

## FY 22 HMA – Grant Application Review Summary

<b>Subapplication Number</b>	EMA-2022-BR-001-0004		
<b>Project Title</b>	Whiteville Floodprint: Mollie’s Branch Stream Restoration and Infrastructure Improvements		
<b>Applicant Name</b>	North Carolina Department of Public Safety		
<b>Subapplicant Name</b>	Whiteville Fire Department		
<b>Project Type</b>	Flood Risk Reduction		
<b>Recommendation</b>	Yes with Conditions		
<b>Federal Cost (FEMA GO)</b>	\$3,695,649	<b>Phased Project</b>	Yes
<b>BCR (subapplication)</b>	1.47	<b>Duplicate Project</b>	No
<b>BCR (reanalysis)</b>	0.00	<b>Benefits (reanalysis)</b>	\$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 infrastructure enhancements along Mollie’s Branch, a creek in Whiteville, North Carolina. Planned enhancements are 5,100 linear feet of floodplain restoration, four culvert updates, and an expanded constructed wetland area. The final design is expected to lower flood depths by as much as 2 feet for 10-year return period storms and smaller, and 1 to 2 feet during the 100-year and larger events. This will lead to an estimated 75% reduction in total buildings in flood extents, and all four road intersections able to withstand 100-year flood heights.

### Technical Feasibility

#### *Project Schedule*

The schedule duration is 36 months. The schedule includes all items in the scope of work and is reasonable.

#### *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	Qualitative Risk Reduction & Resilience Report Benefitting Area Map H&H Report	The project proposes to protect 89 households, nine businesses, two schools, and a pump station during the 100-year event. Subapplication indicates that a professional engineer constructed a model showing that improvements made during this project would reduce flood depth by 1 to 2 feet following the

Item	Documentation	Evaluation
		mitigation. Modeled WSEs were provided up to the 100-year flood with accompanying maps.
Flood Risk Data	H&H Report	<p>The proposed project is in the Special Flood Hazard Area Zone AE with the Regulatory Floodway. It is assumed that the floodway will be affected by construction efforts near roadway crossings.</p> <p>The provided documentation does show how the proposed project will reduce risk. A review of FEMA FIRM maps confirms the project is in the Special Flood Hazard Area.</p>
Residual Risk	No documentation was provided to support this item	Subapplicant has indicated that this project would protect up to the 100-year return period storm. Provided hydraulic report does not include data for larger events and lists no residual risk. The subapplication states that some residual risks will remain for 500-year events but does not elaborate.
Design and Performance Standards	Subapplication Narrative	<p>Subapplication indicates the proposal will adhere to FEMA guidance on “Building Community Resilience with Nature-Based Solutions” (2021).</p> <p>Subapplicant does not specify any state or other regulatory standards this project will adhere to.</p>
Design Drawings, Maps, Photographs	H&H Report	<p>Documentation was provided to support the project.</p> <p>Cross sections at road crossings and a local school were included. Given the size of the project area, this does not adequately model the entire project area.</p>
Upstream and Downstream Impacts	H&H Report	The documentation indicates the proposed project will not have adverse upstream or downstream impacts.
CLOMR/LOMR	Subapplication narrative	The documentation does not explicitly state a CLOMR/LOMR is necessary. The project is in the SFHA Zone AE, with regulatory floodway. In the permitting process, the project narrative mentions adherence to Executive Order 11988 (floodplain management).

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

- Provide documentation to support that the enhancements will be designed and built in compliance with all applicable federal and local standards.

Provide the following Phase 1 deliverables needed to determine technical feasibility:

- Hydrologic and hydraulic data/modeling, and/or other relevant technical data (geomorphic analysis).
- Engineering design (typically 30/60/90) and cost estimate.
- Technical body of information needed to support the desired level of effectiveness/protection or amount of risk reduction.

**Cost-Effectiveness**

The Benefit-Cost Analysis (BCA) was completed based on professional expected damages. The following was found during review of the submitted BCA:

*Cost Estimation*

Input	Value	Evaluation
Project Useful Life (PUL)	30 years	This value is consistent with the FEMA standard value.
BCA Toolkit Initial Project Cost	\$4,927,533	This amount is consistent with the subapplication project cost estimate.
Annual Maintenance Cost	\$24,638	This amount is not reasonable. Maintenance costs are calculated at 0.5% of the total project cost, per FEMA guidance for floodwater diversion and storage projects; but that amount should represent only the activities not performed at the present time. There is no documentation describing the activities associated with the maintenance cost estimate.
BCA Toolkit Total Project Cost	\$5,410,449	This amount is calculated based on the initial project cost, the annual maintenance costs, and the PUL.

*Flood Module*

Seventeen residential structures and eight non-residential structures were analyzed using modeled damages.

Input	Value	Evaluation
Lowest Floor Elevations (LFEs)	Unknown datum used	The values used in the BCA are not consistent with the supporting documentation. The report indicates that a state-run NCEM system was utilized in determining LFEs. These data were not provided as part of the subapplication.
Flood Hazard Data	Water Surface Elevations (in feet) and Discharges (in cubic feet per second)	A hydraulic summary report was provided to support this input for various return periods.  The values used in the BCA are not consistent with the supporting documentation.

Input	Value	Evaluation
		Graphs for water surface elevations for different alternatives were provided as part of a hydraulic report. Corresponding maps showing flooded area extents were also provided. Water surface elevations at individual properties were not provided.
Depth-Damage Function	USACE Generic, Religious Facilities, COM4: Commercial, Office One-Story, Warehouse (Non-Refrigerated)	This curve is consistent with documentation and is appropriate for the structure type(s) and mitigation action.
Building Size	1,778–5,200 sq ft	Tax Cards were provided to support this input.  The values used in the BCA are consistent with the supporting documentation.
Building Replacement Value (BRV)	\$100/sq ft	The BRV used in the BCA is a FEMA standard value.
Building Occupancy	One resident per building	No documentation was provided to support this input, and the values used in the BCA are not reasonable based on national census data.

*Additional Benefits*

Input	Documentation	Evaluation
Social Benefits Residential structures only	Forms from homeowners, census data.	The number of residents and workers per household is not consistent with the project description and supporting documentation. The project documentation does not utilize U.S. Census data for the project locality.
Environmental Benefits	Project Benefit Map	The project area used 15.07 acres, of which 12.94% is urban green open space and 64.96% is riparian. The total project area and percentage of land use of the project area is not consistent with the project description and supporting documentation.  The BCA utilizes the construction extent for the environmental benefit area. No documentation was provided to verify that the area will create or enhance land use.

## **BCA Assistance**

This subapplication qualified for additional BCA assistance. Additional information is needed to show that the project is cost-effective. Additional benefits may include reduced risk of roadway flooding and closures, damages to utilities and loss of services, economic losses related to affected business.

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

- Provide documentation to support the lowest floor elevation. Documentation can include elevation certificates, survey data from qualified professionals, or topographic maps with a maximum contour increment of 2 feet.
- Provide documentation for water surface elevations at individual properties used in the BCA.
- Provide documentation indicating damages to road crossings, average daily traffic count at their locations, length of detour and added travel time, and duration of road closures due to flooding.
- Provide documentation indicating damages utilities and loss of service, economic losses related to flooded businesses.

Provide the following Phase 1 deliverables to determine cost-effectiveness:

- Refinement of the BCA.

## **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:

- Provide documentation to support that the enhancements will be designed and built in compliance with all applicable federal and local standards.
- Provide documentation to support the lowest floor elevation. Documentation can include elevation certificates, survey data from qualified professionals, or topographic maps with a maximum contour increment of 2 feet.
- Provide documentation for water surface elevations at individual properties used in the BCA.
- Provide documentation indicating damages to road crossings, average daily traffic count at their locations, length of detour and added travel time, and duration of road closures due to flooding.
- Provide documentation indicating damages utilities and loss of service, economic losses related to flooded businesses.

Provide the following Phase 1 deliverables needed to determine technical feasibility and cost-effectiveness:

- Hydrologic and hydraulic data/modeling, and/or other relevant technical data (geomorphic analysis).
- Engineering design (typically 30/60/90) and cost estimate.
- Technical body of information needed to support the desired level of effectiveness/protection or amount of risk reduction.
- Refinement the BCA.

- Additional documentation required to support compliance with eligibility, technical feasibility, cost-effectiveness, and EHP requirements.

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.