

DBP Compliance

EPA Quarterly Update



Quarter 2 Update: April – June, 2023

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From: Joshua Schimmel, Executive Director, Springfield Water and Sewer Commission

Date: June 30, 2023

The Springfield Water and Sewer Commission (Commission) is embarking on large-scale upgrades to replace 50- to 100-year-old drinking water infrastructure and to achieve compliance with regulatory limits for disinfection by-products (DBPs). This is a quarterly update on projects related to DBP compliance and water supply capacity.

The following projects to reduce DBPs in the Commission's drinking water and maintain a consistent supply of safe drinking water have progressed over the last quarter:

- **Clearwell & Backwash Pump Station** – CH Nickerson (contractor) continued to make progress on the backwash pump station, clearwell structure, and site piping. The contractor completed work on the windows and doors, installed process piping and hangers, pumps, domestic water treatment equipment, and electrical conduit in the pump station. The contractor completed a majority of the site piping work, including fill piping, domestic water piping, process water piping, and storm drain piping and manholes. Sections of site piping, the stop logs, and the slide gates were tested. The contractor is still on track to reach substantial completion later this summer but is predicting a potential one-month delay to final completion due to electrical equipment delays.
- **New Water Treatment Plant Design** – Hazen submitted 60% design documents in May and hosted a workshop with Commission staff to review all aspects of the design. The updated cost estimate is consistent with the 30% design estimate and is still estimated to be \$311 million for engineering and construction. The Commission is actively seeking additional sources for financing the funding shortfall for this project through state and federal programs and earmarks. Hazen continues to host weekly meetings with the Commission to review aspects of the design and is scheduled to submit 90% design documents in September.
- **42-inch Raw Water Transmission Main and Energy Dissipating Valve and Equalization Tank Facility** – AECOM is developing final design documents for repairs to the existing 42-inch raw water transmission pipeline and construction of the energy dissipating valve facility at the outlet to the new WPF. The Energy Dissipation Valve Facility and the 42-inch Raw Water Transmission Main projects will be combined into one construction project. The combined project is now projected to be completed in mid-2025, three months later than previously projected, more accurately reflecting the total project duration as design has progressed.
- **Cobble Mountain Hydroelectric Station Improvements for Primary Raw Water Conveyance** - Stantec and Kleinfelder are developing conceptual design documents for improvements to the Cobble Mountain Hydrostation, which is the primary raw water conveyance for the Commission. This project is currently projected to be completed in mid-2026 but may change as design progresses.

We have included additional information for each project on the following project update pages.

Please contact us if you would like more information about these projects. More information is also available at <https://waterandsewer.org/projects/>.



Clearwell & Backwash Pump Station

- Project Purpose:** This facility will replace the existing clearwell and backwash, domestic, and process water pumps.
- The existing clearwell is a 1920's slow sand filter that was retrofitted for use as a clearwell and backwash water storage tank for the direct filtration plant in the 1970's. The structural integrity of the clearwell is uncertain and the roof is leaky, allowing rainwater to infiltrate into the filtered water. The roof leaks have been temporarily mitigated by the installation of a geomembrane cover over the clearwell. The clearwell cannot be taken offline for maintenance, presenting a single point of failure for the direct filtration plant. The existing backwash, domestic, and process water pumps are original to the plant and are regularly breaking down and in need of repair.
- This project will provide the reliability and redundancy needed to maintain existing operations and will also function as the first component of the new water treatment plant.
- Delivery Approach:** Design-Build with AECOM (OPM), Tighe & Bond (Engineer), and CH Nickerson (GC). Financed by SRF.
- Design Progress:** Tighe & Bond finalized the design and submitted the final design documents in November.
- Const. Progress:** The contractor continued to make progress on the pump station, clearwell structure, and site piping this quarter. The contractor completed work on the windows and doors and installed process piping and hangers, pumps, domestic water treatment equipment, and electrical conduit in the pump station. The contractor completed a majority of the site piping work, including fill piping, domestic water piping, process water piping, and storm drain piping and manholes. Sections of site piping, the stop logs, and the slide gates were tested.
- Supply Chain:** The delivery time for electrical system components (MCCs and VFDs) continues to be the primary schedule concern. The MCCs, which are a critical path item, were scheduled to be shipped in June but are now expected to be shipped in late July, which will cause a project delay. The ship date for the VFDs has also been delayed. Delivery of 20-inch check valves is delayed due to raw material shortages and worker strikes but is not anticipated to cause schedule delays at this time.
- Project Delays:** Changes in design scope as requested by the Commission and AECOM during the 60% design review, along with pipe delivery delays, resulted in a four-month delay in project completion. Delays in the delivery of the MCCs are now anticipated to result in a further delay of the substantial completion date.
- Operational Issues:** This project continued to require careful coordination between the contractor and the Commission in Quarter 2. Pressure testing and flushing activities were conducted in coordination with operations staff, and initial equipment startups and trainings have begun. Plans are being developed for the final tie-in of the transmission mains and for the startup and testing of the facility in Quarter 3, which will require extensive coordination.
- Schedule:** The contractual substantial completion date is August 2023 (delayed from February 2023), but is currently projected to be extended further due to the delay in the MCC delivery date, likely into September/October 2023.

DBP Compliance

EPA Quarterly Update



Backwash Pump Station & Clearwell Site, 06/07/23



Domestic Water System equipment installed in Pump Station, 05/26/23



New Water Treatment Plant Design

- Project Purpose:** This project is for design and construction of a new water treatment plant (WTP) to meet the system demand while providing a higher level of treatment to achieve long-term, consistent compliance with the Disinfection By-Product (DBP) Rule. The new WTP will replace the existing direct filtration and slow sand filtration plants, which were not designed to remove adequate dissolved natural organic matter (NOM) to meet current regulatory limits for HAA5s and THMs.
- The Commission has frequently been in non-compliance for HAA5s since 2018. To address this issue, after completing several studies, the Commission identified that modifications to the existing plant processes would not be sufficient to achieve compliance, and that the addition of clarification was needed to reliably remove NOM and maintain compliance. Based on the results of a three-season pilot plant operation, Dissolved Air Flotation (DAF) with a polyaluminum chloride coagulant was selected as the clarification process for the new conventional plant.
- Delivery Approach:** Design-Bid-Build with Hazen (Engineer). Planned financing by WIFIA and SRF with additional Commission bonding as needed to provide complete project financing.
- Progress:** Hazen submitted 60% design documents in May and hosted a workshop with Commission staff to review all aspects of the design. The updated cost estimate is consistent with the 30% design estimate and is estimated to be \$311 million for engineering and construction. The Commission is actively seeking additional sources for financing the funding shortfall for this project through state and federal programs and earmarks.
- Hazen continues to host weekly meetings with the Commission to review aspects of the design and is scheduled to submit 90% design documents in September.
- Supply Chain:** Supply chain impacts on this project are currently unknown but are a concern. Lead times for some electrical equipment can be as high as one to two years. The project team is currently discussing how supply lead times may affect the project schedule and exploring options to minimize the impact.
- Project Delays:** The Commission changed the delivery approach to this project, which preliminarily used two construction contracts: the first contract for demolition and site preparation activities and a second contract for the construction of the new WTP. The Commission now plans to complete the project with one contract to reduce risk associated with multiple contractors working on the same project by placing the responsibility for project completion on one contractor. This results in an estimated 6-month delay for project completion.
- Schedule:** The contract is scheduled to be awarded in June of 2024 and to be completed by June of 2028. It was previously scheduled to be completed by December of 2027.

DBP Compliance

EPA Quarterly Update



Updated progress renderings of future water treatment plant by Hazen (May 2023)



42-inch Raw Water Transmission Main, Energy Dissipating Valve, and Equalization Tank

Project Purpose: This project is for the repair of the 42-inch bypass raw water conveyance PCCP pipeline and construction of a new energy dissipating facility (EDV) at the outlet. The pipeline and EDV facility was damaged when a new EDV failed in 2019 and requires repair/replacement. The pipeline and EDV facility provide an important route for raw water to bypass the Cobble Mountain Hydroelectric Station (CMHS), the Intake Reservoir, and the 72-inch Intake Tunnel. The EDV facility provides necessary energy dissipation for the 42-inch outlet, which conveys high pressure water (approximately 200 psi) directly from Cobble Mountain Reservoir. The project also includes the design of a new raw water equalization tank that will be used in the future to directly provide raw water to the new water treatment plant. The EQ tank will eventually replace the need to use the sedimentation basin for raw water storage.

With the 42-inch raw water transmission bypass out of service, the Commission currently relies on the Diversion Gates (the low-level dam outlet) to release water from the Cobble Mountain Reservoir when the CMHS is offline for routine maintenance. This outlet was not designed to operate as a regular intake and is not operable remotely, requiring staff to regularly perform a complicated confined space entry that, in an emergency, would require assistance from a technical rescue team. With the 42-inch bypass out of service, there is currently no bypass for the 72-inch Tunnel.

Returning this route to service will allow the Commission to take the CMHS and 72-inch Intake Tunnel offline for maintenance when needed while maintaining raw water supply to the current and future water treatment plants.

Delivery Approach: Design-Bid-Build with AECOM (Engineer).

Progress: The Energy Dissipating Valve Facility and the 42-inch Raw Water Transmission Main project have been combined into one construction project. AECOM is developing final design documents.

Supply Chain: Supply chain impact on this project is uncertain. Current lead times on materials indicate that this may be less of a concern than some of our other projects.

Project Delays: The combined project is now projected to be completed in mid-2025, which is 3 months later than previously projected. The schedule has been updated to more accurately reflect the anticipated combined project duration as design progressed.

Schedule: Project anticipated to be completed mid-2025.

Cobble Mountain Hydroelectric Station Improvements for Primary Raw Water Conveyance

Project Purpose: The Cobble Mountain Hydroelectric Station (CMHS) is an essential component of the Commission's raw water conveyance system. As part of the primary raw water conveyance route, the CMHS delivers water from the Broome Gate Intake down to the Intake Reservoir while generating power by using the 450-foot elevation difference between the two reservoirs. This project will identify alternatives for conveyance and hydropower generation in response to failing infrastructure at the facility. The existing turbines have reached the end of their operational lives, and only one out of the original three turbines is currently operational and is on a limited operating schedule to limit wear and reduce the risk of failure.

When the CMHS is offline for maintenance, the remaining routes for raw water conveyance are the 42-inch bypass (currently out of service) and the low-level Diversion Gates, which are not designed for regular operation. Restoring the CMHS conveyance route is vital to establishing reliable raw water conveyance for the Commission.

Delivery Approach: Design-Bid-Build with Kleinfelder/Stantec (Engineer).

Progress: Stantec and Kleinfelder are developing conceptual design documents for improvements to the CMHS, which will include rehabilitation of one turbine.

Supply Chain: Supply chain impacts on this project are currently unknown but are a concern.

Project Delays: None at this time.

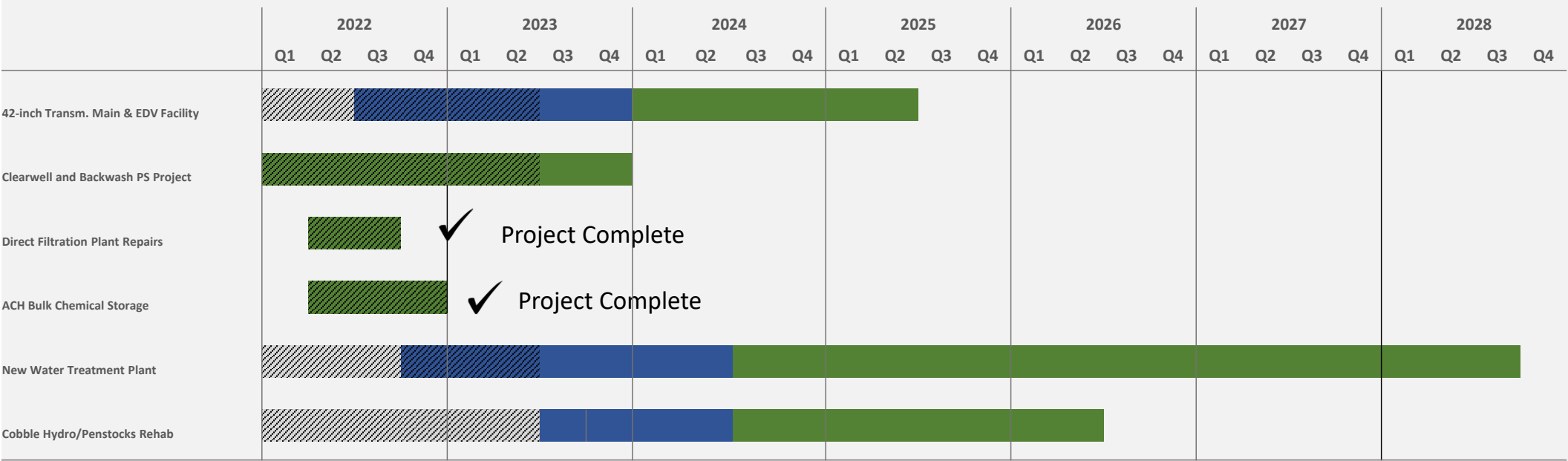
Schedule: This project is currently projected to be completed in mid-2026, but this date is subject to change as design progresses.



Public Relations Manager Jaimye Bartak meets with Senator Warren staffer Chris Gongora in May to discuss the need for funding to complete this critical project.

Engineering Capital Projects Schedule

EPA Quarterly Update – June 2023



Note: Schedule is generalized and subject to change

✓ Project Complete
 ✓ Project Complete