MEMORANDUM

To: Mayor and Members of the City Council

From: Montrè Freeman, City Manager
Dwan Bell, Public Utilities Director
Jon Hawley, Grants Administrator

Date: October 11, 2024

Re: Consideration - Proposed Sedimentation Basin Repair Project

BACKGROUND:

Last October, the General Assembly approved Session Law 2023-134, the biennial state budget, whose appropriations include a $9 million award to the City of Elizabeth City for critical water and sewer system projects. The NC Department of Environmental Quality is administering these funds, and, by statute, may charge an administrative fee. This fee is 1.5 percent of our award, meaning there is a total of $8,865,000 available for projects.

DEQ is managing our appropriation similarly to its standard grant programs. This means the City must submit proposals for each intended use of funds. So far, we have obligated $5.73 million of our appropriation to two projects: the Raw Water Reservoir Replacement Project ($3.3 million) and the Pump Station Rehabilitations Project ($2.43 million). The Council has approved these projects, and grant contracts have been executed for each. This means that $3,135,000 remains available for additional water or sewer projects.

We are now proposing to request approximately $2,100,000 of our appropriation for the Sedimentation Basin Repair Project, which will make urgently needed repairs at our Water Treatment Plant (WTP).

ANALYSIS:

The WTP includes a major concrete structure supporting five sedimentation basins and a raw water aeration channel. The channel and basins are all integral to our water treatment processes; per our plant operators, if even one of these basins were inoperable, it would greatly limit our output of treated water and our ability to serve the city.

The basins and channel are showing signs of significant deterioration. Concrete is cracked and beginning to crumble in several locations, exposing rebar and support beams. The structure's protective surface coatings are also wearing away, and numerous valves and

gates are rusted, leaking, and missing parts. One of our engineering firms, AECOM, has evaluated the structure and provided a detailed, recommended scope of work. This document represents our proposed project, and it is attached for reference. In short, the concrete needs to be repaired and re-coated, and valves and other components need to be repaired or replaced. The crosswalks and access ladders also need to be repaired or replaced for operator safety.

In requesting use of the special appropriation under SL 134, City staff remain mindful that we must use this one-time funding to address critical needs in lasting ways. We believe the proposed Sedimentation Basin Repair Project meets that standard; our SL 134 appropriation is also the best way to fully and promptly fund this urgent work.

STAFF RECOMMENDATION:

By motion: authorize City staff to submit a grant application for the Sedimentation Basin Repair Project to the NC Department of Environmental Quality, as proposed herein, to be funded by the City's special appropriation under Session Law 2023-134.

5. Project Description

Check Appendix A to determine if the S.L. 2023-134 Water/Sewer Directed Project for the local government unit has a specific project and budget identified with the appropriation.

The City of Elizabeth City owns and operates a conventional lime softening water treatment plant (WTP) that has a design capacity of 5.0 million gallons per day (mgd) and treats groundwater from 14 wells. The plant is thought to have been constructed in 1926. As part of the treatment process, a free-standing concrete structure exists and contains a raw water aeration channel and five sedimentation basins. The condition of the concrete in and out of the structure is in poor condition with loss of topcoat and exposed aggregate. There are major losses of concrete, exposed and rusted reinforcing bars in the tee-beam style cross walks and support beams. Drain valves, flow control valves and sluice gates in the aeration channel and sedimentation basins are old, rusted, leak, have broken components and have missing and rusted operating stems. The steel access step rungs in each sedimentation basin are old, rusted with some missing.

The proposed project will clean, repair and coat the exterior and interior concrete surfaces on the sedimentation basin structure; replace failing concrete cross walks and beams; replace drain and flow control valves and sluice gates; and replace access rungs in the interior of the basins. The three 6-inch mud-type drain valves, stems and nuts in the aeration channel will be replaced. The project will also replace the ten 16-inch flow control, mud-type valves, stems and handwheel operators in the influent channel at the head of the sedimentation basins. The fifteen 10-inch mud-type drain valves, stems and nuts will be replaced in the five sedimentation basins. The project will also replace the five 16 x 16-inch flow control sluice gates, stems and handwheel operators in the effluent channel at the end of the sedimentation basins. The five 12-inch butterfly valves will be replaced in the influent filter gullets. Approximately 75 steel access step rungs will be replaced with steel reinforced polypropylene plastic rungs in the sedimentation basins.

The exterior concrete surfaces of the sedimentation basin and adjoining aeration channel will be cleaned with a high-pressure wash to remove damaged concrete and loose aggregate. Damaged areas of concrete will then be patched, followed by applying a coating system consisting of one primer coat and two topcoats.

The top surfaces of the sedimentation basin will be cleaned and coated. These surfaces include the three main walkways, three crosswalks, two support beams, influent channel and effluent channel. The damaged areas of concrete will be patched, followed by applying a coating system consisting of one primer coat and two topcoats. The existing aluminum handrails along the cross walks will be reused, but will be removed and replaced as needed to repair and coat the concrete surfaces.

The interior concrete surfaces of the sedentation basin will be cleaned and rehabilitated. These surfaces include inside the influent channel, the diversion wall, side walls, floors inside the effluent channel and overflow baffle walls. A high-pressure wash will be used to clean the concrete surfaces and to remove all lose concrete and aggregates. It appears that all surfaces of the sedimentation basin will need to be patched and coated. The coating system will consist of two topcoats.

At least nine cross walks and support beams will be removed and replaced in their entirety. The concrete structure will be removed and replaced with a new reinforced concrete T-beam shaped walkway. The new cross walks will be coated with the same coating system as the top surfaces of the sedimentation basin.

Engineering services will include a minimum of five site visits to the WTP with senior civil and structural engineers to view the condition of each sedimentation basin while each is out of service. Only one basin can be taken out of service at a time. Engineering drawings of the basins will be prepared showing the existing conditions and proposed

work. Repair and coating systems will be evaluated and specified. Engineering design plans, bidding documents and technical specifications will be prepared along with an opinion of probable construction cost. A permit application will be prepared and submitted to the NC Public Water Supply Section for approval. Bidding services will be provided and will consist of issuing bidding documents, attending an onsite pre-bid conference, issuing addenda, attending the bid opening, certifying bids and issuing a letter of recommendation. Construction administrative services will be provided and will include attending the pre-construction conference and up to 12 monthly progress meetings, reviewing shop drawings and contractor pay requests, responding to request for information, preparing record drawings, issuing the engineering certification and other tasks. Periodical construction obversion services will be provided and will include up to 12 site visits for the civil and structural engineers to observe application of the coating systems and replacements of the cross walks.

A project budget has been prepared and is estimated to be $2,121,000. A breakdown of the budget is provided in Section 6.