

Legislation Text

File #: 16-4577, **Version:** 1

MINT FARM WATER SUPPLY IMPROVEMENTS - DISSOLVED OXYGEN ADDITION & INVESTIGATION OF SILICA REMOVAL TECHNOLOGIES

COUNCIL INITIATIVE ADDRESSED:

Provide sustainable water quality & environmental infrastructure

CITY ATTORNEY REVIEW: N/A

SUMMARY STATEMENT:

Earlier this year, four test sites along the Cowlitz River were explored to investigate horizontal collector wells as a potential source of water to replace the Mint Farm aquifer. The water quality from the four test sites was generally lower than the Mint Farm aquifer, prompting a decision by the City Council and Beacon Hill Water & Sewer District Commissioners to cease further study of alternate sources and focus instead on optimizing Mint Farm water quality. Several enhanced treatment technologies are available to improve water quality and address customer complaints. The most prolific objections tend to revolve around taste/odor issues and white deposits that are difficult to remove. Both of these issues are complex and distinct, there is no one remedy which will address both, and there are multiple technologies available to address each issue.

To improve taste and odor issues, dissolved oxygen (DO) addition is recommended. Based on an evaluation of life cycle costs and risk-benefit analysis, the preferred method for DO addition at the Mint Farm Regional Water Treatment Plant (MFRWTP) is aeration. Other DO technologies include bulk liquid oxygen, onsite generation, and hydrogen peroxide injection. Dissolved oxygen addition was previously evaluated at the pilot-scale level using liquid oxygen injected into sections of pipe removed from the water distribution system, and at the home-level using commercially available aeration equipment. The use of DO for corrosion control is common practice and the benefits of DO to reduce iron release from pipe scales and inhibit hydrogen sulfide reversion are well documented. Dissolved oxygen provides another weak but stable oxidant which, when slowly introduced into the distribution system, is expected to temper the system's dependency on chlorine to maintain chemical stability. A scope of work and budget has been provided by CH2M to provide design and construction support services for installation of the recommended DO treatment system.

The white deposits generating complaints from our customers have been determined to be primarily silica deposits. Reducing silica concentrations by approximately 75% in the finished water is recommended to reduce white deposits. Potential treatment technologies for removing silica include reverse osmosis, lime softening, precipitation, electrocoagulation, blending, ion exchange, and adsorption using activated alumina. Some level of testing is recommended to evaluate each technology to determine effectiveness, estimate the cost of full scale implementation, and draw comparisons between options. The various technologies are proposed to be evaluated via plate or jar testing at the bench level. To avoid delays in completing an evaluation, a bench scale test to determine the feasibility of electrocoagulation has already been initiated through the equipment vendor. Two less promising technologies are also proposed to be referred to their respective vendors for an assessment based on their current data. The results of any evaluations will be presented in a report that will include a conceptual design and layout of the preferred alternative. A scope of work and budget has been provided by CH2M to complete this silica removal evaluation.

Separate proposals are provided for each scope of work to allow approval, modification, or rejection of one proposal without affecting the other proposal. Both DO design and silica removal evaluation activities can

proceed simultaneously.

FINANCIAL SUMMARY:

The original contract amount awarded to CH2MHill for the Water Supply Review project was \$217,256. A contract supplement in the amount of \$327,550 was later approved to conduct the horizontal collector well investigation. To date, a total of \$390,102 has been spent, leaving a remaining balance of \$154,704.

CH2MHill's proposed fee for DO design and construction support is \$166,564. In order to proceed with only the DO project, authorization of an additional \$11,860 in contract funding is required.

CH2MHill's proposed fee for silica removal evaluation is \$67,296. In order to proceed with only the silica removal concept evaluation, no additional contract funding is required.

The combined fee for both scopes of work is \$233,860, which would require authorization of \$79,156 in additional contract funding.

	Budget Amount	Added or Expended	Funding Available	Total Contract
Original Scope of Work	\$217,256		\$217,256	\$217,256
Amendment No. 1	\$327,550	\$327,550	\$544,806	\$544,806
Amount Expended		(\$390,102)	\$154,704	

	Budget Amount	Funding Required	Funding Available	Total Contract
DO Addition Design Only	\$166,564	\$11,860	\$154,704	\$556,666
Silica Removal Concept Report Only	\$67,296	\$0	\$154,704	\$544,806
Both DO Design and Silica Concept Report	\$233,860	\$79,156	\$154,704	\$623,962

RECOMMENDED ACTION:

Provide direction to staff regarding the following options:

1. Proceed with Dissolved Oxygen Design and Construction Support.
2. Proceed with Silica Removal Concept Design Report.
3. Other direction as determined by the City Council and BHWSD Board.

