

## FY 22 HMA – Grant Application Review Summary

<b>Subapplication Number</b>	EMA-2022-BR-001-0044		
<b>Project Title</b>	Bay River Metropolitan Sewer District Facultative Lagoon System Renovation and Capacity Upgrades		
<b>Applicant Name</b>	North Carolina Department of Public Safety		
<b>Subapplicant Name</b>	County of Pamlico		
<b>Project Type</b>	Flood Risk Reduction		
<b>Recommendation</b>	Yes with Conditions		
<b>Federal Cost (FEMA GO)</b>	\$7,651,325	<b>Phased Project</b>	No
<b>BCR (subapplication)</b>	15.97	<b>Duplicate Project</b>	No
<b>BCR (reanalysis)</b>	1.14	<b>Benefits (reanalysis)</b>	\$11,030,942

### Summary

This is a technical feasibility and cost-effectiveness review in support of the National Technical Review process. Additional Environmental Planning and Historic Preservation (EHP), eligibility and completeness, and funding limitation considerations may affect the selection of this subapplication for further consideration and funding. No contact was made with the applicant or subapplicant; this review is solely based on information provided in the subapplication.

### Scope of Work

The scope of work is well-defined and clearly explains the activities necessary to complete the work. The subapplicant has submitted a subapplication for the repair of existing dykes and improvement of the lagoon system capacity from 200,000 gallons per day (gpd) to 400,000 gpd. The subapplicant proposes to create a spray site for treated wastewater and includes additional infrastructure required for the capacity expansion to serve new addresses with failing septic systems. Providing new connections to unsewered communities will be included in this project to prevent flooded septic systems from infecting groundwater and waterways.

### Technical Feasibility

#### *Project Schedule*

The schedule duration is 36 months. The schedule includes all items in the scope of work and is reasonable. The subapplication states that the duration of the proposed activities is 36 months. The duration of shown in the subapplication is 43 months.

#### *Cost Estimate*

The cost estimate includes sufficient line items consistent with the scope of work.

#### *Technical Design Information*

The following information and documentation were provided to support the project:

Item	Documentation	Evaluation
Proposed Level of Protection	Conceptual Drawings, Subapplication narrative, Engineering Report dated 2015	The project proposes to protect wastewater service during the 100-year event.

Item	Documentation	Evaluation
Flood Risk Data	FEMA FIRM, FIS, Engineering Report	The sewer lagoon is not in the Special Flood Hazard Area.  The provided documentation does show how the proposed project will reduce risk.  The project will lower the risk in the area from a failure of a wastewater lagoon with a history of flooding, located within a 0.2% flood zone (Zone X). The subapplicant notes that the project will prevent hundreds of thousands of gallons of raw sewage from entering and contaminating creeks, rivers, and neighborhoods.
Residual Risk	Engineering Report, Subapplication narrative	The subapplicant stated that residual risk will remain if the entire county were to flood or for residents who do not improve their sewer system per this project.
Design and Performance Standards	Engineering Report, Conceptual Drawings, Subapplication narrative	The subapplication cites NC NWS design standards listed in the 2015 engineering report.
Design Drawings, Maps, Photographs	Conceptual drawings, project maps/photos	Documentation was provided to support the project.  The subapplicant provided conceptual design drawings.
Upstream and Downstream Impacts	Subapplication narrative	The improvements are for increasing sewer capacity of the sewer treatment facility. There are no anticipated impacts to flood zones.
Operation and Maintenance (O&M) Plans	Scope of work narrative	Subapplicant indicates that an O&M plan will be developed as part of the project.

Based on the documentation provided, the project is technically feasible and effective at reducing risk to individuals and property from natural hazards.

**Cost-Effectiveness**

The Benefit-Cost Analysis (BCA) was completed based on historical damages.

The following was found during review of the submitted BCA:

*Cost Estimation*

Input	Value	Evaluation
Project Useful Life (PUL)	50 years	This value is consistent with the FEMA standard value.

Input	Value	Evaluation
BCA Toolkit Initial Project Cost	\$9,700,000	This amount is not consistent with the subapplication project cost estimate. The cost estimate in the subapplication and attached documents is \$9,596,500.
Annual Maintenance Cost	\$5,580	This amount is reasonable. The subapplicant provided a schedule of anticipated O&M activities. An existing O&M is in place, therefore additional inspections and maintenance of the expanded lagoon will be minimal.
BCA Toolkit Total Project Cost	\$9,777,008	This amount is calculated based on the initial project cost, the annual maintenance costs, and the PUL.

*Historical Damages*

Input	Evaluation
Facility Type	The facility type of wastewater service was used in the BCA. This input is consistent with the proposed project in the subapplication.
Loss of Function	The BCA includes loss of sewer service for 6,780 customers. The number of customers was calculated using approximately 3,000 homes and 2.26 residents per home from census data.
Before-Mitigation Damages	The BCA uses 2018 as the damage year with a recurrence interval of 50 years and loss of sewer service of 0.5 days. The recurrence interval is based on a 2018 storm event with 9.7 inches of rain within 24 hours which is comparable to NOAA Atlas 14's 50-year event.
After-Mitigation Damages	BCA uses a recurrence interval of 51 years and loss of sewer service of 0.17 days (4 hours). Documentation was not provided to support the recurrence interval and loss of service days, but is a conservative estimate considering the proposed 100-year level of protection.

**Reanalysis BCA**

A reanalysis BCA was performed, and the following edits were made:

Inputs	Values	Explanation
Initial Project Cost	\$9,596,500	Changed the initial cost from \$9,700,000 to the cost estimate value of \$9,596,500.
Social Benefits	4,500 Residents	Social benefits were added for 4,500 residents benefitting from this mitigation project per the subapplication. No workers were input due to loss of sewer.

Based on the reanalysis BCA, the total benefits associated with this project, \$11,030,942, are greater than the total project cost of \$9,673,509, producing a BCR of 1.14.

Based on the documentation provided, the project is cost-effective. The following condition was identified:

- Provide documentation to support the number of residents for social benefits.

### **Conclusion**

Based on the information provided, the project is technically feasible and cost-effective; therefore, it is recommended for further consideration with the following condition:

- Provide documentation to support the number of residents for social benefits.

This review is an evaluation of the project's technical feasibility and cost-effectiveness. Additional EHP, eligibility and completeness, and funding limitation considerations may affect the selection of this subapplication for further consideration and funding.