FY 22 HMA – Grant Application Review Summary

Subapplication Number	EMA-2022-BR-001-0045		
Project Title	City of Dunn Raw Water Electrical Relocation & 24-inch line replacement		
Applicant Name	North Carolina Department of Public Safety		
Subapplicant Name	City of Dunn		
Project Type	Miscellaneous/Other		
Recommendation	Yes with Conditions		
Federal Cost (FEMA GO)	$6,438,975	**Phased Project**	No
BCR (subapplication)	1.10	**Duplicate Project**	No
BCR (reanalysis)	0.00	**Benefits (reanalysis)**	$0

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 replacement and relocation of all electrical components at the existing raw water pump station and replacement of one of two existing raw water pipelines. The raw water pump station is located adjacent to the Cape Fear River in the 100-year floodplain; it is vulnerable to flooding that could damage the electrical equipment and result in loss of raw water conveyance. The new electrical components would be installed in a nearby location outside the 100-year floodplain. The existing 16-inch raw water pipeline would be replaced with 3,500 linear feet of 24-inch pipeline to provide increased resiliency and redundancy in the raw water conveyance to the City of Dunn water treatment plant (WTP). Raw water pipeline failure has occurred in the past because of flooding that led to streambank instability and erosion around the pipelines.

Technical Feasibility

Project Schedule

The schedule duration is 29 months. The schedule includes all items in the scope of work and is reasonable.

Cost Estimate

The cost estimate does not include sufficient line items consistent with the scope of work. The cost estimate could not be verified because the cost was submitted with lump-sum quantities without specific number of units, unit costs, or other detailed information. The source of the cost estimate is not clear.

Technical Design Information

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

Item	Documentation	Evaluation
Proposed Level of Protection	No documentation was provided to support this item	The project proposes to protect the raw water intake facility during a 100-year event. The level of protection was not specified in the subapplication or supporting documentation, but the intention of the proposed project is to move the facility out of the 100-year floodplain; therefore, the level of protection would likely be the 100-year event. No indication of the level of protection for the raw water pipeline was provided.
Flood Risk Data	Historical streamflow data, pictures of previous flood event	The proposed project is in the Special Flood Hazard Area. Documentation was provided to show how the proposed project will reduce risk. Historical streamflow data shows six events between 1928 and 1952 with stream flows greater than Hurricane Florence in 2018. Pictures were provided showing flooding from Hurricane Florence resulted in water levels just below the entrance to the room housing the pump station electrical equipment. The provided documentation support that larger storm events would likely result in significant damage to the pump station electrical equipment. It is not clear from the documentation provided how the new raw water pipeline will be less vulnerable from flooding related erosion than the existing pipelines.
Residual Risk	No documentation was provided to support this item	Documentation was not provided to identify residual risk. The subapplication narrative indicates the electrical equipment would be moved out of the 100-year floodplain, but the proposed location was not specified. There would be some level of residual risk, depending on the location of the new equipment. No information was provided regarding the residual risk to the raw water pipelines.
Design and Performance Standards	Subapplication narrative	The project will adhere to the 2018 International Code Council NC Building Code and International Code Council NC Residential Code.
Design Drawings, Maps, Photographs	Map and photos	Documentation was provided to support the project. A map showing the existing raw water pipeline alignments and pictures of the raw water intake were provided to support the project. The pictures show flooding from Hurricane Florence and the electrical equipment inside the structure.

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. Amend the cost estimate to contain sufficiently detailed information. Refer to HMA Guidance, Part IV, Section H.1. for guidance on creating a cost estimate.
- Provide documentation showing the proposed location for the new electrical equipment.
- Provide documentation to support the design standard or level of protection for the new raw water pipeline.
- Provide documentation to support that the new pipeline will be designed and installed to mitigate the risk of failure from the streambank instability and erosion that threaten the existing raw water pipelines.

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.
BCA Toolkit Initial Project Cost	$9,006,060	This amount is not consistent with the subapplication project cost estimate. The project cost with grant management costs in FEMA GO is $9,014,565, and $8,585,300 without grant management costs. The initial project cost used in the BCA Toolkit does not match the cost estimate provided.
Annual Maintenance Cost	$9,000	This amount is reasonable. No supporting documentation was provided to support the annual maintenance cost, but there should be minimal additional maintenance costs resulting from the proposed project because pump station maintenance is already conducted routinely.
BCA Toolkit Total Project Cost	$9,130,267	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 'Utilities – Potable Water Service' was used in the BCA. This input is consistent with the proposed project in the subapplication.
Loss of Function	Loss of function of potable water service was included for 37,458 customers. The subapplication and BCA narrative indicate the WTP serves several municipalities and the loss of function of the raw water intake would result in loss of service for

Input	Evaluation
	all the municipalities served by the WTP as this is the only source of treated water available to those customers. No documentation was provided to support the number of customers served. The value of potable water service uses the default value of $116/person/day to estimate a total value of service per day of $4,345,128 for the project benefiting area.
Before-Mitigation Damages	Historical damages were included for 2016 and 2018 with one impact day for each event resulting in the total value of loss of service of $4,345,128 discussed above and no additional monetary damages. No documentation was provided to support the number of impact days. The provided documentation does not show flood levels reaching the electrical equipment during the 2018 event; therefore, the loss of service experienced during that event would not be mitigated by the proposed project. Additionally, no documentation was provided to support that the failure of the raw water pipeline in 2018 resulted in a loss of service since there is an adjacent raw water pipeline providing conveyance from the pump station to the WTP. The 2016 event was assigned a 17-year recurrence interval (RI) and the 2018 event was assigned a 6-year RI, but no documentation was provided to support the RIs used in the BCA for before-mitigation damages.
After-Mitigation Damages	After-mitigation damages were included for a 50-year event with zero impact days and no additional monetary damages, which is not reasonable. It is likely that after-mitigation damages would occur for events larger than the proposed level of protection. The proposed project would remove the pump station electrical equipment from the 100-year floodplain, but no documentation was provided on the residual risk to the new raw water pipeline. A more reasonable after-mitigation RI would be the 101-year event with the number of impact days greater than zero and/or additional monetary damages.

BCA Assistance

This subapplication qualified for additional BCA assistance. Additional information is needed to show the project as cost effective. Additional benefits may include reduced risk of physical damages, loss of function and life safety, where applicable. Ecosystem services and social benefits may also be considered.

Based on the documentation provided, the project's cost-effectiveness could not be determined. The following condition was identified:

- Additional information is needed to show the project as cost effective. Additional benefits may include reduced risk of physical damages, loss of function and life safety, where applicable. Ecosystem services and social benefits may also be considered.

Conclusion

Based on the information provided, the project is technically feasible, and additional information is needed to confirm the cost effectiveness. It is recommended for further consideration with the following conditions:

- Cost estimate should not be submitted as a lump sum. Amend the cost estimate to contain sufficiently detailed information. Refer to HMA Guidance, Part IV, Section H.1. for guidance on creating a cost estimate.
- Provide documentation showing the proposed location for the new electrical equipment.
- Provide documentation to support the design standard or level of protection for the new raw water pipeline.
- Provide documentation to support that the new pipeline will be designed and installed to mitigate the risk of failure from streambank instability and erosion which threaten the existing raw water pipelines.
- Additional information is needed to show the project as cost effective. Additional benefits may include reduced risk of physical damages, loss of function and life safety, where applicable. Ecosystem services and social benefits may also be considered.

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.