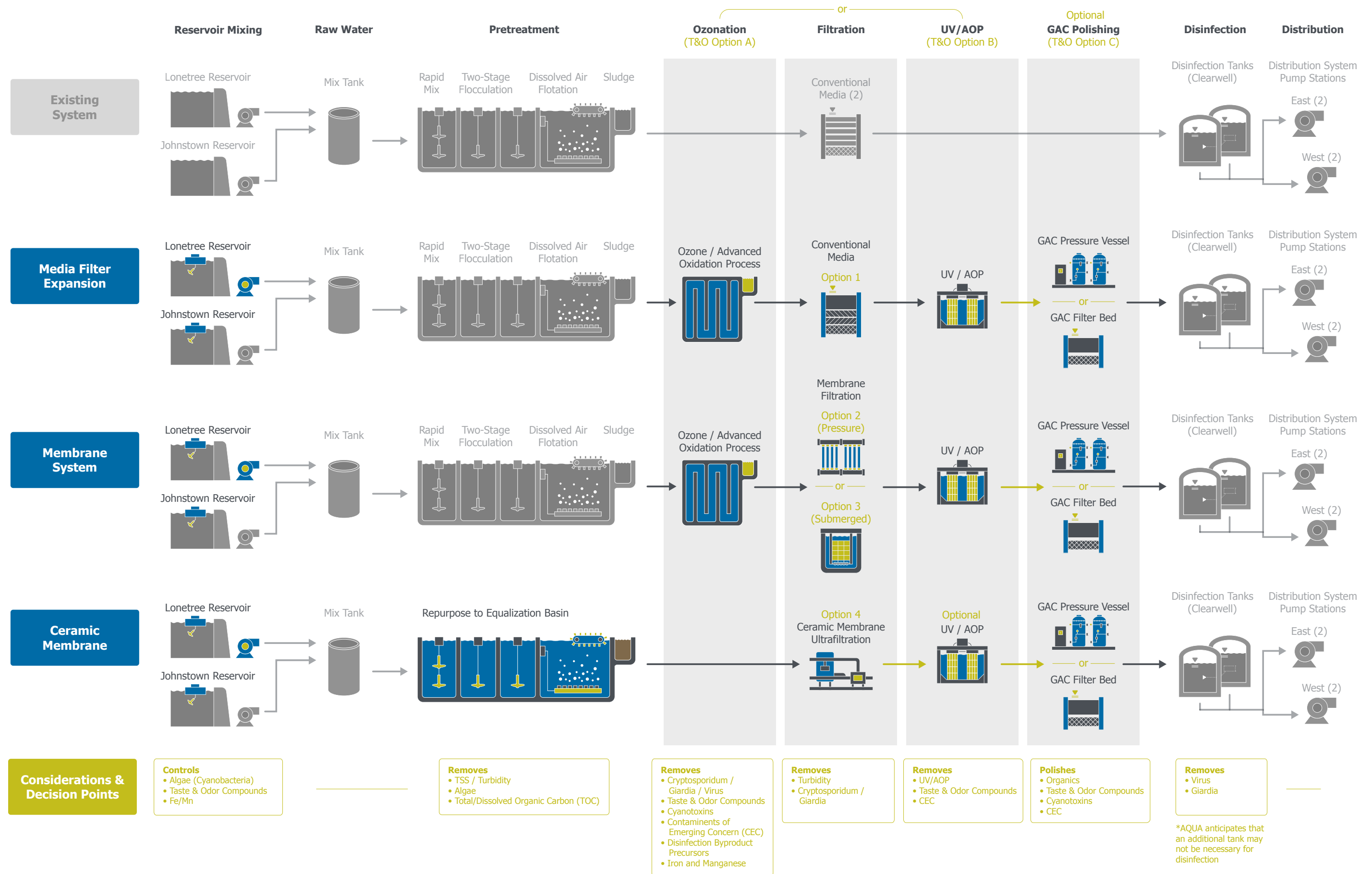
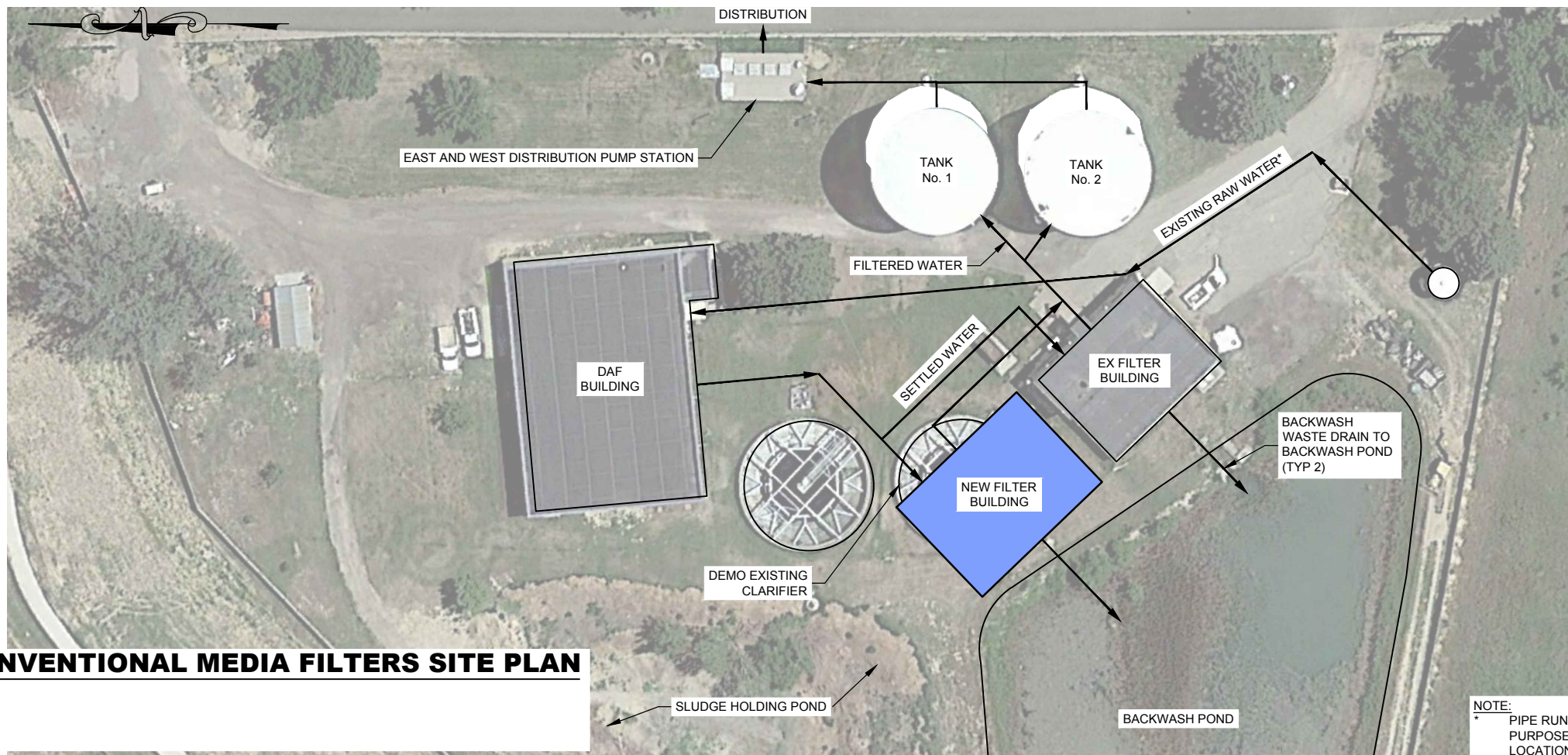


Figure 2 - Treatment Alternatives Evaluation Schematic



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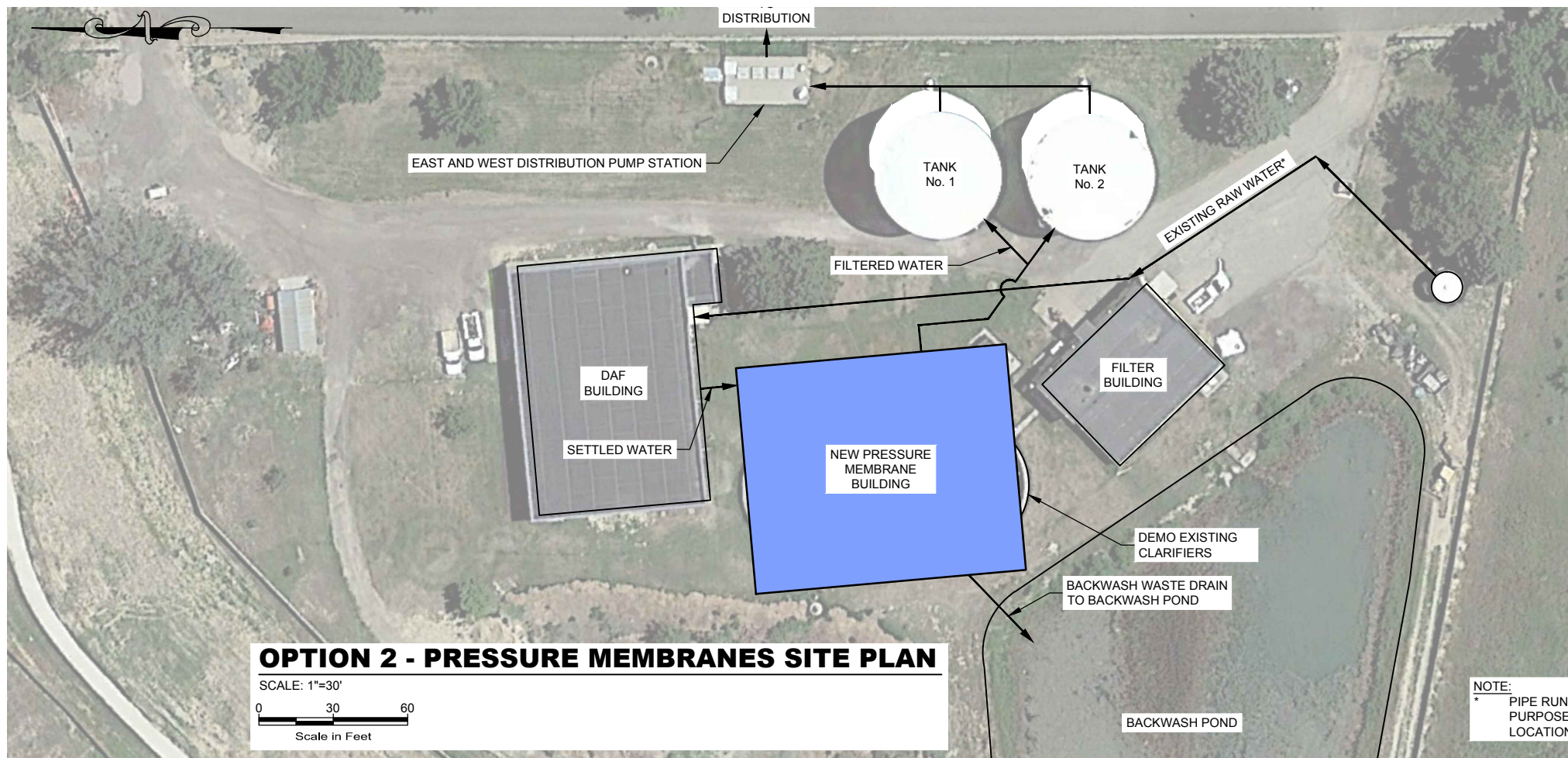


OPTION 1 - CONVENTIONAL MEDIA FILTERS SITE PLAN

SCALE: 1"=30'
 0 30 60
 Scale in Feet

NOTE:
 * PIPE RUNS NOTED FOR SCHEMATIC PURPOSES ONLY. BURIED PIPE LOCATIONS TO BE VERIFIED.

DRAWING IS TO SCALE IF BAR MEASURES: 1" = FULL SCALE 1/2" = HALF SCALE				
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OPTION 2 - PRESSURE MEMBRANES SITE PLAN

SCALE: 1"=30'
 0 30 60
 Scale in Feet

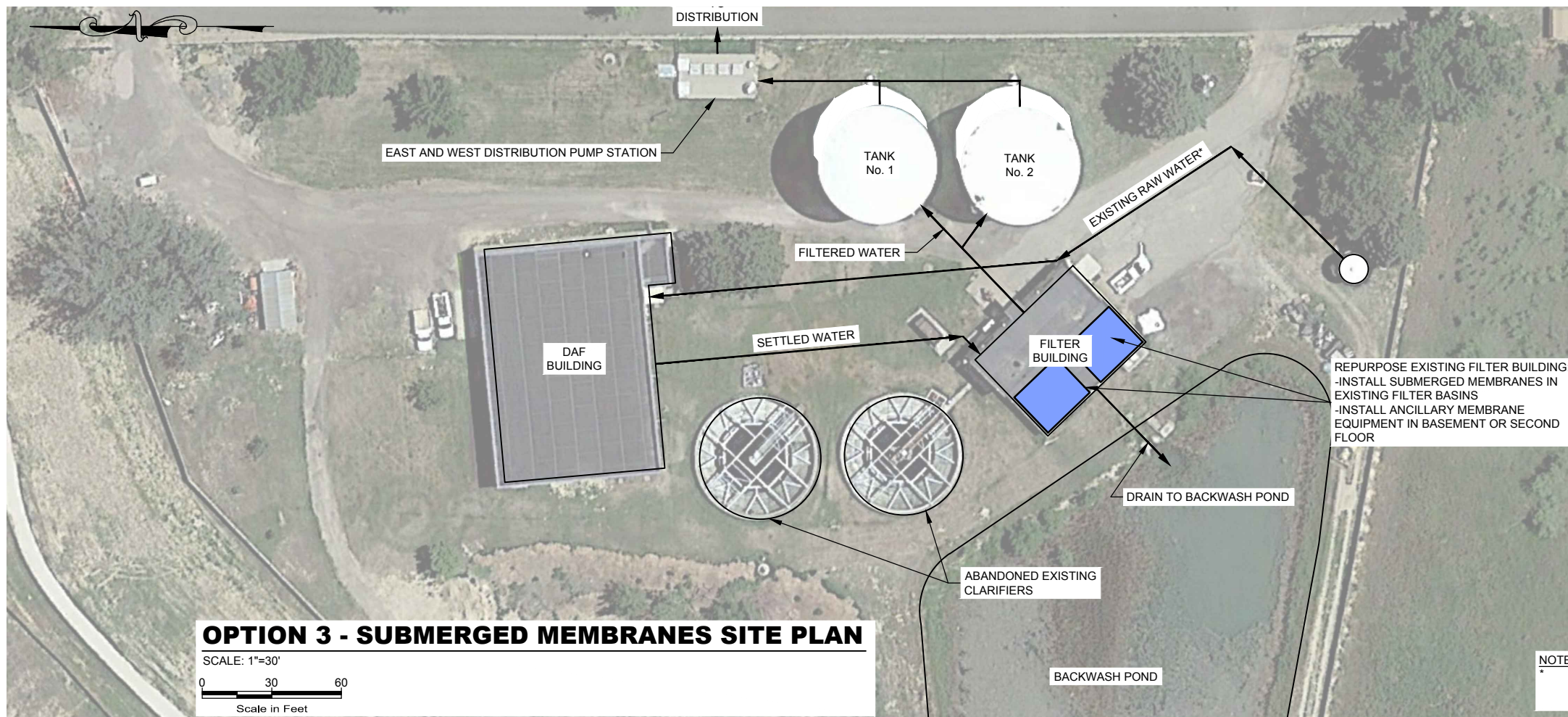
NOTE:
 * PIPE RUNS NOTED FOR SCHEMATIC PURPOSES ONLY. BURIED PIPE LOCATIONS TO BE VERIFIED.

PRELIMINARY
 NOT FOR CONSTRUCTION OR RECORDING

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 WATER TREATMENT PLANT EXPANSION
 23205 CO RD 13 JOHNSTOWN, CO 80534
 CONVENTIONAL FILTER AND
 PRESSURE MEMBRANE SITE PLAN



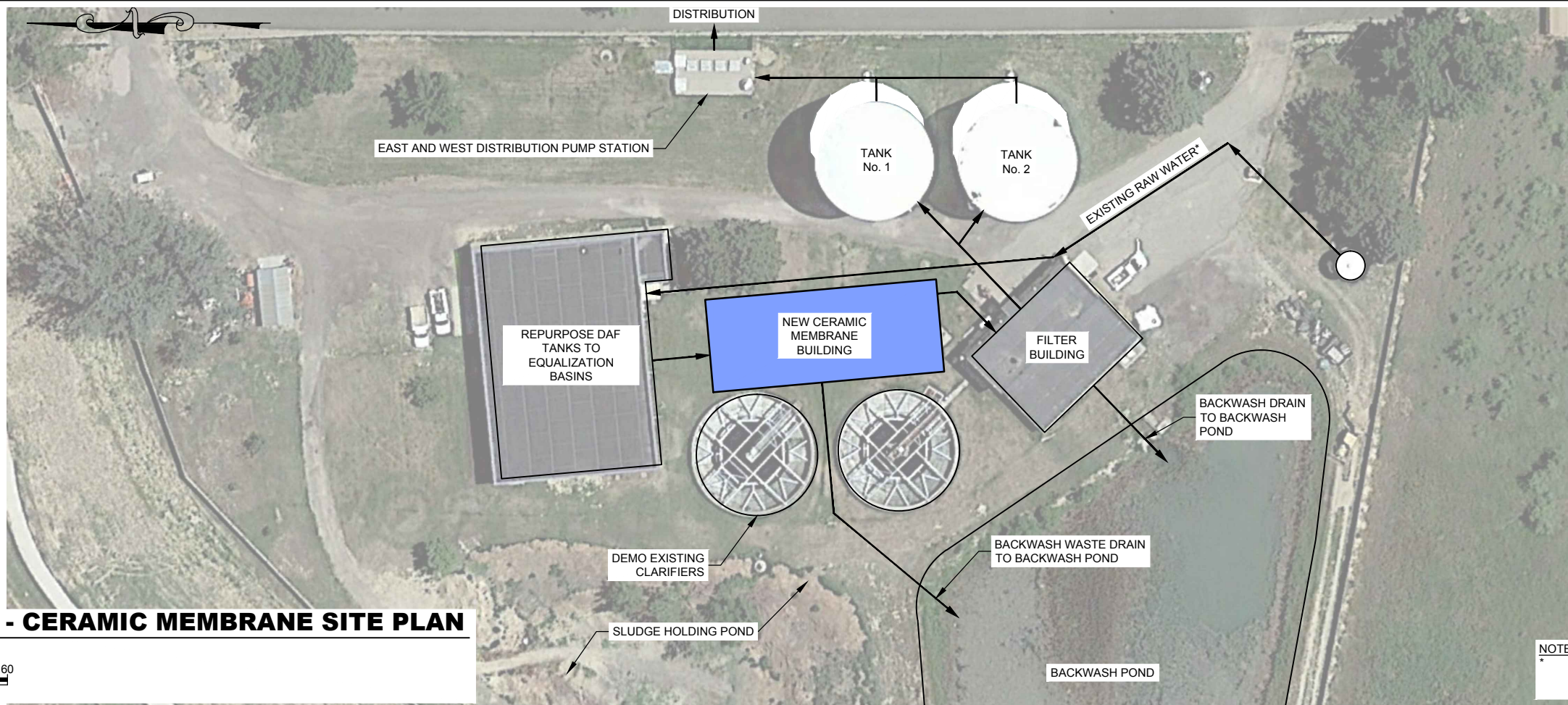
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FIGURE 3-1
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OPTION 3 - SUBMERGED MEMBRANES SITE PLAN

SCALE: 1"=30'
 0 30 60
 Scale in Feet

NOTE:
 * PIPE RUNS NOTED FOR SCHEMATIC PURPOSES ONLY. BURIED PIPE LOCATIONS TO BE VERIFIED.



OPTION 4 - CERAMIC MEMBRANE SITE PLAN

SCALE: 1"=30'
 0 30 60
 Scale in Feet

NOTE:
 * PIPE RUNS NOTED FOR SCHEMATIC PURPOSES ONLY. BURIED PIPE LOCATIONS TO BE VERIFIED.

DRAWING IS TO SCALE
 IF BAR MEASURES:
 1" = FULL SCALE
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 WATER TREATMENT PLANT EXPANSION
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 MEMBRANE GRAVITY FILTER AND
 CERAMIC MEMBRANE SITE PLAN

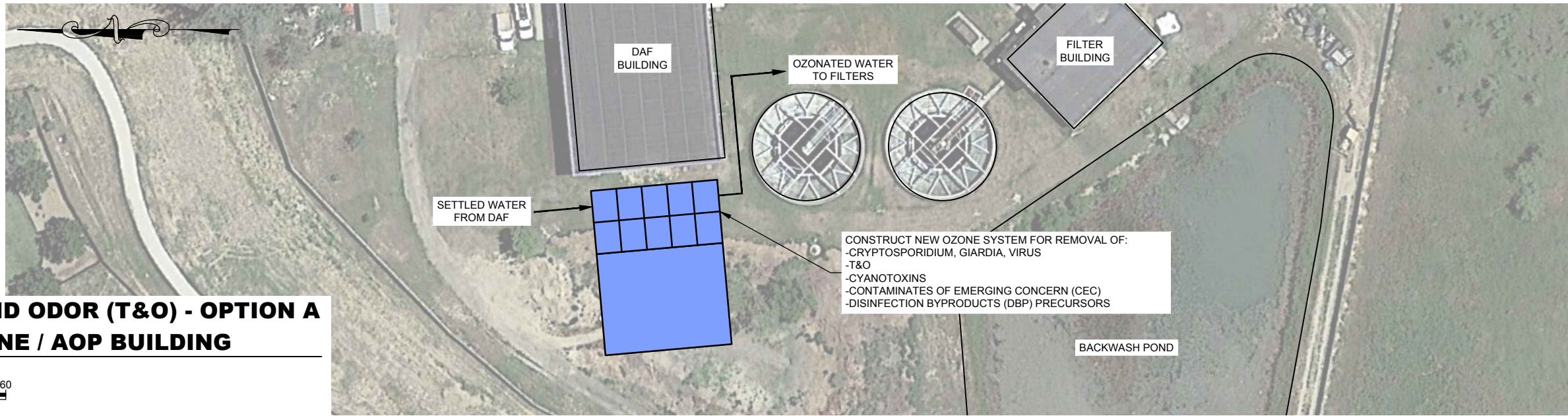


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FIGURE 3-2

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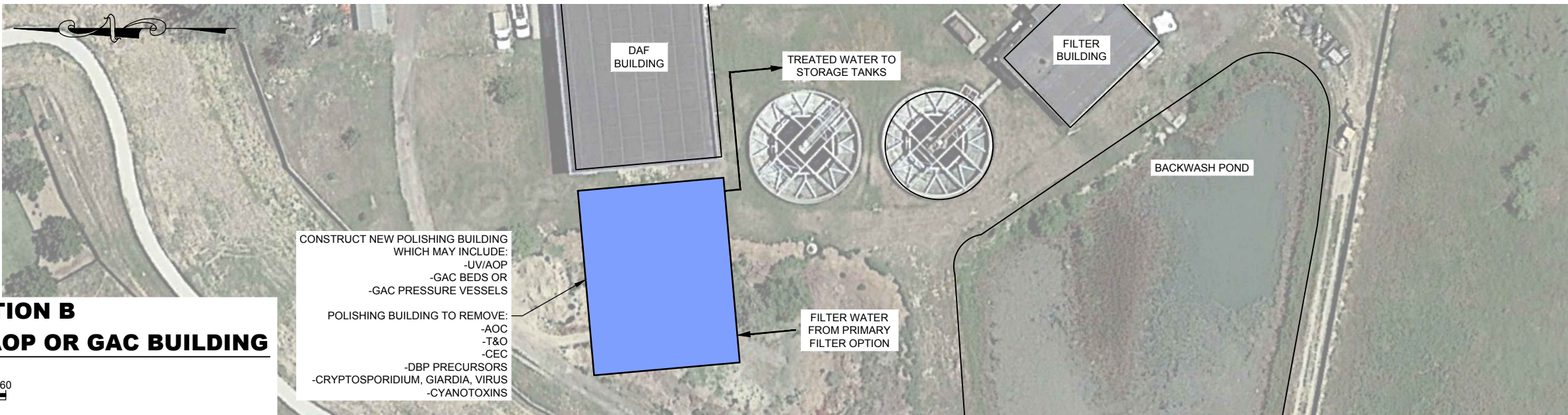
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2/5/2021 C:\USERS\KEITH\AQUA ENGINEERING\001_3_003 JOHNSTOWN WTP EXPANSION - GENERAL\DRAWING\FIGURES\FIGURE 3-2.DWG



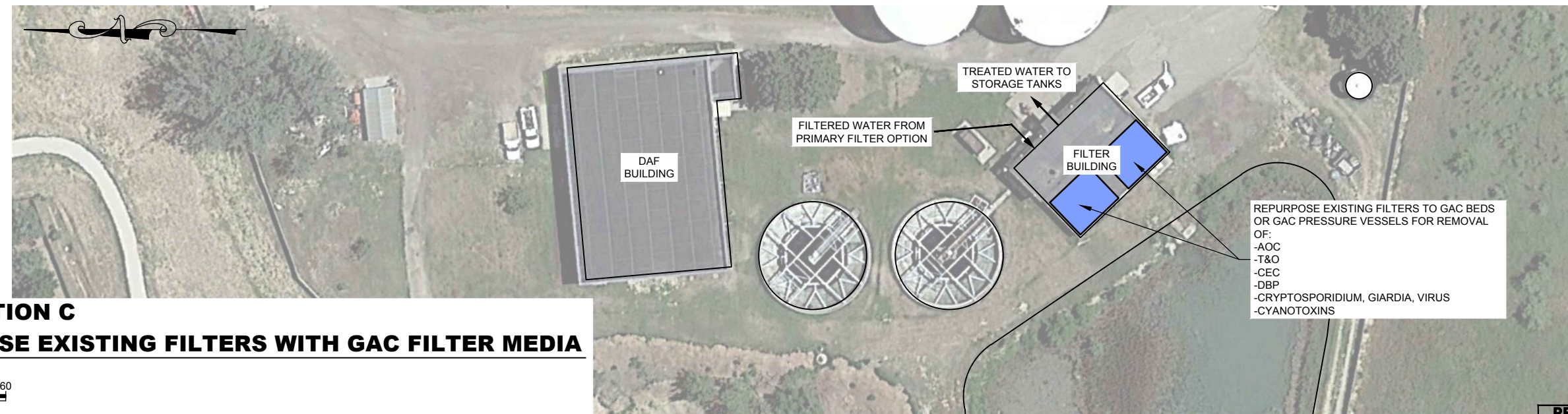
**TASTE AND ODOR (T&O) - OPTION A
 NEW OZONE / AOP BUILDING**

SCALE: 1"=30'
 0 30 60
 Scale in Feet



**T&O - OPTION B
 NEW UV/AOP OR GAC BUILDING**

SCALE: 1"=30'
 0 30 60
 Scale in Feet



**T&O - OPTION C
 REPURPOSE EXISTING FILTERS WITH GAC FILTER MEDIA**

SCALE: 1"=30'
 0 30 60
 Scale in Feet

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 WATER TREATMENT PLANT EXPANSION
 23205 CO RD 13 JOHNSTOWN, CO 80534
 TASTE AND ODOR IMPROVEMENTS
 SITE PLAN

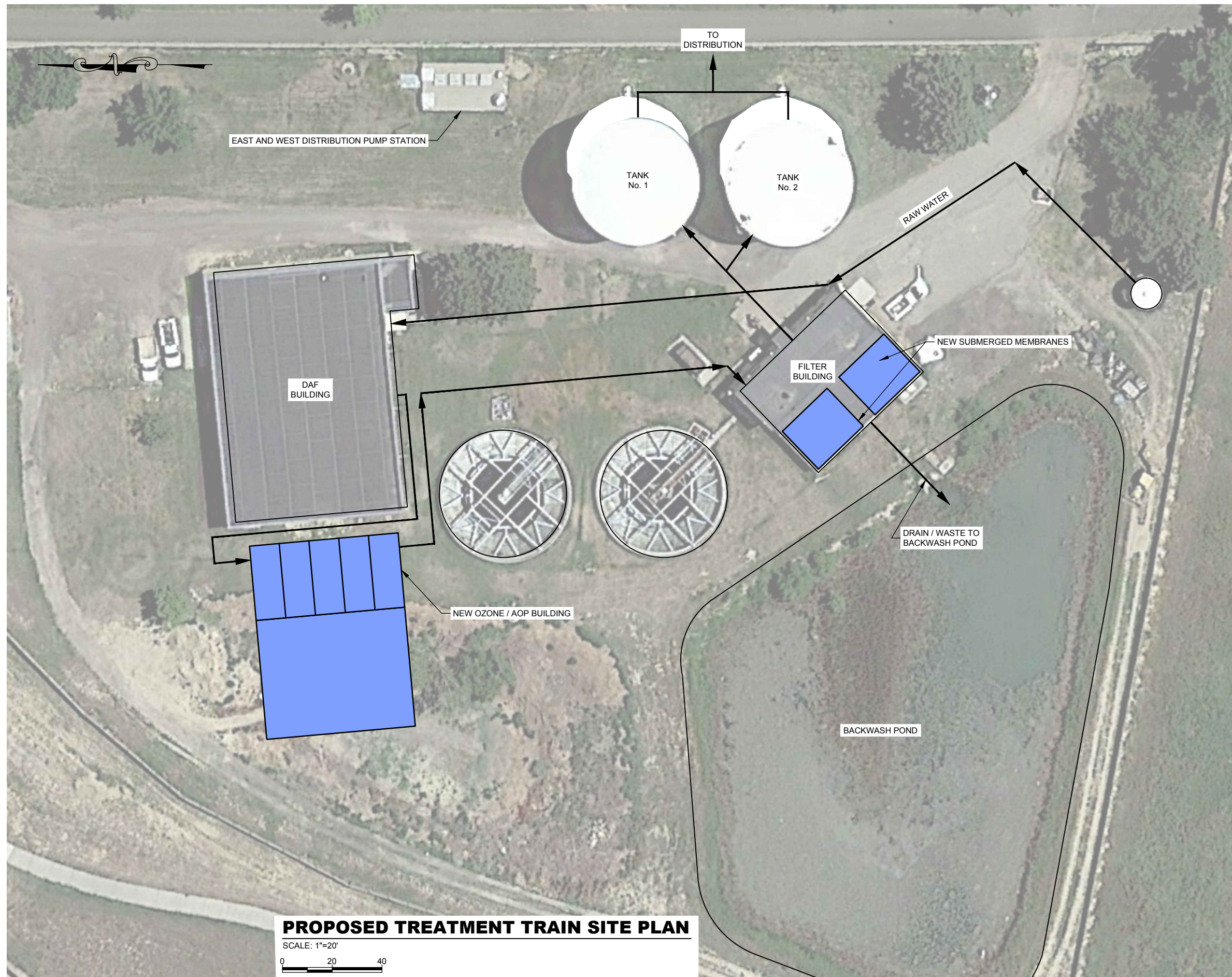


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2/4/2021 C:\USERS\KEITH.RINDT\AQUA ENGINEERING\001_3 003 JOHNSTOWN WTP EXPANSION - GENERAL\DRAWING\FIGURES\FIGURE 3-4.DWG



PROPOSED TREATMENT TRAIN SITE PLAN
 SCALE: 1"=20'
 0 20 40
 Scale in Feet

DRAWING IS TO SCALE
 IF BAR MEASURES:
 1" = FULL SCALE
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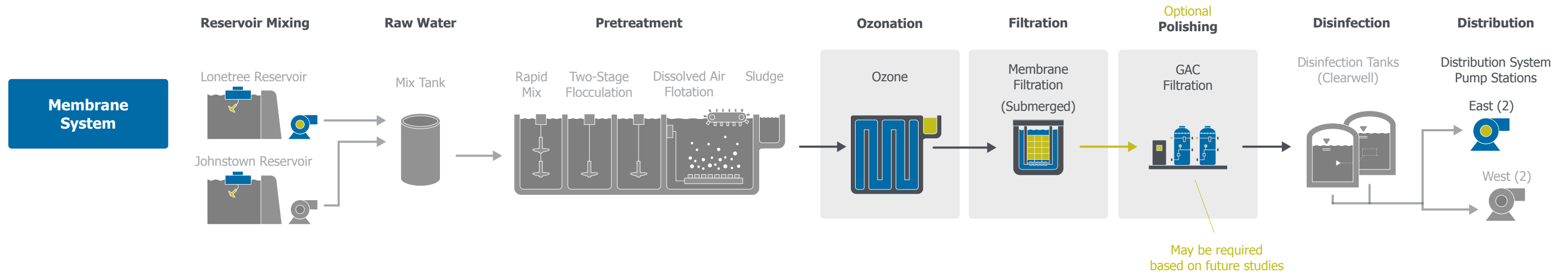
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 WATER TREATMENT PLANT EXPANSION
 23205 CO RD 13 JOHNSTOWN, CO 80534
 CIVIL
 PROPOSED TREATMENT TRAIN
 SITE PLAN



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PRELIMINARY
 NOT FOR CONSTRUCTION OR RECORDING

Figure 4 - Proposed Treatment Train



Treatment Train Value Points

Install Reservoir Mixers to Manage:

- Algae (Cyanobacteria)
- Taste & Odor
- Iron and Manganese

Expand Pump Station to Increase Capacity to 10 to 12 MGD

Maintain Existing DAF* Pretreatment to Remove:

- TSS
- Algae
- Total/Dissolve Organic Carbon
- Turbidity

*With possible re-rating or improvements to increase capacity to 12 MGD

Install New Ozone System to Remove:

- Cryptosporidium / Giardia / Virus
- Taste & Odor
- Cyanotoxins
- Contaminants of Emerging Concern
- Disinfection Byproduct Precursors

Replace Media Filters with Submerged Membranes to Remove:

- Turbidity
- Cryptosporidium / Giardia

Consider GAC to Polish:

- AOC
- Giardia / Virus
- Taste & Odor
- Cyanotoxins
- Contaminants of Emerging Concern
- Disinfection Byproduct Precursors

Maintain Existing Storage and Disinfection to Remove:

- Virus

Increase East PS Capacity to provide 7.4 MGD Capacity:

- Virus



Section 3

Management Approach

SECTION 3 - MANAGEMENT APPROACH

Collaborative Management Approach

AQUA recognizes that the most important success factor for any project is effective communication and collaboration between all stakeholders, accountability, and documentation of key decisions. This team development process must continue from the conceptual and planning stages of the project all the way through facility start-up and commissioning.

Our collaborative approach will take the Town of Johnstown from the very first meeting through the final and successful commissioning of the facility and will include the following elements:

- ✓ Clear understanding of the Project Objectives and Success Criteria.
- ✓ Development and acceptance of Project Work Plan and Critical Path Project Schedule.
- ✓ Regularly Scheduled Conference Calls between AQUA and the Town.
- ✓ Regularly Scheduled Coordination Meetings / Calls between AQUA's team members.
- ✓ Budget, Progress Tracking, and Progress Status Updates.
- ✓ Deliverable Review Meetings & Workshops with AQUA, the Town, and Ramey Environmental Compliance.



Project Management Tools

AQUA's approach to controlling project budget and schedule includes a pre-planning process to identify Project tasks, duration, and associated personnel efforts. A Work Plan will be used to establish the major tasks, deliverables, and task durations to confirm the project effort for each task. Microsoft Project will also be used to document the major components of the project and to tie the individual work tasks with the resource needs.

Cost Controls

The engineering budget for the scope of services will be tracked using our accounting software in combination with an internet cloud-based Microsoft Project Server with the work breakdown structure outlined in the Work Plan. Associated resource costs for major tasks are compared with the overall project schedule, to identify progress along with the fees incurred for the invoice period. In addition, costs will be controlled by using team members with significant experience or particular knowledge of the project to complete specific tasks.

Project Status Reporting System

The AQUA team will provide progress status updates and facilitate necessary discussions. AQUA will schedule and prepare an agenda for each meeting and administer the meeting. Meeting discussions will include a report on progress, present critical issues for discussion and decision-making. As a follow up to the meetings AQUA will prepare meeting notes.



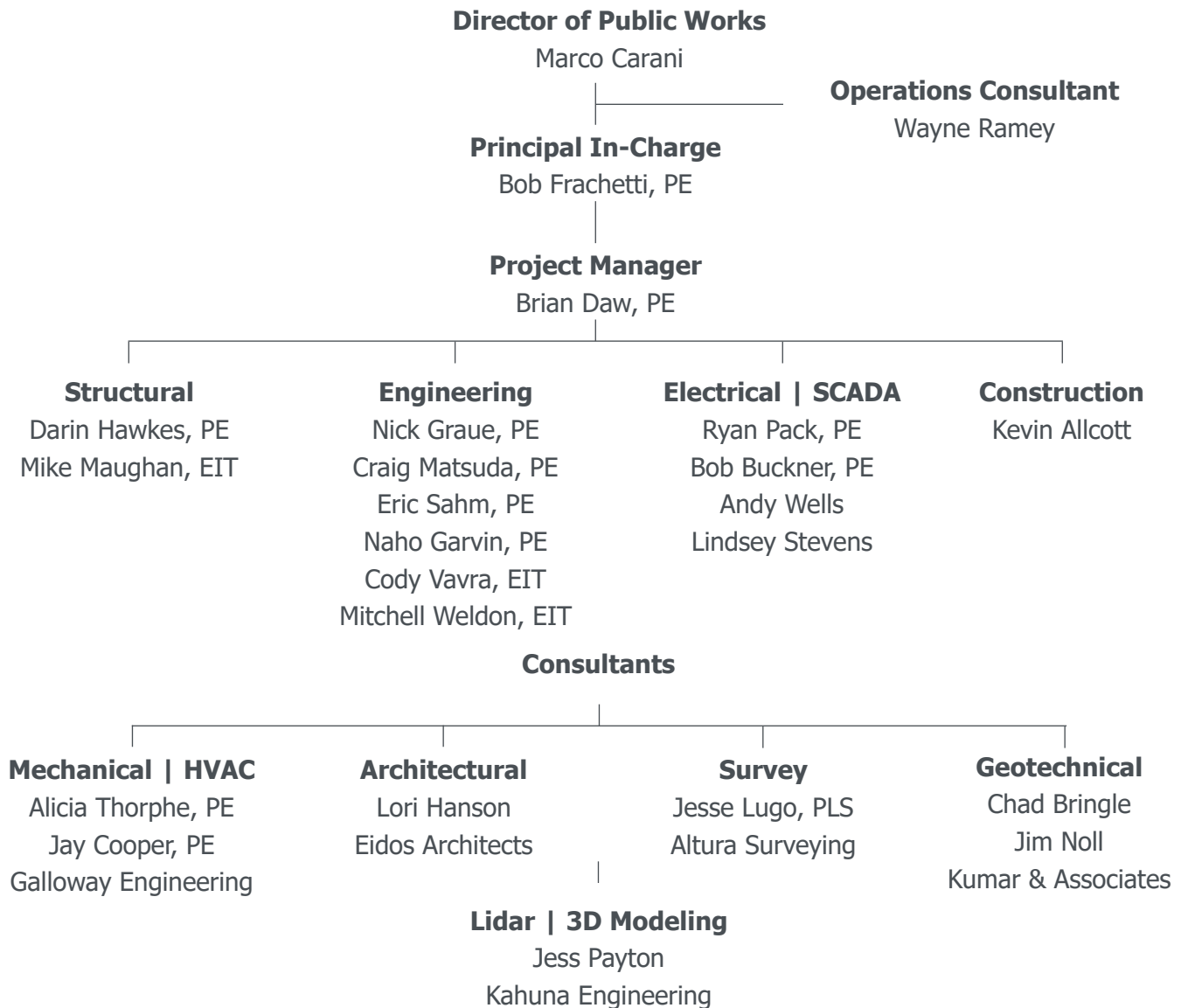
Section 4

Staff Qualifications

SECTION 4 - STAFF QUALIFICATIONS

Your Water Treatment Team!

AQUA has assembled a team of experts and specialists to provide the Town with the right combination of skills and experience to meet the requirements and expectations associated with the Johnstown WTP Expansion project. Our proposed project team has similar experience locally and throughout the country, including upgrades and/or conventional capacity expansions. This team is readily available and prepared, fully committed, and passionate about working with the Town.



SECTION 4 | STAFF QUALIFICATIONS

Key Personnel

Bio's for our key personnel follow. Team Resumes are included in Appendix A for your reference.



Bob Frchetti, P.E. | Principal in Charge

Contact: bob.frchetti@aquaeng.com | 801.683.1251

Education: BS Civil and Environmental Engineering, Clarkson University, Potsdam NY

Licenses: Professional Engineer | CO, NM

Location: AQUA Colorado | 5325 S Valentia Way, Greenwood Village, CO 80111

Bob has over 29 years of project management and technical experience in virtually all areas of water and wastewater engineering including facilities planning, permitting, design, construction, facility commissioning, performance evaluations, and energy efficiency audits. His strengths include process modeling and design, technology and equipment selection, detailed design engineering, energy efficiency upgrades, hydraulics, and construction engineering and management. He also has significant experience with integrated project delivery methods including design-build, CMAR, and performance contracting.

Douglas Sullivan | Acting PE
W, WW & Stormwater | City of
Boulder | 303.263.0708
Relationship: Client Reference

Daymon Johnson, Public Works
Director, Town of Bennett
720.273.9528
Relationship: Client Reference

Parker Newbank III, Eagle River
Water & Sanitation District
970.471.1326
Relationship: Client Reference



Brian Daw, P.E., ENV SP | Project Manager

Contact: briandaw@gmail.com | 303.249.7510

Education: M.S Civil and Environmental Engineering, University of Colorado Boulder
B.S. Civil Engineering California Polytechnic State University, San Luis Obispo

Licenses: Professional Engineer | CO, CA

Located in Denver, Brian brings 25 years of civil engineering and project management experience with the evaluation, planning, design, and construction administration of water and wastewater treatment and infrastructure projects for municipal and industrial clients. Brian is a registered professional civil engineer specializing in potable water treatment including pretreatment, filtration and disinfection process design; residuals handling systems; chemical feed systems; and storage and distribution system modeling and conveyance design. He also has valuable experience guiding utilities with long-term planning efforts that address the variety of treatment, processes, distribution, storage, and general facility issues and improvements that small and large utilities face.

Brian's project responsibilities regularly include leading multi-disciplined engineering teams during treatment evaluations used to identify and develop recommendations for implementing capital and operations projects.

Stephen Grooters, PE, CWP, ENV
SP Engineering Services Manager
City of Boulder | 303.441.3242
Relationship: Client Reference

Julie Koehler, PE, ENV SP
Utilities Engineering Manager
City of Westminster | 303.658.2178
Relationship: Client Reference

Scott O'Brien, CWP, Public Works
Director | Town of Dillon
970.262.3408
Relationship: Client Reference

SECTION 4 | STAFF QUALIFICATIONS



Darin Hawkes, P.E. | Principal | Structural Engineer

Contact: darin.hawkes@aquaeng.com | 801.683.3727

Education: B.S. Civil Engineering, University of Utah

Licenses: Professional Engineer | UT, CO

Location: AQUA Utah | 533 W 2600 S Suite 275, Bountiful, UT 84010

Mr. Hawkes' has a vast amount of experience in various civil engineering disciplines. He specializes in difficult projects that often have space, access and/or extreme time constraints. He has developed a reputation for being able to view a problem from multiple angles to develop a solution that works for his client. His experience ranges from pumping system design, concrete storage tanks and open reservoir design, to large concrete water storage facilities and high elevation snowmaking reservoirs and dams. Many of his projects are provide as turn-key solutions for his clients with his direct involvement from conceptual design through contract administration and project close-out. As part of the AQUA team, he has lead and assisted in the completion of several System Capacity Analyses, Municipal Capital Facility Plans and large-scale Master Plans for both culinary water and wastewater.

Scott Morrison, General Manager,
Mountain Regional Water SSD
435.940.1916
Relationship: Client Reference

Ron Salvesen, City Administrator,
City of Hyrum
435.245.6033
Relationship: Client Reference

Chris Melville, City Manager
City of West Wendover
775.664.3084
Relationship: Client Reference



Nick Graue, P.E. | Senior Project Engineer

Contact: nick.graue@aquaeng.com | 801.683.3733

Education: B.S. Civil Engineering, University of Utah, 2013

Licenses: Professional Engineer | UT, CO

Location: AQUA Utah | 533 W 2600 S Suite 275, Bountiful, UT 84010

Mr. Graue is an intensely ambitious Professional Engineer and Project Manager backed by over a decade of experience in the Water and Energy sectors with a proven track record of successful project delivery and program implementation. Nick's deep passion for natural resource conservation has steered him to managing engineering projects where technology can be leveraged to achieve a more sustainable infrastructure. Nick's work experience involves the entire life cycle of engineering projects, from capital planning feasibility analyses and engineering design to contract administration, construction management, facility commissioning and operations consulting. Nick is particularly adept at managing multi-disciplinary projects where tight coordination between discipline leads is of paramount importance. Prior to his time with AQUA, Nick was employed by Park City, UT as Public Utilities Engineer where he managed the water system hydraulic model, GIS and asset management programs, performed water system master planning, and assisted in the planning, engineering and construction management of capital infrastructure projects.

Scott Morrison, General Manager,
Mountain Regional Water SSD
435.940.1916
Relationship: Client Reference

Ron Salvesen, City Administrator,
City of Hyrum
435.245.6033
Relationship: Client Reference

Chris Melville, City Manager
City of West Wendover
775.664.3084
Relationship: Client Reference

SECTION 4 | STAFF QUALIFICATIONS



Ryan Pack, P.E. | Principal | Electrical/SCADA Engineer

Contact: ryan.pack@skmeng.com | 801.683.3761

Education: BS Electrical Engineering, University of Utah | MBA , Weber State University

Licenses: Professional Engineer | UT, ID, NV, WY, CO, HI, NM

Location: SKM | 533 W 2600 S Suite 25, Bountiful, UT 84010

Mr. Pack has experience with many components of SCADA and controls. He has worked with controls as simple as relay logic and PID loop controllers thru complex radio controlled SCADA systems. He has worked with many different programmable logic controllers and Operator interfaces including Allen Bradley, Control Microsystems, GE, Koyo, Modicon, Siemens, and others. He has utilized many software packages for human machine interface including Allen Bradley, GE Proficy (Intellution), Wonderware, and National Instruments Lookout. He has designed and installed new systems, replaced old systems, and expanded existing control systems. Mr. Pack has worked with many communications systems including radio, fiberoptics, ethernet, serial, and proprietary communications systems such as controlnet and profibus. He has conducted numerous path studies, for both licensed and non-licensed radio communications systems. He has designed and installed radio telemetry systems with over 50 remote sites.

Omar Hammoud
President APG Neuros
450-939-0799
Relationship: Client Reference

David Richards, Water Department
Engineer, City of Idaho Falls |
208.612.8471
Relationship: Client Reference

Matt Meyers, South Davis Sewer
District Engineer (WRR)
801.295.3469
Relationship: Client Reference



Kevin Allcott | Construction Engineer

Contact: kevin.allcott@aquaeng.com | 801.683.3724

Education: B.S. Construction Management, Boise State University

Location: AQUA Utah | 533 W 2600 S Suite 275, Bountiful, UT 84010

Mr. Allcott has over 32 years experience in the construction industry. As a construction manager for AQUA, Mr. Allcott specializes in construction oversight, contract administration, dispute resolution, and construction management. His experience has included trouble shooting, scheduling, contract dispute resolution and performance measurement systems implementation on projects ranging in value from \$2.5 to \$350 million. Mr. Allcott has developed sophisticated computer models of complex construction projects for use in project management as well as recovery plans. These models have also been used to determine cause and affect relationships between changes and increased costs. He has assisted in the defense of claims for additional compensation on several multi-million-dollar constructions projects.

Jeff Walker, Stellar J Corporation
360.518.5097
Relationship: Client Reference

Kathy Parker
208.869.7537
Relationship: Personal Reference

Mike Wright, Giza Development
801.809.3958
Relationship: Client Reference

SECTION 4 | STAFF QUALIFICATIONS

Alicia Thorpe, PE | Sr. Mechanical Project Engineer

Contact: aliciathorpe@gallowayus.com | 970.800.3300

Education: Bachelor of Science in Architectural Engineering, University of Wyoming, 1997

Licenses: Professional Engineer | CO

Location: 5265 Ronald Reagan Blvd., Suite 210 Johnstown, CO 80524

Alicia offers more than 20 years of experience as a project manager in mechanical HVAC design. She is dedicated to building client relationships and providing the highest level of service. Alicia has worked extensively on a wide variety of projects, including commercial, municipal and educational facilities.

Tricia Quigley

HDR, Inc.

Phone: 303.565.7696

Relationship: Professional Reference

Mark Beebe

HDR, Inc.

Phone: 303.318.6353

Relationship: Professional Reference

Dean Smith

Shears Adkins Rockmore Architects.

303.436.9551

Relationship: Professional Reference

Jay Cooper, PE | Mechanical Project Engineer

Contact: jaycooper@gallowayus.com | 970.800.3300

Education: Bachelor of Science in Mechanical Engineering, Colorado State University, 2015

Licenses: Professional Engineer | CO

Location: 5265 Ronald Reagan Blvd., Suite 210 Johnstown, CO 80524

Jay offers five years of experience in mechanical engineering. Jay is a results-driven engineer who uses his knowledge of the building construction process for the benefit of all project stakeholders. He has efficiently designed mechanical and plumbing systems for a wide variety of clients, with a strong base of knowledge in multifamily, commercial and municipal projects. Jay has experience coordinating with internal and external team members to ensure a successful project.

Don Watkins

Belford Watkins Group

Phone: 970.212.1243

Relationship: Professional Reference

James Ohlson

r4 Architects

Phone: 970.224.0630.

Relationship: Professional Reference

Kristin Tresner

Shears Adkins Rockmore Architects

Phone: 303.436.9551

Relationship: Professional Reference



Section 5

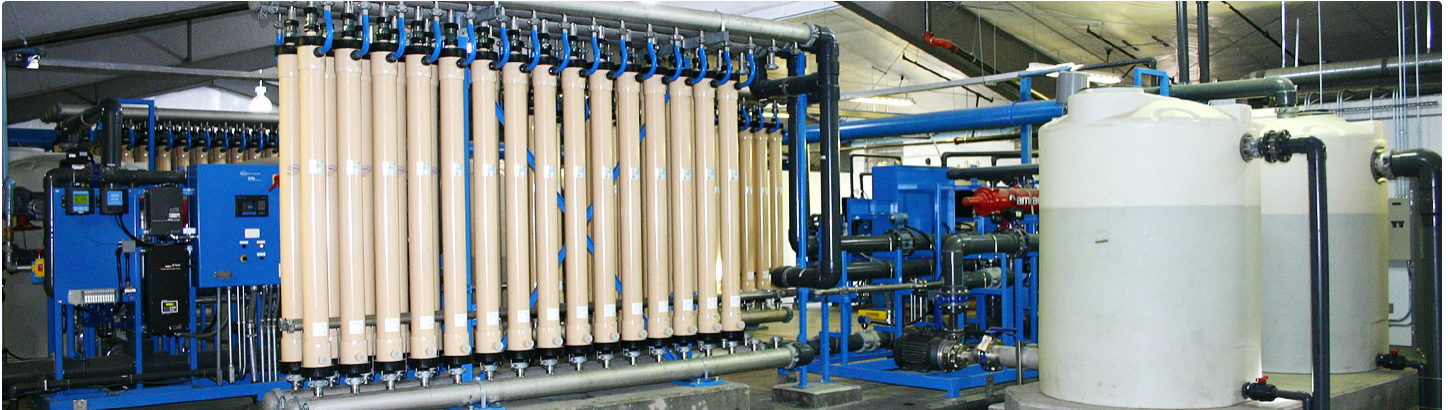
Project Related Experience

Mountain Regional Water District

Signal Hill Water Treatment Plant & Lost Creek Pipeline



MOUNTAIN REGIONAL WATER
SPECIAL SERVICE DISTRICT



Client: Mountain Regional Water Special Service District
Reference: Scott Morrison, General Manager
Contact: 435.940.1916 | E: scottm@mtregional.org
Location: Park City, Utah
Dates: 2002 - 2011
Capacity: 3MDG expandable to 6 MGD
Cost: \$141K (Design) | \$1.4M (Construction)
Firm: AQUA Engineering
Key Team: Scott Roger, PE, Darin Hawkes, PE, Ryan Pack, PE

- ✓ ACEC Award Winning Project
- ✓ One of the first Microfiltration Plants in Utah
- ✓ Design/Build
- ✓ 5.2 Miles of 24" Pipe
- ✓ Riverbank Infiltration System
- ✓ New Telemetry | SCADA

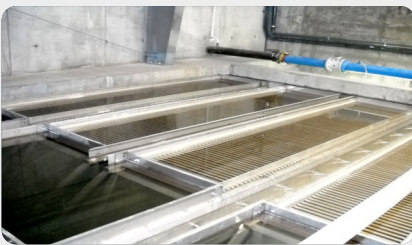


In 2002, AQUA Engineering was hired by Mountain Regional Water Special Services District (MRWSSD) to design the first phase (3 million gallon a day) of a 6 million gallon a day water treatment facility and to investigate options to access water from the Weber River. An alignment in Lost Creek Canyon was chosen for the pipeline, thus giving the project its name. Signal Hill in the Promontory Ranches Development was chosen as the site for the water treatment plant. Construction started in 2003 and the water plant received operational approval from the Utah Division of Drinking Water in February of 2005, marking the end of the \$14 million dollar project. AQUA Engineering teamed with Ames Construction of Salt Lake City on the design-build project which features the first riverbank, groundwater collection system in Utah. It includes a large, high-flow, high-pressure booster pump station with pumping capacity of over 3,000 gpm spread between six 350 horsepower pumps. The pump station was designed with expansion capabilities and has been upgraded since the initial construction to over 10,000 gpm to supply raw water to both MRWSSD and Park City's Quinn's Junction water treatment facility. A 5.2 mile, 24-inch diameter mortar lined, and coated-welded steel, ductile iron, and high-density poly-ethylene transmission pipeline connects the pump station to the water treatment facility. A 1,000-foot rise in elevation occurs along the alignment, which

Signal Hill Water Treatment Plant & Lost Creek Pipeline

passes through sensitive environmental areas, two highway crossings and one river crossing. The terminal reservoir was designed as a low-hazard impoundment and holds 40 acre-feet of water. The treatment plant is one of the first microfiltration membrane plants in the State of Utah and currently treats 4 million gallons of water per day. The riverbank infiltration system developed 1,480 acre-feet of water but has been replaced with a concrete surface diversion structure to supply river water to the plant.

In 2009 AQUA was hired to help the district expand the plant from its equipped capacity of 3 MGD to 4 MGD and to add granular activated carbon (GAC) vessels. The GAC vessels were implemented to control taste and color issues associated with tannic acids produced by decomposition of leaves and foliage entering the river during the change of seasons. The expansion was completed inside a new building addition to the primary structure. The initial design accounted for expansion of the primary clarification of the source water by implementing basins to which lamella plate clarifiers were added along with chemical dosing capabilities for primary treatment. Along with the addition of the clarifiers, sludge settling, collection, aerated storage and dewatering systems were added to the facility to manage and dispose of associated sludge.



Scope Summary

- ✓ Master planning
- ✓ Funding assistance
- ✓ Project Permitting
 - Utah DEQ (Division of Drinking Water & Division of Water Quality)
 - Army Corps of Engineers (Nationwide Permit Program)
 - Utah Stream Alterations
 - State Historic Preservation Organization (SHPO)
 - Utah Department of Transportation
- ✓ County permitting and approvals
- ✓ Construction Management & Observation
- ✓ Detailed design
- ✓ Bidding services (2009 Expansion Project)
- ✓ SCADA & Telemetry System
- ✓ Start-up services

Hooper Water Improvement District

Hooper Water Treatment Plant



The district previously drilled a well that produced about 2700 gpm but the customers complained of taste and odor issues. AQUA worked with the district and their engineer to identify the primary culprit for the taste and odor as iron and manganese. A Pureflow pilot was operated onsite to determine the treatability of the water. Chlorine was used to oxidize the iron and manganese and pressure filtration vessels were installed to filter the water. A backwash tank with a water recovery system was installed. The backwash water allows the iron and manganese settle to the bottom of the tank and the water on the top of the tank is fed back through the treatment system so there is a 99% recovery of the water pumped from the well. The solids are disposed of through the sanitary sewer system. AQUA's service included equipment procurement, bidding document preparation, including technical specifications, and drawings. AQUA also conducted limited construction management for the project.

Client: Hooper Water Improvement District
Reference: Scott Christiansen, District Manager
Contact: P: 801.985.1991 | E: scottsc@hooperwater.net
Location: Hooper, Utah
Dates: 2014 - 2020 (Design/Const. Mngmt)
2019 - 2020 (Construction)
Capacity ~4 MGD
Cost: \$205K (Design) | \$2.2M (Construction)
Firm: AQUA Engineering
Key Team: Brad Rasmussen, PE, Naho Garvin, PE, Lindsey Stevens

- ✓ Detailed design
- ✓ Bidding services
- ✓ Construction services
- ✓ Telemetry / SCADA maintenance





In 2008, AQUA Engineering consulted with Blanding City to design a 3 million gallon a day microfiltration water treatment plant and a new transmission line to the plant from a storage reservoir which facilitated gravity flow operation. In addition to the treatment plant and pipeline, a brand-new Telemetry and SCADA system was designed and installed throughout the City to connect the city's wells, flow monitoring, booster pumps, storage tanks, and irrigation pump system to the treatment plant system. The new treatment plant is located adjacent to the existing facility, directly north of Blanding City. Construction started in 2009 and the treatment plant was brought online in April of 2010, completing the \$2.6 million dollar project.

The treatment plant is one of few microfiltration treatment plants in the State of Utah, which treats 3 million gallons a day, and is easily expandable to treat 4 million gallons a day. No pumping is necessary to move water through the treatment plant. A new 16-inch transmission pipe supplies settled reservoir water via gravity flow to the new treatment plant. The treated effluent is stored offsite in a 1-million-gallon storage tank which feeds Blanding City.

Client: City of Blanding
Reference: Terry Ekker, City Engineer
Contact: P: 435.678.2791 x 3487 | E: tekker@blanding-ut.gov
Location: Blanding, Utah
Dates: 2009 - 2010 (Design) | 2009 - 2010 (Construction)
Capacity: 3 MGD
Cost: \$162K (Design) | \$2.6M (Construction)
Firm: AQUA Engineering
Key Team: Scott Rogers, PE, Darin Hawkes, PE

- ✓ Master planning
- ✓ Funding assistance
- ✓ Detailed design
- ✓ Bidding services
- ✓ Start-up services
- ✓ Construction services
- ✓ Telemetry / SCADA maintenance



City of Boulder

Betasso Water Treatment Facility Capital Improvements



Mr. Daw was responsible for developing and coordinating a multi-disciplined engineering assessment of the City's existing 40-mgd conventional surface water treatment plant and developing decision-support analysis to evaluate options to increase pretreatment capacity, update or replace aging filter equipment and media, implement residuals handling (dewatering) improvements, increase reliability and redundancy of the facility's electrical service and electrical distribution system, and migrate existing equipment from motor control centers exceeding their useful lives. A decision-support matrix was used to prioritize capital and maintenance improvements including new pretreatment basins using high-rate clarification modules; filtration upgrades including replacing existing filter multimedia with dual media, new surface wash systems, new filter valves and actuators, and new backwash troughs; and the implementation of a residuals dewatering system using a combined gravity belt thickener and belt filter press to achieve 16% to 18% solids and reduce the sludge hauling requirements for the City's operations. Brian led the multi-disciplined preliminary design, final design, bidding and construction administration of the \$32M project that was successfully completed in 2019 with <3% change orders and 10% under the engineering budget. Additional services were completed using the remaining budget to complete a 3D model of the entire facility and a CT-tracer study used to identify disinfection limitations in the WTP's aboveground steel clearwells/storage tanks.

Client:	City of Boulder
Contact:	Stephen Grooters, PE, Utilities Engineering Services Manager P: 303.441.3242 Jon Stoddard, Water Treatment Superintendent P: 720. 564.2303
Dates:	2014 - 2019
Capacity:	40 MGD
Location:	Boulder, Colorado
Design Cost:	\$2.4M
Construction Cost:	\$30M

City of Westminster

Semper High-Service Pump Station Reliability and Redundancy Improvements



WESTMINSTER
COLORADO



Mr. Daw was responsible for evaluating, developing and coordinating multi-disciplined assessment and design of electrical system and pumping reliability improvements for the 68-mgd Semper HSPS. The project includes hydraulic transient analysis and design of a new 32,000-gallon surge tank, conversion of a dual 2400V/480V onsite distribution system to 480V, replacing 2400V 600-hp pump motors, a new 1.75MW generator, and a new 36-inch discharge header as a secondary connection to the City's distribution system. Additional scope added by the client includes replacing VFDs, pumps, and critical valves at the Northwest and Reclaimed WTFs.

Client:	City of Westminster
Contact:	Julie Koehler, PE, Utilities Engineering Manager P: 303. 658.2178 Tom Scribner, Water Treatment Superintendent P: 303. 430.2447
Dates:	2017 - 2019
Capacity:	64 MGD
Location:	Boulder, Colorado
Design Cost:	\$1.27M
Construction Cost:	\$14M

SECTION 5 - PROJECT RELATED EXPERIENCE

Extensive Project Experience Relative to Your Needs Municipal & District Consulting Services

Each city, county, and service district has their own unique challenges as it strives to meet the needs of its rate payers. Our goal is to learn and become familiar with these challenges and to find solutions that best fit your circumstances and operations. We listen to your ideas and needs instead of imposing our solutions on you. AQUA has established a reputation for designing municipal infrastructure and facilities that are maintenance friendly and cost effective.

Services Include:

- ✓ Mapping & Modeling Utilities
- ✓ Master Planning
- ✓ Road Systems Design
- ✓ Construction Standards Development
- ✓ Construction Specifications
- ✓ Water Resources
- ✓ Solid Waste Disposal Landfills
- ✓ Transfer Facilities
- ✓ Capital Facility Planning and Impact Fee Analysis
- ✓ Subdivision & Land Development
- ✓ Environmental Compliance
- ✓ Parks & Recreation
- ✓ Streets & Boulevards
- ✓ Storm Drainage Systems
- ✓ Sewer Collection
- ✓ Water Distribution and Storage
- ✓ Grants and Loans Applications

Hyrum City

Ron Salvesen, City Administrator, Hyrum City
P: 435.245.6033 | E: rsalvesen@hyrumcity.com

AQUA Engineering serves as the contract City Engineer for Hyrum City, Utah. As part of their responsibilities they have designed numerous improvements and additions to the City's water distribution, source and storage systems, as well as the City's wastewater collection system and treatment works. They have updated 1,000-3,000 feet of pipe each year since 2006, replacing outdated or undersized piping with 8" or larger pipe to meet State size, material, flow and pressure requirements. The 2011 Water Improvement Project included 3100 feet of 8-inch to 14-inch mainline, cased installation in UDOT right of way, coordination to avoid construction delays and traffic interruptions, as well as the replacement of all the services. It also included 2 PRV Stations. AQUA has designed numerous pump station for both potable, irrigation and wastewater conveyance including a 2100 gpm facility to pump treated wastewater effluent into the pressurized secondary irrigation system. This facility was design and permitted by AQUA.

Grantsville City

James Waltz, Public Works Director | Grantsville City
P: 435.884.0627 | E: jwaltz@grantsvilleut.gov

AQUA Engineering serves as the contract City Engineer for Grantsville City, Utah. As part of its duties AQUA has been responsible for the design of numerous improvements and additions to the City's water distribution system, streets and drainage network, and several municipal facility projects. AQUA has helped the City to design and construct thousands of feet of waterline from 8-inch to 16-inch, multiple PRVs, booster pump stations, groundwater development projects and disinfection facilities. In addition to the dozens of projects that AQUA has designed for the City, we have also implemented standard details and specifications for all projects occurring in City limits, and have assisted the City with review, approval, inspection of projects ranging from single family homes to multi-phase subdivisions and commercial business parks.

SECTION 5 | PROJECT RELATED EXPERIENCE

City of West Wendover

Chris Melville, City Manager | City of West Wendover
P: 775.664.3081 | E: cmelville@westwendovercity.com

AQUA Engineering serves as the contract city engineer for The City of West Wendover. AQUA reviews and inspects all new subdivision and site developments, improvement of existing developments, and also ensures compliance with Pollution Discharge Elimination System storm water and erosion control requirements. Our efforts also include project inspection and QA/QC as well as coordinating and working with planning commissions, city councils, and associated staff to make sure projects are designed and constructed correctly.

Elk Ridge City

David Jean, Public Works Director | Elk Ridge City
P: 801-423-2300 Ext. 5 | E: davidj@elkridgecity.org

AQUA Engineering serves as the contract city engineer for Elk Ridge City. AQUA reviews and inspects all new subdivision and site developments, improvement of existing developments, and also ensures compliance with Utah Pollution Discharge Elimination System storm water and erosion control requirements. Our efforts also include project inspection and QA/QC as well as coordinating and working with planning commissions, city councils, and associated staff to make sure projects are designed and constructed correctly. In addition to its' typical City Engineering duties, AQUA has helped Elk Ridge to design several projects ranging from water pipeline replacements, PRVs and booster pump stations, streets improvements and municipal facilities.

Mountain Regional Water District

Scott Morrison, General Manager | Mountain Regional
P: 435-645-2555

AQUA Engineering serves as contract District Engineer for Mountain Regional Water District. As the District Engineer, AQUA is responsible for assisting the district with water system master planning, design engineering and construction management services for various water system improvements projects. AQUA has completed several water system master plans and capital facility plans for the District as well as designed multiple pump stations, PRVs, storage tanks and an energy recovery facility and the district's flagship water treatment facility. Notable projects include the Signal Hill Water Treatment Plant, a 4MGD micro-filtration membrane plant; the Lost Canyon Booster Pump Station, a 4,000+ horsepower pumping facility that conveys 7,000 Acre-Feet of raw water to through 5 miles of high pressure welded steel pipe to the Snyderville Basin for regional water use by several water service districts including MRW; and the Silver Creek Tank and Pump Station which assists the District with its' sustainability goals by capturing the energy of water moving downhill through the use of micro-turbine, offsetting the District's energy costs by \$300,000 annually.

Emigration Improvement District

Eric Hawkes | Emigration Improvement District
P: 801-243-5741 | E: eric@ecid.org

AQUA Engineering has worked with Emigration Improvement District (EID) on various water related projects to improve water service and provide fire protection to the residents of Emigration Canyon. AQUA performed the initial water system evaluation and modeling followed by design and project management for the installation of 22,600 lineal feet of 8" water main along the main canyon road including fire hydrants, pressure reducing stations, connection to existing line, service laterals, and asphalt patching. Once this project was completed, the water model for the system was updated and calibrated based on actual fire flow tests at several fire hydrant locations. In addition, a fire hydrant map was generated for the Salt Lake County UFA.

Firm Experience Summary

- ✓ Over 200 Water & Wastewater Treatment Facilities
- ✓ National & International Experience
- ✓ Proven Record of Innovation, Efficiency, and Resource Recovery
- ✓ Reputation and successful history of efficient, cost-effective, and innovative projects
- ✓ Efficiency + Experience = low overhead, we can provide this high level of service and experience at very competitive billing rates.

Below is a select summary of our treatment plant clients by State, many with multiple projects:

Arizona

- Antelope Point Marina Wastewater Treatment Plant
- Big Park Water Reclamation Plant
- Black Canyon Arsenic WTP (3)
- Bullhead City Wastewater Treatment Plant
- Chino Valley Water Reclamation Facility
- Eagar Wastewater Lagoons
- Inscription Canyon Ranch Water Reclamation Facility
- Katherine Heights Wastewater Treatment System
- Page Wastewater Treatment Plant
- Parker Water Reclamation Plant
- Prescott City Airport Wastewater Treatment Plant
- Prescott Valley Water Reclamation Facility
- Wahweep Marina Wastewater Facility

California

- Beaumont Water Reclamation Facility
- California City Wastewater Treatment Plant
- Corona Water Reclamation Facility
- Heber Water Reclamation Facility
- Imperial Valley Water Reclamation Facility
- Las Gallinas Water Reclamation Facility
- Mesquite Lakes Water Reclamation
- Morongo Wastewater Treatment Plant
- Western Riverside County Regional Wastewater Authority
- Willow Creek Wastewater Treatment Facility

Canada

- Kamloops Wastewater Treatment Plant

Colorado

*Bob Frachetti, P.E. Colorado Principal Experience

- Bayfield Water Reclamation Facility
- Gem Village Wastewater Treatment Lagoons
- Avon Wastewater Treatment Facility Blower Control Project Eagle River Water & Sanitation District*
- Boulder County / Eldorado Springs Wastewater System *
- Briggsdale Water Storage Tank and Booster Pump Station*
- Broomfield Wastewater Treatment Facility Odor Control Assessment Study/Design*
- City of Boulder IBM Lift Station*
- City of Idaho Springs Wastewater Treatment Facility*
- Clearwater Water Reclamation Facility*
- Colorado Springs Utilities (CSU) Biogas Utilization Study
- Columbine Lake Water District*
- Dukes West MHP Water System Improvements*
- Gateway Village Water Storage Tank and Booster Pump Station*
- Henderson Mill Water Treatment Plant*
- Lake Forrest Mutual Water Company*
- Lookout Mountain Water District Membrane Filtration Upgrade*
- Mt Crested Butte Wastewater Treatment Facility Comprehensive Performance Evaluation (CPE)*
- Nederland Wastewater Treatment Facility*
- Plum Creek Wastewater Treatment Facility*
- Sludge Management Plan, 201 Facility Plan

SECTION 5 | PROJECT RELATED EXPERIENCE

- Amendment Madison Metropolitan Sewerage District*
- Squaw Creek Wastewater Treatment Facility
- Eagle River Water and Sanitation District*
- St. Vrain Sanitation District Wastewater Treatment Facility*
- Tabernash Meadows Water & Sanitation District, Ground Water Well Permitting*
- Tabernash Meadows Water & Sanitation District Biosolids Handling Improvements*
- Town of Ault Wastewater Treatment Facility*
- Town of Bennett Wastewater Treatment Facility*
- Town of Bennett Water System Improvements*
- Town of Crested Butte Wastewater Treatment Facility*
- Town of Erie Wastewater Treatment Facility Facilities Plan and Comprehensive Performance Evaluation (CPE)*
- Town of Georgetown Wastewater Treatment Facility*
- Town of Georgetown Water Treatment Facility Improvements*
- Town of Kersey Wastewater Treatment Facility*
- Town of Lyons Wastewater Treatment Facility*
- Tri-Lakes Wastewater Treatment Facility*
- United Water & Sanitation District / Brannan Pit Raw Water Pump Station*
- Ute Lake Ranch Wastewater Reclamation Facility*
- Vail Wastewater Treatment Facility. Instrumentation Upgrades, Eagle River Water & Sanitation District*
- West Jefferson County Wastewater Treatment Facility*
- Wolf Creek Ski Area Wastewater Treatment Facility*

Hawaii

- Fort Shafter Water Reclamation Facility
- Pearl Harbor Water Reclamation
- Puako Water Reclamation

Idaho

- Cliffs Water Reclamation Facility Boise
- Franklin City Wastewater Treatment Plant
- Hailey Wastewater Treatment Plants
- Jerome City Wastewater Treatment Plant
- Jerome Pretreatment Facility
- Magic Valley Potato Process Water Treatment Facilities

(2)

- City Wastewater Treatment Plant
- Rexburg Wastewater Treatment Facility

Missouri

- Guys Foods Process Water Treatment Plant

New Mexico

- Edgewood Water Reclamation Facility
- Gallup Wastewater Treatment Plant
- Moriarty Wastewater Plant
- PaaKo Water Reclamation Facility
- Pinion Hills Wastewater Plant
- San Felipe Water Reclamation Facility
- Santa Rosa Wastewater Plant
- Springer Wastewater Plant
- Taos Wastewater Plant
- Tucumcari Wastewater Plant

Nevada

- Elko Wastewater Treatment Plant
- West Wendover Water Reclamation Facility

Utah

- Alta Water Treatment Plant
- Amangiri Wastewater Treatment Plant
- American Gourmet Process Water Treatment Plant
- Ananyu Water Reclamation Facility
- Ash Creek Wastewater Treatment Facility
- Bench Lake Water Reclamation Facility
- Bison Creek Water Reclamation Facility
- Blanding Water Treatment Plant
- Blue Mountain Energy Recover
- Bonneville Lime Slaking Facility
- Boundary Springs Water Treatment Facility
- Bountiful City Water Treatment Facility
- Brigham City Wastewater Treatment
- Bristlecone Water Reclamation Facility
- Brown's Canyon Water Treatment Plant
- Canyonlands by Night Water Plant
- Cedar City Wastewater Treatment Plant
- Central Davis County Sewer District Wastewater Treatment Plant

SECTION 5 | PROJECT RELATED EXPERIENCE

- Clover Club (Borden) Foods Process Water Treatment Facility
- Confluence Park Wastewater Treatment Plant
- Dameron Valley Wastewater Treatment Facility
- Dannon Yogurt Process Water Treatment Plant
- Day Break Water Treatment Facility
- Diamond Ranch Water & Wastewater Facility
- Diamond Ranches Wastewater Treatment Facility
- Diamond Ridges Wastewater Treatment Plant
- Driggs Wastewater Treatment Facility
- E.A. Miller Wastewater Treatment Plant
- East Zion's Special Service District – Wastewater Treatment Facility
- Elwood Wastewater Treatment
- Grantsville Wastewater Treatment Lagoons
- Green Hills Water Treatment
- H.C. Brill Foods Plant
- Heber Valley Water Reclamation Facility
- Hill Air Force Base Process Water Treatment Facility
- Hyclone Labs Pretreatment Facility
- Hyrum Wastewater Treatment Plant
- Jordanelle Water Treatment Plant
- Kennecott Mine Water Neutralization Treatment Facility
- Kennecott Refinery Wastewater Treatment Plant
- LDS Cannery Wastewater Treatment Plant
- Leeds Regional Water Reclamation Facility
- Lost Creek Water Treatment Project
- Magna Water Reclamation Facility
- Malt-O-Meal Pretreatment Facility
- Mancos Wastewater Facility
- Morgan Wastewater Treatment Facility
- Moroni Wastewater Treatment Plant
- Mosaic Water Reclamation Facility
- Mountain Green Wastewater Treatment Plant
- Nestle Pretreatment Facility
- Oakley Water Reclamation Facility
- Orem Wastewater Treatment Plant
- Pacific States Cast Iron Water Treatment
- Payson City Wastewater Treatment Plant
- Provo Wastewater Treatment
- Rainbow Ranch Water Treatment Facility Capitol Reef National Park
- Richmond Water Reclamation Facility
- Ruth's Diner Wastewater Treatment Plant – Emigration Canyon
- Salem Wastewater Treatment Lagoons
- Salt Lake City Airport Oil Skimming
- Salt Lake City Wastewater Treatment Plant
- Salt Lake Service Area #3 Water Treatment Plant
- Santaquin Wastewater Treatment Facility
- Shepherd's Egg Farm
- Silver Pointe Wastewater Plant
- Smith's Food King Dairy and Bakery Process Water Treatment Facility
- South Davis Co. Sewer Improvement Dist. North Wastewater Treatment Plant
- South Davis Co. Sewer Improvement Dist. South Wastewater Treatment Plant
- Spanish Fork Wastewater Treatment Plant
- Spring Creek Treatment Plant
- Springdale Wastewater Treatment Facility
- Springville Wastewater Treatment Facility
- Stansbury Wastewater Treatment Facility
- Stouffer Foods Process Water Treatment Plant
- Tooele Army Dept Process Water Treatment Plant
- Tooele Valley Water Reclamation Facility
- Tooele Wastewater Treatment Facility
- Tremonton Wastewater Treatment
- Tuhaye Ranch Wastewater Treatment
- United Park City Mines Water Treatment Facility
- Wasatch Resource Recovery Facility
- Wendover Wastewater Treatment Facility
- Wendover Water Treatment Plant
- West Point Dairy Wastewater Treatment Plant
- Western Quality Dairy
- Western Zirconium Process Wastewater Treatment
- Wolf Creek Water Reclamation Facility

Wyoming

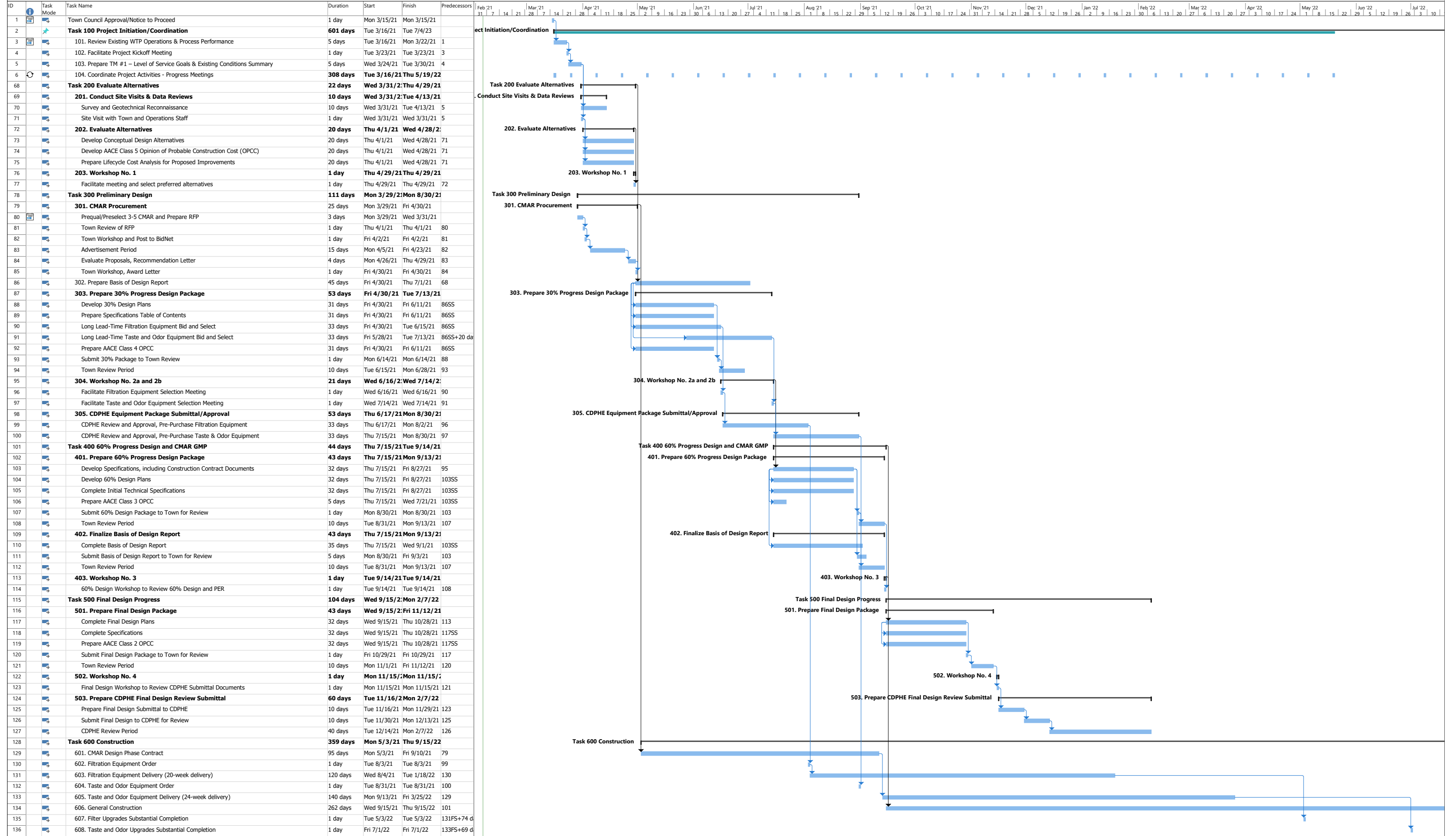
- Jona Well Field Water Treatment Plant



Section 6

Project Schedule

Town of Johnstown, Water Treatment Plant Expansion
Project Schedule





Appendix A | Resumes



Brian C. Daw. P.E | Project Manager

Phone: 801.683.3746 | **Email:** briandaw@gmail.com

Located in Denver, Brian brings 25 years of civil engineering and project management experience with the evaluation, planning, design, and construction administration of water and wastewater treatment and infrastructure projects for municipal and industrial clients. Brian is a registered professional civil engineer specializing in potable water treatment including pretreatment, filtration and disinfection process design; residuals handling systems; chemical feed systems; and storage and distribution system modeling and conveyance design. He also has valuable experience guiding utilities with long-term planning efforts that address the variety of treatment, processes, distribution, storage, and general facility issues and improvements that small and large utilities face.

Brian's project responsibilities regularly include leading multi-disciplined engineering teams during treatment evaluations used to identify and develop recommendations for implementing capital and operations projects. He also has a proven track record of maintaining transparency and well-documented records throughout the project lifecycle to facilitate decision-making and stakeholder records.

As Project Manager, Brian will diligently work with the Town to evaluate treatment options and related costs to assist you with identifying preferred approaches that meet the your operational and capital cost goals.

Project Experience

Project Manager | Betasso Water Treatment Facility Capital Improvements, City of Boulder (CO)

Brian was responsible for developing and coordinating a multi-disciplined engineering assessment of the City's existing 40-mgd conventional surface water treatment plant and developing decision-support analysis to evaluate options to increase pretreatment capacity, update or replace aging filter equipment and media, implement residuals handling (dewatering) improvements, increase reliability and redundancy of the facility's electrical service and electrical distribution system, and migrate existing equipment from motor control centers exceeding their useful lives. A decision-support matrix was used to prioritize capital and maintenance improvements including new pretreatment basins using high-rate clarification modules; filtration upgrades including replacing existing filter multimedia with dual media, new surface wash systems, new filter valves and actuators, and new backwash troughs; and the implementation of a residuals dewatering system using a combined gravity belt thickener and belt filter press to achieve 16% to 18% solids and reduce the sludge hauling requirements for the City's operations. Brian led the multi-disciplined preliminary design, final design, bidding and construction administration of the \$32M project that was successfully completed in 2019 with <3% change orders and 10% under the engineering budget. Additional services were completed using the remaining budget to complete a 3D model of the entire facility and a CT-tracer study used to identify disinfection limitations in the WTP's aboveground steel clearwells/storage tanks.

Project Manager | Semper High-Service Pump Station Reliability & Redundancy

Improvements, City of Westminster (CO). Brian was responsible for evaluating, developing and coordinating multi-disciplined assessment and design of electrical system and pumping reliability improvements for the 68-mgd Semper HSPS. The project includes hydraulic transient analysis and design of a new 32,000-gallon surge tank, conversion of a dual 2400V/480V onsite distribution system to 480V, replacing 2400V 600-hp pump motors, a new 1.75MW generator, and a new 36-inch discharge header as a secondary connection to the City's distribution system. Additional scope added by the client includes replacing VFDs, pumps, and critical valves at the Northwest and Reclaimed WTFs.

Project Manager | Advanced Water Treatment Water Quality Consulting Services, Town of Castle Rock (CO).

Brian was responsible for managing an ongoing on-call agreement with the Town to provide a variety of water quality consulting and engineering services focused on the integration of the Town's new advanced indirect potable reuse treatment plant. Services primarily consisted of evaluating the Town's water quality data to identify raw water, treatment process and finished water quality goals for the Town's integration of its new advanced treatment processes. Task orders included the evaluation of existing operating data to establish baseline performance for the treatment plant in meeting regulatory requirements; developing recommended water quality

Education

MS Civil & Environmental Engineering
University of Colorado – Boulder

BS Civil Engineering,
California Polytechnic State University

Registration

Professional Engineer:
CO, CA

Work Experience

25 Years

Expertise

- Water Treatment Planning, Design, and Construction Guidance
- Wastewater Collection and Treatment System Planning, Design, and Construction Oversight
- Cost-Benefit Analysis

Brian C. Daw. P.E | Project Manager

Project Experience continued

parameters and their respective concentrations/levels to be used for monitoring of taste and odor treatment processes, advanced oxidation (ozone) for removal of contaminants, biological filtration for removal of organics and emerging contaminants; granular activated carbon for water quality polishing for finished water distribution; and UV for disinfection and emerging contaminant removal. Other tasks included modeling intra-zone mixing and associated water quality in the distribution system, and providing the Town with technical support addressing customer questions regarding the indirect potable reuse and natural and anthropogenic contaminants.

Project Manager | Town of Dillon, Lead and Copper Rule Compliance Treatment Town of Dillon (CO).

Brian led the evaluation of corrosion control treatment alternatives in response to lead action-level exceedances observed in the Town's distribution system.

Project Manager | River Water Treatment and Pump Station Evaluation and Design, Confidential Client (WY).

Brian was responsible for leading the evaluation and alternatives analysis for a river water intake and treatment system that was subject to high particle loads from colloidal materials that had compromised an existing multimedia filtration and ion-exchange resin treatment system, resulting in the client's long-term lease of RO membrane filtration and ion-exchange equipment to meet treated water goals. The team analyzed ten (10) alternatives consisting of advanced treatment approaches to successfully identify a recommended treatment train incorporating ultrafiltration downstream of the media filters, purchase of a permanent RO membrane system and addition of an electrodeionization polisher to target remaining mineral contaminants.

Project Manager | Lead & Copper Rule Compliance Treatment Recommendations, Town of Dillon (CO).

Prepared a corrosion control treatment evaluation report in response to increased LCR sample concentrations observed in the Town's distribution system. The project included evaluating the Town's raw and distribution system water quality, and developing corrosion control strategies for minimizing LCR concentrations. Brian also led the coordination effort with CDPHE to identify reasonable, cost-effective approaches to managing LCR concerns observed within a concentration of multi-family residences. Brian was responsible for managing preparation of the plans and specifications for the recommended treatment option and guiding the recommendations through the CDPHE for approval.

Project Manager | City of Durango, College Mesa WTP Onsite Generation Disinfection System, Durango, CO.

The City of Durango requested assistance from HDR to prepare documentation required by the Colorado Department of Public Health and Environment for installing a temporary disinfection system consisting of a tablet feeder. The City is required to take their gas chlorine system off line. HDR was also asked to prepare documentation and transmit supporting information for the Construction Approval Application for the permanent installation of a MIOX disinfection system.

Project Manager | Town of Georgetown, WTF Improvements Project Georgetown, CO

Developed and coordinated a siting and treatment evaluation and decision-support analysis for capital improvements. The scope included distribution system hydraulic modeling and alternatives analysis of treatment facility and storage tank sites, conventional and membrane treatment processes, and pump station and distribution system improvements to replace outdated treatment processes and provide reliable potable water service. Prepared design documents for a new membrane filtration facility; microhydroelectric facility; rehabilitation of an existing 1.5-mg storage tank & foundation; and, a new pump station and 400,000-gallon storage tank with 2,200-lf main extension. The design phase was completed under strict deadline requirements enabling Town to secure loans made available through the American

Project Manager / Lead Engineer | Lookout Mountain Water District, Membrane Filtration Upgrade Project, Clear Creek County, CO Membrane filtration upgrades included process improvements for pretreatment of iron, manganese, and total organic carbon; installation of three Siemens Memcor membrane units (total capacity of 550 gpm); preparing regulatory applications; and, providing construction engineering services. The total project cost was \$1.25 million.

Project Engineer | Metro Wastewater Reclamation District, Chlorine Disinfection System Conversion, Central Treatment Plant (CTP), Denver, CO Project engineering responsible for leading multi-discipline engineering evaluation of alternatives and preliminary design for converting gaseous chemical storage and feed systems to bulk liquid systems for disinfection and dechlorination of 180-mgd wastewater discharge and constructing a new 4,000-gpm plant water pump station. Project was completed for approximately \$10 million. Responsibilities included managing multi-disciplined design team and cost-estimating team; facilitating client design meetings; developing bulk liquid storage facilities and chemical feed equipment; and developing a hydraulic model to evaluate alternative discharge scenarios under tight water elevations restrictions.



Bob Frchetti, PE | Principal

Phone: 303.995.7800 | Email: bob.frchetti@aquaeng.com

Bob has over 30 years of project management and technical experience in virtually all areas of water and wastewater engineering including facilities planning, permitting, design, construction, facility commissioning, performance evaluations, and energy efficiency audits. His strengths include process modeling and design, technology and equipment selection, detailed design engineering, energy efficiency upgrades, hydraulics, and construction engineering and management. He also has significant experience with integrated project delivery methods including design-build, CMAR, and performance contracting.

Project Experience

SELECT WATER ENGINEERING EXPERIENCE

Bennett On Call Engineering Services, 2017 - Current

Water Distribution System, Permitting Assistance, Davis Bacon Compliance Review, WWTF On Call Eng. Services, Water Storage Tank Evaluation, Lagoon & E. Interceptor, ISO Fire Flow Modeling, Cordella LS Immediate Improv., Reclaimed Water Permitting Evaluation, Renewable Water Supply Consulting

Indian Hill Water District On Call Engineering, Current

Engineering Analysis, Hydraulic Modeling, Water Master Planning, Project Management

Boulder County, CO San Souci Water Treatment Plant, 2020

Surface Water Treatment, Facility Planning, Design, Permitting, Project Management

Spring Valley Metro District #1, CO Arapahoe Well #2, 2020

Groundwater Development, Hydraulic Analysis, Design

Clear Water Metropolitan District, Water Treatment Storage & Distribution, 2018

Principal in Charge/Project Manager

Miller Ranch Pump Station Water Engineering, 2018

Principal in Charge/Project Manager

Town of Bennett Water System Improvements. Principal-in-Charge/ Project Manager. Managed and performed engineering for multiple projects including complete water system infrastructure audit and assessment, capital improvement plan, water system hydraulic model, new storage tank alternatives evaluation, multiple well house upgrades (pumps and SCADA), new groundwater well drilling, permitting, treatment, and connection to distribution system. Engineer of Record for new 0.5 MG elevated water storage tank and distribution system improvements project including planning, permitting, design, construction engineering.

Town of Georgetown WTF Improvements. Principal-in-charge for a \$3.6 million improvements project including a new 0.63 MGD membrane filtration facility; micro hydroelectric facility; replacement of an existing 1.5-mg storage tank; a new 1,500-gpm pump station; and a new 400,000-gallon welded steel storage tank with 2,000-lf distribution main extension. Design phase services were completed under strict deadline requirements enabling Town to secure \$3.34 million of loan forgiveness and 0% loans made available through the American Recovery and Reinvestment Act (ARRA) and Colorado state revolving funds.

Tabernash Meadows W&S District. Project Manager for new ground water well permitting and chlorination project.

Lookout Mountain Water District Membrane Filtration Upgrade. Principal-in-Charge for membrane filtration CL2 disinfection upgrades including process improvements for pretreatment of iron, manganese, and total organic carbon; installation of three Siemens Memcor membrane units (total capacity of 550 gpm); design of chlorine disinfection facilities; preparing regulatory applications; and, providing construction engineering services. The total project cost was \$1.25 million.

Education

BS Civil and Environmental Engineering, Clarkson University
Potsdam, New York, 1990

Graduate Level Coursework:

Syracuse University Environmental Chemistry and Analysis, 1992

SUNY Environmental Science and Forestry Water Pollution Engineering, 1992

Licensing

Professional Engineer Colorado, 1994
Professional Engineer, New Mexico, 2007 (inactive)

Work Experience

30 Years

Experience Highlights

- Project Manager/ Principal in Charge and Engineer of Record for numerous water and wastewater treatment facility projects
- Construction experience as a General Contractor and Resident Engineer
- Process design expertise and process equipment and technology specialist
- Alternative project delivery experience: design-build; CMAR; public private partnerships

Bob Frachetti, PE | Principal

Project Experience (continued)

Briggsdale Water Storage Tank and Booster Pump Station. Project Manager and lead design engineer for design and construction of a new bolted steel water storage tank and booster pump station. Project was funded by the USDA grant. Prepared Final Design (plans and specifications) and managed office and field engineering.

Gateway Village Water Storage Tank and Booster Pump Station. Project Manager for design and construction of new 0.5 MG bolted steel water storage tank and booster pump station.

United Water & Sanitation District / Brannan Pit Raw Water Pump Station. Project Manager / lead design engineer for 25 cfs raw water pumping station. Vertical turbine pumps and controls. 36" DIP discharge piping.

Lake Forrest Mutual Water Company. Project Manager / lead design engineer for RO water treatment system for fluoride removal.

Dukes West MHP Water System Improvements. Project Manager/ lead design engineer for well upgrades, chlorination, and storage tanks.

Henderson Mill Water WTP. Project Manager/ lead design engineer for new 0.25 MGD membrane water treatment plant.

Columbine Lake Water District. Project Manager/ lead design engineer for water treatment system upgrade to remove iron and manganese.





Darin Hawkes, PE | Principal

Phone: 801.683.3727 | **Email:** darin.hawkes@aquaeng.com

Mr. Hawkes' has a vast amount of experience in various civil engineering disciplines. He specializes in difficult projects that often have space, access and/or extreme time constraints. He has developed a reputation for being able to view a problem from multiple angles to develop a solution that works for his client. His experience ranges from pumping system design, concrete storage tanks and open reservoir design, to large concrete water storage facilities and high elevation snowmaking reservoirs and dams. Many of his projects are provided as turn-key solutions for his clients with his direct involvement from conceptual design through contract administration and project close-out. As part of the AQUA team, he has lead and assisted in numerous design projects, the completion of several System Capacity Analyses, Municipal Capital Facility Plans and large-scale Master Plans for both culinary water and wastewater.

Project Experience

Water Storage Facilities

Mountain Regional Water 2MG Rectangular Tank Design - 2016

Civil, Structural, Mechanical Design & Construction Management
Rectangular tank design, partially buried, conventionally reinforced concrete. Lead all aspects of civil engineering design and construction management services.

Promontory Ranch 1MG Concrete Tank Design - 2015

Civil, Structural, Mechanical Design & Construction Management
Circular tank design, partially buried, conventionally reinforced concrete, ridge-top site with difficult access. Lead all aspects of civil engineering design and construction management services.

Snowbird Snowmaking Reservoir Design - 2015

Civil, Structural, Mechanical Design & Construction Management
Open 10 MG lined reservoir, high altitude (10,200 msl), extreme access, blasting required, rock excavation. Lead all aspects of civil engineering design and construction management services.

Snowbasin Snowmaking Reservoir Design - 2014

Civil, Structural, Mechanical Design & Construction Management
Open 12 MG lined reservoir, high altitude (8,700 msl), extreme access, blasting required. Lead all aspects of civil engineering design and construction management services.

Owens Corning 225Kgal Fire Storage Tank Design - 2013

Civil, Structural, Mechanical Design & Construction Management
Circular tank design, partially buried, conventionally reinforced concrete with fire pump station structure built integral with the tank deck. Lead all aspects of civil engineering design and construction management services.

Hyrum City, Utah - 2MG Concrete Tank - 2011

Civil, Structural, Mechanical Design & Construction Management
Circular tank design, partially buried, conventionally reinforced concrete, space constraints required extensive hillside shoring using soil screws and retaining mesh. Lead all aspects of civil engineering design and construction management services.

Elk Ridge City, Utah - 1MG Prestressed Concrete Tank - 2008

Civil, Structural, Mechanical Design & Construction Management
Circular tank design, partially buried, prestressed reinforced concrete; assisted with structural design and construction management services.

Education

BS Civil Engineering,
University of Utah, 2003

Registration

Professional Engineer (Structural):
Utah

Work Experience

17 Years

Affiliations

ASCE

Expertise

- Hydro and Civil Structural Design (Storage Tanks, Retaining Walls, Platforms, etc.)
- Pumping System Design
- Industrial Facility Expansion, Remodel and Retrofit
- Hydraulic & Hydrologic
- Computer Modeling
- Facility Plans & Master Plans
- Water Resources Treatment

Darin Hawkes, PE | Principal

Project Experience (continued)

Pumping Stations

Deer Crest Booster Pump Station

Civil, Structural, Mechanical Design & Construction Management

Mountain Regional Water 2MG Tank Booster Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Grantsville West Bench Booster Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Mountain Regional Water Bear Hollow Booster Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Mountain Regional Water Blackhawk Booster Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Hyrum City Reclaimed Water Pumping Station

Civil, Structural, Mechanical Design & Construction Management

Master Plans, Capital Facility Plans, Planning Documents

Driggs Idaho Water System Facility Plan

CAD software water modeling, Planning and system characterization

Western Zirconium Chemical Milling Facility Site Feasibility Study

Construction Feasibility Review

Sage Glen Well Preliminary Engineering Report

Develop PER as required per Utah Division of Drinking Water Requirements

Pole Canyon Wet Utilities Master Plan

Planning, Survey coordination, CAD Utility Modelling, Cost analysis

West Wendover Nevada Culinary Water and Wastewater System Master Plan

Planning

Wells and Groundwater Development

Utah Valley University Irrigation Well

Civil, Structural, Mechanical Design & Construction Management

Utah Valley University South Well Overdrill

Civil, Structural, Mechanical Design & Construction Management

Utah Valley University Heat Exchange Wells

Civil, Structural, Mechanical Design & Construction Management





Kevin Allcott | Construction Manager

Phone: 801.683.3724 | **Email:** kevin.allcott@aquaeeng.com

Mr. Allcott has over 32 years experience in the construction industry. As a construction manager for AQUA, Mr. Allcott specializes in construction oversight, contract administration, dispute resolution, and construction management. His experience has included trouble shooting, scheduling, contract dispute resolution and performance measurement systems implementation on projects ranging in value from \$2.5 to \$350 million. Mr. Allcott has developed sophisticated computer models of complex construction projects for use in project management as well as recovery plans. These models have also been used to determine cause and affect relationships between changes and increased costs. He has assisted in the defense of claims for additional compensation on several multi-million-dollar constructions projects.

Project Experience

Construction Management

Rexburg City, ID WWTP Expansion and Upgrade, 2013

Utilized a fixed film process followed by existing oxidation ditches to bring the plant to a capacity of 4.8 mgd, adding ultraviolet disinfection, and a new screw press facility costing about \$9 million.

Stansbury Park Improvement District, 2012

Construction oversight for modifications to an existing lagoon facility including screens, lift station, blower building, and aeration and chlorine contact basins.

Tooele City, UT Wastewater Treatment Plant Phase 2 Upgrade, 2012

Expanded the plant from 2 mgd to about 4 mgd in two phases. Project cost expected to be about \$8.5 million. First phase construction complete. Second Phase includes sludge screw presses solar drying, and UV disinfection.

Tremonton, UT WWTP Salsnes Filter Building, 2011

Installed a new filtering system for redundancy to the primary clarifier.

Provo, UT Wastewater Treatment Dewatering Facility, 2010

The expansion of the sludge dewatering facility including a new building, centrifuge, and associated upgrades costing about \$2.5 million.

Brigham City, UT, WWTP Expansion, 2010

Increased the hydraulic capacity from 4 MGD to 6 MGD and installed new screw presses for biosolids dewatering.

Springville City, UT WWTP Upgrade, 2009

Expansion and Upgrade utilizing a STM Aerotor process that is in construction to bring the plant to a capacity of 6 mgd costing about \$11 million.

Tooele City, UT Wastewater Treatment Plant Phase 1 Upgrade, 2008

Expansion to bring the plant from 2 mgd to about 4 mgd in two phases. Project cost expected to be about \$8.5 million.

Jerome City, ID Wastewater Treatment Plant Upgrade, 2008

Expansion and Upgrade utilizing an MBR process. Included several phases to bring the plant to a capacity of 4.5 mgd costing about \$10 million.

Wolf Creek Sewer District, UT, 2008

0.8 mgd MBR facility at a cost of about \$7 million.

Tremonton, UT WRF Expansion and Upgrade, 2004

Expanded from a 1 mgd facility to 2.2 mgd using STM Aerotor costing \$2.2 million.

Hyrum City, UT WWTP Expansion and Upgrade, 2004

Utilized a Kubota membrane process for a 2 mgd plant with a cost of \$5 million.

Spanish Fork, UT WWTP Upgrade, 2004

Expanded capacity from 3.5 to 5 mgd using STM Aerotor costing \$2.8 million.

Education

B.S. Construction Management,
Boise State University, 1981

Work Experience

32 Years

Expertise

- Construction Oversight
- Contract Administration
- Dispute Resolution
- Construction Management

Kevin Allcott | Construction Manager

Project Experience (continued)

Oakley, UT Water Reclamation Facility, 2004
A new Zenon ZeeWeed 250,000 gpd facility costing \$1.7 million.

Construction Project Oversight
2002 Spanish Fork Belt Press Facility - Spanish Fork, Utah
2002 Orem Secondary Clarifier - Orem, Utah
2001 3-Mile Reservoir Rehab and Aluminum Cover - West Wendover, Nevada
2001 Orem Final Clarifier and DAF Thickener - Orem, Utah
2001 Orem Administration Building - Orem, Utah
2002 Payson WWTP Upgrade, STM Aerotor, Final Clarifier, Digester - Payson, UT
1981 -1985 Morrison-Knudsen Company - Boise, Idaho

Construction Management Consulting
1986 - 1988 Anheuser-Busch Companies Expansion - Newark, New Jersey
1989 - 1990 Honda Motors, Accord Manufacturing Facility - East Liberty, Ohio
1990 - 1992 Southwestern Bell Data Center - St. Louis, Missouri
1992 INEL Chemical Processing Plant - Idaho Falls, Idaho



Nicholas Graue, PE | Senior Project Engineer

Phone: 801.683.3733 | **Email:** nick.graue@aquaeing.com

Mr. Graue is an intensely ambitious Professional Engineer and Project Manager backed by over a decade of experience in the Water and Energy sectors with a proven track record of successful project delivery and program implementation. Nick's deep passion for natural resource conservation has steered him to managing engineering projects where technology can be leveraged to achieve a more sustainable infrastructure. Nick's work experience involves the entire life cycle of engineering projects from capital planning, feasibility analyses and engineering design to contract administration, construction management, facility commissioning and operations consulting.

Project Experience

Mayflower Mountain Resort Water Master Planning & Design, 2020

Engineering Analysis, Hydraulic Modeling, Water Master Planning, Water Storage Tanks, Pump Stations, Flow Control Facilities, PRVs, Utility Design, Project Management

Lakeview Business Park Water & Sewer Master Plan, 2020

Engineering Analysis, Hydraulic Modeling, Utility Master Planning, Design, Project Management

Boulder County, CO San Souci Water Treatment Plant, 2020

Surface Water Treatment, Facility Planning, Design, Permitting, Project Management
West Wendover Water GIS Mapping Update, 2020
GIS Master Planning, Database Design

Spring Valley Metro District #1, CO Arapahoe Well #2, 2020

Groundwater Development, Hydraulic Analysis, Design, Project Management
Snowbird Resort Mid-Gad Lodge Spring Collection & Disinfection Project, 2020
Groundwater, Site Utilities, Mechanical Design, Project Management

Salt Lake County Service Area 3 Chickadee Ski-Run Water & Sewer Realignment Project, 2020

Utilities, Water Distribution, Wastewater Collection, Construction Management

Oakley City, UT Cottonwood Springs Improvements, 2020

Groundwater, Mechanical Design, Project Management

Aspen Acres Association Spring Improvements, 2020

Groundwater, Mechanical Design, Instrumentation & Controls, Project Management, Construction Management

Mountain Regional Water, Glenwild Booster Station Upgrades, 2020

Hydraulic Analysis, Mechanical Design, Site Utilities, Permitting
Mountain Regional Water, Hidden Creek PRV & Booster, 2020

Construction Management

Metro Water District of Salt Lake and Sandy Telemetry Radio System Improvements, 2020

Telemetry System Planning & Design

Town of Alta, UT Bay City Mine Pump Improvements, 2020

Hydraulic Analysis, Mechanical Design, Permitting

City of Grantsville, UT Contract District Engineering, Ongoing

Land Use Planning, Utility Master and Capital Facility Plans, Development Plan Review, Hydraulic Modeling, Engineering Analysis

City of Driggs, Idaho Contract District Engineering, Ongoing

Development Plan Review, Hydraulic Modeling, Engineering Analysis

Education

BS Civil Engineering
University of Utah, 2013

Registration

Professional Engineer:
UT, CO, NV, ID, OR, WA

Certifications

Envision Sustainability Professional (ENV SP), Institute for Sustainable Infrastructure

Work Experience

12 Years

Affiliations

AWWA
AWWA/Energy Management Committee

Expertise

- Project Management
- Water System Master Planning
- Hydraulic Modeling
- Pumping System Design
- Intelligent Water Systems
- SCADA & Instrumentation
- Water Conveyance & Transmission
- Asset Management
- Site Utilities
- Water Distribution
- Water Storage Facilities

Nicholas Graue, PE | Senior Project Engineer

Project Experience (continued)

3Kings Water Treatment Plant

Replacement of Park City's existing Spiro Water Treatment Plant with a new 7 MGD mining influenced water treatment plant. The new facility will treat water from four unique water sources including two mine drainage tunnels and a spring. The project includes several sustainable measures like micro-hydro power generation and a water heat transfer HVAC system.

Land Use Planning & Development, Hydraulic Modeling, Pumping System Design, IT Network Design, SCADA & Instrumentation, Asset Management

Western Summit County Interconnect Project

Regional interconnect valve vault and transmission line to further interconnect Western Summit County water service districts.

Hydraulic Modeling, Utilities Design, Mechanical Design, Construction Management

Middle School Well Improvements

Assessment and replacement of existing Middle School Well pumping system including submersible pump and motor, soft starter, electrical and instrumentation.

Hydraulic Modeling, Pumping System Design, Construction Management, Electrical, Instrumentation

Park City Golf Course Maintenance Facility

New 10,000 sq. ft. maintenance building for Park City Golf Course operations, maintenance and administration offices. Project located in a sensitive residential area and involved heightened architectural features and significant public involvement.

Land Use Planning & Development, Architectural, Structural, Site Utilities, Construction Management

Empire Tank Replacement

Replacement of existing 1M gallon above ground steel water tank with a new partially buried concrete tank.

Land Use Planning & Development, Utilities Design, System Analysis

Deer Crest Pump Station and Transmission Line

New drinking water pumping station and transmission line located on a challenging site in a ski run on Deer Valley Resort. The project allowed Park City to save one million kilowatt-hours per year in electrical energy consumption due to a more efficient method of conveying water to the upper reaches of Deer Valley.

Land Use Planning & Development, Hydraulic Modeling, Energy Analysis, Pumping System Design, Mechanical Design, SCADA & Instrumentation Design, Construction Management

Creekside Water Treatment Plant

Reconstruction of two drinking water wells deemed under the influence of drinking water. Project included the demolition of two well houses and construction of a new consolidated well house to contain filtration and ultraviolet disinfection and on-site hypochlorite generation equipment to satisfy drinking water standards applied to groundwater deemed under the influence of surface water.

Land Use Planning & Development, Environmental Permitting, Pumping System Design, Mechanical Design, SCADA & Instrumentation Design, Construction Management

Park Meadows Well Improvements

Replacement of existing Park Meadows Well pumping system including submersible pump and motor, variable frequency drive, electrical and instrumentation.

Hydraulic Modeling, Pumping System Design, Construction Management

Park City Water SCADA and Telemetry System Replacement

Progressive design-build project to fully replace existing water utility SCADA system & telemetry communications system. The project replaced of all PLC and IO modules for two water treatment plants, three wells and 75 remote distribution system facilities and also included the construction of a high-speed 5G radio and fiber optic networks to support system communications.

SCADA & Telemetry System Master Planning, SCADA & Instrumentation Design, IT Network Design, Systems Integration, Construction Management

Park City Top of Main Street Pressure Reducing Station

New pressure reducing station serving the heart of Historic Old Town in Park City, UT.

Hydraulic Modeling, Site Utilities, Mechanical Design, Construction Management.

Park City Heights Water Storage Tank

Water storage tank site selection feasibility study including construction feasibility assessment and preliminary engineering.

Hydraulic Modeling, Feasibility Study, Utilities Design, Construction Management

Park City Distribution System Hydraulic Model

Constructed and calibrated a full distribution system hydraulic model for Park City's water system and administered the hydraulic modeling program to support project development review, water system master planning and water system optimization efforts.

GIS, Hydraulic Modeling, Operations Analysis



Ryan Pack, P.E. - Principal

(801) 683-3761 - ryan.pack@skmeng.com

Mr. Pack has experience with many components of SCADA and controls. He has worked with controls as simple as relay logic and PID loop controllers thru complex radio controlled SCADA systems. He has worked with many different programmable logic controllers and Operator interfaces including Allen Bradley, Control Microsystems, GE, Koyo, Modicon, Siemens, and others. He has utilized many software packages for human machine interface including Allen Bradley, GE Proficy (Intellution), Wonderware, and National Instruments Lookout. He has designed and installed new systems, replaced old systems, and expanded existing control systems. Mr. Pack has worked with many communications systems including radio, fiberoptics, ethernet, serial, and proprietary communications systems such as controlnet and profibus. He has conducted numerous path studies, for both licensed and non-licensed radio communications systems. He has designed and installed radio telemetry systems with over 50 remote sites.

Work Experience

18 Years

Education

BS Electrical Engineering
University of Utah, 2002

MBA
Weber State University, 2005

Registration

Professional Engineer:

UT, ID, NV, WY, CO, HI, NM

Specialties

- Electrical and Controls
- Design
- Construction Oversight
- Control Systems
- Telemetry and SCADA Systems
- Design
- Control Testing
- Programming
- Startup and Maintenance
- Contracts

Project Experience

Lost Creek Project, Summit County, UT. Electrical/Controls Engineer

Mr. Pack worked on this project in all aspects from the shallow wells to the treatment facility. Ryan designed Mountain Regional Water's SCADA system, and has continued working on the system since original installation. He oversaw the programming and startup of the existing Lost Creek Canyon control system, and is extremely familiar with its layout, configuration, and applications. Ryan also worked on the design for the motor controls, power distribution, lighting, and instrumentation for this system.

Mountain Regional Water SCADA, Summit County, UT. Controls Engineer

SKM designed a new SCADA system for the district that included all of the water distribution, raw water collection, and treatment. He worked with the water district to design a new SCADA system that included all of the water distribution, raw water collection, and treatment. He worked with the water district to meet their monitoring, reporting, and control needs. Ryan coordinated the installation with their staff, and programmed much of the system. This included reporting, monitoring, alarming, and full control of the system. He continues to maintain the system with SKM's staff of service personnel.

Idaho Falls Water SCADA, Idaho Falls, ID. Controls Engineer

SKM designed a backup power generation system for the water department, as well as the control interface between the Generator and the SCADA system. Mr. Pack is currently maintaining their water system SCADA and controls, and is under contract to perform programming on their upcoming additions.

Santaquin SCADA, Santaquin, UT. Controls Engineer

SKM designed a new SCADA system for the city that included all of the water distribution, wastewater collection, and wastewater treatment facility. Mr. Pack worked with the city to meet their monitoring and control needs, and provide a system that would work for them. He coordinated the installation with local trades, and aided in the programming of the system. This included reporting, monitoring, alarming, and full system control.

Summit Park Boosters, Summit County, UT. Electrical/Controls Engineer

SKM worked on the electrical and controls design for the two pump stations, and flow control station required for this project. Mr. Pack designed the motor controls, instrumentation, and controls required to operate the facilities as required by Mountain Regional Water.

Bountiful City Water, Bountiful, UT. Electrical/Controls Engineer

SKM has worked on numerous projects for the City of Bountiful. Mr. Pack has designed numerous motor control and distribution systems for wells and boosters for the city. He has worked with the department head to incorporate complete system control from the motor control enclosure for each of these sites.

Davis and Weber Counties Canal SCADA, Weber County, UT. Controls Engineer

SKM is currently working on installation of a new SCADA monitoring system for the canal company. This includes the monitoring of all canal discharge flows, as well as monitoring of the primary canal flow. Ryan designed the radio network, control system, and aided the district in coordinating installation of required hardware.

East Zion SCADA, East Zion SSD, UT. Electrical/Controls Engineer.

Ryan Designed the Electrical, Controls, and SCADA system for this community's water system. This included phase conversion for the booster pumps, tank level monitoring, well control and communications between the sites. Ryan designed all of the motor controls and instrumentation for this project.





Alicia Thorpe, PE

PRINCIPAL | SR. MECHANICAL PROJECT MANAGER

Alicia offers more than 20 years of experience as a project manager in mechanical HVAC design. She is dedicated to building client relationships and providing the highest level of service. Alicia has worked extensively on a wide variety of projects, including commercial, municipal and educational facilities.

PROJECT ROLE

Mechanical HVAC and plumbing design

Coordination of mechanical and plumbing systems

On-site problem solving

New construction and remodel projects

Building commissioning

EDUCATION

Bachelor of Science in Architectural Engineering, University of Wyoming, 1997

PROJECT EXPERIENCE: WATER TREATMENT FACILITIES

Gold Creek Wastewater Treatment Plant | Elizabeth, CO

Water Treatment Plant | Fallon, NV

Wastewater Treatment Plant | Lafayette, CO

Sterling Water Treatment Plant | Sterling, CO

Rifle Water Treatment Plant | Rifle, CO

Dory Hill Water Treatment Plant | Black Hawk, CO

City of Greeley Bellevue Water Treatment Plant | Fort Collins, CO

Eagle River Water and Sanitation District | Avon, CO

Consolidated Mutual Water Company Water Treatment Plant | Lakewood, CO

Scottsdale Water Treatment Plant | Scottsdale, AZ

UNC Central Campus Chilled Water Plant | Greeley, CO

CSU Engines and Energy Conversion Lab | Ft. Collins, CO

New Belgium Brewery Water Filtration Plant | Fort Collins, CO

MEMBERSHIPS & LICENSING

Professional engineer, licensed in Colorado and 23 other states

Member American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

Member National Council of Examiners for Engineering & Surveying (NCEES)



Jay Cooper, PE
MECHANICAL PROJECT ENGINEER

Jay offers five years of experience in mechanical engineering. Jay is a results-driven engineer who uses his knowledge of the building construction process for the benefit of all project stakeholders. He has efficiently designed mechanical and plumbing systems for a wide variety of clients, with a strong base of knowledge in multifamily, commercial and municipal projects. Jay has experience coordinating with internal and external team members to ensure a successful project.

PROJECT ROLE

- Mechanical HVAC and plumbing design
- Knowledge of design codes
- Review of shop drawing submittals
- Preparation of field observation reports and field investigations
- Coordination with multiple other disciplines and stakeholders in system design to appropriately meet project needs
- On-site problem solving
- New construction and remodel projects

EDUCATION

Bachelor of Science in Mechanical Engineering, Colorado State University, 2015

MEMBERSHIPS & LICENSING

Professional Engineer
Licensed in Colorado

PROJECT EXPERIENCE

- Greeley Water Treatment Plant** | Greeley, CO
- Loveland Fire Station** | Loveland, CO
- Gilcrest Fire Station** | Gilcrest, CO
- Platteville Fire Station** | Platteville, CO
- Legacy Academy** | Elizabeth, CO
- Aims General Services Building** | Greeley, CO
- Future Legends Sports Complex** | Windsor, CO
- Towneplace Hotel at DIA** | Denver, CO
- Aloft Hotel** | Salt Lake City, UT
- Huron Multifamily** | Denver, CO
- Bank of Colorado** | Greeley, CO: 4,000 sf bank
- New Belgium Clinic** | Fort Collins, CO
- The Broadmoor Resort** | Colorado Springs, CO
- Lyric Cinema Café** | Fort Collins, CO
- Golds Gym** | Cheyenne, WY
- Chuze Gyms** | Various locations
- Central Park Station** | Aurora, CO
- Gravity One Climb** | Broomfield, CO

Chad Bringle, P.E.

Project Engineer



Education

Mississippi State University
B.S., Biological Engineering, 1997

Professional Registration

Registered Professional Engineer:
Colorado

Professional Affiliations

Colorado Association of
Geotechnical Engineers (CAGE)

American Society of Civil Engineers
(ASCE)

Qualifications Summary

Mr. Bringle has over **18 years of experience** in geotechnical engineering and construction materials testing. He is responsible for conducting project management for soil and foundation geotechnical investigations and subsequent geotechnical design level reports, and contract specification compliance. His design experience includes recommendations for shallow and deep foundations, retaining walls, floor slab performance, groundwater mitigation and dewatering, pavement subgrade stabilization, pavement thickness design, pavement condition and distress mitigation. Mr. Bringle's construction background includes shallow foundation excavation, deep foundation construction techniques and inspection, reinforcement steel inspection, mix designs overview, asphalt inspection, earthwork inspection, and stabilized subgrade techniques.

Professional Experience

▪ **Chatfield Reservoir Reallocation Project** (Littleton, CO): Provided geotechnical recommendations for proposed recreational and environmental improvements to the Chatfield State Park. Geotechnical recommendations included multiple bridge and building foundations, shore fill placement below the water table for Cigar and Titan Lakes, borrow area assessments and embankment fill recommendations, settlement considerations for new fill placement, and internal clay core considerations for proposed embankment dikes.

▪ **Semper High Service Pump Station** (Westminster, CO): Provided geotechnical recommendations for the proposed improvements to the Semper High Service Pump Station. The proposed improvements consisted of an emergency generator, two medium voltage transformers, voltage switchgear, four transformers, a new 32,000-gallon surge tank with a 24-inch buried pipe, a new flow meter vault with a buried 48-inch pipe, and site improvements including grading, retaining walls, and new pavement and new concrete flatwork.

▪ **Plum Creek Lift Station Phase I Infrastructure** (Douglas County, CO): Provided geotechnical recommendations for new lift station and water and sewer lines for the 400-acre Plum Creek Development.

▪ **1.5 MG Potable Water Tank and Water Treatment Plant** (Georgetown, CO): Provided field exploration and geotechnical recommendations for a new 1.5 MG water tank at an existing water tank site and new water treatment plant adjacent to Clear Creek at the base of Guanella Pass. The existing water tank was heavily distressed due to bearing on variable soil conditions consisting of bedrock on the uphill side and man-placed fill on the downhill side. Provided design level drawings and provided construction observation services for a reinforced segmental concrete block retaining wall to create a level pad above a steep bank down to Clear Creek for the new water tank.

▪ **Georgetown Wastewater Treatment Plant Expansion** (Georgetown, CO): Performed geotechnical engineering study for improvements to the existing wastewater treatment plant in Georgetown, Colorado.

▪ **88th Avenue Open Space Improvements** (Adams County, CO): Provided geotechnical recommendations for environmental restoration of the South Pond riparian habitat. Provided geotechnical recommendations for new fishing pier, backfill considerations and structures located on new shorebank construction.

▪ **Spinney Mountain Reservoir** (Park County, CO): Provided a Geotechnical Data Report for the Seepage Evaluation of Spinney Mountain Dam.

▪ **Onsite Wastewater Treatment System (OWTS) Design** (Summit, Grand, Larimer, Weld Counties, & Tri-County Health): Provided numerous OWTS design systems for residential and small business construction.



Jim Noll, P.E.

President

Principal-in-Charge



Education

University of Colorado
B.S. Civil Engineering, 1985

Winona State University
B.S., Geology, Winona, MN, 1979

Professional Registration

Registered Professional Engineer:
Colorado

Professional Affiliations

Past President Colorado Association of
Geotechnical Engineers (CAGE)

American Council of Engineering
Companies of Colorado (ACEC/CO)

American Society of Civil Engineers
(ASCE)

Qualifications Summary

Mr. Noll has over **37 years of experience** in geotechnical, geological and materials engineering. He has performed a wide variety of investigations and engineering services for projects including transportation; drainage/waterways; retail, industrial and commercial buildings; water and wastewater treatment/distribution facilities; residential development; earthen dams; and mining operations. Transportation related projects range from urban interchanges to mountainous terrain to rural aggregate surface roadways. Structures associated with the projects include single to multi span bridges and viaducts, and numerous retaining wall types. His background includes project management ranging from small-scale projects to large, multi-year contracts for various governmental agencies.

Professional Experience

- Project Manager for numerous drainage way projects throughout the Front Range of Colorado. The projects range from intermittent streams to large creeks and rivers. Various structures were included in the geotechnical studies including large earthen embankments and drop/grade control structures. The drop/grade control structures range from grouted sloping boulder drops to vertical drops with cutoff walls ranging from driven sheet piles to conventional concrete walls. Recommendations for reducing channel bank erosion, bank stabilization and methods for establishing vegetation were provided.
- Project Manager for a wide variety of water and wastewater projects including pipelines, 0.5 to 5 million-gallon water tanks, along with new treatment facility construction and existing facility expansion. The water and sanitation districts include the Town of Erie, City of Aurora, City of Arvada, City of Brighton, Centennial Water and Sanitation, Denver Water, Southgate Water and Sanitation, Stonegate Sanitation, Roxborough Water and Sanitation District, City of Thornton, and Westminster TOD Waterline, City of Westminster. A recent project includes the City of Aurora's Prairie Water Project which consists of 32 miles of a 60-inch diameter, flexible steel pipe which will transmit raw water from Brighton to the Aurora Reservoir. Also, a project for the Roxborough Water and Sanitation District included the Wastewater Regionalization Project which consisted of 13.5 miles of sanitary sewer installation.
- Project Manager for numerous roadway construction/interchange projects throughout Colorado. The projects include I-70 and S.H. 58 Interchange Improvements, Plum Creek Parkway Extension at I-25, I-25/23rd Avenue Braided Ramp, Collector/Distributor Road – Speer Boulevard to 19th Avenue, 144th Avenue and I-25 Interchange, I-225 and Alameda Avenue Interchange, C-470 and Alameda Parkway Interchange Improvements, C-470 Extension from I-70 to U.S. 6, Lucent Blvd. and C-470 Interchange, East and West Interchanges for U.S. 36 at Interlocken Loop, State Highway 40 Limon to Hugo, and State Highway 50C in Pueblo, and the Park Avenue Viaduct from the Platte River to Blake Street.
- Performed nondestructive deflection testing and overlay analysis for agencies such as the E-470 Public Highway Authority and CDOT. The pavement analysis was performed through the use of a Falling Weight Deflectometer (FWD) to determine the existing structural capacity of the pavement section and underlying subgrade materials for estimation of remaining pavement life and overlay requirements. The evaluation and analysis has been performed for a wide range of facilities including major interstate highways, low volume streets, airfield pavements and parking lot facilities.



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