

FY 21 HMA – Grant Application Review Summary

Subapplication Number	EMA-2021-BR-005-0044		
Project Title	Water Supply Resiliency Project for SRU Pump Station Along Yadkin River		
Applicant Name	North Carolina Department of Public Safety		
Subapplicant Name	City of Salisbury		
Project Type	Infrastructure Retrofit		
Recommendation	Yes with Conditions		
Federal Cost (FEMA GO)	\$22,496,850	Phased Project	No
BCR (subapplication)	1.34	Duplicate Project	No
BCR (reanalysis)	1.24	Benefits (reanalysis)	\$42,305,456

Summary

This is a technical feasibility and cost-effectiveness review in support of the National Technical Review process. No contact was made with the applicant or subapplicant; this review is solely based on information provided in the subapplication. The project was found to be technically feasible and cost-effective; therefore, it is recommended for further consideration with the conditions listed in the conclusion.

This review only constitutes an evaluation of the technical feasibility and cost-effectiveness of the proposed project. 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.

Scope of Work

The scope of work is well-defined and clearly explains the activities necessary to complete the work. The City of Salisbury (subapplicant) has submitted a subapplication for the construction of a new raw water intake and pump station. The nearby existing pump station will be replaced because—when the river reaches high stages—the building floods and the pump station must be temporarily taken offline. The project includes construction of a new intake and pump station, new gravel access road and bridge, new 42-inch-diameter raw water line, and demolition of the existing pump station. The proposed project is intended to reduce risk of loss of potable water supply for 48,900 residents.

Technical Feasibility

Project Schedule

The schedule provided indicates the project would be completed in 36 months. The schedule does not include all items in the scope of work but appears reasonable.

The subapplicant states that final design and permitting are intended to be conducted as pre-award tasks. Design, permitting, and land acquisition are included in the cost estimate and considered essential components of the project; these items should therefore be included in the schedule. The proposed schedule should be amended to include essential scope of work elements, such as design, permitting, and land acquisition.

Cost Estimate

The cost estimate includes sufficient line items. Line items included sitework, pipes, pump station, bridge, demolition, land acquisition, and engineering. The cost estimate is consistent with the scope of work. The cost estimate was prepared by a professional engineer.

The cost estimate includes lump sum items for the sitework, pipelines, pump station, building, bridge, and demolition. A more detailed cost estimate should be provided to support the project cost.

Technical Design Information

To achieve flood protection for potable water service, the following information and documentation were provided to support the project:

- Conceptual map of the proposed improvements prepared by the subapplicant's design consultant
- FEMA Flood Insurance Rate Map of project area
- Select information from an analysis of flow gauge information of the river performed by Yadkin College
- Subapplicant states the project will be designed in accordance with local and state codes.
- Technical memorandum indicating that FEMA FIS data and computed flow data in the Yadkin River were evaluated to determine water surface elevations at the pump station for various storm events. The memorandum also correlated water surface elevations to various hazard levels for the pump station (i.e., elevations at which the access road would flood, the site would flood, and water would enter the pump station). The hazard levels were related to the storm event elevations to assess the existing levels of protection. The documentation indicated that the pump station electricity is shut down beginning with the 10-year storm event.
- New pump station and associated equipment will be constructed approximately 4.5 feet above the 100-year elevation to provide a level of protection exceeding the 100-year recurrence interval (RI) event.

Based on the documentation provided, the project is technically feasible and effective at reducing risk to individuals and property from natural hazards. The following conditions were identified:

- Cost estimate should not be submitted as a lump sum and should contain sufficiently detailed information, such as a budget narrative based on HMA Guidance, Part IV, Section H.1. In addition, the eligibility of the line items within the cost estimate should be verified.
- Proposed schedule should be verified that all appropriate line items are included, such as design, permitting, and land acquisition.
- Additional source documentation supporting the hazard levels/flood elevations referenced by the subapplicant should be provided.

Cost-Effectiveness

The Benefit-Cost Analysis (BCA) for this project was completed based on professional expected damages using the damage-frequency assessment (DFA) module of the FEMA BCA Tool. The BCA evaluated the construction of a new pump station to avoid potable water service loss of function due to flooding.

The following was found during review of the submitted BCA:

- *Project Useful Life (PUL):* PUL utilized was 50 years, which is consistent with the FEMA standard value for a pump station.
- *Annual Maintenance Cost:* Annual maintenance cost is estimated at \$0, which appears reasonable. Costs were estimated based on lower anticipated maintenance costs associated with new higher-performing equipment. Salisbury-Rowan Utilities Department is responsible for all maintenance after the project is complete.
- *Total Mitigation Project Cost:* Total mitigation project cost (including maintenance) indicated in the BCA was \$31,496,850. The initial project cost in the BCA is consistent with the project cost estimate.
- *Loss of Function:* Loss of function of potable water service resulting from flooding of the pump station was included in the BCA. The subapplication indicates that this is the only pump station that services 48,900 residents. Of those 48,900 residents, the subapplicant states that approximately 21 percent (10,300) would receive emergency water from the neighboring municipality as a result of an interlocal agreement. The remaining 38,600 would have a loss of potable water service, which was entered as the number of customers served in the BCA. A map of the service area and documentation from surrounding communities that are served solely by this pump station was provided and the population count seems reasonable.
- *Year Property Was Built:* The subapplicant lists the year the property was built as 1970; however, no supporting documentation was provided.
- *Before-Mitigation Damages:* Professional estimated damages included loss of function of the potable water service, costs associated with temporary/emergency pumping (e.g., pump rental, gas, labor), costs to purchase emergency water from neighboring municipalities, and costs to repair flood damage to the building and equipment. Damages were included for the 10-, 20-, 50-, and 100-year RIs, which were determined based on documented flow gauge data and FEMA FIS information.
 - Loss of function of the potable water service was included for each RI; however, it is unclear how the impact days were calculated.
 - Temporary pump costs were included in the BCA based on a \$5,000 per day assumption for pump rental, gas, and labor. Pumping durations of 1, 180, 270, and 365 days were included for the 10-, 20-, 50-, and 100-year RIs. Supporting documentation was not provided to justify these costs and durations.
 - Costs associated with purchasing emergency water were based on the number of days that the pump station is out of service. Emergency water purchasing durations of 2, 180, 270, and 365 days were included for the 10-, 20-, 50-, and 100-year RIs at a cost of \$13,200 per day. Supporting documentation was not provided to justify the costs and durations for purchasing emergency water.
 - Damage costs to repair the building and equipment are included in the BCA; however, it is unclear how these repair costs were determined.
- *After-Mitigation Damages:* After-mitigation damages were included for the 500-year RI, which include damages similar to the before-mitigation 10-year RI. Although the proposed project is to be designed to 4.5 feet above the 100-year elevation, the BCA narrative indicated that residual damages are assumed for the 500-year RI (because the 500-year elevation is unknown). This approach appears reasonable.

Reanalysis BCA

A reanalysis BCA was performed for this subapplication and the following edits were made:

- Before-mitigation damages were revised for the 50-year and 100-year RIs. Costs for temporary pumping, purchasing of raw water, and facility damages were reduced to match the 20-year damages because no documentation supporting the increase in damages was provided.

Based on the reanalysis BCA, the total benefits associated with this project, \$39,190,959, are greater than the total project cost of \$31,496,850, producing a BCR of 1.24.

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

- Documentation supporting the number of days of potable water loss of function, number of days requiring temporary pumping, and number of days of purchasing of emergency water should be provided.
- Documentation supporting the daily cost of purchasing emergency water, as well as the daily cost of temporary pumping, should be provided.
- Documentation supporting the building and equipment repair costs should be provided.

Conclusion

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

- Cost estimate should not be submitted as a lump sum and should contain sufficiently detailed information, such as a budget narrative based on HMA Guidance, Part IV, Section H.1. In addition, the eligibility of the line items within the cost estimate should be verified.
- Proposed schedule should be verified that all appropriate line items are included, such as design, permitting, and land acquisition.
- Additional source documentation supporting the hazard levels/flood elevations referenced by the subapplicant should be provided.
- Documentation supporting the number of days of potable water loss of function, number of days requiring temporary pumping, and number of days of purchasing of emergency water should be provided.
- Documentation supporting the daily cost of purchasing emergency water, as well as the daily cost of temporary pumping, should be provided.
- Documentation supporting the building and equipment repair costs should be provided.

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