



Charlotte County Utilities

White Paper

EAST PORT WATER RECLAMATION FACILITY HEADWORKS

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East Port Water Reclamation Facility Headworks

Statement

The current East Port WRF headworks provides screening, grit removal and flow routing for the currently permitted 6 million gallons per day average annual daily flow (MGD AADF) of the plant. During initial attempts to begin rehabilitation of the existing headworks in 2024, more than standard deterioration was identified. After a further in-depth investigation by CCU staff, it was found that there is significant damage to the mechanical and structural components of the headworks. This damage is limiting the performance of the headwork systems. To maintain the plant's treatment capabilities, the issues with plant headworks needs to be corrected as soon as possible.

Objective

The objective of this project will be to correct all of the damaged systems of the headworks and increase the resiliency of the headworks in a way that is fiscally responsible to the Charlotte County Utility (CCU) Department. To do this, it is expected that the following mechanical equipment may need to be replaced.

- Bar screens,
- Grit removal system and associated pipework,
- Odor control,
- Electrical and control systems.

In addition, key parts of the concrete structure were found to be in poor condition and will need various levels of rehabilitation, but particularly inside the flow channels where extensive rehabilitation will be necessary, including a new coating system.

To facilitate any repairs, a bypass system with rudimentary screening, grit removal and flow routing will need to be installed ahead of construction to allow operations to continue.

Background

A new headworks with sufficient capacity to match the needs of the 9 MGD AADF and 12 MGD AADF expansions of the plant was originally included in the 9 MGD AADF Expansion project scope. It was removed from the project at 60% design in 2021. At that time, the existing headworks was evaluated by CCU staff in consult with the project team and determined it to be serviceable for at least 9 MGD AADF with only minor adjustments to increase capacity and by mitigating peak hour flow (PHF) concerns via other related efforts. CCU would only need to replace specific headworks process mechanical equipment with in-kind replacements as needed. The following PHF mitigation projects were planned and/or implemented:

- Addition of an Equalization Tank,
- Inflow and infiltration reduction projects in the collection system,
- Completion of the installation of the 48" interceptor, and
- Completion of the construction of the grand master lift station.

When the new headworks was removed from the project in 2021, the future flow rate projections were based on pre-pandemic years and did not show such a steep future flow curve projection as they do

now. In addition, there were other high priority rehabilitations needed in other parts of the plant. Therefore, the decision was made to reallocate those design and construction monies within the 9 MGD AADF Expansion project to other efforts deemed more beneficial at the time, and the costs to rehabilitate the existing headworks deferred to the future.

A wastewater plant headworks typically lasts 8-12 years between major rehabilitation cycles depending on the character of the influent wastewater, flow conditions, and design intent. The last major rehabilitation of the existing headworks was completed in 2010, so in 2024 CCU staff performed an in-house preliminary evaluation of the existing headworks, determined some rehabilitation was warranted, and started down the path of rehabilitation. While early in the process of procuring replacement mechanical parts for screening and grit equipment, structural damage was identified. This structural damage was substantial enough to change the project from a minor rehabilitation situation to a major improvement project. In July 2025, a structural engineer from Jones Edmunds performed an evaluation of the existing headworks structure and determined the existing headworks may only have 1-5 years remaining life.

Description

Option #1 – Rehabilitate the existing headworks. This will include the following:

- Substantial structural rehabilitation,
- New channel coating system,
- New deck plating,
- New/rehabilitate gate/control structures,
- New bar screens,
- New grit removal system,
- Associated pipework,
- Odor control,
- Electrical, and controls.

A temporary passive overflow bypass system will be needed for maintenance of plant operations.

Below is a planning level cost estimate with an accuracy range of minus 25% to plus 75%. The baseline year for this estimate is 2025, and a 3% escalation per year to the midpoint of construction will be assumed.

East Port WRF Existing Headworks Rehabilitation ROM		
Design		
Project Management		\$60,000
Studies and Preliminary Design Documents		\$20,000
Design Documents		\$150,000
Permitting		\$25,000
Bidding		\$35,000
Construction Oversight		\$290,000
Contingency	10.0%	\$58,000
Design Cost Escalation (2 years)	6.0%	\$38,280
Base Design Total		\$676,280
Construction		
Project Management		\$500,000
Bypass/MOPO		\$1,000,000
Material Procurement		\$2,800,000
Labor		\$1,200,000
Markup	15.0%	\$825,000
Contingency	10.0%	\$632,500
Bonds and Insurance	1.5%	\$104,363
Construction Cost Escalation (2 years)	6.0%	\$423,712
Base Construction Total		\$7,485,574
CCU Staff (Design/Construction Oversight)	2.5%	\$204,046
ROM Estimate		
Base Project Cost		\$8,365,901
High Estimate	75.0%	\$14,640,326
Low Estimate	-25.0%	\$6,274,425
Midpoint Estimate		\$10,457,376

Option #2 – Build a new higher capacity headworks. This will include the following:

- New concrete structure,
- Channel coating system,
- Deck plating,
- Safety rails,
- Stairs,
- Screening,
- Grit removal,
- Pipework,
- Odor control,
- Electrical and controls,
- Odor control,
- Tailings chutes and dumpster bay, and
- All other supporting systems and appurtenances.

Below is planning level cost estimate with an accuracy range of minus 25% to plus 75%. The baseline year for this estimate is 2025, and a 3% escalation per year to the midpoint of construction will be assumed.

East Port WRF New Headworks ROM		
Design		
Project Management		\$100,000
Studies and Preliminary Design Documents		\$25,000
Design Documents		\$250,000
Permitting		\$30,000
Bidding		\$50,000
Construction Oversight		\$455,000
Contingency	10.0%	\$91,000
Design Cost Escalation (2 years)	6.0%	\$60,060
Base Design Total		\$1,061,060
Construction		
Project Management		\$850,000
Bypass/MOPO		\$1,000,000
Material Procurement		\$5,000,000
Labor		\$2,500,000
Markup	15.0%	\$1,402,500
Contingency	10.0%	\$1,075,250
Bonds and Insurance	1.5%	\$177,416
Construction Cost Escalation (2 years)	6.0%	\$720,310
Base Construction Total		\$12,725,476
CCU Staff (Design/Construction Oversight)	2.5%	\$344,663
ROM Estimate		
Base Project Cost		\$14,131,200
High Estimate	75.0%	\$24,729,599
Low Estimate	-25.0%	\$10,598,400
Midpoint Estimate		\$17,664,000

Option #3 – Do nothing. The majority of the process mechanical equipment of the existing headworks is already beyond a reasonable service lifetime and catastrophic failure of many pieces of equipment has occurred or is imminent. Eventually the deterioration of the concrete structure will be so severe that it may be deemed unsafe, the entire headworks will need to be removed from service, and a semi-permanent bypass will need to be installed to mimic the various functions of the headworks. According to the structural engineer at Jones Edmunds, this may occur within 1-5 years.

Recommendation

Option #2 is the recommended option. It will not only accomplish the outcome of a major rehabilitation cycle but also addresses future flows through at least the (future) 12 MGD AADF expansion of the plant. With the increase in growth within Charlotte County the need to expand the plant to 12 MGD AADF will occur much sooner than originally expected. If we only rehabilitate the existing headworks, at this time we would be constructing a new headworks to meet the 12 MGD expansion flows. Given the high cost to rehabilitate the existing headworks from its current state, it is more beneficial to use those monies towards a new higher capacity headworks that will meet the flows for the 12 MGD expansion and have a much longer service lifetime.