

DBP Compliance

EPA Quarterly Update



Quarter 4 Update: October – December 2023

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Date: December 29, 2023

The Springfield Water and Sewer Commission (Commission) has embarked 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) worked on startup activities in October, November, and December. After the delayed arrival of the MCCs in September, the contractor completed the majority of startup activities in October, including bringing the backwash pumps, wash water pumps, and process water pumps online and making the first of two water transmission main connections. Startup activities for the new domestic water system (used to provide potable water to facilities on campus) extended into December while the contractor worked to resolve issues with the sodium hypochlorite feed system. In early December the new domestic water system was brought online and the contractor was able to complete the final transmission main connection, which disconnected the existing clearwell from the system.
- **New Water Treatment Plant Design** – In October Hazen conducted a workshop with the Commission to review the 90% design documents submitted in September. A peer review of the 90% documents was completed by Kleinfelder/Stantec and discussed in a workshop held in November. Hazen has been incorporating review comments while continuing to hold weekly design meetings with the Commission to receive input on the final design details. The 100% design documents are scheduled to be submitted to the Commission for review in January. Hazen submitted a permit application to MassDEP for design approval of the new WTP on October 26, 2023. Hazen continues to work to complete the state and local permitting required to put this project out to bid.
- **42-inch Raw Water Transmission Main / Energy Dissipating Valve (EDV) and Equalization Tank Facility** – AECOM incorporated peer review and Commission comments and submitted 100% design documents in October and is currently working to finalize the documents for bidding. The BRP WS 32 Distribution Modification permit was conditionally approved by MassDEP in October. The combined project is now projected to be bid in January 2025 and completed in late-2025. Project bidding was delayed slightly due to design coordination issues between the proposed equalization tank at the EDV facility and the new Water Treatment Plant as well as delays in securing a waiver from EPA WIFIA program for the specified valves for the facility.
- **Cobble Mountain Hydroelectric Station Improvements for Primary Raw Water Conveyance** - Stantec and Kleinfelder developed and submitted conceptual design documents this quarter for improvements to the Cobble Mountain Hydrostation, which is the primary raw water conveyance for the Commission. The Commission reviewed and provided comments on the conceptual design. Improvements to the power plant are projected to be completed in mid-2026 but the schedule may change as design progresses and more specifics are known about the project.

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 1920s slow sand filter that was retrofitted for use as a clearwell and backwash water storage tank for the direct filtration plant in the 1970s. 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; parts are no longer readily available for more frequently necessary repairs.
- 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 MA Drinking Water SRF.
- Design Progress:** Tighe & Bond submitted the final design documents in November 2022.
- Const. Progress:** CH Nickerson (contractor) worked on startup activities in October, November, and December. After the delayed arrival of the MCCs in September, the contractor completed the majority of startup activities in October. The backwash pumps and process water pumps were brought online during the second week of October. The following week, the first of the two transmission main connections to the existing clearwell was disconnected and reconnected to the new Hydraulic Control Structure; the first step towards isolating and disconnecting the old clearwell from the system.
- Startup activities for the new domestic water system (used to provide potable water to facilities on the West Parish campus) extended into December while the contractor worked to resolve issues with the sodium hypochlorite feed system used to establish a chlorine residual. After improvements were made, the new domestic water system was brought online during the first week of December. The contractor was able to complete the final transmission main connection to following week, isolating and disconnecting the existing clearwell from the system.
- Over this quarter the contractor also completed the demolition work in the old pump room, removing the old backwash, process water, and domestic water pumps and ancillary equipment.
- Supply Chain:** The MCCs, which were a critical path item, were scheduled to be shipped in June but did not arrive until early September, causing a project delay. The ship date for the VFDs and 20-inch check valves were also delayed but did not impact overall project schedule.
- Project Delays:** Changes in design scope to improve the function of the facility 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 resulted in a three-month construction delay. Delays in bringing the domestic water system online delayed the project final completion by an additional two months.
- Operational Issues:** This project continued to require regular coordination between the contractor and the Commission in Quarter 4. Startup of each pump system required careful coordination across the Design Build Team, OPM, and the Commission's operations and engineering staff. The two transmission main connections required shutdowns of segments of the Commission's transmission mains and use of temporary systems to maintain consistent flow and water quality.
- Schedule:** Substantial completion was awarded in December.

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Backwash Pump Station & Clearwell Facility, 10/17/2023



First transmission main connection, 10/19/2023



New Water Treatment Plant Design

- Project Purpose:** This project is for design and construction of a new water treatment plant (WTP) to meet 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 been in periodic 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 using WIFIA and SRF with additional Commission revenue bonding as needed to provide complete project financing.
- Progress:** In October Hazen conducted a 90% design review workshop with the Commission. A peer review of the 90% documents was completed by Kleinfelder/Stantec and discussed in a workshop held in November. Hazen has been incorporating review comments while continuing to hold weekly design meetings with the Commission to receive input on the final design details. The 100% design documents are scheduled to be submitted in January. Hazen submitted a permit application to MassDEP for design approval of the new WTP on October 26, 2023. Hazen continues to work to complete the local and state permitting required to put this project out to bid.
- 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 evaluating 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 substantially completed by August 2028.

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October 2023 progress rendering of the new WTP exterior and landscaping



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 were damaged when a new EDV failed in 2019. 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 (EQ) 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 would require assistance from a technical rescue team should an emergency evacuation be required. 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: AECOM incorporated peer review and Commission comments and submitted 100% design documents in October. They are currently working to finalize the documents for bidding. The BRP WS 32 Distribution Modification permit was conditionally approved by MassDEP in October. The combined project is now projected to be bid in January and completed in late-2025.

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 the third quarter of 2025, which is later than previously projected. The schedule has been updated to more accurately reflect the anticipated combined project duration as design progressed. Some project delays were related to needing to secure a waiver from EPA WIFIA program for the specified valves for the facility which are not made in America. Other delays have been related to the need to coordinate some aspects of the design with the design of the new WTP.

Schedule: Project anticipated to be completed the third quarter of 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 upgrades to hydropower generation in response to failing infrastructure at the facility. The existing 1930 turbines are mostly beyond the end of their operational lives, with only one out of the original three turbines currently operational on a limited 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 developed and submitted conceptual design documents this quarter for improvements to the CMHS. The conceptual design incorporates information collected during the condition assessment conducted during the previous quarter and includes recommendations for rehabilitation of the Unit #3 turbine; replacement of the turbine generator; replacement of the crane, oil lubrication and drainage system, excitation system, plant control system, and critical valves; and improvements to the structure and substructure; site drainage improvements; and penstock maintenance. The Commission reviewed and provided comments on the conceptual design. Improvements to the power plant are projected to be completed in mid-2026 but the schedule may change as design progresses.

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

Project Delays: None at this time.

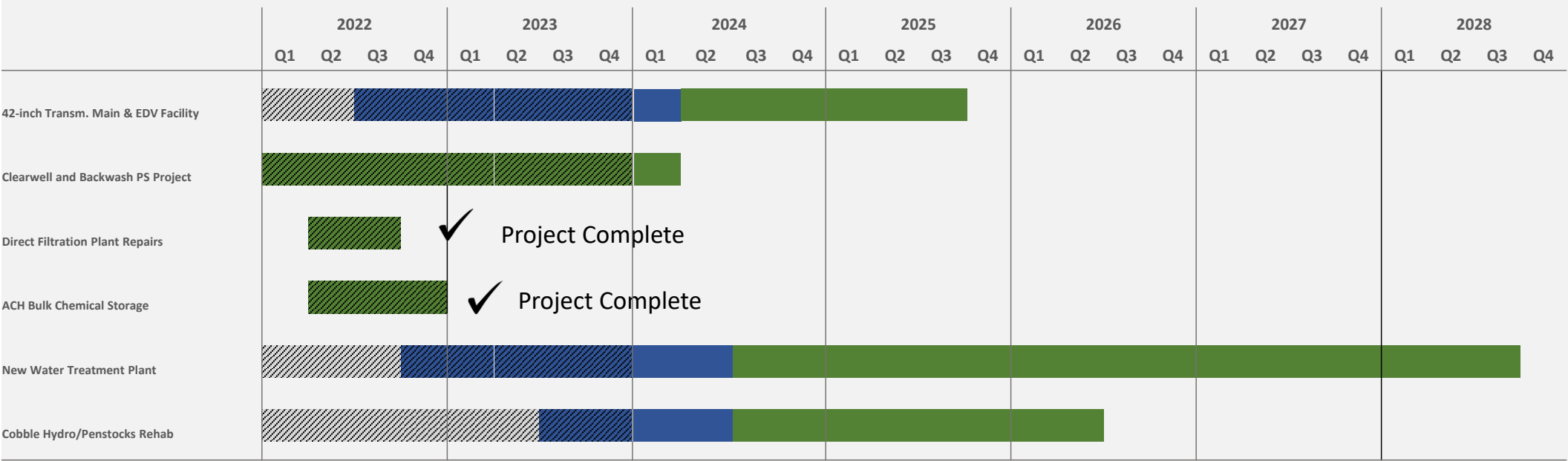
Schedule: This project is currently projected to be completed in mid-2026, but this date is subject to change as design progresses.



Powerhouse Generator Room in 1931 (left), Powerhouse Generator Room in 2022 (right)

Engineering Capital Projects Schedule

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Note: Schedule is generalized and subject to change

✓ Project Complete
 ✓ Project Complete