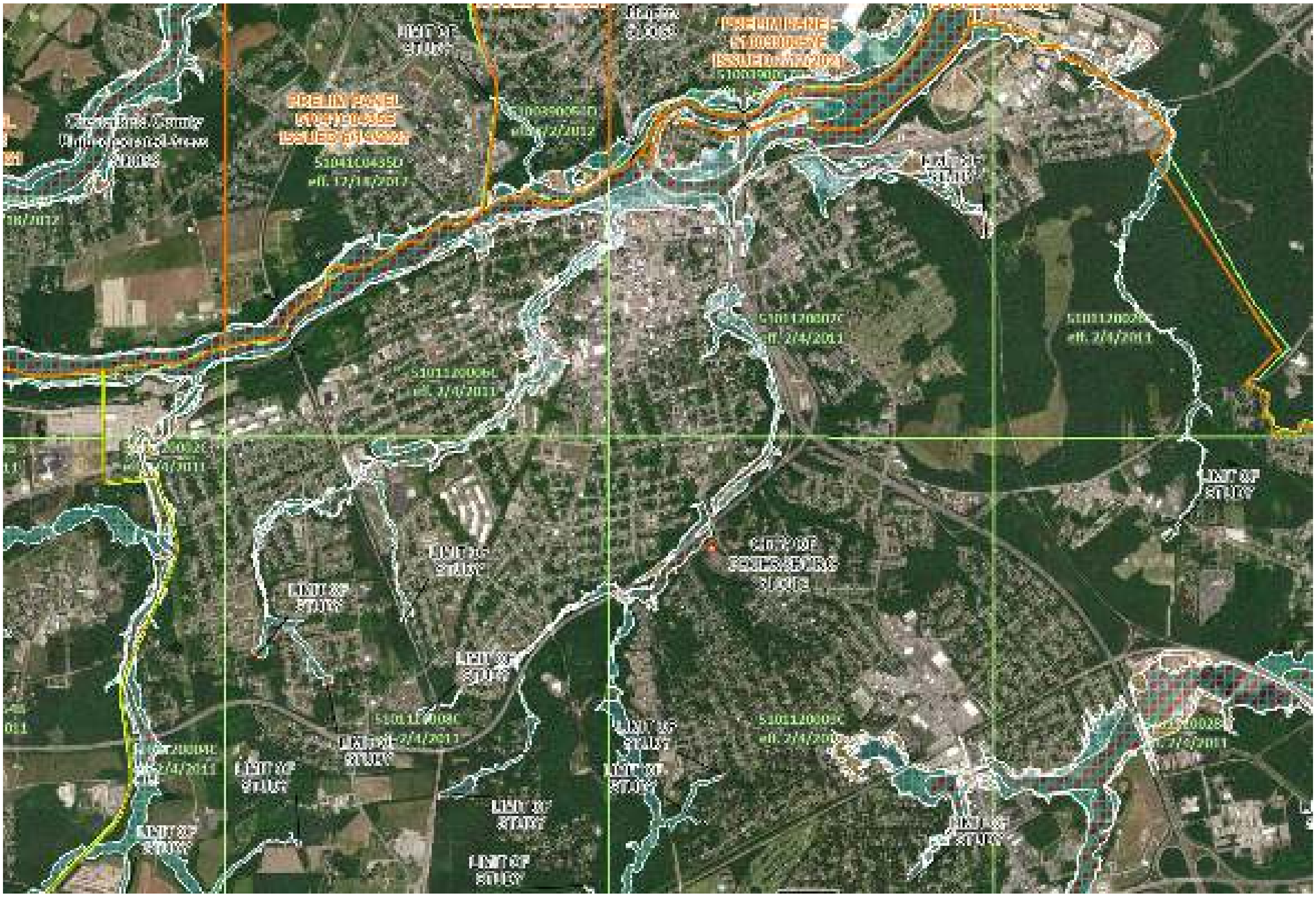
COMMUNITY FLOOD PREPAREDNESS FUND
LAKEMONT PROJECTS GRANT APPLICATION



CITY OF PETERSBURG, VA

COMMUNITY ID #510112
SUBMITTED APRIL 8, 2022

City of Petersburg

Office of the City Manager
135 North Union Street
Petersburg, Virginia 23803

(804) 733-2301
Fax 732-9212
TDD 733-8003

April 8, 2022

Ms. Wendy Howard-Cooper
Director of Dam Safety and Floodplain Management
Virginia Department of Conservation and Recreation
600 East Main Street, 24th Floor
Richmond, VA 23219

RE: Authorization of City of Petersburg CFPF Project Application

Dear Ms. Howard-Cooper and Members of the CFPF Review Team:

The City of Petersburg has assembled the attached Project grant application to request Community Flood Preparedness Fund assistance to implement a flood prevention and protection project in the Lakemont Neighborhood. The project will result in the improvement of structural stormwater conveyance systems that will provide community scale benefits in an underserved section of the City.

The City has been relying on key partnerships and funding assistance to make progress in addressing historic and repetitive localized flooding in this neighborhood because of antiquated and insufficient storm sewer systems, and the Community Flood Preparedness Fund is an ideal opportunity to expand on previous partnerships that focused more on water quality and less on the management of the quantity of stormwater runoff. As the City is a documented low-income geographic area, and the project site is within a designated Qualified Opportunity Zone, with a very high social vulnerability index score, the City respectfully requests a waiver of the full match requirement. Please accept this letter as my authorization of the request for CFPF assistant to enable the City to make significant progress toward Resilience and equitable management of our floodplains.

Sincerely,

Kenneth Miller
Interim City Manager

Appendix A: Application Form for Grant Requests for All Categories

Virginia Department of Conservation and Recreation
Virginia Community Flood Preparedness Fund Grant Program

Name of Local Government:

City of Petersburg

Category of Grant Being Applied for (check one):

____ **Capacity Building/Planning**

__X__ **Project**

_____ **Study**

NFIP/DCR Community Identification Number (CID) 510112

If a state or federally recognized Indian tribe, Name of tribe N/A

Name of Authorized Official: Kenneth Miller

Signature of Authorized Official: Kenneth Miller

Mailing Address (1): 135 N Union Street

Mailing Address (2): _____

City: Petersburg **State:** Virginia **Zip:** 23803

Telephone Number: (804) 733-2300 **Cell Phone Number:** (____) _____

Email Address: kmiller@petersburg-va.org

Contact Person (If different from authorized official): Darryl Walker

Mailing Address (1): 1340 E. Washington Street

Mailing Address (2): _____

City: 510112 **State:** Virginia **Zip:** 23803

Telephone Number: (804**)**733-2357 **Cell Phone Number: (____)** _____

Email Address: dwalker@petersburg-va.org

Is the proposal in this application intended to benefit a low-income geographic area as defined in the Part 1 Definitions? Yes X No ____

Categories (select applicable project):

Project Grants (Check All that Apply)

- ☐ Acquisition of property (or interests therein) and/or structures for purposes of allowing floodwater inundation, strategic retreat of existing land uses from areas vulnerable to flooding; the conservation or enhancement of natural flood resilience resources; or acquisition of structures, provided the acquired property will be protected in perpetuity from further development.
- ☐ Wetland restoration.
- ☐ Floodplain restoration.
- ☐ Construction of swales and settling ponds.
- ☐ Living shorelines and vegetated buffers.
- ☐ Structural floodwalls, levees, berms, flood gates, structural conveyances.
- X Storm water system upgrades.
- ☐ Medium and large scale Low Impact Development (LID) in urban areas.
- ☐ Permanent conservation of undeveloped lands identified as having flood resilience value by *ConserveVirginia* Floodplain and Flooding Resilience layer or a similar data driven analytic tool.
- ☐ Dam restoration or removal.
- ☐ Stream bank restoration or stabilization.
- ☐ Restoration of floodplains to natural and beneficial function.
- ☐ Developing flood warning and response systems, which may include gauge installation, to notify residents of potential emergency flooding events.

Study Grants (Check All that Apply)

- ☐ Studies to aid in updating 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 other land use ordinances to incorporate flood protection and mitigation goals, standards and practices.
- ☐ 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). For example, a local government might conduct a hydrologic and hydraulic study for an area that had not been studied because the watershed is less than one square mile. Modeling the floodplain in an area that has numerous letters of map change that suggest the current map might not be fully accurate or doing a detailed flood study for an A Zone is another example.
- ☐ Studies and Data Collection of Statewide and Regional Significance.
- ☐ Revisions to existing resilience plans and modifications to existing comprehensive and hazard.
- ☐ Other relevant flood prevention and protection project or study.

<u>Capacity Building and Planning Grants</u>

- ☐ Floodplain Staff Capacity.
- ☐ Resilience Plan Development
  - ☐ Revisions to existing resilience plans and modifications to existing comprehensive and hazard mitigation plans.
  - ☐ Resource assessments, planning, strategies and development.
    - Policy management and/or development.
    - Stakeholder engagement and strategies.

Location of Project (Include Maps): Lakemont Neigbhorhood, Petersburg, VA 23803
refer to Appendix A for Detailed Maps of the Project Area

NFIP Community Identification Number (CID#):(See appendix F 510112

Is Project Located in an NFIP Participating Community? ☒ Yes ☐ No

Is Project Located in a Special Flood Hazard Area? ☐ Yes ☒ No

Flood Zone(s) (If Applicable): N/A

Flood Insurance Rate Map Number(s) (If Applicable): 5101120007C eff. 2/4/2011
5101120026C eff. 2/4/2011

Total Cost of Project: $2,800,878

Total Amount Requested $2,624,498

Table of Contents

Appendices

A. Detailed Map of the Project Area (Qualified Opportunity Zone Map)
B. FIRMette of the Project Area
C. Historic flood damage data and/or images
D. Non-fund financed maintenance and management plan for project extending a minimum of 5 years from project close
E. Social Vulnerability Index
F. Completed Scoring Criteria Sheet and Checklist
G. Estimates for work to be completed by third parties

Scope of Work Narrative

1.0. Project Information

The City of Petersburg is applying for Community Flood Preparedness Fund assistance to implement a flood prevention and protection project in the Lakemont Neighborhood within the City of Petersburg. The City is respectfully seeking assistance with this flood prevention/protection project to reduce property damage caused by flooding. The project will result in the improvement of structural stormwater conveyance systems that will provide community scale benefits in an underserved section of the City. The project is a continuation of progress that was initiated as a City-wide study.

- *Population*. the City of Petersburg has a population of 31,362 as of 2019. The City is a low-income geographic area, as defined in the CFPF Grant Manual, as an area where the median household income ($38,679) is significantly less than 80% of the local median household income ($74,222 in VA), according to the US Census Data in 2019[1].
- *Historic flooding data and hydrologic studies projecting flood frequency*. The project site, though not a mapped floodplain, is subject to significant routine flooding from the adjacent Petersburg National Battlefield property and aging and inadequate storm sewer infrastructure or lack thereof throughout the Lakemont Neighborhood. The nature of the various flooding and drainage problem areas are described in the Lakemont Neighborhood Drainage Study (2019), presented in Appendix C of the City's initial Resilience Plan, which was developed in a sequence of study that was initiated formally in the City-wide Water Quality Master Plan (Appendix A of the initial Resilience Plan), where flooding problem areas throughout the City were documented and identified for further study.
- *The ability of the local government to provide its share of the cost*. The City has been working to address flooding and stormwater management for many years and has recently made significant progress in the Lakemont Neighborhood using key partnerships and grant funding assistance. Refer to the Budget Narrative for additional information.
- *The administration of local floodplain management regulations*. The City has an existing floodplain ordinance but requested and been notified of award of CFPF assistance in the Round 2 cycle to hire a CFM and update the existing ordinance to address the updated FEMA mapping. The existing ordinance can be found at the following website: (https://library.municode.com/va/petersburg/codes/code_of_ordinances?nodeId=PTIICO_CH58FL)
- *Other necessary information to establish project or study priority.*
  - *Repetitive loss and/or severe repetitive loss properties*. As the subject project area is not within mapped floodplain limits, the homes do not participate in the NFIP. However, the City is aware of property impacts from routine flooding, and has observed high water marks, particularly in the vicinity of the Battlefield project. Complaints by the residents were received and documented in the community meetings conducted as part of the Lakemont Neighborhood Drainage Study. Refer to page 26 of Appendix C of the City's initial Resilience Plan.

[1] https://www.census.gov/quickfacts/fact/table/petersburgcityvirginia,VA,US/PST045219

- *Residential and/or commercial structures*. The projects to be implemented with this funding assistance request will provide direct benefit to at least 13 residential structures and community-scale, indirect benefits to the entire neighborhood.
- *Critical facilities*. There are no critical facilities within the project site.

2.0 Need for Assistance

The City of Petersburg's need for assistance is well documented in terms of financial and staff resources. For this project, the City has exhausted several avenues of funding assistance and collaboration for the past decade since the neighborhood was initially identified for further study in the Water Quality Master Plan (Appendix A of the City's initial Resilience Plan). As mentioned previously in Section 1.0, the City is a low-income geographic area. The project site is within a Qualified Opportunity Zone (ID 51730810100), as presented in **Appendix A**. Further, the project site is in an area designated as Very High Social Vulnerability (Index score: 3.0), as presented in **Appendix E**, which is in census tract 8101.

3.0. Goals and Objectives

The primary goal of the project is to implement the storm sewer system upgrades identified in the Lakemont Neighborhood Drainage Study, including the North Whitehill Drive Drainage Improvements, the Battlefield Flood Remediation and Drainage Improvements, and the Hare Street Storm Sewer Improvements. Though progress has been made with design of the North Whitehill Drive Drainage Improvements, due to proximity, these three systems could be efficiently bid and constructed as one project.

4.0. Approach, Milestones, and Deliverables

If awarded, the City will use existing term contracts to assign task orders for completion of the engineering professional services to develop construction documents. Once the construction documents are prepared, the City will follow Virginia Procurement Law to publicly advertise for construction bids. The project may be subdivided to allow for competitive bidding and to expedite the construction process. Presented in the following is an estimated timeline with milestones and deliverables. The project will be completed within three years of award.

Date	Milestone	Deliverable
June 2022	Anticipated Award	Announcement
June 2022	Commence Project	Issued task order
April 2023	Engineering	Construction documents
May 2023	City Review	Bid documents
June 2023	Contractor Selection	Construction contract
June 2025	Construction	Completed project
Ongoing	Maintenance	System performance

5.0. Relationship to Other Projects

In 2013, the City received a technical assistance grant from the National Fish and Wildlife Foundation to implement a GIS database and develop a City-wide Water Quality Master Plan. During the development of the Water Quality Master Plan, work sessions were conducted with City staff to identify drainage problem areas throughout the City. As a result, several neighborhood drainage studies were identified as priority to better understand the root cause of repetitive flooding and routine maintenance issues. Through partnerships and funding assistance, the City has been able to identify and prioritize

drainage improvement projects in the Lakemont Neighborhood in the City's Ward 1. While some progress has been made to fund the implementation of drainage improvement projects, the key priority of current and past funding assistance has been water quality protection. The Community Flood Preparedness Fund is unique in the type of projects that are eligible, which specifically include storm water system upgrades.

6.0. Maintenance Plan

Refer to **Appendix D** for the required Maintenance Plan to be implemented by the City.

7.0. Criteria

Funding assistance for this project will provide the City the ability to continue a trajectory of successful implementation of drainage improvements and stormwater system upgrades that provide a community scale benefit for the Lakemont Neighborhood. The project site is in an area of very high social vulnerability and a low-income geographic area. Water quality treatment measures consistent with the Chesapeake Bay TMDL Action Plan for urban areas have been proposed to enhance the project benefits from an environmental perspective. Please refer to the completed scoring criteria sheet presented in **Appendix F**.

8.0. Supporting Documentation

The following is a list of supporting documentation as required by the CFPF grant manual and associated links or location in the Appendix where more data is provided.

- Detailed map of the project area (**Appendix A**)
- FIRMette of the project area (**Appendix B**)
- Historic flood damage data and/or images: In addition to the documentation presented in the City's initial Resilience Plan both as appendices and by reference, the Walkable Watershed Concept Plan is included in **Appendix C**
- A link to the current floodplain ordinance: https://library.municode.com/va/petersburg/codes/code_of_ordinances?nodeId=PTIICO_CH58FL
- Non-fund financed maintenance and management plan for project extending a minimum of 5 years from project close (**Appendix D**)
- A link to the current hazard mitigation plan: https://www.craterpdc.org/environment/hazard_plan_2017.htm
- A link to the current comprehensive plan: http://www.petersburg-va.org/378/Comprehensive-Plan
- Social vulnerability index score(s) for the project area: 3.0, the project site is in census tract 8101, which according to the Virginia Vulnerability Viewer is classified has high social vulnerability (Map attached in **Appendix E**).
- Letters of support from affected communities: N/A
- Completed Scoring Criteria Sheets (**Appendix F**)

Budget Narrative

The following is the budget narrative requested per the Grant Manual:

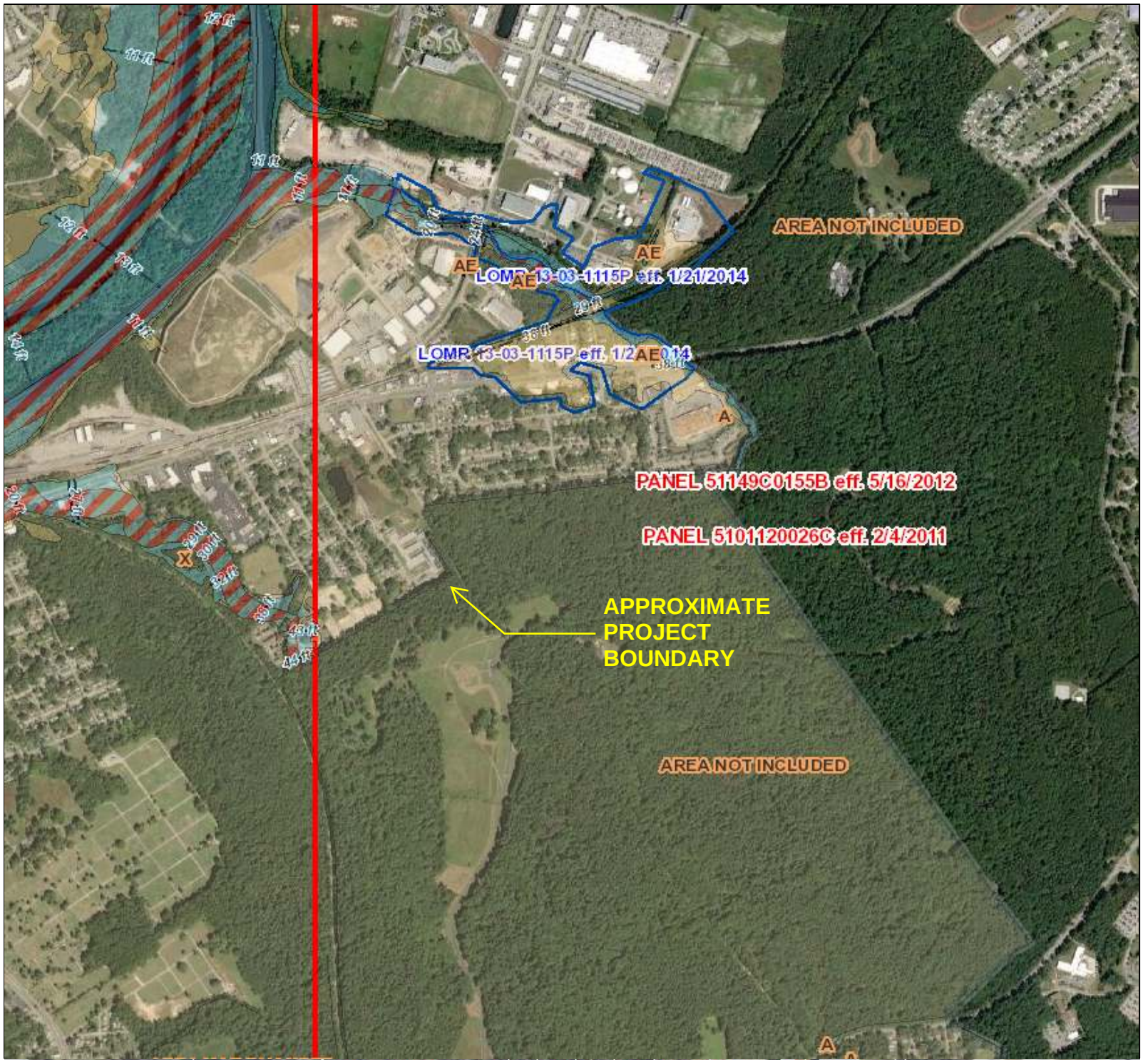
- Estimated total project cost: $2,800,878. The City has received a draft (non-binding) scope of work and associated fee from a third-party consultant for the engineering design and development of construction documents (**Appendix G**). The scope of design has been revised from the initial project limits defined in the 2019 Lakemont Drainage Study due to progress on the City's part in better understanding the source of issues in the Neighborhood and the overall existing infrastructure. According to the Project Management Institute, engineering for detailed design is typically approximately 15% of the total project budget (www.pmi.org). As the City wishes to implement full system drainage improvements from problem areas to outfall, the total project cost is estimated at $2,546,253 plus a 10% contingency due to the rising market prices and supply chain issues for a total of 2,800,878.
- Amount of funds requested from the Fund: $2,624,498.
- Amount of cash funds available: The City respectfully requests full funding of this project and for a waiver of match funds, per the letter signed by the Interim City Manager. The City has received partial grant funding for design of the North Whitehill Drainage Improvement Project from the National Fish and Wildlife Foundation and has partnered with James River Association to submit a grant through the Chesapeake Bay Trust's Green Streets, Green Jobs, Green Towns grant for a total anticipated cash funds available of $176,380.
- Please refer to the cover letter for the City's authorization to request for funding.

Appendix A

DCR **Virginia Flood Risk Information System (VFRIS)**

Lakemont Neighborhood

Date: 3/30/2022



Legend

Flood Hazard Zone Labels
- Flood Hazard Zone Labels

Flood Hazard Zones
- A and V Zones (1% annual chance flood hazard)
- Regulatory Floodway
- X-Shaded (0.2% annual chance flood hazard)
- X-Shaded(L) (area with reduced risk due to levee)
- Zone D
- Area of Minimal Flood Hazard

Base Flood Elevation
- Base Flood Elevation

Cross-Section
- Cross-Section

Flood Insurance Rate Map (FIRM)
- Flood Insurance Rate Map (FIRM)

LOMRs: Effective
- LOMRs: Effective

Water Lines
- Water Lines

1:2,256.99

0 0.0075 0.015 0.03 mi

Map of Opportunity Zones

Image created at: https://opportunityzones.hud.gov/resources/map

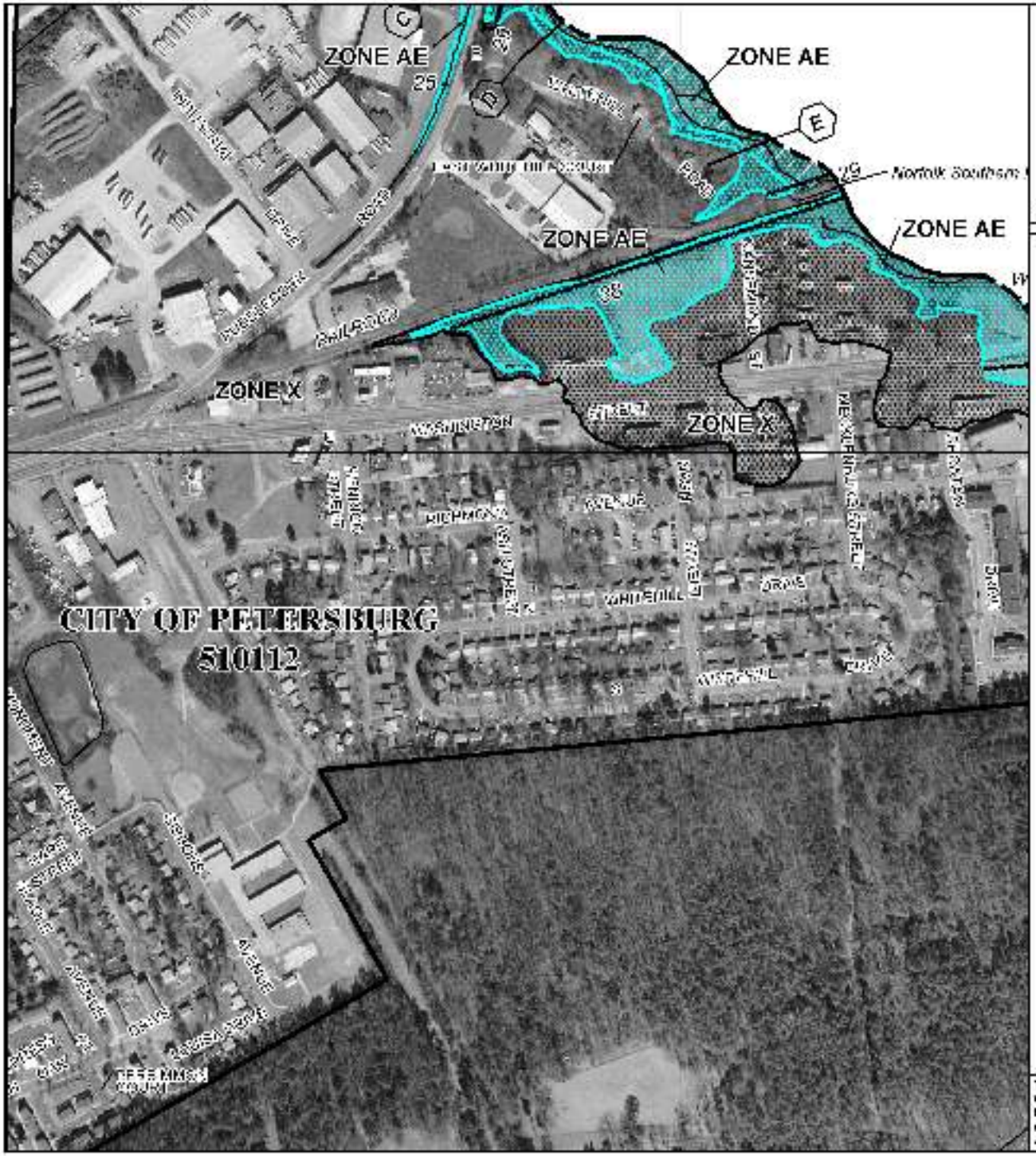
Lakemont Neighborhood, Petersburg, VA is in opportunity zone ID 51730810100.

2. GREEN: N. S.Whitehill to Henrico (2100 LF)
Phase 1 scope - storm, sanitary, and SUE along alignment shown.
Phase 2 scope - max area is tan box, includes topo, property lines, physical improvements (~3500 LF * 50 FT wide)

1. RED: N. Whitehill Dr (1700 LF)
ORANGE: S.Whitehill Alternate Route (750 LF)
Phase 1 scope - storm, sanitary, and SUE along alignment shown.
Phase 2 scope - max area is white box, includes topo, property lines, physical improvements (~3300 LF * 50 FT wide)

3. BLUE: Hare St to outfall at Poor Creek (900 LF)
Phase 1 scope - storm, sanitary, and SUE along alignment shown.
Phase 2 scope - includes topo, property lines, physical improvements (~900 LF * 50 FT wide)

Appendix B



MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0026C

FIRM

FLOOD INSURANCE RATE MAP

CITY OF

PETERSBURG, VIRGINIA

INDEPENDENT CITY

PANEL 26 OF 45

CONTAINS:

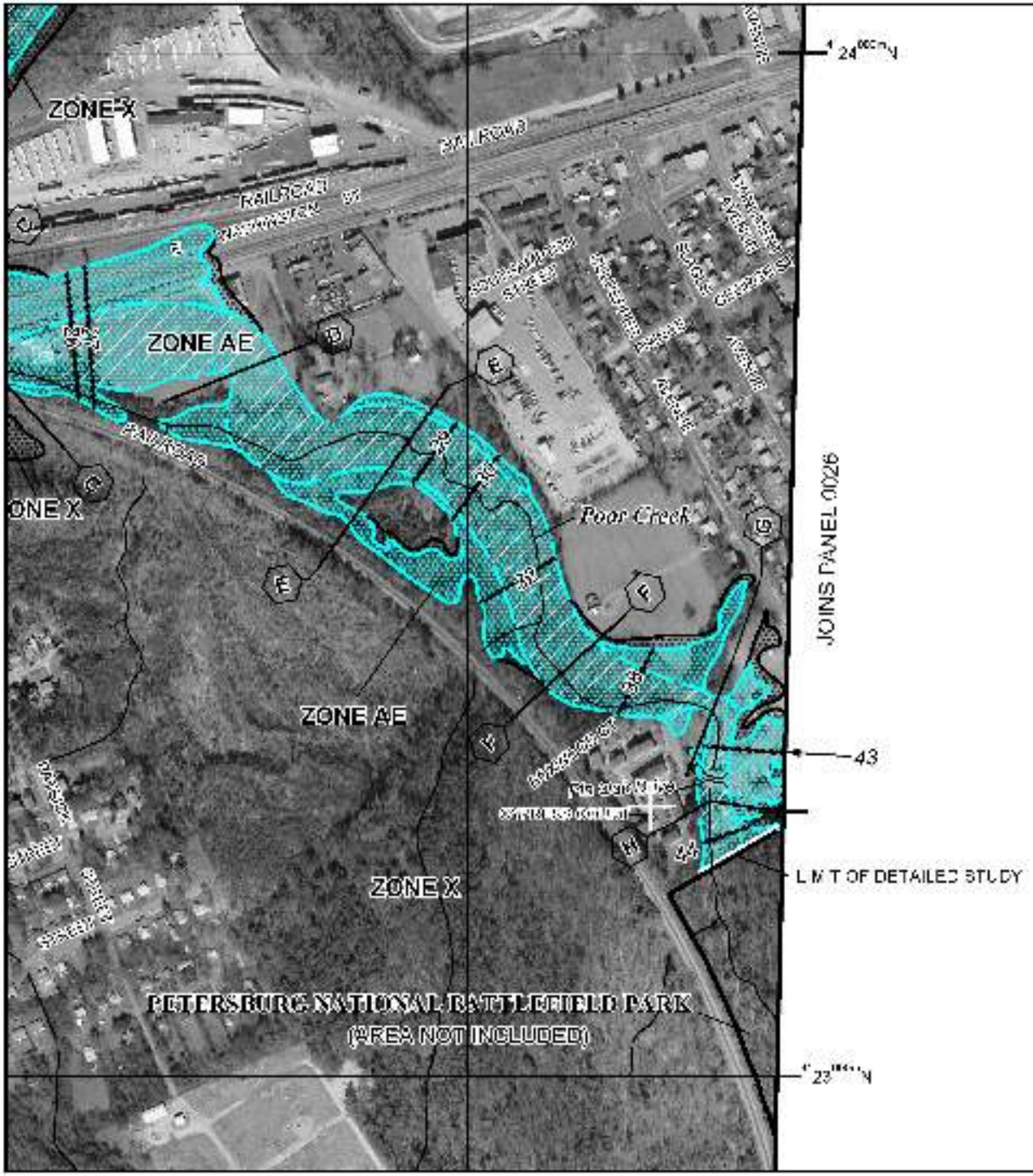
COMMUNITY	NUMBER	PANEL	SUFFIX
PETERSBURG, CITY OF	510112	0026	C

MAP NUMBER
5101120026C

EFFECTIVE DATE
FEBRUARY 4, 2011

Federal Emergency Management Agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the NFHL FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at https://www.fema.gov



MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0007C

FIRM

FLOOD INSURANCE RATE MAP

CITY OF

PETERSBURG, VIRGINIA

INDEPENDENT CITY

PANEL 7 OF 45

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PETERSBURG, CITY OF	510112	0007	C

MAP NUMBER
5101120007C

EFFECTIVE DATE
FEBRUARY 4, 2011

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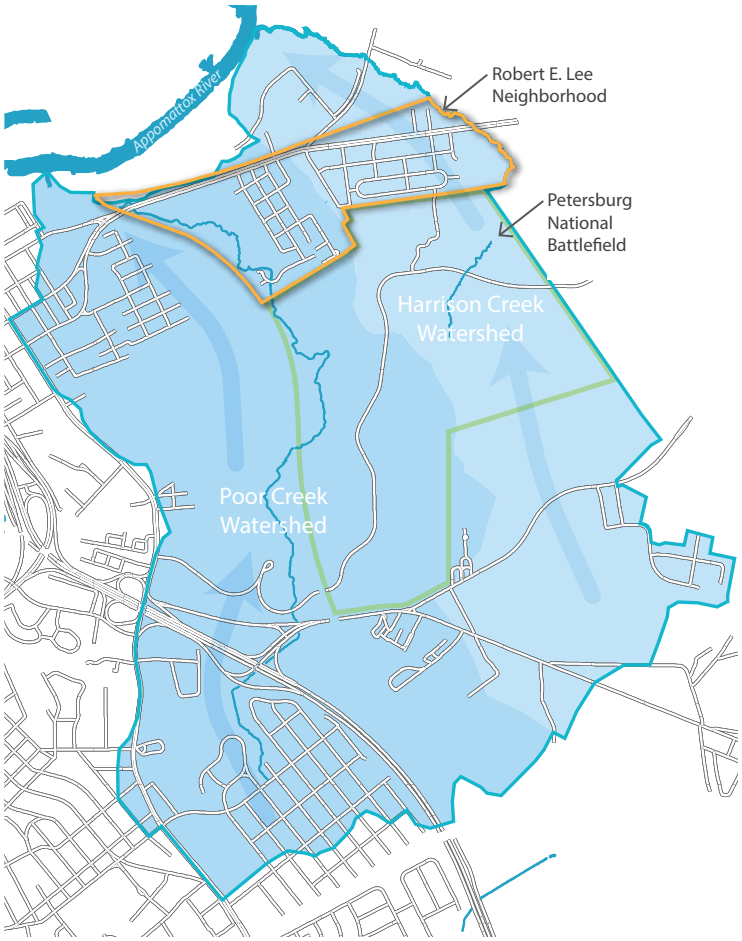
Appendix C





Petersburg Walkable Watershed Concept Plan



Rain that falls within Poor and Harrison Creek watersheds (shown in blue) flows to Poor Creek or Harrison Creek, then to the Appomattox River and ultimately the Chesapeake Bay.

In urban areas, the stormwater drainage system, which includes a series of underground pipes, open stream channels, street gutters and ditches, can carry pollutants from streets, yards and businesses to the creek.

A walkable watershed includes neighborhood features that improve stormwater and pedestrian safety simultaneously.

Overview

The Petersburg Walkable Watershed Concept Plan develops a shared vision and set of strategies to address flooding and improve quality of life for the Robert E. Lee (REL) neighborhood. This concept plan was developed in collaboration with the City of Petersburg, James River Association and the REL Neighborhood Watch Association.

The concept plan is based on a walkable watershed approach, which integrates the flow of water and people into a cohesive strategy to improve the overall health of a community and the surrounding watershed.

Through multiple community meetings, surveys, mapping and analysis and input from project partners, this plan identifies opportunities to:

- **Improve chronic flooding** in areas identified by residents.
- **Add on-street features** to reduce traffic speed, litter, and flooding.
- **Increase community connection** to nearby destination, parks and open space.
- **Engage and educate residents** to celebrate nearby waterways and natural resources.

Please visit: www.walkablewatershed.com or contact Darryl Walker, City of Petersburg at (804) 733-2355 or dwalker@pertersburg-va.org for more information.

Petersburg Walkable Watershed
healthy waters | healthy communities

A special thanks to the Robert E. Lee Neighborhood Watch Association and Mr. Williams for their time and feedback.

Existing Conditions

Project Background

The City of Petersburg partnered with James River Association, Center for Watershed Protection and Skeo Solutions on a Walkable Watershed process in the Robert E. Lee Neighborhood. Funded by the National Fish and Wildlife Foundation, the project focused on training for City staff and community-based planning to identify opportunities to address stormwater using green infrastructure strategies and address related community quality of life goals.

Community Assets and Challenges

The project team conducted resident surveys in late 2015-early 2016 to identify neighborhood assets and challenges. The project team shared results from the survey and initial existing condition analysis with residents during the REL Neighborhood Watch Association's month meeting on April 12. As part of that meeting, residents were asked to identify and prioritize community assets and challenges - those highlighted in **bold** represent top priorities for participants:

Assets:

- Quiet residential neighborhood
- **REL Elementary School and youth who are active in the neighborhood**
- **Neighborhood churches and businesses**
- **Neighborhood Watch Association**
- Harrison and Poor Creeks
- Proximity to Appomattox River, Petersburg National Battlefield and other natural areas

Challenges

- Few sidewalks
- Few play areas
- **Flooding in streets and yards**
- Littering on streets
- Few areas to walk and interact with nature or the creeks
- Perception and awareness of creeks
- **Public safety**
- **Speed of traffic**
- Few public gathering places
- **Home ownership**
- **Street lighting**
- Distance to nearest grocery store
- Few trash cans

Existing Conditions Summary

Resident input and analysis shows there is a strong connection between existing stormwater infrastructure and where chronic flooding occurs in the neighborhood. The map on the following page identifies:

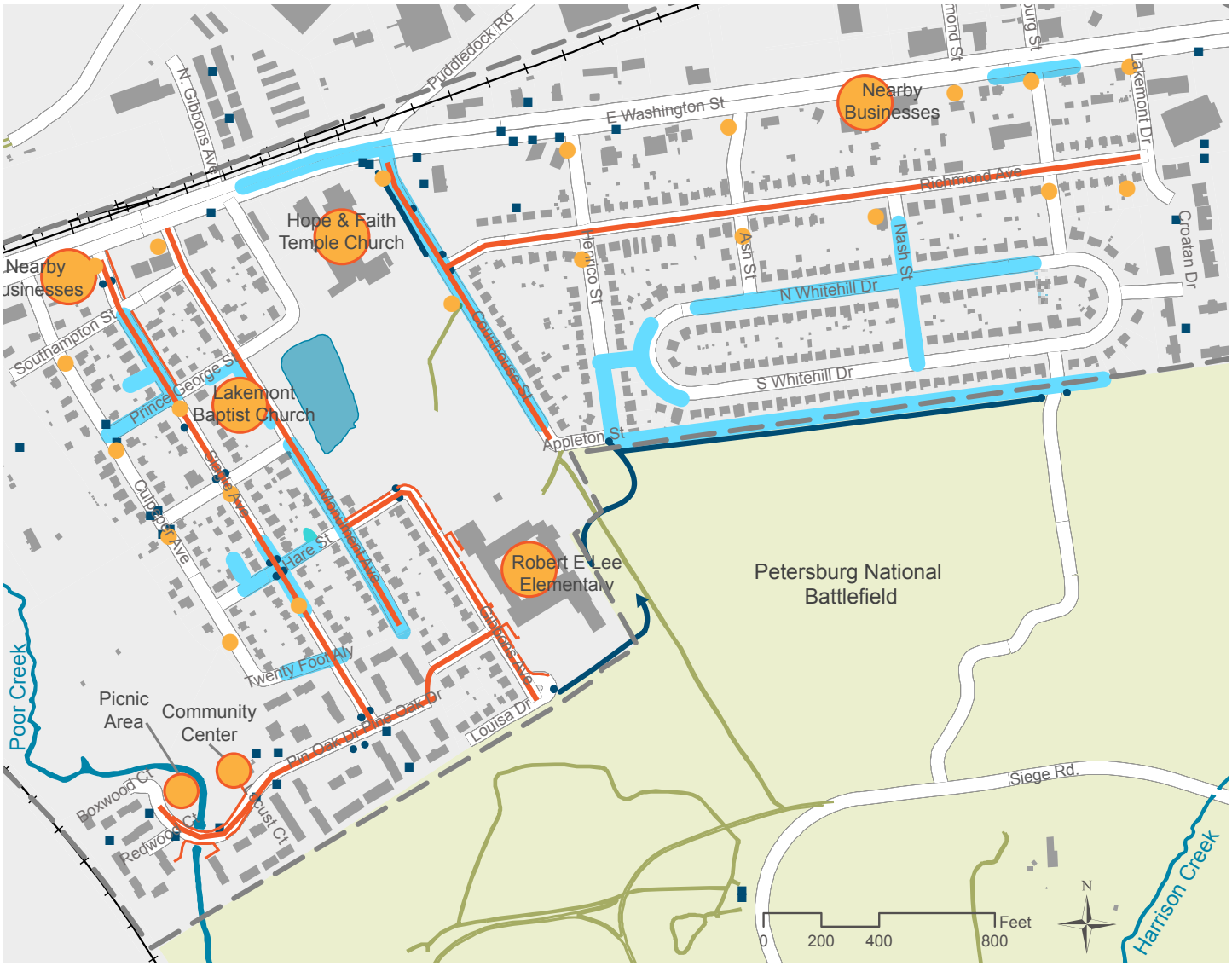
- Areas prone to flooding as experienced by residents
- Existing stormwater infrastructure and sidewalks
- Neighborhood destinations and primary routes to those destinations

Residents reported that regular flooding during and after storm events cause flooding on many streets in the REL neighborhood, shown in the photos that residents took on the following page. A combination of clogged or under sized storm inlets and lack of sidewalks makes walking difficult in these conditions.

By gaining a better understanding of location specific issues, stormwater infrastructure can be improved using a combination of traditional and green infrastructure or natural drainage strategies. Draft strategies were shared with the REL Neighborhood Watch during their April 12 meeting and based on their input, a refined concept plan was shared on June 14.

The Walkable Watershed Concept Plan on page 5 identifies opportunities to address stormwater management and flooding, improve walkability and access, and increase safety through traffic calming. A key next step will be to conduct a drainage study to better understand existing infrastructure capacity and evaluate the combination of traditional and green infrastructure strategies needed to address stormwater and flooding. The Concept Plan identifies opportunities to integrate walkability, safety, access, and amenities into these infrastructure improvements.

Residents discuss neighborhood assets and challenges.



Existing Conditions

- Community Destinations
- Transit Stops
- Primary Routes
- Existing Sidewalks
- Storm Inlet
- Catch Basin
- Ditch or Concrete Channel
- Resident Reported Flooding

Photos taken by residents document the flooding that occurs during rain events. In the event of heavier rainfall, roads in the neighborhood can be hazardous to drive on due to the depth of stormwater flooding the streets. Especially when stormwater floods impervious areas, it can collect litter, debris and hazardous materials such as oil from roads. These hazardous materials, will eventually drain into storm inlets and ultimately reach the Chesapeake Bay and contribute to water pollution.

Concept Plan

Reduce Flooding through Natural Drainage and Complete Streets

Primary Routes

A **Slagle Avenue** - Add sidewalk to connect with new sidewalk. Narrow traffic lanes to help slow traffic. Integrate natural drainage strip between sidewalk and streets to absorb stormwater. Include on-street parking on one or both sides of street.

B **Courthouse Avenue** - Widen swale on east side of road. Clean and maintain storm drains. Consider upgrading drainage pipe at Courthouse and Appleton.

Secondary Routes

C **Monument Avenue -** Consider installing a drainage swale on the west side of the street to allow stormwater to drain off the road and away from homes.

D **Richmond Avenue** - Add pedestrian safety amenities, such as sidewalks, or natural drainage strip where feasible.

Safe Crossings - Intersection Retrofit

Add natural drainage strategies like a vegetated traffic circle and/or bioretention curb extensions. Integrate bus stop and amenities such as trash cans. Add crosswalks to slow traffic at intersections.

Swales

Consider installing grassy or planted swales along the edge of the road right of way to catch and hold stormwater during major rain events to reduce flooding. Consider pedestrians and explore adding sidewalks as part of street improvements.

Stormwater Infrastructure Improvements

Inspect, repair and maintain storm inlets. Consider updating infrastructure to accommodate possible increase in runoff to reduce flooding.

E **Boxwood Court -** Consider moving trash dumpster to reduce trash and litter entering Poor Creek.

Planted Buffer Along Improved Swale

F Coordinate with National Battlefield (NPS) to install a swale or buffer to address flooding in backyards along Whitehill Drive.

Rain Garden

G Consider installing rain garden off Hare Street to reduce on-street stormwater flooding backyards and alley.

Example of how curb extensions, street parking, and vegetation between sidewalk and street could be added along Slagle Avenue.

Example of a planted swale during rain event

With dense vegetation, absorbent soils, and underground storage capacity, rain gardens help treat stormwater and prevent flooding of homes and streets. Photo courtesy of CNT/RainReady.

Integrate Public Safety and Enhance Connectivity

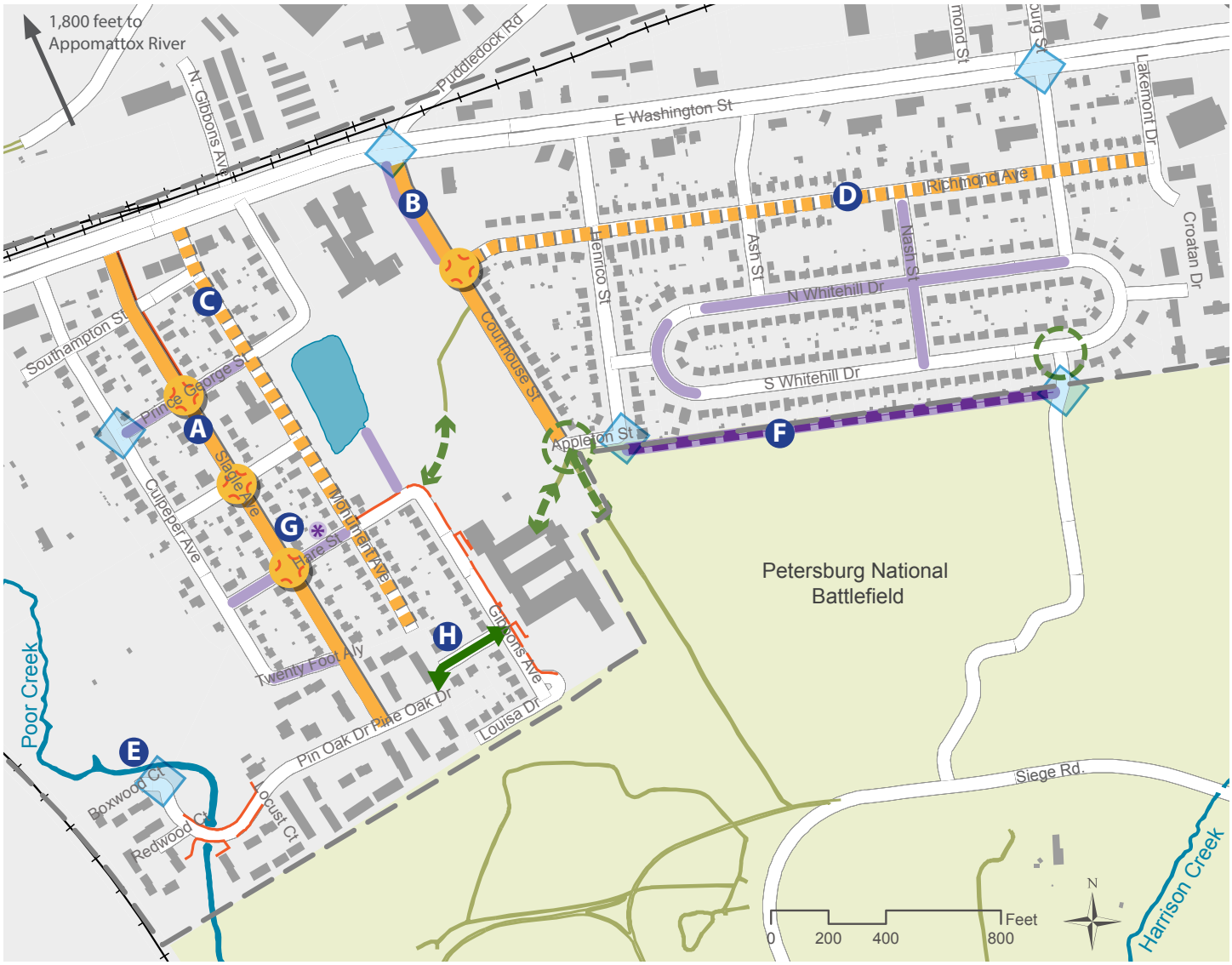
Trail Connecting Pin Oak and Gibbons

H Improve route amenities such as overhead lighting and connect to existing trails to create neighborhood walking loop.

Connect to Existing Trails

Improve walkability and access to community amenities by improving existing trails and connections, including to REL Elementary and National Battlefield access area. Consider planting trees along trails.

Existing entrance into Petersburg National Battlefield at Appleton Street.



On-Street Opportunities

Sidewalks and Natural Drainage

- Primary Route
- Secondary Route

Safe Crossing

- Intersection Retrofit

Natural Drainage Retrofit

- Swales

Existing Infrastructure

- Stormwater Infrastructure Improvements

- A Specific Recommendations

Off-Street Opportunities

Natural Drainage Retrofit

- Planted Buffer and Improved Swale
- Rain Garden

Trails

- Connect to Existing Trails
- On-Street Route
- Trailhead Access

- Existing Sidewalks
- Existing Trails

Grassy Swale Example

Grassy swales along streets without sidewalks could address street flooding by providing holding space for stormwater during rain events -- swales are designed to drain after rain event to avoid standing water. Swales can also be designed for ease of maintenance and to minimize trash collection.

Opportunities

A Hare & Slagle Green Intersection Retrofit

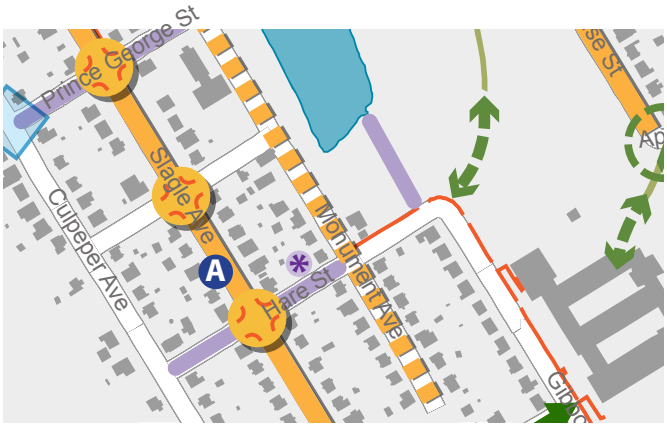
Current Conditions

- Intersection floods regularly.
- Storm inlets regularly clogged with litter.
- No sidewalks, public trash cans or bus waiting areas.
- Cars regularly speed through intersection.

Potential Opportunities

Opportunities to reduce flooding, calm traffic and provide public amenities:

- Add residential scale traffic circle with vegetation to slow traffic and collect stormwater to reduce flooding.
- Add sidewalks and public transportation waiting area to increase pedestrian safety.
- Include crosswalks at intersection of Slagle and Hare Streets.
- Add public trash can at all public transportation waiting areas to reduce neighborhood litter.



Example of a vegetated traffic circle in a residential neighborhood that slows traffic, collects stormwater and adds aesthetic value. A drainage study will identify whether there is adequate road width and right of way to accommodate a traffic circle.

Complete Street on Slagle and Courthouse

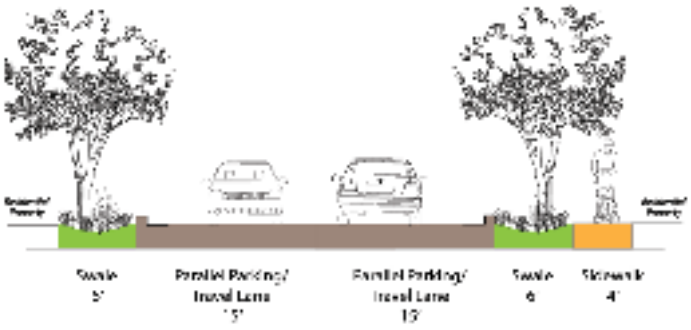
Current Conditions

- Main roads lack sidewalks.
- Cars regularly speed on residential roads.
- Regular flooding makes walking, biking and driving unsafe after major storm events.
- Wide residential streets, parking on one or both sides and municipal right-of-way on both sides of street.

Potential Opportunities

- Add sidewalks on one side of street, crosswalks at intersections, and include additional storm inlets where appropriate.
- Include vegetated bump-outs or swales in municipal right-of-way where appropriate to collect stormwater off-street and calm traffic. For example, with approximately 60' of public right-of-way on Slagle Avenue, there is potential to re-design main roadways to incorporate sidewalks and green infrastructure practices.

Existing Street Dimensions - Slagle Avenue



Example of how a sidewalk and stormwater swales can be incorporated within a portion of the right-of-way.

F Planted Buffer and Improved Swale

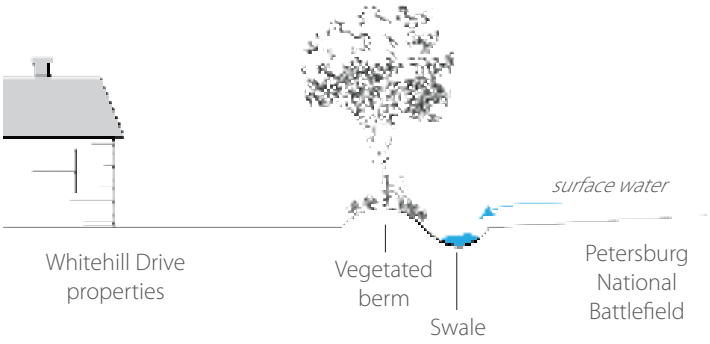
Current Conditions

- Existing swale on Petersburg National Battlefield is undersized and filled in with tree roots.
- Residential backyards along swale regularly flood, sometimes up to homes.
- Existing stormwater pipe at Henrico Street for swale is undersized.
- Petersburg National Battlefield needs to maintain vegetative buffer for park aesthetics.

Potential Opportunities

Opportunities to reduce flooding and improve aesthetics:

- Resize existing swale to increase capacity to hold and move water during storm events.
- Redesign swale to include a vegetated berm on the northern side to prevent flooding in residential backyards.
- Consider planting native evergreen water tolerant shrubs to provide a buffer between park and homes.



A planted buffer along an expanded swale will allow surface water draining from the Petersburg National Battlefield to be collected without flooding residential properties and maintain a visual buffer between residential neighborhood and the park.

Potential Community Programs

Adopt a Drain Program

Develop an 'Adopt a Drain' program, modeled from other programs around the country. Residents adopt a drain and help keep it clear of trash and debris and report any issues to the City. The program connects residents with their local utility staff. The neighborhood's ~70 drains could be adopted by resident volunteers. Tools could be provided including rakes, brooms, trash bags, safety vests and shovels could be requested via grants. Program could be expanded to include swales or other natural drainage features.

Litter and Debris Reduction

Coordinate with community organizations on education and outreach on:

- promoting litter prevention and removal
- organizing community clean up days
- installing public trash cans and signs that celebrate Poor Creek, Harrison Creek and the Appomattox River.

Public Art as Cue to Care/Education

Work with local artists to design storm drain art to illustrate that rainwater drains to local waterways. Engage residents in the design and identifying key locations for storm drain art and/or storm drain markers.

Photos: (top) residents can Adopt-a-Drain and place medallions on top to educate the community about where stormwater goes; (bottom) public art can be an educational tool to promote awareness and stewardship.

Moving Forward

Next Steps

Key next steps include securing funding for a drainage study to better understand infrastructure capacity and design solutions. The following principles for implementation can guide next steps for moving forward.

- **Build Partnerships -** Strengthen existing and develop new partnerships between federal, state and local governments and community organizations for implementation and stewardship.
- **Grow Community Stewardship -** Continue to grow and foster community stewardship through outreach, education and opportunities for community involvement.
- **Engage Youth -** Build on existing youth programs and initiatives to engage youth in environmental education opportunities. As projects move forward, invite youth to participate in the design process and in the designing and building of outdoor play and learning areas.
- **Seek Funding -** Develop a plan to seek funding, including a list of potential grants and associated deadlines. Assemble teams early to develop winning proposals. Continue to seek opportunities that cross programs and initiatives to leverage funding for projects.
- **Phase Projects Over Time** - While some recommendations may be implemented in the near term, some projects will need to be phased over time. Develop an action list to coordinate initiatives and projects among partners. Continue to refine ideas during the design process.
- **Celebrate Successes! -** Sustain momentum and support by celebrating successes along the way.

Potential Partners and Funding Sources

The following organizations have been identified as potential partners and collaborators with the REL Neighborhood to address community goals and address stormwater concerns:

- City of Petersburg (Department of Parks & Leisure, Public Works, Department of Health)
- National Parks Conservation Association
- National Park Service
- Robert E Lee Elementary Parent Teacher Association
- Friends of the Lower Appomattox River
- Fort Lee - Corps Volunteer Coordinator
- Habitat for Humanity
- Project Home
- Petersburg Area Community Development Corporation
- Crater Planning District
- Cameron Foundation
- Faith & Hope Baptist Church
- WOW Camp
- Boy Scouts of America - Area troops
- Petersburg City Council - Ward 1 Councilperson

Potential Funding Sources	*Deadlines and Funding*
National Fish and Wildlife Foundation *Innovative Nutrient and Sediment Reduction Grant*	Up to $750,000. The proposal submitted by James River Association in May 2016 for drainage study, coalition building, and adopt a drain pilot program was not awarded. Reapply in Spring 2017.
National Park Service *Park Project Planning*	As part of their annual budget planning, Petersburg National Battlefield can apply to NPS for funding for specific projects, this could include funds to address the swale project (see H on Concept Plan). A drainage study or further assessment of this area could inform the design of this drainage system.
City of Petersburg *Community Development Block Grant*	Up to $600,000 is awarded to Petersburg each year from U.S. Housing and Urban Development. Deadline for proposals is the second Friday in January each year.

For more information about the project, please visit: www.walkablewatershed.com
or contact Darryl Walker, City of Petersburg at (804) 733-2355 or dwalker@pertersburg-va.org.

Appendix D

Maintenance and Management Plan

June 2022 – June 2027

All projects proposed in the Lakemont Neighborhood will be maintained in accordance with the City's Virginia Stormwater Management Program (VSMP) which includes ongoing preventative maintenance of the storm drain system, including vacuuming inlet and manhole structures and jetting storm sewer pipes, as needed. Routine inspections of stormwater management facilities, and corrective maintenance, are also performed in accordance with the City's VSMP and Municipal Separate Storm Sewer System (MS4) Permit.

Appendix E

Lakemont Neighborhood

April 1, 2022

Social Vulnerability Index Score

- Very Low Social Vulnerability
- Low Social Vulnerability
- Moderate Social Vulnerability
- High Social Vulnerability
- Very High Social Vulnerability
- Not inlcuded in the analysis

1:18,056

0 0.075 0.15 0.3 mi

0 0.125 0.25 0.5 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Created from the Virginia Vulnerability Viewer

Center for Coastal Resources Management

ADAPTVA

Appendix F

Appendix B: Scoring Criteria for Flood Prevention and Protection Projects

Virginia Department of Conservation and Recreation
Virginia Community Flood Preparedness Fund Grant Program

Applicant Name:	City of Petersburg, VA	
Eligibility Information		
Criterion	**Description**	**Check One**
1. 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)?		
Yes	Eligible for consideration	X
No	Not eligible for consideration	
2. Does the local government have an approved resilience plan and has provided a copy or link to the plan with this application?		
Yes	Eligible for consideration under all categories	X
No	Eligible for consideration for studies, capacity building, and planning only	
3. If the applicant is <u>not a town, city, or county</u>, are letters of support from all affected local governments included in this application?		
Yes	Eligible for consideration	N/A
No	Not eligible for consideration	
4. Has this or any portion of this project been included in any application or program previously funded by the Department?		
Yes	Not eligible for consideration	
No	Eligible for consideration	X
5. Has the applicant provided evidence of an ability to provide the required matching funds?		
Yes	Eligible for consideration	X
No	Not eligible for consideration	
N/A	Match not required	

Project Eligible for Consideration	☒ Yes ☐ No
Applicant Name:	City of Petersburg, VA

Scoring Information		
Criterion	**Point Value**	**Points Awarded**
6. Eligible Projects (Select all that apply)		
Projects may have components of both 1.a. and 1.b. below; however, only one category may be chosen. The category chosen must be the primary project in the application.		
1.a. Acquisition of property consistent with an overall comprehensive local or regional plan for purposes of allowing inundation, retreat, or acquisition of structures.	**50**	
☐ Wetland restoration, floodplain restoration ☐ Living shorelines and vegetated buffers. ☐ Permanent conservation of undeveloped lands identified as having flood resilience value by *ConserveVirginia* Floodplain and Flooding Resilience layer or a similar data driven analytic tool ☐ Dam removal ☐ Stream bank restoration or stabilization. ☐ Restoration of floodplains to natural and beneficial function. ☐ Developing flood warning and response systems, which may include gauge installation, to notify residents of potential emergency flooding events.	**45**	
1.b. any other nature-based approach	**40**	
All hybrid approaches whose end result is a nature-based solution	**35**	
All other projects	**25**	25
7. Is the project area socially vulnerable? (Based on ADAPT VA's Social Vulnerability Index Score.)		
Very High Social Vulnerability (More than 1.5)	**15**	15
High Social Vulnerability (1.0 to 1.5)	**12**	
Moderate Social Vulnerability (0.0 to 1.0)	**8**	
Low Social Vulnerability (-1.0 to 0.0)	**0**	
Very Low Social Vulnerability (Less than -1.0)	**0**	
8. Is the proposed project part of an effort to join or remedy the community's probation or suspension from the NFIP?		

Yes	**10**	
No	**0**	0
9. Is the proposed project in a low-income geographic area as defined in this manual?		
Yes	**10**	10
No	**0**	
10. 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?		
Yes	**5**	5
No	**0**	
11. Does this project provide "community scale" benefits?		
Yes	**20**	20
No	**0**	
Total Points		75

Appendix D: Checklist All Categories

Virginia Department of Conservation and Recreation

Community Flood Preparedness Fund Grant Program

Scope of Work Narrative	
Supporting Documentation	**Included**
Detailed map of the project area(s) (Projects/Studies)	☒ Yes ☐ No ☐ N/A
FIRMette of the project area(s) (Projects/Studies)	☒ Yes ☐ No ☐ N/A
Historic flood damage data and/or images (Projects/Studies)	☒ Yes ☐ No ☐ N/A
A link to or a copy of the current floodplain ordinance	☒ Yes ☐ No ☐ N/A
Non-Fund financed maintenance and management plan for project extending a minimum of 5 years from project close	☒ Yes ☐ No ☐ N/A
A link to or a copy of the current hazard mitigation plan	☒ Yes ☐ No ☐ N/A
A link to or a copy of the current comprehensive plan	☒ Yes ☐ No ☐ N/A
Social vulnerability index score(s) for the project area from ADAPT VA's Virginia Vulnerability Viewer	☒ Yes ☐ No ☐ N/A
If applicant is not a town, city, or county, letters of support from affected communities	☐ Yes ☐ No ☒ N/A
Completed Scoring Criteria Sheet in Appendix B, C, or D	☒ Yes ☐ No ☐ N/A
Budget Narrative	
Supporting Documentation	**Included**
Authorization to request funding from the Fund from governing body or chief executive of the local government	☒ Yes ☐ No ☐ N/A
Signed pledge agreement from each contributing organization	☐ Yes ☐ No ☒ N/A

Appendix G

A Budget for Engineering Services for
Lakemont Capital Improvement Projects – Construction Documents

Submitted to:

City of Petersburg

December 23, 2021

The City of Petersburg and its partners have been studying drainage improvement projects in the Lakemont Neighborhood for many years. The projects selected for further study and engineering design herein where first identified in the City's Lakemont Neighborhood Drainage Study, as follows:

- Battlefield Flood Remediation and Drainage Improvements
- North Whitehill Drive Drainage Improvements
- Hare Street Storm Sewer Improvements

The pupose of this budget narrative is to advance conceptual study of the three identified projects and to perform engineering design. At the completion of this scope of work, the City intends to have "shovel ready" drainage improvement projects ready for implementation, i.e., approved and permitted construction documents ready for Contractor procurement.

Task 1: Phase 1 Field Survey for Conceptual Engineering

Timmons Group will prepare a field run survey for the site to include horizontal and vertical location of storm and sanitary sewer alignments with invert data, and surface indications of subsurface utilities within the project site boundaries, as provided in the attached map.

An underground utility survey will be performed to designate and map underground facilities on the project site (see attached survey limits map). This utility survey will include horizontal designation through geophysical methods and is defined as Quality Level "B" by the American Society of Civil Engineers (ASCE). The accuracies of the markings are subject to the depth and electrical conductivity of the utility as well as site (soil) conditions and manhole access. In addition, fiber optics lines without tracer wires may be unable to locate. This service does not include the use of ground penetrating radar. Exclusions for this survey may include Irrigation Systems and Lines, Roof Drains, Non-Conductive Utility Lines & Conduits, and Abandoned Lines. Test pits are also an excluded service.

Task 2: Wetland Delineation and Confirmation

Timmons Group will review existing, readily obtainable environmental information for each of the three project areas such as USGS mapping, aerial photography, NWI mapping and soil survey information to delineate waters of the U.S. and/or other jurisdictional features. A wetland delineation of the subject project areas will be performed in accordance with the 1987 U.S. Army Corps of Engineers (COE) Wetland Delineation Manual and appropriate Regional Supplement. The flagged wetland limits will be GPS located

for mapping purposes. A preliminary wetland delineation map showing the approximate size, shape and location of wetlands and or waters of the U.S. present on the subject property will then be prepared. Timmons Group will facilitate the confirmation of wetland locations through submittal of a Jurisdictional Determination (JD) package to the U.S. Army Corps of Engineers (COE). This package will consist of a narrative, wetland delineation map and wetland delineation field data sheets. Timmons Group will conduct a site visit with the COE to review the site conditions, flagged wetland limits and confirm findings. A Jurisdictional Determination (JD) letter for the wetland delineation will be obtained from the COE. This task will also include activities to provide due diligence with historic preservation (EHP) requirements.

Task 3: Conceptual Engineering Design

This task is provided to allow stormwater engineers to study the existing hydraulics of each of the systems and evaluate improvement alternatives to determine the optimal design and alignment for implementation. The initially proposed improvements for the Battlefield Flood Remediation and Drainage Improvement and the North Whitehill Drive Drainage Improvements were contingent upon providing underground detention and tying into existing systems; however, the purpose of this grant is to build resilient infrastructure and communities, which includes cost-effective solutions to reduce or eliminate risk and damage from future natural hazards. By proposing a conceptual engineering design task, engineers will fully study the existing and proposed systems to define projects that meet these objectives.

During this task, engineers will perform field reconnaissance and study each alignment to determine the most hydraulically effective improvement with considerations for potential conflicts. We will specifically consider project aspects such as geotechnical engineering, environmental permitting, historic preservation, utility relocation, construction access/constraints, and cost.

Task 4: Field Services for Engineering Design

4a. Topographic Survey: This task will include topographical survey along the final selected alignment of each improvement to prepare construction documents. The budget for this task has been developed based on providing comprehensive design-level, field run topographical survey along each of the alignments shown on the attached map. Contouring to be plotted at a 1-foot interval. The survey will be performed based on the Commonwealth of Virginia DPOR and local governing requirements and standards. A proper land records research will be conducted to establish property lines for all lots that overlap or join the survey limits. Property lines in accordance with the land records and monumentation found on the ground/field will be shown on the final deliverable. The basis of this survey will be NAD83 (North American Datum 1983) and NAVD88 (North American Vertical Datum 1988) (Virginia South Zone).

Notes:

- Property lines will be established based on proper records research, however property corners will not be set in the field nor included in this proposal.
- This survey will be prepared based on the assumption that a title commitment will not be provided to the surveyor. If a title commitment is not provided to the surveyor, existing easements or other pertinent facts may affect the subject project area that otherwise would not be found in a normal property records research.

4b. Environmental Permitting: A Pre-Construction Notification (PCN) for the appropriate Nationwide Permit (NWP) will be prepared and submitted to the COE. The NWP authorizes certain activities required for working in Waters of the United States. The PCN submittal will contain a narrative describing in detail the purpose of the project and the necessity of the proposed disturbance to demonstrate that this disturbance is warranted. Responses to Requests for Additional Information (RAI) will be prepared to answer any questions posed by

the COE as a result of the PCN. Negotiation of NWP authorization will be undertaken to facilitate regulatory approval of the project.

Task 5: Construction Document Development

This task will include final design, which will include a 60% submittal, a 90% submittal, and final construction documents. Design calculations prepared in the conceptual phase will be refined and finalized. The 60% design documents will include the final layout and alignment, including any water quality and detention components necessary. Potential construction conflicts will be addressed. The plan set will be sufficient to initiate environmental permitting, if necessary.

The 90% submittal will include the stormwater management and erosion and sediment control plans consistent with any VSMP requirements, as well as traffic maintenance, construction notes and details, and other design information, as necessary. The 90% submittal will be considered final plans and will include sufficient information to initiate any permitting required by the City, as well as an accompanying engineer's opinion of probable cost and technical specifications.

The final construction documents will address any City comments and will accompany the bid package for public Contractor procurement. Timmons Group will prepare and submit a Stormwater Construction General Permit Registration Statement to the local plan reviewing authority. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared per state regulations for management of stormwater discharges associated with construction activities. This work will be performed in accordance with the July 1, 2014 DEQ VAR-10 Permit requirements.

Exclusions: At this time, it is not anticipated the following services will be necessary nor is it feasible to determine an appropriate budget, without additional information to be determined as proposed. However, the following services can be provided, should they be deemed necessary:

- Test pits
- Utility relocation design
- Geotechnical investigations and engineering
- Floodplain compliance
- Plan review and/or coordination with VDOT
- Construction stake-out
- Construction observation and inspection
- Materials testing during construction
- Field run as-built survey or record drawings
- Easement plats

Proposed Budget

The following budget has been prepared to accompany the proposed scope.

Task 1: Phase 1 Field Survey for Conceptual Engineering	$54,770
Task 2: Wetland Delineation and Confirmation	$10,920
Task 3: Conceptual Engineering Design	$119,130
Task 4: Field Services for Engineering Design	$47,010
Task 5: Construction Document Development	$149,400
Reimbursables	$700
Total:	**$381,938**