

# 3744 - Town of Waverly Nature-Based Stormwater BMP Feasibility Study

## Application Details

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**Funding Opportunity:**

3294-Virginia Community Flood Preparedness Fund - Study Grants - CY25 Round 6

**Funding Opportunity Due Date:** Dec 1, 2025 11:59 PM

**Program Area:** Virginia Community Flood Preparedness Fund

**Status:** Under Review

**Stage:** Final Application

**Initial Submit Date:** Nov 24, 2025 3:48 PM

**Initially Submitted By:** Angela McPhaul

**Last Submit Date:**

**Last Submitted By:**

## Contact Information

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### Primary Contact Information

**Active User\*:** Yes

**Type:** External User

**Name\*:** Mrs. Angela Middle Name McPhaul  
Salutation First Name Last Name

**Title:** Mayor

**Email\*:** amcphaul@town.waverlyva.us

**Address\*:** 119 Bank St

Waverly Virginia 23890  
City State/Province Postal Code/Zip

**Phone\*:** 804-834-2330 Ext.

Phone  
###-###-####

**Fax:** ###-###-####

**Comments:**

## Organization Information

**Status\*:** Approved

**Name\*:** Town of Waverly

**Organization Type\*:** Local Government

**Tax ID\*:** 54-6001672

**Unique Entity Identifier (UEI)\*:** SJQ2LM6SHNK6

**Organization Website:** <https://waverlyva.org/government/>

**Address\*:** 119 Bank St

Waverly Virginia 23890-  
City State/Province Postal Code/Zip

**Phone\*:** 804-834-2330 Ext.  
###-###-####

**Fax:** ###-###-####

**Benefactor:**

**Vendor ID:**

**Comments:**

## VCFPF Applicant Information

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### *Project Description*

**Name of Local Government\*:** Town of Waverly

Your locality's CID number can be found at the following link: [Community Status Book Report](#)

**NFIP/DCR Community Identification Number (CID)\*:** 510097

If a state or federally recognized Indian tribe,

**Name of Tribe:**

**Authorized Individual\*:** Angela McPhaul  
First Name Last Name

**Mailing Address\*:** 119 Bank St  
Address Line 1  
Address Line 2  
Waverly Virginia 23890  
City State Zip Code

**Telephone Number\*:** 804-834-2330

**Cell Phone Number\*:** 804-834-2330

**Email\*:** amcphaul@town.waverlyva.us

Is the contact person different than the authorized individual?

**Contact Person\*:** Yes

**Contact:** Kit Friedman  
First Name Last Name  
1964 Wakefield St  
Address Line 1  
Address Line 2  
Petersburg Virginia 23805  
City State Zip Code

**Telephone Number:** 804-861-1666

**Cell Phone Number:** 516-655-6414

**Email Address:** kfriedman@craterpdc.org

**Enter a description of the project for which you are applying to this funding opportunity**

**Project Description\*:**

The Town of Waverly faces chronic flooding from undersized stormwater infrastructure. FEMA maps fail to capture risks, and runoff from Route 460 compounds issues. The proposed study will assess infrastructure, explore nature-based solutions, and recommend resilient practices in targeted locations to reduce flood impacts, protect natural resources, enhance local aesthetics, and support regional growth, safety, and economic development.

**Low-income geographic area means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.**

Is the proposal in this application intended to benefit a low-income geographic area as defined above?

**Benefit a low-income geographic area\*:** Yes

**Information regarding your census block(s) can be found at census.gov**

**Census Block(s) Where Project will Occur\*:** Townwide

**Is Project Located in an NFIP Participating Community?\*** No

**Is Project Located in a Special Flood Hazard Area?\*** No

**Flood Zone(s)**  
**(if applicable):**

**Flood Insurance Rate Map**  
**Number(s)**  
**(if applicable):**

## Eligibility - Round 4

Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these)?

**Local Government\*:** Yes  
Yes - Eligible for consideration  
No - Not eligible for consideration

If the applicant is not a town, city, or county, are letters of support from all affected local governments included in this application?

**Letters of Support\*:** N/A  
Yes - Eligible for consideration  
No - Not eligible for consideration

Has this or any portion of this project been included in any application or program previously funded by the Department?

**Previously Funded\*:** No  
Yes - Not eligible for consideration  
No - Eligible for consideration

Has the applicant provided evidence of an ability to provide the required matching funds?

**Evidence of Match Funds\*:** Yes  
Yes - Eligible for consideration  
No - Not eligible for consideration  
N/A - Match not required

## Scope of Work - Studies - Round 4

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### ***Scope of Work***

#### **Upload your Scope of Work**

Please refer to Part IV, Section B. of the grant manual for guidance on how to create your scope of work

**Scope of Work\*:** CID510097\_TownofWaverly\_CFPF-1.pdf

**Comments:**

### ***Budget Narrative***

**Budget Narrative Attachment\*:** CID510097\_TownofWaverly\_CFPF-2.pdf

**Comments:**

## Scoring Criteria for Studies - Round 4

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### ***Scoring***

Revising floodplain ordinances to maintain compliance with the NFIP or to incorporate higher standards that may reduce the risk of flood damage. This must include establishing processes for implementing the ordinance, including but not limited to, permitting, record retention, violations, and variances. This may include revising a floodplain ordinance when the community is getting new Flood Insurance Rate Maps (FIRMs), updating a floodplain ordinance to include floodplain setbacks or freeboard, or correcting issues identified in a Corrective Action Plan.

**Revising Floodplain Ordinances\*:** No  
Select

**Creating tools or applications to identify, aggregate, or display information on flood risk or creating a crowd-sourced mapping platform that gathers data points about real-time flooding. This could include a locally or regionally based web-based mapping product that allows local residents to better understand their flood risk.**

**Mapping Platform\*:** No  
Select

**Conducting hydrologic and hydraulic studies of floodplains. Applicants who create new maps must apply for a Letter of Map Revision or a Physical Map Revision through the Federal Emergency Management Agency (FEMA).**

**Hydrologic and Hydraulic Studies\*:** No  
Select

**Funding of studies of statewide and regional significance and proposals will be considered for the studies listed below - Up to 45 points**

**Studies and Data Collection of Statewide and Regional Significance Scoring:**

Updating precipitation data and IDF information (rain intensity, duration, frequency estimates) including such data at a sub-state or regional scale on a periodic basis. (45)

Regional relative sea level rise projections for use in determining future impacts. (45)

Vulnerability analysis either statewide or regionally to state transportation, water supply, water treatment, impounding structures, or other significant and vital infrastructure from flooding. (45)

Flash flood studies and modeling in riverine regions of the state. (45)

Statewide or regional stream gauge monitoring to include expansion of existing gauge networks. (45)

New or updated delineations of areas of recurrent flooding, stormwater flooding, and storm surge vulnerability in coastal areas that include projections for future conditions based on sea level rise, more intense rainfall events, or other relevant flood risk factors. (45)

Regional flood studies in riverine communities that may include watershed scale evaluation, updated estimates of rainfall intensity, or other information. (45)

Regional hydrologic and hydraulic studies of floodplains. (45)

Studies of potential land use strategies that could be implemented by a local government to reduce or mitigate damage from coastal or riverine flooding. (40)

Other proposals that will significantly improve protection from flooding on a statewide or regional basis (35)

**Studies and Data Collection of Statewide and Regional Significance\*:**

Vulnerability analysis either statewide or regionally to state transportation, water supply, water treatment, impounding structures, or other significant and vital infrastructure from flooding

**Is the project area socially vulnerable?** (based on ADAPT Virginia's Social Vulnerability Index Score)

**Social Vulnerability Scoring:**

Very High Social Vulnerability (More than 1.5)

High Social Vulnerability (1.0 to 1.5)

Moderate Social Vulnerability (0.0 to 1.0)

Low Social Vulnerability (-1.0 to 0.0)

Very Low Social Vulnerability (Less than -1.0)

**Socially Vulnerable\*:** High Social Vulnerability

**Is the proposed project part of an effort to join or remedy the community's probation or suspension from the NFIP?**

**NFIP\*:** No

**Is the proposed project in a low-income geographic area as defined below?**

"Low-income geographic area" means any locality, or community within a locality, that has a median household income that is not greater than 80 percent of the local median household income, or any area in the Commonwealth designated as a qualified opportunity zone by the U.S. Secretary of the Treasury via his delegation of authority to the Internal Revenue Service. A project of any size within a low-income geographic area will be considered.

**Low-Income Geographic Area\*:** Yes

Projects eligible for funding may also reduce nutrient and sediment pollution to local waters and the Chesapeake Bay and assist the Commonwealth in achieving local and/or Chesapeake Bay TMDLs.

Does the proposed project include implementation of one or more best management practices with a nitrogen, phosphorus, or sediment reduction efficiency established by the Virginia Department of Environmental Quality or the Chesapeake Bay Program Partnership in support of the Chesapeake Bay TMDL Phase III Watershed Implementation Plan?

**Reduction of Nutrient and Sediment Pollution\*:** No

**Comments:**

## Scope of Work Supporting Information - Studies

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### ***Scope of Work Supporting Information***

Is the proposed study a new study or updates on a prior study?

**New or Updated Study\*:** New Study

Describe the relationship of the study to the local government's needs for flood prevention and protection, equity, community improvement, identification of nature-based solutions or other priorities contained in this manual

**Relationship of Study to Priorities Contained in this Manual\*:**

The Town of Waverly proposes a stormwater Best Management Practices (BMP) feasibility study that directly advances the priorities of the Virginia Department of Conservation and Recreation's Community Flood Preparedness Fund (CFPF). This study will evaluate the town's existing stormwater infrastructure, identify areas of vulnerability, and recommend BMPs such as bioretention, permeable pavements, and detention basins to reduce localized flooding. By focusing on strategies that mitigate the impacts of heavy rainfall and climate-driven storm events, the project supports CFPF's core mission of reducing flood risk and strengthening community resilience.

In alignment with CFPF priorities, the feasibility study will provide the technical foundation for integrating stormwater BMPs into Waverly's broader resilience planning efforts. The study will include hydrologic and hydraulic analyses to model flood scenarios and assess system capacity, ensuring that future capital projects are data-driven and strategically targeted. This approach not only enhances Waverly's ability to prioritize investments but also positions the town to pursue subsequent CFPF implementation grants with well-supported proposals.

The project also advances compliance with local, state, and federal floodplain management standards, ensuring that recommended BMPs meet regulatory requirements and maximize eligibility for funding. Equally important, the study will engage community stakeholders in identifying solutions, empowering residents to participate in resilience planning and building local capacity to manage stormwater sustainably. By combining technical analysis with community input, the project reflects CFPF's emphasis on equity and locally driven resilience.

Ultimately, this feasibility study represents a critical step for Waverly in transitioning from planning to implementation. It provides a roadmap for cost-effective, environmentally sound stormwater solutions tailored to local conditions, while aligning with the CFPF's priorities of flood risk reduction, resilience planning, regulatory compliance, and community empowerment. Through this effort, Waverly will strengthen its preparedness for future flooding challenges and enhance its competitiveness for future CFPF funding opportunities.

**Describe the qualifications of the individuals or organizations charged with conducting the study or the elements of any request for proposal that define those qualifications**

#### **Qualifications of Individuals**

##### **Conducting Study\*:**

George Mason University's Dr. Celso Ferreira, PE, leads the Mason Flood Hazards Research Lab and will be acting as the Principal Investigator. Dr. Ferreira has extensive experience leading stormwater engineering studies at multiple scales. His group research strives to incorporate future climate variability, sea-level rise, and human-induced environmental changes into engineering practice and design. His group also focuses on integrating riverine, urban, and coastal flooding analysis in real-time, near-future forecasting, and critical infrastructure design.

Ferreira has written more than 20 technical publications and his research is currently funded by the National Science Foundation, the Department of Interior, the National Fish and Wildlife Foundation, and several private organizations. He was recently appointed a visiting scholar at Stanford University and an associate researcher at the USGS National Research Program. He has more than 10 years of experience working on consulting projects related to water resources, and environmental and coastal engineering in the U.S. and Brazil.

The Crater Planning District Commission has experience in applying for and administering CFPF grants, as evidenced by progress made on awards from Rounds 4 and 5. The Town of Waverly has limited staff capacity and expertise in stormwater/floodplain management. Crater PDC will be acting as Project Manager, facilitating meetings between the Town and the consultant, steering committee meetings, and all grant administration/reporting duties. Crater PDC's Environment & Resilience Planner, Kit Friedman, is currently administering two CFPF grants and multiple other grants both regionally and on behalf of localities, including Emporia, Hopewell, and Petersburg. They are a Certified Floodplain Manager, hold a B.S. in Natural Resources Conservation, and a Master's in Urban & Regional Planning.

**Describe the expected use of the study results in the context of the local resilience plan or, in the case of regional plans, how the study improves any regional approach**

##### **Expected use of Study Results\*:**

The results of this study will directly inform the development of CFPF project applications in future funding rounds, with support from Crater PDC's Regional Resilience Plan (currently in progress, to be completed and adopted summer 2026).

Understanding the best locations for stormwater BMPs and having 30% designs completed in this study will serve as the foundations of future applications for implementation funding.

**If applicable, describe how the study may improve Virginia's flood protection and prevention abilities in a statewide context (type N/A if not applicable)**

##### **Statewide Improvements\*:**

This study will set a precedent for the many small towns throughout Southside Virginia. The Town of Waverly is bisected east-west by Route 460, a Corridor of Statewide Significance, and north-south by Route 40. Local flooding in Waverly disrupts traffic along these critical roadways, as well as impeding emergency vehicle access between the northern and southern portions of Sussex County.

**Provide a list of repetitive and/or severe repetitive loss properties. Do not provide the addresses for the properties, but include an exact number of repetitive and/or severe repetitive loss structures within the project area**

**Repetitive Loss and/or Severe**      CID510097\_TownofWaverly\_CFPF-12.pdf

##### **Repetitive Loss Properties\*:**

**Describe the residential and commercial structures impacted by this project, including how they contribute to the community such as historic, economic, or social value. Provide an exact number of these structures in the project area**

##### **Residential and/or Commercial Structures\*:**

Per the last Census, Waverly has roughly 1014 housing units with new construction actively occurring. Several new homes are currently being built. 90 businesses, 7 churches, and 48 structures on the National Historic Register. The Town of Waverly is growing with nearby economic development projects spurring an influx of new community members and small businesses to support them.

**If there are critical facilities/infrastructure within the project area, describe each facility**

**Critical Facilities/Infrastructure\*:**

The Town of Waverly's critical infrastructure faces significant risks from flooding, making resilience planning essential. The town's water and wastewater systems, recently upgraded with new mains, wells, and monitoring equipment, remain vulnerable to inundation during heavy rainfall events. Floodwaters can overwhelm pump stations, contaminate wells, and disrupt service, threatening public health and safety. Transportation corridors such as U.S. Route 460, which serves as Waverly's primary east-west artery and evacuation route, are also prone to flooding. Roadway closures not only isolate residents but impede emergency response and commerce. Municipal facilities, including Town Hall and emergency service stations, are central to disaster coordination yet are themselves at risk of flood damage, which could compromise the town's ability to manage crises. Electric power and telecommunications networks, critical for both daily life and emergency operations, are susceptible to outages when substations or lines are impacted by floodwaters. Even Waverly's churches, civic organizations, and historic downtown district-important community anchors-face structural and economic losses when flooding occurs, reducing their ability to serve as informal support centers during disasters.

By identifying these vulnerabilities, the Town of Waverly underscores the urgent need for flood mitigation strategies such as stormwater BMPs, improved drainage, and resilience planning. Protecting critical infrastructure from flooding not only safeguards essential services but also strengthens community cohesion and economic stability, aligning directly with the priorities of the Community Flood Preparedness Fund.

## Budget

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### ***Budget Summary***

**Grant Matching Requirement\*:**

LOW INCOME - Flood Prevention and Protection Studies - Fund 90%/Match 10%

Is a match waiver being requested?

**Match Waiver Request** Yes

Note: Only low-income communities are eligible for a match waiver

\*:

**I certify that my project is in a low-income geographic area:** Yes

**Total Project Amount (Request +** \$500,000.00

**Match)\*:** \*\*This amount should equal the sum of your request and match figures

**REQUIRED Match Percentage** \$50,000.00  
**Amount:**

## BUDGET TOTALS

Before submitting your application be sure that you meet the match requirements for your project type.



**Match Percentage:**

10.00%

Verify that your match percentage matches your required match percentage amount above.

**Total Requested Fund Amount:** \$450,000.00

**Total Match Amount:** \$50,000.00

**TOTAL:** \$500,000.00

***Personnel***

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

***Fringe Benefits***

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

***Travel***

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

***Equipment***

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

***Supplies***

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

***Construction***

Description	Requested Fund Amount	Match Amount	Match Source
No Data for Table			

***Contracts***

Description	Requested Fund Amount	Match Amount	Match Source
George Mason University Flood Hazards Lab	\$400,000.00	\$0.00	
Crater PDC Administrative Services	\$50,000.00	\$50,000.00	
	<b>\$450,000.00</b>	<b>\$50,000.00</b>	

## Pre-Award and Startup Costs

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

## Other Direct Costs

Description	Requested Fund Amount	Match Amount	Match Source
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No Data for Table

## Supporting Documentation

### Supporting Documentation

Named Attachment	Required Description	File Name	Type	Size	Upload Date
Detailed map of the project area(s) (Projects/Studies)	Study Boundary-	CID510097_TownofWaverly_CFPF-3.png	png	1 MB	11/24/2025 03:08 PM
FIRMette of the project area(s) (Projects/Studies)	FIRMette	CID510097_TownofWaverly_CFPF-4.zip	zip	60 MB	11/24/2025 03:12 PM
Historic flood damage data and/or images (Projects/Studies)	Recent CBS6 News Story on Flooding in Waverly	CID510097TownofWaverly_CFPF-6.pdf	pdf	7 MB	11/24/2025 03:20 PM
A link to or a copy of the current floodplain ordinance	Sussex County Floodplain Ordinance	CID510097TownofWaverly_CFPF-5.pdf	pdf	20 KB	11/24/2025 03:19 PM
Maintenance and management plan for project					
A link to or a copy of the current hazard mitigation plan	Richmond-Crater Hazard Mitigation Plan	CID510097_TownofWaverly_CFPF-7.pdf	pdf	119 KB	11/24/2025 03:22 PM
A link to or a copy of the current comprehensive plan	Waverly Small Area Comp Plan	CID510097TownofWaverly_CFPF-8.pdf	pdf	3 MB	11/24/2025 03:23 PM
Social vulnerability index score(s) for the project area	SVI	CID510097_TownofWaverly_CFPF-9.pdf	pdf	232 KB	11/24/2025 03:26 PM

Named Attachment	Required Description	File Name	Type	Size	Upload
					Date
Authorization to request funding from the Fund from governing body or chief executive of the local government	Letter of Authorization	CID510097_TownofWaverly_CFPF-10.pdf	pdf	43 KB	11/24/2025 03:27 PM
Signed pledge agreement from each contributing organization					
Maintenance Plan					
<i>Benefit-cost analysis must be submitted with project applications over \$2,000,000. in lieu of using the FEMA benefit-cost analysis tool, applicants may submit a narrative to describe in detail the cost benefits and value. The narrative must explicitly indicate the risk reduction benefits of a flood mitigation project and compares those benefits to its cost-effectiveness.</i>					
Benefit Cost Analysis					
Other Relevant Attachments	Scopes of Work/Cost Estimates from George Mason University & Crater PDC	CID510097TownofWaverly_CFPF-11.pdf	pdf	246 KB	11/24/2025 03:37 PM

### ***Letters of Support***

Description	File Name	Type	Size	Upload Date
Letter of Support from Sussex County	CID510097_TownofWaverly_CFPF-13.pdf	pdf	220 KB	11/24/2025 03:31 PM