



Grant Application

Virginia Community Flood Preparedness Fund

Category: Capacity Building and Planning

Proposed Project: **Portsmouth's
Data-driven and Equity-Driven Resilience Strategy**

September 3, 2021



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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:

Portsmouth, VA

Category of Grant Being Applied for (check one):

Capacity Building/Planning

Project

Study

NFIP/DCR Community Identification Number (CID) 515529

If a state or federally recognized Indian tribe, Name of tribe _____

Name of Authorized Official: Angel L. Jones, City Manager

Signature of Authorized Official: _____

Mailing Address (1): 801 Crawford Street

Mailing Address (2): _____

City: Portsmouth State: VA Zip: 23704

Telephone Number: () Cell Phone Number: () _____

Email Address:

Contact Person (If different from authorized official): Thomas Quattlebaum,
Stormwater Compliance Manager

Mailing Address (1): Department of Engineering and Technical Services

Mailing Address (2): 801 Crawford Street

City: Portsmouth State: VA Zip: 23704

Telephone Number: () Cell Phone Number: ()

Email Address:

Is the proposal in this application intended to benefit a low-income geographic area as defined in the Part 1 Definitions? Yes 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.
- 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.

Capacity Building and Planning Grants

- 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): City-wide

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

F 515529

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): AE, A

Flood Insurance Rate Map Number(s) (If Applicable): see attachments

Total Cost of Project: \$586,610

Total Amount Requested \$527,949

Appendix D: Scoring Criteria for Capacity Building & Planning

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

Applicant Name:		
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	✓
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	
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	✓
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	✓
5. Has the applicant provided evidence of an ability to provide the required matching funds?		
Yes	Eligible for consideration	✓
No	Not eligible for consideration	
N/A	Match not required	

Capacity Building and Planning Eligible for Consideration		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Applicant Name:			
Scoring Information			
Criterion	Point Value	Points Awarded	
6. Eligible Capacity Building and Planning Activities (Select all that apply)			
Revisions to existing resilience plans and modifications to existing comprehensive and hazard mitigation plans.	55		
Development of a new resilience plan.	55	✓	
Resource assessments, planning, strategies and development.	45	✓	
Policy management and/or development.	40	✓	
Stakeholder engagement and strategies.	25	✓	
Goal planning, implementation and evaluation.	25	✓	
Long term maintenance strategy.	25	✓	
Other proposals that will significantly improve protection from flooding on a statewide or regional basis.	15		
7. Is the area within the local government to which the grant is targeted socially vulnerable? (Based on ADAPT VA's Social Vulnerability Index Score.)			
Very High Social Vulnerability (More than 1.5)	15		
High Social Vulnerability (1.0 to 1.5) **note:compared to region and state	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 activity part of an effort to join or remedy the community's probation or suspension from the NFIP?			
Yes	10		
No	0	✓	
9. Is the proposed project in a low-income geographic area as defined in this manual?			
Yes	10	✓	
No	0		
10. Does this project provide "community scale" benefits?			
Yes	20	✓	
No			
Total Points		257	

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

THE DEPARTMENT Use Only

Virginia Department of Conservation and Recreation	Date Approved	Date Denied
Printed Name	Title	

Reason for Denial

VRA Use Only

Virginia Resources Authority	Date Received	Date Grant Modified
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Virginia Department of Conservation and Recreation
(DCR)
Attention: Virginia Community Flood Preparedness
Fund (CFPF)
Division of Dam Safety and Floodplain Management
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Angel L. Jones, City Manager
801 Crawford Street
Portsmouth, VA 23704

Re: City of Portsmouth authorization to request funding from CFPF for Capacity Building and Planning

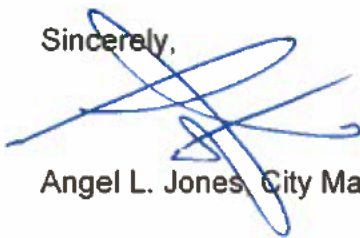
Dear DCR Review Committee,

This communication confirms the intent of the City of Portsmouth to assume responsibility for implementation of the proposed *Portsmouth's Data-driven and Equity-Driven Resilience Strategy*. under the Virginia Community Flood Preparedness Fund (CFPF) Grant Program.

The total amount of the project is \$586,610 of which the proposed CFPF share is 90 percent, a total of \$527,949. The proposed Portsmouth share is 10 percent, a total of \$58,661. It is the intent of City to utilize City funding to fulfill the match requirements.

Thank you for your support of the City of Portsmouth. Your partnership is an investment in our effort to protect residents and critical systems in the City.

Sincerely,



Angel L. Jones, City Manager

Virginia Department of Conservation and Recreation
(DCR)
Attention: Virginia Community Flood Preparedness
Fund (CFPF)
Division of Dam Safety and Floodplain Management
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Angel L. Jones, City Manager
801 Crawford Street
Portsmouth, VA 23704
757-393-8641

Re: City of Portsmouth Pledge Agreement to match funding from CFPF for Capacity Building and Planning, if awarded

Dear DCR Review Committee,

The City of Portsmouth is proposing a project entitled *Portsmouth's Data-driven and Equity-Driven Resilience Strategy* under the Virginia Community Flood Preparedness Fund (CFPF) Grant Program.

The total amount of the project is \$586,610 of which the proposed CFPF share is 90 percent, a total of \$527,949. **The proposed Portsmouth share is 10 percent, a total of \$58,661.** It is the intent of City to utilize City funding to fulfill the match requirements.

As the contributor of the match, The City of Portsmouth will pay the cash contribution during the agreement period. The source of funding for the cash contribution will be City funds. The contact information for the contributor's representative is Thomas Quattlebaum and he can be contacted at quattlebaumt@portsmouthva.gov, 757-393-8592, or at the Department of Engineering and Technical Services, 801 Crawford Street Portsmouth, VA 23704

Sincerely,



Angel L. Jones, City Manager

Rates and Hours

Labor Category		Principal Engineer	Project Engineer	Senior Scientist	Engineer	Architect	Senior Engineer	Scientist	Project Assistant			
Billable Labor Rate		\$ 265	\$ 160	\$ 185	\$ 130	\$ 150	\$ 185	\$ 130	\$ 134			
Task	Description									Task Hours	Task Fee	
1	Project Management	76	4	5					112	197	\$ 36,713	
2	Baseline Review of Plans and Data / Vulnerability Assessment	48	65	97	145	85	60	135		635	\$ 101,315	
3	Adaptation Alternatives Analysis	59	187	144	210	161	193	230		1184	\$ 189,250	
4	Stakeholder Engagement and Internal Capacity Building	23	27	128	163	115	57	186		699	\$ 107,260	
5	Project-Based Final Report	52	138	133	107	137	176	125		868	\$ 143,735	
		258	421	507	625	498	486	676	112	3583		
											Direct Costs	\$ 578,273
											Travel and Supplies	\$ 8,337
											Total	\$ 586,610

**The estimate for travel and supplies includes airfare, hotel, car rental, and stakeholder meeting supplies/ refreshments

Overview of Schedule and Deliverables

Task	Deliverable	% Effort	Budget	Timeline	
1 Project Management					
	Deliverable 1: The consultant will organize an internal kickoff meeting and provide meeting documents such as the slides, notes, and attendee list. Ongoing monthly progress reports will be provided.	6%	\$36,713	ongoing	
2 Baseline Review of Plans and Data / Vulnerability Assessment					
2.1 Initial internal stakeholder engagement and review of precedent work/needs assessment	Deliverable 2: The consultant will provide a short document specifying: <ul style="list-style-type: none"> The assumptions, data sources, and metrics that will be used in the analysis. A plan for engagement and coordination with external stakeholders Resource needs identification (financial, human, technical assistance, training) This document will be developed in consultation with the City and approved by the City. 	17%	\$101,315	Months 1-3	
2.2 Vulnerability/Exposure/ Scenario/Approach Development for prioritizing adaptation needs and strategies for each community/neighborhood	Deliverable 3: The consultant will provide the City with the reviewed vulnerability data and key parameters identifying risks and assets, vulnerable populations, focusing on risks to precipitation, sea level rise, storm surge, and compound flooding. Initial adaptation strategies based on the technical and economic assessments will be presented. Potential strategies will be explored, including technical assumptions and results as well as the drafts for public-facing presentations of these strategies including any visuals that will be included in public presentations.			Months 4-9	
3 Adaptation Alternatives Analysis					
3.1 Scenario refinement and preliminary feasibility assessment	Deliverable 4: Memo with a refined assessment of each neighborhood's options for resilience approaches, coupled with their pros/cons, costs, benefits, and other considerations. Basic project scoping will have estimated design/construction costs and FEMA benefit cost analysis (BCA) 6.0 tool reports resulting from screening.	32%	189,250	Months 10-22	
4 Stakeholder Engagement and Internal Capacity Building					
4.1 Integrating feedback from community engagement	Deliverable 5: Minimum of 2 community meetings and up to 20 internal meetings. <ul style="list-style-type: none"> Stakeholder meeting documents such as the slides, notes, and attendee list. Plan for developing, increasing, or strengthening knowledge, skills and abilities of existing or new staff. This may include training of existing staff, hiring personnel, contracting with of expert consultants or advisors. 	18%	107,260	Months 10-34	
5 Project-Based Final Report					
5.1 Final Report integrating outcomes into existing plans and operations	Deliverable 6: The Consultant will provide a final report after approval and revision from the City. This report will be aimed at the general public and be in an accessible and visually appealing format. It will be a blueprint for Portsmouth's Resilience Vision, including an implementation plan and timelines for specific elements of completion such as training, certifications, plan development, and plan maintenance over time. A GIS database with all results and data will be provided.	25%	\$143,735	<i>Due at end of month 36</i>	
			Travel and Supplies	\$8,337	
			Total	\$586,610	Total 3 years

Proposed Project Summary

Portsmouth's Data-driven and Equity-Driven Resilience Strategy will identify specific projects to adapt critical assets and to keep vulnerable communities dry. We will first examine exposure to sea level rise, increased rainfall, and impacts from tidal and storm surge flooding, incorporating data underlying the current effective FEMA flood maps for the City. We will build upon previous studies, projects and lessons learned. This proposal lays out the framework by which we will compare and prioritize cost effective and equitable project-based approaches. This study will be completed by qualified and experienced resilience consultants with the support of City staff.

Prioritized projects will be based on criteria which will include social vulnerability and cost-effectiveness. Actionable projects will be matched with funding sources and responsibilities for implementation will be designated. The layered approach for stakeholder engagement to gather feedback and direction will support community buy-in. Findings will integrate input from stakeholder engagement workshops. Engagement will include coordination and alignment with other local and inter-jurisdictional projects, plans, and activities. This initial strategy will provide a foundation for long term planning to support an aligned, adaptive, and comprehensive roadmap to guide the City of Portsmouth. We will initiate a long-term funding strategy and an actionable adaptation plan to ensure that the protection will be enhanced and expanded continuously over decades.

The **Resilience Strategy** is based on an Adaptation Framework which:

- Identifies different types of projects to address flood risks across the City
- Incorporates nature-based infrastructure to the maximum extent possible.
- Includes considerations of all parts of a local government regardless of socioeconomics or race.
- Includes coordination with other local and inter-jurisdictional projects, plans, and activities and has a clearly articulated timeline or phasing for plan implementation
- Is based on the best available science and incorporates climate change, sea level rise, and storm surge (where appropriate), and current flood maps

The 5 tasks are summarized below and then in more detail in later sections.

Task Overview

Task 1 – Project Management

- The project management task ensures that the project is delivered in a quality manner by a project manager. This task includes the steps required to initiate, plan, execute and control the project scope, schedule, and budget to deliver the project. This includes organizing a Project Kick-Off Meeting and Check-in meetings to be scheduled at an appropriate frequency.

Task 2 – Baseline Review of Plans and Data / Vulnerability Assessment

- Review and confirm vulnerability data and key parameters and conduct resource needs identification
- Determine the most appropriate climate scenarios to use, considering best available science and alignment with regional and state projections.
- Identify risks and assets, vulnerable populations, focusing on precipitation, sea level rise, storm surge, and compound flooding.

Task 3 – Adaptation Alternatives Analysis

- Tailored resilience approaches will be developed based on the results of a technical and economic assessment of each neighborhood’s options. The resilience approaches will be coupled with their pros/cons, costs, benefits, and other considerations. Cost effectiveness screening will utilize the FEMA BCA 6.0 Tool.
- In tandem with the innovative natural and engineered solutions assessed, we will work to incorporate the aesthetic, performance, and design parameters that are cost-effective and acceptable to the City’s residents, elected officials, and staff.

Task 4 – Stakeholder Engagement and Internal Capacity Building

- Stakeholder engagement will have a layered approach to gather feedback and direction
- The City of Portsmouth will conduct outreach to coordinate participation which will focus to include historically underrepresented communities
- We will develop drawings for each of the approaches and how they could look in various areas

Task 5 – Project-Based Final Report

- Final Resilience Strategy Report’s approaches will focus on flood control, flood proofing, blue-green infrastructure, drainage improvements, and restoration.

Proposal Overview

- This **Capacity Building and Planning** study is a **new** study.
- This study directly addresses Portsmouth’s needs for flood prevention and protection, equity, community improvement, identification of nature-based solutions or other key priorities.
- The qualifications of the individuals or organizations charged with conducting the study are defined as planners, engineers, and scientists who **specialize in resilience and adaptation** work. This project will utilize competitively solicited work by **qualified and experienced consultants**.
- The expected use of the study results in the context of the components of local resilience plans including the Build One Portsmouth Comprehensive Plan, the Hampton Roads Planning District Commission’s (HRPDC) Regional Hazard Mitigation Plan, and other plans outlined in Appendix A.
- This study may improve Virginia’s flood protection and prevention abilities in a statewide context by serving as a pilot study. Documentation of lessons-learned and feasibility of adaptation approaches may be applied to other jurisdictions in the State.

Building upon Previous Efforts

Resilience within Portsmouth looks different from community to community. Due to the nature of the way Portsmouth’s communities were built, homes in different neighborhoods are vulnerable to flooding for different reasons. Is it because they don’t have curbs or updated drainage or because the seawall is too low? Resources also differ one block to the next, and all needs must be addressed realistically. Portsmouth needs to have plans to address flooding in every part of the community, and when the needs are different, each strategy will be different.

This proposal goes through the elements needed for Portsmouth to have a comprehensive resilience strategy. The standalone adopted plan will be based on be components from a range of different plans that have been adopted. We will outline how goals and objectives from each of these components and how they will be aggregated. The

goal is to empower the community with something explicit and specific and tie the pieces together cohesively and proactively (Figure 1).

The *Build One Portsmouth Comprehensive Plan* was adopted by the Portsmouth City Council on November 27, 2018. The plan represents the strategic direction the City plans to take and articulates a vision of the City based on the expressed values and aspirations of Portsmouth’s citizens.

Figure 2 is a word cloud, where the larger words appeared more often in the plan’s resilience goals and strategies, as well as from the interview answers. One crucial resilience strategy led Portsmouth to establish an Officer of Resiliency to coordinate sustainability and resiliency efforts across City departments and agencies. Another strategy in the plan is to **“Examine all critical assets (hospitals, fire stations, police stations, transportation corridors, etc.) that have high exposure to hazard situations and develop resiliency solutions for these facilities.”**

Through the engagement process, it was clear that the Portsmouth community strives to attract and retain a healthy, diverse, and growing population with reduced social, economic, and ecological barriers by promoting education and workforce training opportunities, improving access to healthcare, addressing environmental justice issues, and supporting planned mixed-use development in previously underserved areas. These concerns and goals are to be revisited and refined through on-going stakeholder engagement and developed into supportive goals to be achieved under project prioritization and implementation.



Figure 1: Aligning Portsmouth’s Resilience Strategy to be driven by previous plans and projects

1. **Historic Identity/Urban Fabric** – The unique social strengths and needs among communities stem from long tenured residents with intergeneration shipyard employment, as well as a significant history of faith-based communities.
2. **Significant Low-Income Populations** – About 18% of residents live below the poverty line¹ and many of the City’s youth are dependent on public assistance. These conditions appear to directly impact engagement in schools and health.
3. **Aging Housing Stock** - The current housing stock is not as marketable to families with school-aged children due to age and type. Modernization and diversification of Portsmouth’s housing and overall net retention of families in Portsmouth could help improve the education system. The opposition to mixed-use districts presents a strong barrier.
4. **Congestion and Barriers** - Tolls currently act as a barrier to residents and visitors and the overall dependence on cars creates congested traffic patterns and time delays.
5. **Outdated Infrastructure** - Aging infrastructure is currently being improved, but there is still work to be done. Many of the infrastructure upgrades are being done to prevent recurrent flood issues.
6. **Contained City Boundaries** - Approximately 42% of Portsmouth is tax exempt and there is little opportunity to expand outwards. Taking advantage of vacant and underutilized land is essential for the local government’s future.
7. **Port and Naval Presence** - The City’s port and naval presence creates unique environmental and health problems related to hazardous materials and emissions.

The plan compiles an extensive list of implementation tools and resources to help the City understand potential short and long-term opportunities which would address these challenges. However, as Portsmouth begins to move into its next phase of resilient planning, it is pertinent to begin understanding potential pitfalls and limitations to future implementation and how to begin preparing for these issues.

Portsmouth’s Resiliency Program

Building on the foundation created by the Build One Portsmouth Comprehensive plan, the City retained a consultant to help develop and implement a City-wide resilience program, identifying the current state, ideal future state, and steps towards implementation (Figure 3). Portsmouth’s Resilience Roadmap has begun with mapping out the City’s current state, desired state, and how to bridge the gaps between them. Resilience is not a new concept to the City, as time and again Portsmouth has proven its ability to address the risks its faces and rebound from shocks and stresses. The future will present the City with increasing risks from changing climatic conditions, including rising sea levels, and stronger hurricanes and coastal storms. Meeting these challenges will require innovative and integrated solutions to manage risk, fund improvements, balance competing demands, and maintain or improve service to the public and stakeholders – which include the socially vulnerable.

¹ https://pilotonline.com/news/government/local/article_0461606c-797e-11e8-a8f0-8b7684639951.html

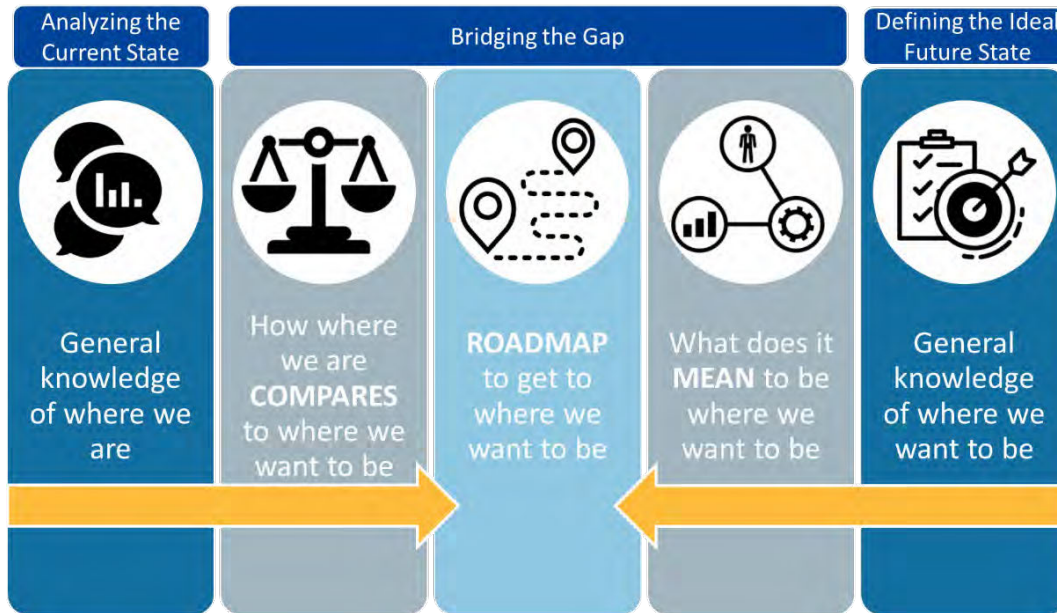


Figure 3: Overview of the three phases of Portsmouth’s resilience initiative

Portsmouth’s approach to building resilience is multifaceted. Each step is building a solid foundation for a more resilient future in line with the City’s long-term resilience vision. At the culmination of the program, Portsmouth aims to integrate resilience into their day-to-day decision-making process, setting the stage for a sustainable and resilient future. However, this visioning process has been conceptual in nature, and the proposed strategy is needed to transform the context into projects and practices to adopt.

The more specific aspects of the current program include comprehensive stormwater modeling and pursuit of funding. The modelling will improve the City’s understanding of localized flood risks. Five FEMA grants have been successfully pursued including one project awarded over \$7 million in federal funding to construct a new stormwater pump station in the City’s Olde Towne Historic District. Additionally, the City leveraged the requirement to comply with the America’s Water Infrastructure Act of 2018 to improve its water utility resilience, and informally applied the methodology to broader operational considerations which resulted in an update of the City’s Shelter Plan to explicitly address pandemics. Appendix B lists more details on these concurrent projects, which the proposed strategy is designed to align with.

The Resiliency Roadmap visioning process identified the following guidelines and principles, which will be integrated into the proposed strategy:

- **Data Gathering and Assessments** - It is through data that we define where Portsmouth is now, and it is through data that we define the issues and obstacles currently or potentially blocking achievement of the City’s future. We will help the City to innovatively identify, collect, and manage data to drive achievement of the City’s goals and unique definition of resilience.
- **Integrating and Building on Existing Work** – Acknowledging and incorporating the work already underway and completed is critical to a holistic resilience strategy. While a steering committee is important to

maintain priorities and accountability, implementation will require a role from everyone building on existing and future aligned efforts.

- **Planning for Flexible Adaptation Over Time** – Change will occur at a wide variety of scales from city-level to neighborhood specific. Resilience initiatives may deliver rapid changes while some may take years to be realized. Prioritizing strategies for the short, medium, and long-term will be imperative to implement no regret projects now while planning and funding projects requiring more analysis and development.
- **Ensuring the Consideration of Fairness and Equity** – The work we do has both direct and indirect impacts on a diverse array of stakeholders. Some of the most marginalized of these groups are often those most vulnerable to the impacts of shocks and stresses and lack the means or clout to have their needs and perspectives heard. Ensuring and facilitating this inclusion in pursuit of common understandings at each step is critical to future resilience planning.
- **Focusing on Community-Driven and Connected Solutions** – Identified objectives and initiatives will be developed with, not for, the community. Connecting and aligning people, places, and regional geographic position will create benefits across multiple systems. The community will be integrated in developing solutions for the places they live, work, and play.
- **Coordinating and Aligning with External Efforts** – Regional, State, and Federal entities all have heavy investment in the sustainability and future resilience of the City of Portsmouth. Ensuring the coordination and involvement of these entities is critical to the successful development of a resilience plan. Key partnerships provide a key opportunity to understand current and future risks and how present efforts could provide mutual resilient dividends to the City and the Port Authority.
- **Identifying Multi-Functional Resilience Solutions** – Historically, resilience projects were implemented based on a particular and discrete benefit. How far we have come! Portsmouth’s resilience process will ensure projects are targeted appropriately to provide a multitude of co-benefits that interact with one another including socio-economic, environmental, equitable and health benefits.

Rationale for 10% Match

The entire City of Portsmouth qualifies for the 10% match if compared against region or state. Portsmouth’s poverty rate, at 18.2%, is significantly higher than the State’s rate of 10.6%.² The proposed study will utilize data from the Virginia Flood Risk Information System (VFRIS) and ADAPT VA’s Virginia Vulnerability Viewer.

The components of the proposed strategy are designed to safeguard community-wide, inserting mechanisms for equity to be realized through the protection measures. There are pockets of the City that have very mixed income levels. The City has identified vulnerable populations based on age, lack of accessibility to health care and food, flood risk, and lack of access to transportation. Many City youth depend on public assistance.

These socially and economically vulnerable residents are disproportionately affected by flood hazard events. These factors make it essential that this and future hazard mitigation strategies consider socioeconomic and equity concerns. These marginalized groups have traditionally lacked the economic and political influence to have

² <https://www.vdh.virginia.gov/data/social-determinants-of-health/poverty/>

their needs and perspectives heard, and more importantly addressed. Ensuring and facilitating their inclusion in pursuit of common understandings is critical to future resilience planning.

Scope of Work Narrative

The process will kick off with developing a method to ensure that the outcomes include the appropriate resource assessments, planning, strategies, policy management, and development guidelines. Criteria and benchmarks will be set to direct goal planning, implementation, evaluation, and a long-term maintenance strategy. The following sections provide more details on each task.

1 Project Management

The project management task ensures that the new resilience strategy is delivered in a quality manner by a project manager. This task includes the steps required to initiate, plan, execute and control the project scope, schedule, and budget to deliver the project. This includes organizing a Project Kick-Off Meeting and Check-in meetings to be scheduled at an appropriate frequency.

2 Baseline Review of Plans and Data / Vulnerability Assessment

2.1 Initial internal stakeholder engagement and review of precedent work/needs assessment

This will be a technical, internally focused phase of work which is intended to build upon existing work already completed by the City/region. Academic partners and local experts may also be consulted during this phase. Much of this effort will be during the check-in meetings.

2.2 Vulnerability/Exposure/ Scenario/Approach Development for prioritizing adaptation needs and strategies for each community/neighborhood

Areas of concern for future flood impacts can be categorized into residential neighborhoods, government buildings, critical infrastructure, and business districts. Portsmouth's biggest concerns during a flood event relate to maintaining infrastructure and levels of service, keeping residents in temporary and transitional housing safe, temporary shelters that may not address long term displacement, and having high water vehicles for emergency response. For the neighborhoods of concern (outside of downtown) the priority is for people to have food, water, safety.

Figure 4 identifies 8 sources of flooding that Portsmouth will focus on, assessing how changes in sea level, tides, rainfall and storm surge may increase future extreme events.

At the kickoff meeting, we will consider SLR scenarios and future rainfall projections after consideration of alignment with regional/state efforts and latest science on SLR and precipitation intensity increases. Two SLR scenarios and two future rainfall projections will be selected at a later check-in meeting.

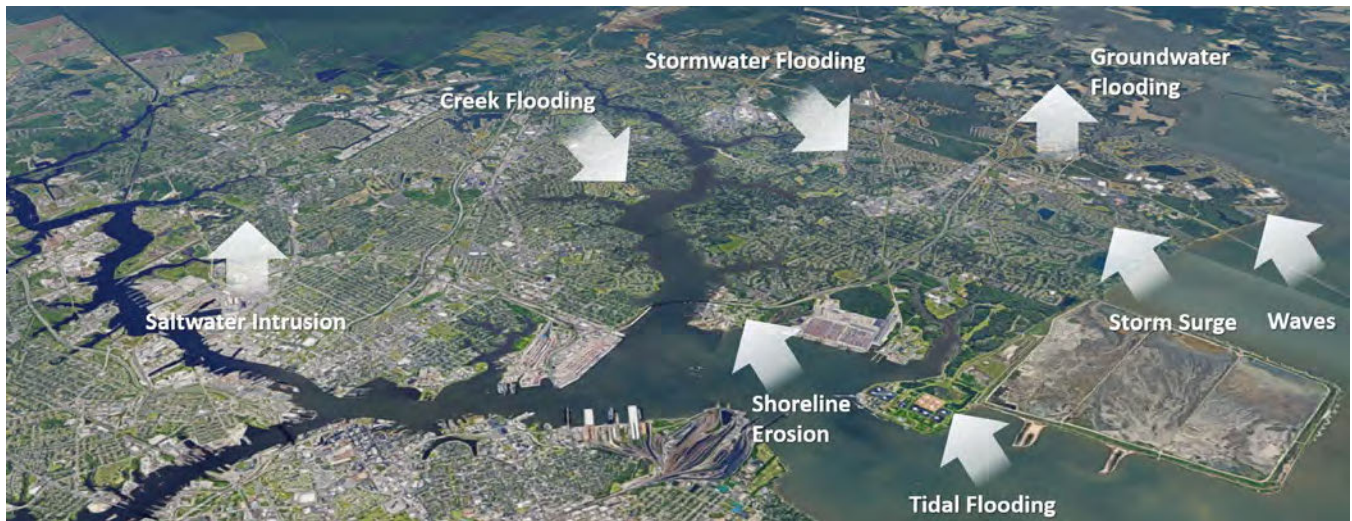


Figure 4: Portsmouth's flood-related risks to be assessed

Example approach categories include:

1. Measures to Improve Drainage & Manage Water
2. Measures to Reduce Damage from Flooding
3. Measures to Reduce Waves & Erosion
4. Measures to Raise the Land

** All categories will consider nature-based solutions such as blue/green/gray infrastructure

Methodology for Vulnerability Assessment

The following Vulnerability Assessment components are summarized in a conceptual way. Working with the data available, the consultant will work to get spatially explicit results, but will rely on indices, relative risk and qualitative indicators for components such as capacity.

- **Exposure**
 - Map out assets. How would each asset be impacted by storm surge, precipitation, tidal, and compound flooding?
- **Sensitivity**
 - Identify asset/threat pairs. What are the key areas of concern?
- **Adaptive Capacity**
 - How likely can each asset adapt (assets are listed below)?
 - What are the resources within each community which help to reduce impacts?
- **Vulnerability Assessment**
 - Assign degrees of vulnerability for each asset based on exposure, sensitivity, potential impacts, and adaptive capacity
- **Probability**
 - Assign degrees of vulnerability for each asset (will likely be a scale such as high/medium/low)
- **Consequences**
 - What are the quantitative and qualitative impacts to an asset from a hazard?
- **Risk Assessment**
 - Combination of probability of hazard and its consequences
- **Resilience Assessment**
 - Cross-map vulnerability and risk at building and neighborhood level
 - Strongest overlaps are places that most need attention to resilience

Proposed Asset Inventory:

Portsmouth has highlighted the following assets as priorities:

- **Public housing**
- **Non-residential buildings (e.g., commercial and industrial)**
- **Neighborhoods/residential buildings**
- **City facilities**
 - Schools
 - Emergency services/shelters
- **Military facilities**
- **Port facilities**
- **Health care facilities**
- **Infrastructure**
 - Roads
 - Stormwater system
 - Utilities (power, water, wastewater, and cable/internet)
- **Ecosystems**
 - Tidal wetlands
 - Canopy coverage threatened by saltwater intrusion and SLR

Proposed Consequences to Assess:

- Value of damaged structures
- Loss of property tax revenue if buildings destroyed/unusable
- Loss of sales tax if buildings destroyed/unusable
- Increase in commuting times/loss of productivity due to flooding
- Inability to access health care facilities
- Value of damaged/destroyed City facilities
- Problems with getting to schools due to flooded roads, sidewalks
- Impact of real estate values
- Breakdown exposure based on demographic data: sex, income, race, age, location

The consultant will use available information (e.g., expected flooding for current conditions for various flood frequencies and/or projected future flooding based on previously completed studies that account for climate change) and data developed during this process to assess changes quantitatively or qualitatively in frequency and magnitude to inform the analysis; the project approach will be customized to make the best use of the available data.

The consultant will deliver three adaptation scenarios, including a no action scenario. These adaptation scenarios will be spatially explicit, detailing which adaptation measures are feasible for different portions of the City. These adaptation measures may include, but should not be limited to, new flood protection infrastructure, enhancing the existing drainage network, hardening key infrastructure, enhancing natural buffers, flood-proofing existing assets, or changing land use patterns. These scenarios will be based on a review of the technical feasibility of different adaptation measures, a rigorous economic assessment of their potential costs and benefits, their impacts on the natural and urban environment, and stakeholder input.

3 Adaptation Alternatives Analysis

To refine the conceptual scenarios and approaches into specific projects in specific neighborhoods, this task entails a preliminary feasibility assessment of each neighborhood's options for resilience approaches, coupled with their pros/cons, costs, benefits, and other considerations. The analysis would compare the potential costs of alternative solutions and the underlying economic value preserved or enhanced by the adaptation measures. Spatially explicit adaptation scenarios will be assessed to determine their technical feasibility, protective value, costs, and flexibility to respond to changes in future conditions. These scenarios will include a range of protection and accommodation strategies and include both structural and non-structural solutions.

It is necessary to consider the economic feasibility and implications of investment in different adaptation measures in the initial planning phase. This assessment will consider the relative return-on-investment of alternative adaptation approaches and explicitly consider the costs to protect different portions of the County from climate risks. The purpose of this analysis is to estimate the economic or financial feasibility of alternative protection strategies. These would be initial, order-of-magnitude estimates. These would be inclusive of costs that would be borne by the private and public sectors. The FEMA BCA 6.0 tool will be used to screen up to 10 projects for cost effectiveness.

The exact metrics used to complete this assessment would be developed by the consultant in consultation with the City. These could include, for example, the cumulative costs of adaptation, the replacement costs of lost infrastructure (roadway, sewer, water, electric, and critical public facilities such as police and fire stations), the

loss of fiscal generating revenue, and lost economic activity. The costs could include the estimated cost of implementation of a strategy, the opportunity cost of lost net fiscal resources, real estate value, infrastructure, jobs, wages, and economic output associated with each scenario. The benefits could include improved safety, an aggregate estimate of real estate value, infrastructure value, net fiscal revenue, jobs, wages, and economic output protected, or increases in property values attributable to adaptation investments. The consultant will work with the County to develop these high-level scenarios and estimates, including basic project scoping for at least 10 projects will be included with estimated design and construction costs.

The consultant will work with the City and key stakeholders including academic partners to present a summary of this information in a way that can be easily understood by the general public. This information will be presented during the stakeholder engagement process.

4 Stakeholder Engagement and Internal Capacity Building

This task entails stakeholder identification, outreach and education strategies. The consultant will work with the City and key stakeholders including academic partners to refine the adaptation scenarios based on the technical and economic assessments. The consultant will develop three or four potential scenarios, which will be presented in a way that they can readily be understood by the general public. They will be presented in a way designed to illicit feedback and educate the community about trade-offs and benefits associated with different approaches. To ensure equitable participation, digital and non-digital strategies as well as various outreach will be explored. Portsmouth will provide staffing support and attend all meetings. The City will coordinate, select attendees, provide announcements/advertisements/postings of materials for all meetings. All meetings may be virtual, in-person, or both.

The purpose of the engagement will be to educate the community about the trade-offs and benefits of different adaptation approaches as well as to listen to residents' priorities and concerns. To ensure ample opportunity for dialogue it is likely that at least a portion of the engagements will be structured as an open house or hands on workshop. A minimum of two public engagement events will be held. The final engagement event will present the findings of the project.

Internally, the team will develop an implementation plan with timelines for specific elements of completion such as training, certifications, and plan development. The project team will assign parties responsible for capacity building and/or plan development process. The implementation plan will include an outline for developing, increasing, or strengthening knowledge, skills and abilities of existing or new staff. This may include training of existing staff, hiring personnel, contracting with of expert consultants or advisors.

5 Project-Based Final Report

The Final Report will be aimed at the general public, in an accessible and visually appealing format, summarizing the refined adaptation scenarios as well as providing a recommendation on preferred approaches. It will be a blueprint for Portsmouth's Resilience Vision, including an implementation plan and timelines for specific elements of completion such as training, certifications, plan development, and plan maintenance over time. This report will outline how to integrate the outcomes into existing plans and operations. It will define performance outputs and measures and how the expected results, benefits, and success will be measured. It will include plans for maintaining capacity, as necessary, over the long term. A draft of the final report will be provided to the City for review and comment before being finalized.

Appendices and Attachments

Appendix A: Portsmouth's Plans and Reports

The following is a selection of plans and reports that are key foundations for Portsmouth's Resilience effort

Document Name	Date	Goal of Document
Risk and Resilience Assessment and Emergency Response Plan	March 2020	<p>The report meets the AWIA requirements of an all-hazards assessment of DPU's physical and cyber assets and the assessment focused on assets that DPU deemed critical to delivering their operational and business missions. Using the J100 process risk mitigation measures were identified that could be implemented to reduce the risk for the threats identified.</p> <p>The analysis results inform the Capital Improvement Plan (CIP) and the Emergency Response Plans (ERP). The mitigation initiatives typically fall within these two categories of plans; the first category requires capital investment (e.g., to implement a distributed water banking system), and the latter requires coordinated planning with relevant stakeholders (e.g., to ensure steps to manually operate the control systems are documented and available to necessary personnel). DPU's next step is to evaluate business cases for mitigation initiatives proposed to support the CIP and ERP efforts.</p>
Community Shelter Plan with Pandemic Considerations	November 2020	<p>The plan provides results of a capability assessment of Portsmouth's current community shelter plans and procedures. The results and recommendations for improvement include results, high-level planning and operations tasks for implementation by the City, and findings from six shelter site visits. The identified recommended tasks are conceived for performance in the short term to enhance preparedness and readiness ahead of 2021 Hurricane season in addition to other events that could necessitate the City activating shelter plans.</p>
Resilience Gap Analysis	August 2019	<p>This analysis identifies the gaps between the anticipated performance and the desired performance of Portsmouth's data, capabilities, capacities, engagement processes, and collaboration skillsets. This will enable the City to begin to prioritize actions and establish qualitative and quantitative indicators for measuring and monitoring progress towards your resilience goals.</p>
Portsmouth Poverty Study	7/8/2019	<p>Presents the results of a study on poverty in Portsmouth which aims to put forth implementable recommendations on several high-profile, high-impact issues that will require involvement from a variety of Portsmouth stakeholders. A top priority identified during the retreat was to create a City Council Taskforce on Poverty. Contains an overview of Portsmouth's current poverty prevention, alleviation, and research efforts; reviews of other city's efforts to address poverty; provides findings from public input regarding the causes and correlations of poverty; offers recommendations for the Portsmouth City Council; and highlights priority census tracts within Portsmouth experiencing high rates of poverty.</p>

Build One Portsmouth, Portsmouth 2018 Comprehensive Plan	11/27/2018	Updates the city's planning efforts and sets a strategic direction to be more resilient in all facets of the city's operations (Thriving, Evolving, Resilient, Equitable)
The New Normal of Flooding in Portsmouth, VA	10/22/2018	Describes a Resilience Adaptation Feasibility Tool (RAFT) - that addresses the daunting challenges coastal communities are facing related to sea level rise and climate change. This aim of this project was to investigate how residents and business owners in low-to-moderate income communities in Portsmouth, Virginia cope with flooding, and to assess implications for how the local government can better engage with residents to better meet their information needs so they can be more resilient to flooding.
FY 2019 Proposed Operating and Capital Improvement Program (CIP) Budgets	3/26/2018	The proposed General Fund Budget totals \$241,726,136, a \$2.7 million or 1% increase over the FY 2018 Budget. The overall proposed budget totals \$720,102,069.
Real Estate Market and Feasibility Analysis	5/17/2017	The study reviewed key real estate uses in the downtown market to help the City understand prospects for growth.
Hampton Roads 2040 Long-Range Transportation Plan	6/1/2016	Summarizes the fiscal-constraint process, identifying transportation revenues that will reasonably be available to help preserve the transportation system and support additional investments over the next 20 years in order to keep people and goods moving as efficiently as possible
Adaptation Response to Recurrent Flooding, Portsmouth Comprehensive Planning Support Report 1	10/15/2015	Generate knowledge regarding the perceptions and the experiences of citizens relating to recurrent flooding
2015 Floodplain Management and Repetitive Loss Plan Update	8/1/2015	Floodplain management to produce a program of activities that will reduce the community's vulnerability to the flooding and meet other community needs (uses CRS 10 steps)

Portsmouth Demographic Study	6/1/2015	This report describes recent demographic changes in the City of Portsmouth, Virginia
City of Portsmouth Zoning Ordinance	12/9/2014	This Ordinance is intended to ensure that all development within the city's jurisdiction is consistent with the goals, objectives, policies, strategies, and actions of the Destination 2025 Comprehensive Plan and any other adopted plans addressing the city's growth and development.
Downtown Design Manual - City of Portsmouth	8/27/2009	Developments for new Design Guidelines/Standards and Procedures to facilitate reinvestment in properties within the Downtown districts while maintaining overall historic integrity and design quality
Destination 2025, City of Portsmouth Comprehensive Plan	2/1/2005	The plan articulates a vision of the City in the year 2025 based on the expressed values and aspirations of Portsmouth's citizens. It provides the means to realize the Vision through clear and consistent goals and policies and through specific action strategies that the City will take over time to achieve the desired future.

Appendix B: Portsmouth's Concurrent Resilience Efforts

The following provides a list of concurrent projects Arcadis is assisting the City which also broadly inform our understanding of the City while improving the City's resilience:

- City-wide stormwater H&H modeling
 1. JLUS Study
 2. Citywide Stage 1
 3. Citywide Stage 2
- Stormwater Regulatory/Compliance projects:
 1. Audit Response
 2. IHRF
 3. Public BMP Inspections
 4. Private BMP Inspections
 5. SWPPP Program
 6. Floatables
 7. TMDL Action Plan
 8. MS4 Reporting Database
 9. Nutrient Bank Feasibility Study
 10. MS4 Permit Reapplication
 11. MS4 Annual Report
 12. Stormwater Site Plan Reviews
- Stormwater / Drainage Improvement Projects
 1. Churchland ES
 2. Templar Drive
 3. Pine Road
 4. Portsmouth Blvd
 5. Dogwood Trail
 6. Glasgow
 7. City Park
 8. Lake Jean Analysis
- Operational Services
 1. Community Shelter Plan with Pandemic Considerations
- Utility Projects
 1. Department of Public Utility's Risk and Resilience Assessment & Emergency Response Plan (AWIA 2018): Improved City's Utility Posture towards Resiliency and Achieve Compliance with AWIA 2018, prioritized projects identified for implementation
 2. Colorado Ave
 3. Kirby St
 4. Utilities Site Plan Review
- FEMA/VDEM Grant Application & Projects
 1. *Portsmouth Hazard Mitigation Plan Addendum (FEMA FY 2018)*
 - a) *Summarized Scope: Develop an enhanced planning and implementation strategy for Portsmouth building on the 2017 Hampton Roads Hazard Mitigation Plan (2017 HRHMP). Implement two mitigation actions in the 2017 HRHMP.*
 - b) *Federal Funding Awarded: \$24,975*

- c) *Status: Initial Draft of Addendum reviewed and commented by City ahead of advancement of community stakeholder engagement steps in concert with 2022 HRHMP update. Pending 2022 HRHMP update stakeholder engagement*
- 2. *Infrastructure Improvements and Mitigation Strategies to Guide Advance Assistance Hazard Mitigation Grant Application Development (FEMA FY 2018)*
 - a) *Summarized Scope: Develop hazard mitigation strategies for critical facilities which are aligned with the City's resilience goals. Prioritization and selection of a project to develop and submit for funding under a grant program.*
 - b) *Federal Funding Awarded: \$137,812.50*
 - c) *Status: Mitigation Strategy Memorandum framework developed for advancement in concert with other resiliency tasks. Draft Strategy anticipated ready for review by City July 2021*
- 3. *Severe Repetitive Loss/NFIP Housing and Benefit Cost Analysis Toolkit*
 - a) *Summarized Scope: Assistance to help Portsmouth homeowners understand their properties' risk from flooding, learn about potential mitigation strategies that could be taken to reduce risk, and provide tools for choosing and implementing those strategies*
 - b) *Federal Funding Awarded: \$150,000*
 - c) *Status: City recently executed agreement with Virginia Department of Emergency Management (VDEM)*
- 4. *Olde Towne Stormwater Pump Station*
 - d) *Summarized Scope: Implementation of stormwater pump station in Olde Towne.*
 - e) *Federal Funding Awarded: \$7,485,000*
 - a) *Status: Agreement from FEMA/VDEM received by City*
- 5. *IC Norcom Generator Project*
 - f) *Summarized Scope: Implementation of stormwater pump station in Olde Towne.*
 - g) *State Funding Awarded: \$450,000*
 - b) *Status: Approval Letter Responded to initiate release of funds*
- 6. *City of Portsmouth Public Safety Complex Redevelopment*
 - a) *Summarized Scope: Implementation of Public Safety Complex project to consolidate several city emergency response services into a new single complex*
 - b) *Status: Under FEMA review process*
- 7. *Emergency Services Communication Improvements*
 - a) *Summarized Scope: Procurement of an updated reliable and interoperable land mobile radio communication system to be used by City's public safety personnel*
 - b) *Status: Under FEMA review process*
- 8. *Arcadis Pro Bono First Floor Elevation (FFE) Project / Additional FFE information under FEMA funding*
 - a) *Summarized Scope: Determine an accurate and low-cost remote sensing technique for measuring FFE and to develop a pilot FFE inventory for the City of Portsmouth*
 - b) *Status: Contract under City legal review / Under FEMA review*
 - c) *This project was also awarded an additional \$300,000 under FEMA's PDM program in 2020.*

Appendix C: Other Supporting Documents

1. Link/copy of current floodplain ordinance
2. Detailed maps of the project area(s)
3. FIRMS/FIRMette of the project area(s)
4. HRPDC HMP Update excerpt
5. Historic flood damage data and/or images
6. Repetitive loss properties and other maps

Chapter 14.1 - FLOOD PROTECTION

Sec. 14.1-1. - Purpose and statutory authorization.

- (a) *Statutory authorization [44 CFR 59.22(a)(2)].* This chapter is adopted pursuant to the statutory authority granted to localities by Code of Virginia § 10.1-600, et seq.
- (b) *Findings of fact.* The flood hazard areas of Portsmouth are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all which adversely affect the public health, safety, and general welfare. These flood losses are caused by the cumulative effect of obstructions in floodplains causing increases in flood heights and velocities, and by the occupancy in flood hazard areas by uses vulnerable to floods or hazardous to other lands which are inadequately elevated, flood-proofed, or otherwise protected from flood damages.

Trends in tide data over the last 100 years suggest that Portsmouth is facing an increased danger of flooding caused by both sea level rise and subsidence. The data also suggest that Portsmouth may experience a rise in base flood elevations greater than four feet in the next 100 years.

- (c) *Statement of purpose.* The purpose of these provisions is to reduce the loss of life and property; to reduce the creation of health and safety hazards; to reduce the disruption of commerce and governmental services; to reduce the extraordinary and unnecessary expenditure of public funds for flood protection and relief; and to reduce the impairment of the tax base by:
 - (1) Regulating uses, activities and development which, alone or in combination with other existing or future uses, activities and development, will cause damaging increases in erosion or in flood heights, velocities, and frequencies.
 - (2) Restricting or prohibiting certain uses, activities and development from locating within districts subject to flooding.
 - (3) Requiring all those uses, activities and developments that do occur in flood-prone districts to be protected and/or flood-proofed against flooding and flood damage.
 - (4) Protecting individuals from buying land and structures which are unsuited for intended purposes because of flood hazards.
 - (5) Controlling the alteration of natural floodplains, stream channels, and natural protective barriers which are involved in the accommodation of flood waters.
 - (6) Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards to other lands.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-2. - Applicability.

The provisions of this chapter shall apply to all privately and publicly owned lands within the jurisdiction of the City of Portsmouth and (a) identified as areas of special flood hazard according to the flood insurance rate map (FIRM) that is provided to the City of Portsmouth by the Federal Emergency Management Agency (FEMA) and dated August 3, 2015 or any subsequent revisions or amendments thereto or (b) otherwise deemed special flood hazard areas pursuant to the provisions of this chapter.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-3. - Compliance and liability.

- (a) No land shall hereafter be developed and no structure shall be located, relocated, constructed, reconstructed, enlarged or structurally altered except in full compliance with the terms and provisions of this chapter and any other applicable ordinances and regulations which apply to uses within the jurisdiction of this chapter.
- (b) The degree of flood protection sought by the provisions of this chapter is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study, but does not imply total flood protection. Larger floods may occur on rare occasions. Flood heights may be increased by manmade or natural causes, such as excessive rainfall, ice jams, and bridge openings restricted by debris. This chapter does not imply that districts outside the floodplain district or that land use within such district will be free from flooding or flood damages.
- (c) The provisions of this chapter shall not impose liability on the City of Portsmouth or any officer or employee thereof for any flood damages that result from reliance on this chapter or any administrative decision made hereunder.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-4. - Penalties.

- (a) Any person who fails to comply with any of the requirements or provisions of this chapter or any order of the floodplain administrator or his designee, or any authorized employee shall be guilty of the appropriate violation and subject to the penalties therefore. Any person who fails to comply with any of the requirements or provisions of this chapter or any order of the floodplain administrator or his designee or any other authorized employee shall be guilty of a class 1 misdemeanor.
- (b) In addition to the above penalties, all other actions are hereby reserved, including an action seeking equitable relief for the proper enforcement of this chapter by the floodplain administrator or his designee or other authorized employee. The imposition of a fine or penalty for any violation of, or noncompliance with, the provisions of this chapter shall not excuse the violation or noncompliance so as to permit it to continue, and all violations shall be corrected or remedied within a reasonable time. Any structure constructed, reconstructed, enlarged, altered, or relocated in noncompliance of this chapter may be declared by the City of Portsmouth to be a public nuisance and abatable as such. Flood insurance and/or certificates of occupancy may be withheld from structures constructed in violation of this chapter.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-5. - Specific definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Addition (to an existing building) means any walled and roofed expansion to the perimeter of a building in which the addition is connected by a common load-bearing wall other than a fire wall. Any walled and roofed addition which is connected by a fire wall or is separated by independent perimeter load-bearing walls is new construction.

Appurtenant or accessory structure means an accessory structure not to exceed 200 square feet.

Base flood means a flood having a one percent chance of being equaled or exceeded in any given year.

Base flood elevation (BFE) means one percent annual chance water surface elevation designated by the Federal Emergency Management Agency. The water surface elevation of the base flood in relation to the datum specified on the community's flood insurance rate map. For the purposes of this ordinance, the base flood is the one percent annual chance flood.

Basement means any area of the building having its floor sub-grade (below ground level) on all sides.

Board means the board of zoning appeals.

Breakaway wall means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral-loading forces without causing damage to the elevated portion of the building or supporting foundation system.

Coastal high-hazard area means an area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high-velocity wave action from storms or seismic sources.

Design flood elevation (DFE) means the higher of:

- (1) The base flood elevation at the depth of peak elevation (including wave height) which has a one percent or greater chance of being equaled in any given year plus 3.0 feet; or
- (2) The elevation of the base flood associated with the area designated on a flood hazard map adopted by the community, or otherwise legally designated plus 3.0 feet.

Development means any manmade change to improved or unimproved real estate, including, but not limited to, buildings or other structures, the placement of manufactured homes, streets, mining, dredging filling, grading, paving, excavation or drilling operations or storage of equipment or materials, or the subdivision of land. For purposes of this chapter the date of development is considered the date of land disturbance or the date of issuance of a land disturbance permit, whichever is earlier.

Elevated building/structure means a non-basement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns.

Encroachment means the advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or development into a floodplain, which may impede or alter the flow capacity of a floodplain.

Existing construction means structures for which the start of construction commenced before the effective date of the most recent FIRM (August 3, 2015). "Existing construction" may also be referred to as "existing structures."

Flood or flooding means:

- (1) A general and temporary condition of partial or complete inundation of normally dry land areas from:
 - a. The overflow of inland or tidal waters;
 - b. The unusual and rapid accumulation or runoff of surface waters from any source; or
 - c. Mudflows which are proximately caused by flooding as defined in paragraph b. of this section and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.
- (2) The collapse or subsidence of land along the shore of a lake or other body of water as a result or erosion or undermining caused by waves or currents of water exceeding anticipated

cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as a flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in subsection (1) of this section.

Flood insurance rate map (FIRM) means an official map of the city on which FEMA has delineated both the special flood hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a digital flood insurance rate map (DFIRM).

Flood insurance study (FIS) means a report by FEMA that examines, evaluates, and determines flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation, and determination of mudflow and flood-related erosion hazards.

Floodplain means any land area susceptible to being inundated by water from any source and subject to special restrictions as defined in section 14.1-10 and 14.1-11.

Floodprone area means any land area susceptible to being inundated by water from any source.

Floodproofing means any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water, and sanitary facilities, structures, and their contents.

Floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Freeboard means a factor of safety usually expressed in feet above the base flood elevation for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization in the watershed.

Highest adjacent grade (HAG) means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Historic structure means any structure that is:

- (1) Listed individually in the National Register of Historic Places (a listing maintained by the Department of the Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- (2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district; or
- (3) Individually listed by the commonwealth in an inventory of historic places.

Hydrologic and hydraulic engineering analysis means analysis performed by a professional engineer licensed by the Commonwealth of Virginia, in accordance with standard engineering practices that are accepted by the Virginia Department of Conservation and Recreation and FEMA, used to determine the base flood, other frequency floods, flood elevations, floodway information and boundaries, and flood profiles.

Letter of map change (LOMC) means an official FEMA determination, by letter, that amends or revises an effective FIRM or FIS. Letters of map change include LOMAs, LOMRs, and CLOMRs, which are defined as follows:

- (1) *Letter of map amendment (LOMA)* means an amendment based on technical data showing that a property was incorrectly included in a designated special flood hazard area (SFHA). A

LOMA amends the current effective FIRM and establishes that a land as defined by metes and bounds or a structure is not located in a special flood hazard area (SFHA).

- (2) *Letter of map revision (LOMR)* means a revision based on technical data that may show changes to flood zones, flood elevations, floodplain and floodway delineations, and planimetric features. A letter of map revision based on fill (LOMR-F) is a determination that a structure or parcel of land has been elevated by fill above the base flood elevation and is, therefore, no longer exposed to flooding associated with the base flood. In order to qualify for this determination, the fill must have been permitted and placed in accordance with this chapter.
- (3) *Conditional letter of map revision (CLOMR)* means a formal review and comment as to whether a proposed flood protection project or other project complies with the minimum National Flood Insurance Program (NFIP) requirements for such projects with respect to delineation of SFHAs. A CLOMR does not revise the effective FIRM or FIS.

Limit of moderate wave action (LiMWA) means a boundary that identifies the landward location of the 1.5 foot wave height delineating a zone called the "Coastal A Zone."

Lowest floor means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Federal Code 44 CFR Section 60.3.

Manufactured home means, for purposes of this chapter, a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term manufactured home also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days, but does not include a recreational vehicle.

Manufactured home park/subdivision means a parcel or contiguous parcels of land divided into two or more manufactured home lots for rent or sale.

Market value means the city assessment value of the building as prepared by the city assessor.

Mean sea level means, for purposes of the National Flood Insurance Program, the North American Vertical Datum (NAVD88) of 1988 or other datum, to which base flood elevations shown on the FIRM are referenced.

New construction means, for the purposes of determining insurance rates, structures for which the start of construction commenced on or after December 31, 1974, and includes any subsequent improvements to such structures. For floodplain management purposes, new construction means structures for which the start of construction commenced on or after the effective date of a floodplain management ordinance adopted by the city, and includes any subsequent improvements to such structures.

NFIP means the National Flood Insurance Program.

Post-FIRM structure means a structure for which construction or substantial improvement occurred after December 31, 1974.

Pre-FIRM structure means a structure for which construction or substantial improvement occurred on or before December 31, 1974.

Primary frontal dune means a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune occurs at the point where there is distinct change from a relatively steep slope to a relatively mild slope.

Recreational vehicle means a vehicle which is:

- (1) Built on a single chassis;
- (2) Four hundred square feet or less when measured at the largest horizontal projection;
- (3) Designed to be self-propelled or permanently towable by a light-duty truck; and
- (4) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational camping, travel or seasonal use.

Repetitive loss structure means a structure covered by a contract for flood insurance that has incurred flood related damage on two separate occasions during a ten-year period for which the cost of repairs, on the average, equaled or exceeded 25 percent of the market value of the structure before the damage occurred or \$10,000.00, whichever is less.

Severe repetitive loss structure means a structure that: (a) is covered under a contract for flood insurance made available under the NFIP; and (b) has incurred flood related damage — (i) For which four or more separate claims payments have been made under flood insurance coverage with the amount of each such claim exceeding \$5,000.00, and with the cumulative amount of such claims payments exceeding \$20,000.00; or (ii) For which at least two separate claims payments have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure before the damage occurred.

Shallow flooding area means a special flood hazard area with base flood depths from one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident. Such flooding is characterized by pending or sheet flow.

Special flood hazard area (SFHA) means the land in the floodplain subject to a one percent or greater chance of being flooded in any given year as determined as set forth in this ordinance. These areas are designated as AE, AO, A, and VE on the FIRM.

Start of construction means the date of issuance of the building permit, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within 180 days of the permit date. The actual start means either:

- (1) The first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or
- (2) The placement of a manufactured home on a foundation.

Start of construction (Coastal Barriers Act) means, for other than new construction and substantial improvement, under the Coastal Barriers Resource Act (P.L.- 97-348), the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of the construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building. The term "permanent construction" does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include the installation on the

property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration on any wall, ceiling, floor or other structural part of a building, whether or not the alteration affects the external dimensions of the building.

Structure means, for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

Substantial damage means damage of any origin sustained by a structure when the cost of restoring the structure to its pre-damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. A structure that has been damaged two or more times by flood events during any consecutive ten-year period with a cumulative building loss equal to or exceeding 50 percent of the market value before the damage shall also be considered a substantial damaged structure.

Substantial improvement means any combination of repair, reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either before the improvement or repair is started or, if the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition substantial improvement is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not the alteration affects the external dimensions of the structure. This term includes structures which have incurred repetitive loss or substantial damage regardless of the actual repair work performed. The term does not, however, include either:

- (1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary or safety code requirements and which are the minimum necessary to ensure safe living conditions; or
- (2) Any alteration of a structure listed on the National Register of Historic Places or a state inventory of historic places, provided that the alteration will not preclude the structure's continued designation as a historic structure.

Notwithstanding the foregoing, historic structures undergoing work that would constitute a substantial improvement as defined above, shall comply with all ordinance requirements that do not preclude the structure's continued designation as a historic structure. Documentation that a specific ordinance requirement will cause removal of the structure from the National Register of Historic Places or the State Inventory of Historic Places shall be obtained from the Secretary of the Interior or the State Historic Preservation Officer. Any exemption from ordinance requirements will be the minimum necessary to preserve the historic character and design of the structure.

Violation means the failure of a structure or other development to be fully compliant with the provisions of this ordinance. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this ordinance is presumed to be in violation until such time as that documentation is provided.

VA USBC means the Virginia Uniform Statewide Building Code, as amended and supplemented from time to time.

Water surface elevation means the height, in relation to the North American Vertical Datum of 1988 (NAVD88) (or other datum, where specified) of floods of various magnitude and frequencies in the floodplains of coastal or riverine areas.

Watercourse means any natural or artificial lake, river, creek, stream, ditch, channel, waterway, gully, ravine, swale, or wash in which water flows, either continuously, periodically, or intermittently, and which has a definite channel, bed, or banks. Watercourse includes specifically designated areas in which substantial flood damage may occur.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-6. - Description of district.

- (a) Description of special flood hazard areas. The various special flood hazard districts shall include the special flood hazard areas (SFHAs). The basis for the delineation of these districts shall be the flood insurance study (FIS), and flood insurance rate map (FIRM) prepared for the City of Portsmouth by the Federal Emergency Management Agency, Federal Insurance Administration, dated August 3, 2015, and any subsequent revisions or amendments thereto. The City of Portsmouth may identify and regulate local flood hazard or pending areas that are not delineated on the FIRM. These areas may be delineated on a "Local Flood Hazard Map" using best available topographic data and locally derived information such as flood of record, historic high water marks or approximate study methodologies.

The boundaries of the SFHA Districts are established as shown on the FIRM, which is declared to be a part of this ordinance and which shall be kept on file at the City of Portsmouth Department of Neighborhood Advancement, and which may include the following districts:

- (1) The floodway district is in an AE Zone and is delineated, for purposes of this chapter, using the criterion that certain areas within the floodplain must be capable of carrying the waters of the one percent annual chance flood without increasing the water surface elevation of that flood more than one foot at any point. The areas included in this district, if any, are shown on the FIRM. Currently, according to the above-referenced FIRM (August 3, 2015), there are no floodways designated in the latest Portsmouth FIS.
 - (2) The AE or AH Zones on the FIRM accompanying the FIS shall be those areas for which one percent annual chance flood elevations have been provided and the floodway has not been delineated.
 - (3) The A Zone on the FIRM accompanying the FIS shall be those areas for which no detailed flood profiles or elevations are provided, but the one percent annual chance floodplain boundary has been approximated.
 - (4) The AO Zone on the FIRM accompanying the FIS shall be those areas of shallow flooding identified as AO on the FIRM.
 - (5) The Coastal A Zone shall be those areas, as defined by the VA USBC, that are subject to wave heights between 1.5 and 3 feet, and identified on the FIRM as areas between the V zone and the limit of moderate wave action (LiMWA).
 - (6) The VE or V Zones on the FIRMs accompanying the FIS shall be those areas that are known as coastal high hazard areas, extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity (three-foot and higher) wave action.
- (b) Overlay concept.
- (1) The floodplain districts described above shall be in addition to and shall overlay all other zoning districts designated on the Official Zoning Ordinance Map as adopted by section 40.1 of this Code. The provisions for the floodplain districts shall serve as a supplement to the underlying district provisions.
 - (2) In any conflict between the Code requirements for the floodplain districts and those for any underlying zoning district, the more restrictive provisions and/or those pertaining to the floodplain districts shall apply.
 - (3) In the event any provision concerning a floodplain district is declared inapplicable as a result of any legislative or administrative actions or judicial decision, the basic underlying provisions shall remain applicable.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-7. - Official zoning map.

The boundaries of the floodplain districts are established as shown on the flood insurance rate map, which is declared to be a part of this chapter and which shall be kept on file in the office of the department of neighborhood advancement.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-8. - District boundary changes.

The delineation of the floodplain districts may be revised by the Portsmouth City Council where natural or manmade changes have occurred, where more detailed studies have been conducted or undertaken by the U.S. Army Corps of Engineers or other qualified agency, or where an individual documents the need for such change. However, prior to any such change, approval must be obtained from the Federal Emergency Management Agency.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-9. - Interpretation of district boundaries.

Initial interpretations of the boundaries of the floodplain districts shall be made by the director of neighborhood advancement or his designee. Should a dispute arise concerning the boundaries of any of the districts, the board of zoning appeals shall make the necessary determination. The person questioning or contesting the location of the district boundary shall be given a reasonable opportunity to present his case to the board and to submit his own technical evidence if he so desires.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-10. - General provisions.

- (a) *Permit requirement.* All uses and development occurring within any floodplain district, including placement of manufactured homes, shall be undertaken only upon the issuance of the appropriate permit. Such development shall be undertaken only in strict compliance with the provisions of this chapter and with all other applicable codes and ordinances as amended, including the VA USBC and the City of Portsmouth development ordinances. Prior to the issuance of any such permit, the floodplain administrator shall require all applications to include compliance with all applicable state and federal laws and shall review all sites to assure they are reasonably safe from flooding. Under no circumstances shall any use, activity, and/or development adversely affect the capacity of the channels or floodways of any watercourse, drainage ditch, or any other drainage facility or system.
- (b) *Site plans and permit applications.* All applications for development in any floodplain district and all building permits issued for activity in the floodplain district shall include the following information:
 - (1) The elevations of the "lowest floor" (including HVAC equipment and duct work), and the basement, or in Coastal A and V Zones, the lowest horizontal structural member (including HVAC equipment and duct work).
 - (2) For nonresidential structures to be flood-proofed, the elevation to which the structure will be flood-proofed. Such elevation shall be at least three feet above the base flood elevation for the district. Floodproofing design must be certified by a Virginia registered professional

engineer or architect. Documentation of certification by a registered professional engineer or architect of the design and methods of construction is required.

- (3) The elevation of the base flood at the site.
 - (4) Topographic information showing existing and proposed ground elevations.
- (c) *Standards for manufactured homes.* Section 14.1-11(e) prohibits the permanent placement of manufactured homes in floodplain districts. Manufactured homes may be temporarily placed in a floodplain district provided that:
- (1) Manufactured homes placed in the floodplain district temporarily on individual lots or parcels, must meet all the requirements for new construction, including the elevation and anchoring requirements in section 14.1-11 of this Code.
 - (2) Manufactured homes that are temporarily placed on sites shall be elevated on a permanent foundation so that the lowest floor of the manufactured home is elevated to or above the base flood elevation and shall be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement.
 - (3) Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable state anchoring requirements for resisting wind forces.
 - (4) The length of time a manufactured home may be left on a lot and be considered temporary shall not exceed the time limitations provided in the zoning ordinance.
- (d) *Standards for recreational vehicles.* Recreational vehicles placed on sites within floodplain districts shall be on the site for fewer than 180 consecutive days and be fully licensed and ready for highway use. For the purposes of this chapter, a recreational vehicle shall be deemed ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick-disconnect-type utilities and security devices, and has no permanently attached additions.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-11. - District provisions.

- (a) *General standards.* The following provisions shall apply to all permits:
- (1) New construction, substantial improvements, and repairs for substantial damage shall be according to the VA USBC and this chapter, and anchored to prevent flotation, collapse, or lateral movement of the structure.
 - (2) New construction, substantial improvements, and repairs for substantial damage shall be constructed with materials and utility equipment resistant to flood damage below the design flood elevation (DFE) in cases when those elements are allowed below the DFE.
 - (3) New construction, substantial improvements, and repairs for substantial damage shall be constructed by methods and practices that minimize flood damage.
 - (4) Electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities, including duct work, shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.
 - (5) New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.
 - (6) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters.

- (7) On-site waste disposal systems shall be designed to current City of Portsmouth standards and shall be located and constructed to avoid impairment to them or contamination from them during flooding.

(b) *Floodplain requirements.*

- (1) The following provisions shall apply within the floodway district of an AE zone:
 - a. Within any floodway area, no encroachments, including fill, new construction, substantial improvements, or other development shall be permitted unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that the proposed encroachment will not result in any increase in flood levels within the community during the occurrence of the base flood discharge. Hydrologic and hydraulic analysis shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently-accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the floodplain administrator.
 - b. Development activities which increase the water surface elevation of the base flood may be allowed, provided that the applicant first applies — with the City of Portsmouth's endorsement — for a conditional letter of map revision (CLOMR), and receives the approval of the Federal Emergency Management Agency.
 - c. If subsection 14.1-11(b)(1)a. is satisfied, all new construction and substantial Improvements shall comply with all applicable flood hazard reduction provisions in sections 14.1-10 and 14.1-11 of this Code.
 - d. The placement of manufactured homes (mobile homes) is prohibited except in an existing manufactured home (mobile home) park or subdivision. A replacement manufactured home is prohibited.
- (2) The following provisions shall apply within an AE or AH zone [44 CFR 60.3(c)].
 - a. Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the areas of special flood hazard, designated as Zones A1-30 and AE or AH on the FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the City of Portsmouth.
 - b. Development activities in Zones A1-30 and AE or AH, on the City of Portsmouth's FIRM which increase the water surface elevation of the base flood by more than one foot may be allowed, provided that the applicant first applies — with the City of Portsmouth's endorsement — for a conditional letter of map revision, and receives the approval of the Federal Emergency Management Agency.
- (3) The following provisions shall apply within an A zone [44 CFR 60.3(b)].
 - a. The Approximated Floodplain District shall be that floodplain area for which no detailed flood profiles or elevations are provided, but where a 100-year floodplain boundary has been approximated. Such areas are shown as Zone A on the maps accompanying the FIS. For these areas, the base flood elevations and floodway information from federal, state, and other acceptable sources shall be used, when available. Where the specific one percent annual chance flood elevation cannot be determined for this area using other sources of data, such as the U.S. Army Corps of Engineers Floodplain Information Reports, U.S. Geological Survey Flood-Prone Quadrangles, etc., then the applicant for the proposed use, development and/or activity shall determine this base flood elevation. For development proposed in the approximate floodplain the applicant must use

technical methods that correctly reflect currently accepted non-detailed technical concepts, such as point on boundary, high water marks, or detailed methodologies hydrologic and hydraulic analyses. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a thorough review by the floodplain administrator.

- b. The floodplain administrator reserves the right to require a hydrologic and hydraulic analysis for any development. When such base flood elevation data is utilized, the lowest floor shall be elevated to the design flood elevation (DFE).
 - c. During the permitting process, the floodplain administrator shall obtain:
 - 1) The elevation of the lowest floor (including HVAC, all duct work, and the basement) of all new and substantially improved structures; and
 - 2) If the structure is non-residential has been flood-proofed in accordance with the requirements of this article, the elevation (in relation to mean sea level) to which the structure has been flood-proofed. Residential structures shall not be flood-proofed.
 - d. Base flood elevation data shall be obtained from other sources or developed using detailed methodologies comparable to those contained in a FIS for subdivision proposals and other proposed development proposals (including manufactured home parks and subdivisions) that exceed 50 lots or five acres, whichever is the lesser.
- (4) The following provisions shall apply within an AO zone [44 CFR 60.3(c)].
- a. All new construction and substantial improvement of residential structures shall have the lowest floor, including basement, elevated to or above the flood depth specified on the FIRM, above the highest adjacent grade at least as high as the depth number specified in feet on the FIRM. If no flood depth number is specified, the lowest floor, including basement, shall be elevated no less than two feet above the highest adjacent grade.
 - b. All new construction and substantial improvements of non-residential structures shall:
 - 1) Have the lowest floor, including basement, elevated to or above the flood depth specified on the FIRM, above the highest adjacent grade at least as high as the depth number specified in feet on the FIRM. If no flood depth number is specified, the lowest floor, including basement, shall be elevated at least two feet above the highest adjacent grade; or
 - 2) Together with attendant utility and sanitary facilities be completely flood-proofed to the specified flood level so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.
 - c. Adequate drainage paths around structures on slopes shall be provided to guide floodwaters around and away from proposed structures.
- (5) The following provisions shall apply for the Coastal A Zone (limits of moderate wave action). Buildings and structures within this zone shall comply with V zone standards with the lowest supporting member elevated to or above the base flood elevation plus 3.0 feet of freeboard, and must comply with the provisions in paragraph b.2. in this section (14.1-11) (provisions for zones AE or AH) and paragraphs a. and d. in this section (14.1-11).
- (6) The following provisions shall apply for the VE or V Zones (Coastal High Hazard areas).
- a. All new construction and substantial improvements in Zones V and VE (V if no base flood elevation is available) shall be elevated on pilings or columns so that:

- 1) The bottom of the lowest horizontal structural member of the lowest floor (including all HVAC and duct work but excluding the pilings or columns) is elevated above the base flood level by at least three feet; and
 - 2) The pile or column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Wind and water loading values shall each have a one percent chance of being equaled or exceeded in any given year (one-percent annual chance).
- b. A registered professional engineer or architect shall develop or review the structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of Section 14.1-11(b)(6)(a)(2) of this code.
- c. The floodplain administrator shall obtain the elevation (in relation to mean sea level) of the bottom of the lowest horizontal structural member of the lowest floor (including all HVAC and duct work, but excluding pilings and columns) of all new and substantially improved structures in Zones V and VE. The floodplain management administrator shall maintain a record of all such information.
- d. All new construction shall be located at least 50 feet landward of the reach of mean high tide.
- e. All new construction and substantial improvements shall have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood-lattice work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purpose of this section, a breakaway wall shall have a design safe loading resistance of not less than ten and no more than 20 pounds per square foot. Use of breakaway walls which exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so required by local codes) may be permitted only if a registered professional engineer or architect certifies that the designs proposed meet the following conditions:
- 1) Breakaway wall collapse shall result from water load less than that which would occur during the base flood; and
 - 2) The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and nonstructural). Maximum wind and water loading values to be used in this determination shall each have a one percent chance of being equaled or exceeded in any given year.
- f. The enclosed space below the lowest floor shall be used solely for parking of vehicles, building access, or storage. Such space shall not be partitioned into multiple rooms, temperature-controlled, or used for human habitation.
- g. The use of fill for structural support of buildings is prohibited. When non-structural fill is proposed in a coastal high hazard area, appropriate engineering analyses shall be conducted to evaluate the impacts of the fill prior to issuance of a development permit.
- h. The man-made alteration of sand dunes and mangrove stands, which would increase potential flood damage, is prohibited.
- i. All recreational vehicles placed in V-zones shall be on site for fewer than 180 consecutive days, be fully licensed and ready for highway use or meet the same standards as for conventional housing in V-zones.

(c) *Additional provisions for watercourse.*

- (1) Prior to any proposed alteration or relocation of any channels or of any watercourse, stream, etc., within this jurisdiction, a permit shall be obtained from the U.S. Corps of Engineers, the Virginia Department of Environmental Quality, and the Virginia Marine Resource Commission (a joint permit application is available from any of these organizations). Furthermore, in riverine areas, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management), other required agencies, and the Federal Emergency Management Agency.
- (2) The flood carrying capacity within an altered or relocated portion of any watercourse shall be maintained.

(d) *Elevation and construction standards.* In all identified flood hazard areas where base flood elevations have been provided in the FIS or generated by a certified professional in accordance with subsection 14.1-11(b)(3) of this code the following provisions shall apply:

- (1) *Residential construction.* New construction or substantial improvement of any residential structure (including manufactured homes) in Zones A1-30, AE, AH and A with detailed base flood elevations shall have the lowest floor including HVAC, duct work, and basement, elevated to at least the design flood elevation which is the BFE plus 3.0 feet. No floodproofing below the design flood elevation (DFE) of residential construction is allowed.
- (2) *Non-residential construction.* New construction or substantial improvement of any commercial, industrial, or non-residential building (or manufactured home) shall have the lowest floor, including basement, elevated at least three feet above the base flood level.

Buildings located in all A1-30, AE, and AH zones may be floodproofed in lieu of being elevated provided that all areas of the building components below the elevation corresponding to the BFE plus three feet are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification, including the specific elevation (in relation to mean sea level) to which such structures are floodproofed, shall be maintained by the floodplain administrator.

- (3) *Space below the lowest floor.* In zones A, AE, AH, AO, and A1-A30, fully enclosed areas, of new construction or substantially improved structures, which are below the regulatory flood protection elevation shall:
 - a. Not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator).
 - b. Be constructed entirely of flood resistant materials below the design flood elevation which is the BFE plus three feet.
 - c. Include measures to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, the openings must either be certified by a professional engineer or architect or meet the following minimum design criteria;
 - 1) Provide a minimum of two openings on different sides of each enclosed area subject to flooding.

- 2) The total net area of all openings must be at least one square inch for each square foot of enclosed area subject to flooding.
- 3) If a building has more than one enclosed area, each area must have openings to allow floodwaters to automatically enter and exit.
- 4) The bottom of all required openings shall be no higher than one foot above the adjacent grade.
- 5) Openings may be equipped with screens, louvers, or other opening coverings or devices, provided they permit the automatic flow of floodwaters in both directions.
- 6) Foundation enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and, therefore, do not require openings. Masonry or wood underpinning, regardless of structural status, is considered an enclosure and requires openings as outlined above.

(e) *Prohibited uses.*

- (1) The following uses shall be specifically prohibited within all "A", "AE", "V" and "VE" floodplain districts:
 - a. Sanitary landfills, junkyards, outdoor storage of inoperative vehicles.
 - b. Manufactured homes (except as a temporary use in accordance with subsection 14.1-10(c)).
 - c. Surface mines and borrow pits.
 - d. Manufacture, bulk storage, transformation or distribution of petroleum (except for retail sales), chemical or asphalt products or any hazardous materials as defined in either or both of the following:
 - 1) Superfund Amendment and Reauthorization Act of 1986.
 - 2) Identification and Listing of Hazardous Wastes, 40 CFR section 261 (1987).
 - a. Oil and oil products including petrochemicals.
 - b. Radioactive materials.
 - c. Any material transported or stored in large commercial quantities (such as 55-gallon drums) which is a very soluble acid or base, causes abnormal growth of an organ or organism, or is highly biodegradable, exerting a strong oxygen demand.
 - d. Biologically accumulative poisons.
 - e. Substances containing the active ingredients of poisons that are or were ever registered in accordance with the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 USC 135 et seq.).
 - f. Substances highly lethal to mammalian or aquatic life.
 - g. Storage or land application of industrial wastes.
 - h. Outdoor storage of equipment, materials or supplies which are buoyant, flammable or explosive.
- (2) Nonconforming uses of this chapter notwithstanding, no expansion of any of the above uses located within the floodplain district shall be permitted.

(f) *Standards for subdivision proposals.*

- (1) All subdivision proposals shall be consistent with the need to minimize flood damage;

- (2) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;
- (3) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards; and
- (4) Base flood elevation data shall be provided for subdivision proposals and other proposed development proposals (including manufactured home parks and subdivisions) that exceed 50 lots or five acres, whichever is the lesser.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-12. - Design criteria for public improvements.

- (a) *Sanitary sewer facilities.* All new or replacement sanitary sewer facilities and private package sewage treatment plants, including all pumping stations and collector systems, shall be designed to minimize or eliminate infiltration of floodwaters into the systems and of discharges from the systems into the floodwaters. The facilities and plants shall be located and constructed to minimize or eliminate flood damage and impairment.
- (b) *Water facilities.* All new or replacement water facilities shall be designed to minimize or eliminate infiltration of floodwaters into the system and shall be located and constructed to minimize or eliminate flood damage.
- (c) *Drainage facilities.* All storm drainage facilities shall be designed to convey the flow of surface waters without causing injury to persons or damage to property. The facilities shall ensure drainage away from buildings and on-site waste disposal sites. The city engineer may require a primary underground system to accommodate frequent floods and a secondary surface system to accommodate larger, less frequent floods. Drainage plans shall be consistent with local and regional drainage plans. The facilities shall be designed to prevent the discharge of excess runoff onto adjacent properties.
- (d) *Utilities.* All utilities, such as gas lines, electrical and telephone systems, being placed in floodprone areas should be located, elevated (where possible) and constructed to minimize the chance of impairment during a flooding occurrence.
- (e) *Streets and sidewalks.* Streets and sidewalks should be designed to minimize their potential for increasing and aggravating the levels of flood flow. Drainage openings shall be designed to reduce exposure to flood hazards.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-13. - Variances; factors to be considered.

- (a) Variances shall be issued only upon (i) a showing of good and sufficient cause, (ii) after the board of zoning appeals has determined that failure to grant the variance would result in exceptional hardship to the applicant, and (iii) after the board of zoning appeals has determined that the granting of such variance will not result in (a) unacceptable or prohibited increases in flood heights, (b) additional threats to public safety, (c) extraordinary public expense; and will not (d) create nuisances, (e) cause fraud or victimization of the public, or (f) conflict with local laws or ordinances. While the granting of variances generally is limited to a lot size less than one-half acre, deviations from that limitation may occur. However, as the lot size increases beyond one-half acre, the technical justification required for issuing a variance increases. Variances may be issued by the board of zoning appeals for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, in conformance with the provisions of this

section. Variances may be issued for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that the criteria of this section are met, and the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety. In passing upon applications for variances, the board of zoning appeals shall satisfy all relevant factors and procedures specified in other sections of the zoning ordinance and consider the following additional factors:

- (1) The danger to life and property due to increased flood heights or velocities caused by encroachments. No variance shall be granted for any proposed use, development, or activity within any floodway district that will cause any increase in the 100-year flood elevation.
 - (2) The danger that materials may be swept on to other lands or downstream to the injury of others.
 - (3) The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination, and unsanitary conditions.
 - (4) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners.
 - (5) The importance of the services provided by the proposed facility to the community.
 - (6) The requirements of the facility for a waterfront location.
 - (7) The availability of alternative locations not subject to flooding for the proposed use.
 - (8) The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.
 - (9) The relationship of the proposed use to the comprehensive plan and floodplain management program for the area.
 - (10) The safety of access by ordinary and emergency vehicles to the property in time of flood.
 - (11) The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters expected at the site.
 - (12) The historic nature of a structure. Variances for repair or rehabilitation of historic structures may be granted upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
 - (13) Such other factors which are relevant to the purposes of this chapter.
- (b) The board of zoning appeals may refer any application and accompanying documentation pertaining to any request for a variance to any engineer or other qualified person or agency for technical assistance in evaluating the proposed project in relation to flood heights and velocities, and the adequacy of the plans for flood protection and other related matters.
 - (c) Variances shall be issued only after the board of zoning appeals has determined that the granting of such will not result in (a) unacceptable or prohibited increases in flood heights, (b) additional threats to public safety, (c) extraordinary public expense; and will not (d) create nuisances, (e) cause fraud or victimization of the public, or (f) conflict with local laws or ordinances.
 - (d) Variances shall be issued only after the board of zoning appeals has determined that the variance will be the minimum required to provide relief.
 - (e) The board of zoning appeals shall notify the applicant for a variance in writing that the issuance of a variance to construct a structure below the base flood elevation (a) increases the risks to life and property and (b) will result in increased premium rates for flood insurance.

- (f) A record shall be maintained of the above notification as well as all variance actions, including justification for the issuance of the variances. Any variances that are issued shall be noted in the annual or biennial report submitted to the federal insurance administrator.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-14. - Conditions for use of existing structures.

- (a) A structure or use of a structure or premises which lawfully existed in the floodplain district before the enactment of these provisions, but which is not in conformity with these provisions, may be continued subject to the following conditions:
 - (1) Any modification, alteration, repair, reconstruction or improvement of any kind to a structure and/or use located in any floodplain area to an extent or amount of less than 50 percent of its current market value during a consecutive ten-year period shall conform to the VA USBC and be elevated and/or flood-proofed to the greatest extent possible, as determined by the floodplain administrator.
 - (2) Any modification, alteration, repair, reconstruction or improvement of any kind to a structure or use, regardless of its location in a floodplain area, to an extent or amount of 50 percent or more of its current market value during a consecutive ten-year period shall be undertaken only in full compliance with the provisions of this chapter and shall require the entire structure to conform to the VA use.
 - (3) Additions must comply with subsection 14.1014(a)(1) and (2) above, as applicable, and meet the following requirements:
 - a. For additions that are less than 50 percent of the current market value of the existing building during a consecutive ten-year period, all parts of the addition to include duct work, HVAC equipment and electrical must be above the design flood elevation which is the BFE plus 3.0 feet.
 - b. For additions that are 50 percent or more of the current market value of the existing building during a consecutive ten-year period, the addition and the existing building must be in full compliance with the provisions of this chapter and both the addition and the existing building shall be required to conform to the VA USBC.
 - (4) Existing structures in the floodway area shall not be expanded or enlarged unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practices that the proposed expansion would not result in any increase in the base flood elevation.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-15. - Administration.

- (a) *Designation of a floodplain administrator.* The City of Portsmouth Director of Neighborhood Advancement is hereby appointed to administer and implement these regulations and is referred to herein as the floodplain administrator. The floodplain administrator may:
 - (1) Do the work themselves. In the absence of a designated floodplain administrator, the duties are conducted by the city manager or his designee.
 - (2) Delegate duties and responsibilities set forth in these regulations in whole or in part to qualified technical personnel, plan examiners, inspectors, and other employees.

- (3) Enter into a written agreement or written contract with another community or private sector entity to administer specific provisions of these regulations.
 - (4) Administration of any part of these regulations by another entity shall not relieve the community of its responsibilities pursuant to the participation requirements of the National Flood Insurance Program as set forth in the Code of Federal Regulations at 44 C.F.R. Section 59.22.
- (b) *Duties and responsibilities of the floodplain administrator.* Duties and responsibilities of the floodplain administrator shall include but are not limited to:
- (1) Interpreting floodplain boundaries and providing available base flood elevation and flood hazard information.
 - (2) Review applications for permits to determine whether proposed activities will be located in the special flood hazard area (SFHA).
 - (3) Review applications to determine whether proposed activities will be reasonably safe from flooding and require new construction and substantial improvements to meet the requirements of these regulations.
 - (4) Review applications to determine whether all necessary permits have been obtained from the federal, state, or local agencies from which prior or concurrent approval is required; in particular, permits from state agencies for any construction, repair, or any alteration of a dam, reservoir, or waterway obstruction (including bridges, culverts, structures), any alteration of a watercourse, or any change of the course, current, or cross section of a stream or body of water, including any change to the 100-year frequency floodplain of free-flowing non-tidal waters of the state.
 - (5) Verify that applicants proposing an alteration of a watercourse have notified adjacent communities, the Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management), and other appropriate agencies (VADEQ, VIMS, VMRC, USACE) and have submitted copies of such notifications to FEMA.
 - (6) Advise applicants for new construction or substantial improvement of structures that are located within an area of the coastal barrier resources system established by the Coastal Barrier Resources Act that Federal flood insurance is not available on such structures; areas subject to this limitation are shown on FIRMs as coastal barrier resource system areas (CBRS) or otherwise protected areas (OPA).
 - (7) Approve applications and issue permits to develop in flood hazard areas if the provisions of this chapter have been met, or disapprove applications if the provisions of this chapter have not been met.
 - (8) Inspect or cause to be inspected, buildings, structures, and other development for which permits have been issued to determine compliance with these regulations or to determine if non-compliance has occurred or violations have been committed.
 - (9) Review elevation certificates and require incomplete or deficient certificates to be corrected.
 - (10) Submit to FEMA, or require applicants to submit to FEMA, data and information necessary to maintain FIRMs, including hydrologic and hydraulic engineering analyses prepared by or for the city, within six months after such data and information becomes available if the analyses indicate changes in base flood elevations.
 - (11) Maintain and permanently keep records that are necessary for the administration of these regulations, including:
 - a. Flood insurance studies, flood insurance rate maps (including historic studies and maps and current effective studies and maps) and letters of map change; and

- b. Documentation supporting issuance and denial of permits, elevation certificates, documentation of the elevation (in relation to the datum on the FIRM) to which structures have been flood-proofed, other required design certifications, variances, and records of enforcement actions taken to correct violations of these regulations.
- (12) Enforce the provisions of these regulations, investigate violations, issue notices of violations or stop work orders, and require permit holders to take corrective action.
 - (13) Advise the board of zoning appeals regarding the intent of these regulations, and for each application for a variance, prepare a staff report and recommendation.
 - (14) Administer the requirements related to proposed work on existing buildings.
 - (15) Make determinations as to whether buildings and structures that are located in flood hazard areas and that are damaged by any cause have been substantially damaged.
 - (16) Make reasonable efforts to notify owners of substantially damaged structures of the need to obtain a permit to repair, rehabilitate, or reconstruct, and prohibit the non-compliant repair of substantially damaged buildings except for temporary emergency protective measures necessary to secure a property or stabilize a building or structure to prevent additional damage.
 - (17) Undertake, as determined appropriate by the floodplain administrator due to the circumstances, other actions which may include but are not limited to: issuing press releases, public service announcements, and other public information materials related to permit requests and repair of damaged structures; coordinating with other federal, state, and local agencies to assist with substantial damage determinations; providing owners of damaged structures information related to the proper repair of damaged structures in special flood hazard areas; and assisting property owners with documentation necessary to file claims for increased cost of compliance coverage under NFIP flood insurance policies.
 - (18) Notify the Federal Emergency Management Agency when the corporate boundaries of the City of Portsmouth have been modified.
 - (19) Provide a map that clearly delineates the new corporate boundaries or the new area for which the authority to regulate pursuant to these regulations has either been assumed or relinquished through annexation.
 - (20) If the FIRM for any annexed area includes special flood hazard areas that have flood zones that have regulatory requirements that are not set forth in these regulations, prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the city council for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended regulations shall be provided to Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management) and FEMA.
 - (21) Upon the request of FEMA, complete and submit a report concerning participation in the NFIP which may request information regarding the number of buildings in the SFHA, number of permits issued for development in the SFHA, and number of variances issued for development in the SFHA.
 - (22) It is the duty of the floodplain administrator to take into account flood, mudslide and flood-related erosion hazards, to the extent that they are known, in all official actions relating to land management and use throughout the entire jurisdictional area of the community, whether or not those hazards have been specifically delineated geographically (e.g. via mapping or surveying).

(c) *Use and interpretation of FIRMs.* The floodplain administrator shall make interpretations, where needed, as to the exact location of special flood hazard areas, floodplain boundaries, and floodway boundaries. The following shall apply to the use and interpretation of FIRMs and data:

- (1) Where field survey topography indicates that adjacent ground elevations:
 - a. Are below the base flood elevation, even in areas not delineated as a special flood hazard area on a FIRM, the area shall be considered as special flood hazard area and subject to the requirements of these regulations;
 - b. Are above the base flood elevation, the area shall be regulated as special flood hazard area unless the applicant obtains a letter of map change that removes the area from the SFHA.
- (2) In FEMA-identified special flood hazard areas where base flood elevation and floodway data have not been identified and in areas where FEMA has not identified SFHAs, any other flood hazard data available from a federal, state, or other source shall be reviewed and reasonably used.
- (3) Base flood elevations and designated floodway boundaries on FIRMs and in FISs shall take precedence over base flood elevations and floodway boundaries by any other sources if such sources show reduced floodway widths and/or lower base flood elevations.
- (4) Other sources of data shall be reasonably used if such sources show increased base flood elevations and/or larger floodway areas than are shown on FIRMs and in FISs.
- (5) If a preliminary flood insurance rate map and/or a preliminary flood insurance study has been provided by FEMA:
 - a. Upon the issuance of a letter of final determination by FEMA, the preliminary flood hazard data shall be used and shall replace the flood hazard data previously provided from FEMA for the purposes of administering these regulations.
 - b. Prior to the issuance of a letter of final determination by FEMA, the use of preliminary flood hazard data shall be deemed the best available data pursuant to subsection 14.1-11(b)(3)(a) and used where no base flood elevations and/or floodway areas are provided on the effective FIRM.
 - c. Prior to issuance of a letter of final determination by FEMA, the use of preliminary flood hazard data is permitted where the preliminary base flood elevations or floodway areas exceed the base flood elevations and/or designated floodway widths in existing flood hazard data provided by FEMA. Such preliminary data may be subject to change and/or appeal to FEMA.

(d) *Jurisdictional boundary changes.*

- (1) The city floodplain ordinance in effect on the date of annexation shall remain in effect and shall be enforced by the city for all annexed areas until the city adopts and enforces an ordinance which meets the requirements for participation in the National Flood Insurance Program. The city shall pass a resolution acknowledging and accepting responsibility for enforcing floodplain ordinance standards prior to annexation of any area containing identified flood hazards. If the FIRM for any annexed area includes special flood hazard areas that have flood zones that have regulatory requirements that are not set forth in this ordinance, the city shall prepare amendments to these regulations to adopt the FIRM and appropriate requirements, and submit the amendments to the city council for adoption; such adoption shall take place at the same time as or prior to the date of annexation and a copy of the amended regulations shall be provided to Department of Conservation and Recreation (Division of Dam Safety and Floodplain Management) and FEMA.

- (2) In accordance with the Code of Federal Regulations, Title 44 Subpart (B) Section 59.22(9)(v) all NFIP participating communities must notify the Federal Insurance Administration and optionally the Virginia Department of Conservation and Recreation in writing whenever the boundaries of the community have been modified by annexation or the community has otherwise assumed or no longer has authority to adopt and enforce floodplain management regulations for a particular area.
 - (3) In order that all flood insurance rate maps accurately represent the community's boundaries, a copy of a map of the community suitable for reproduction, clearly delineating the new corporate limits or new area for which the community has assumed or relinquished floodplain management regulatory authority must be included with the notification.
- (e) Submitting technical data. Base flood elevations in the City of Portsmouth may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, the city shall notify the Federal Emergency Management Agency of the changes by submitting technical or scientific data. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data.
- (f) *Letters of map revision.* When development in the floodplain causes a change in the base flood elevation, the applicant, including state agencies, must notify FEMA by applying for a conditional letter of map revision or a letter of map revision. Examples include but are not limited to:
- (1) Any development that causes a rise in the base flood elevations within the floodway.
 - (2) Any development occurring in Zones A1-30 and AE without a designated floodway, which will cause a rise of more than one foot in the base flood elevation.
 - (3) Alteration or relocation of a stream (including but not limited to installing culverts and bridges).

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-16. - Records.

Records of actions associated with administering this chapter shall be kept on file and maintained by the floodplain administrator.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-17. - Abrogation and greater restrictions.

This chapter supersedes any ordinance currently in effect in the floodplain. Any ordinance, however, shall remain in full force and effect to the extent that its provisions are more restrictive.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

Sec. 14.1-18. - Severability.

If any section, subsection, paragraph, sentence, clause, or phrase of this chapter shall be declared invalid for any reason whatever, such decision shall not affect the remaining portions of this chapter. The remaining portions shall remain in full force and effect; and for this purpose, the provisions of this chapter are hereby declared to be severable.

(Ord. No. 2015-36, § 2(Exh. A), 6-9-2015)

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Virginia State Plane South zone. The **horizontal datum** was NAD 83, HARN. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA/NINGS 12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided by the Commonwealth of Virginia through the Virginia Base Mapping Program (VBMP). The orthophotos were flown in 2009 at scales of 1:100 and 1:200.

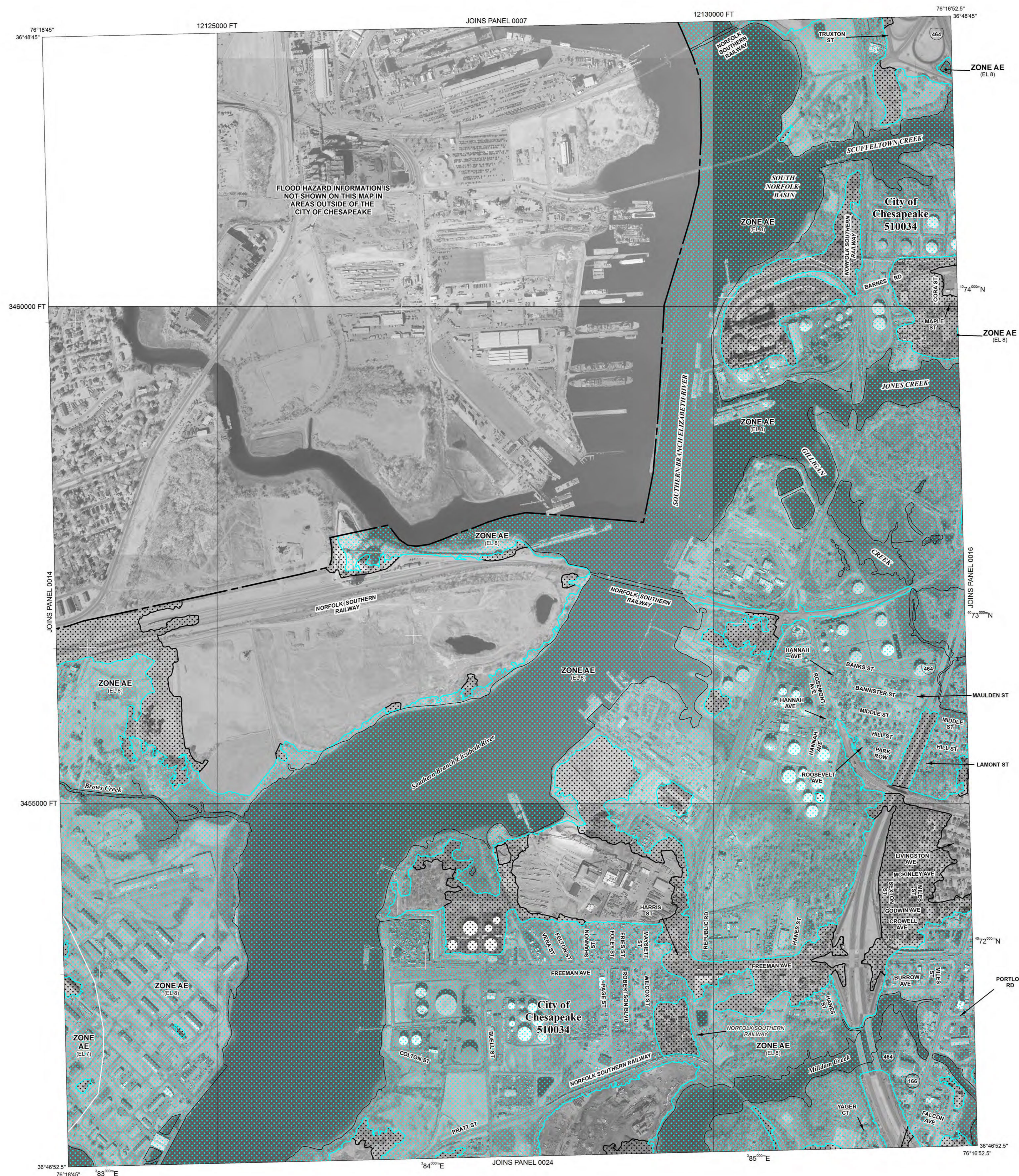
Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unvisited streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map showing the layout of map panels for this jurisdiction.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/mfp>.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AV, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A**: No Base Flood Elevations determined.
- ZONE AE**: Base Flood Elevations determined.
- ZONE AH**: Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO**: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR**: Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently identified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE AV**: Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V**: Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE**: Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X**: Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from the 1% annual chance flood.

OTHER AREAS

- ZONE X**: Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D**: Areas in which flood hazards are understood, but possible.

FLOOD BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- Base Flood Elevation line and value, elevation in feet* (EL 987)
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

- 87°07'45", 32°22'30"
- 76°11'N
- 1000-meter Universal Transverse Mercator grid values, zone 19
- 600000 FT
- 5000-foot grid values: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M 1.5
- River Mile

MAP REPOSITORY
Planning Department, 306 Cedar Road, 2nd Floor, Chesapeake, Virginia 23322 (Maps available for reference only, not for distribution.)

INITIAL NFIP MAP DATE
June 18, 1970

FLOOD HAZARD BOUNDARY MAP REVISIONS
None

FLOOD INSURANCE RATE MAP EFFECTIVE DATE
July 17, 1970

FLOOD INSURANCE RATE MAP REVISIONS
January 22, 1976
February 2, 1977

May 2, 1999 - to change Special Flood Hazard Areas, to add roads and road names, to reflect updated topographic information, to incorporate previously issued Letters of Map Revision, and to update corporate limits and map format.
December 16, 2014 - to incorporate new detailed Coastal Flood Hazard Analyses and to update map format.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0015D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF CHESAPEAKE, VIRGINIA INDEPENDENT CITY

PANEL 15 OF 122
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHESAPEAKE, CITY OF	510034	0015	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5100340015D

MAP REVISED
DECEMBER 16, 2014

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS-12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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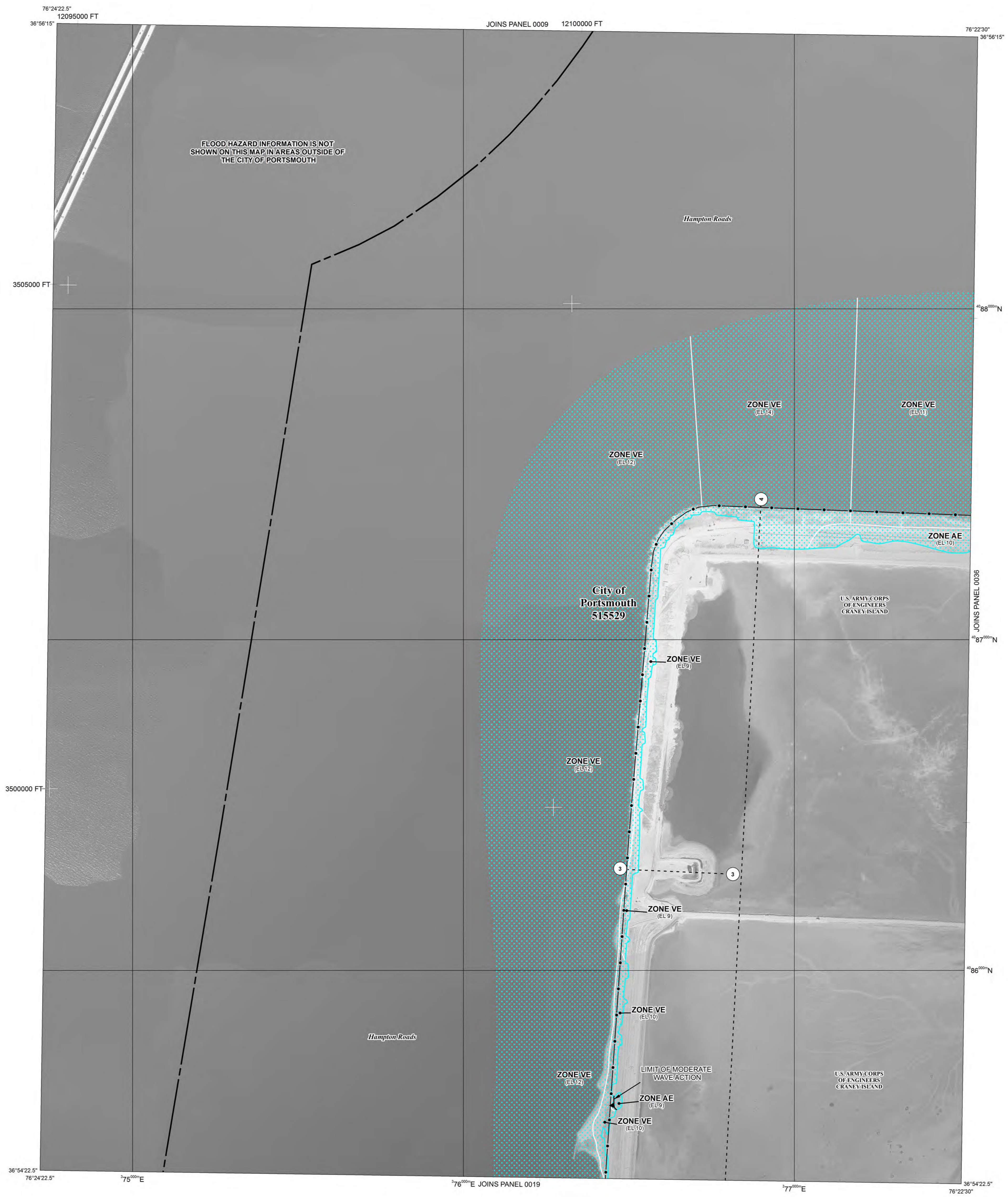
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If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2827) or visit the FEMA website at <http://www.fema.gov/business/nfip>.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently described. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- Base Flood Elevation line and value; elevation in feet* (EL 987)
- Base Flood Elevation value where uniform within zone; elevation in feet

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Plume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge
- Geographic coordinates; referenced to the North American Datum of 1983 (NAD 83); Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 18N
- 5000-foot grid values: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- River Mile

MAP REPOSITORY
Department of Planning, City Hall Building, 851 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)

INITIAL NFIP MAP DATE
May 15, 1970

FLOOD HAZARD BOUNDARY MAP REVISIONS
None

FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970

FLOOD INSURANCE RATE MAP REVISIONS
None

For description of revisions, see the Notice to Users page in the Flood Insurance Study report.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0017D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA INDEPENDENT CITY

PANEL 17 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0017	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290017D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

NOTES TO USERS

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To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA NINGS-12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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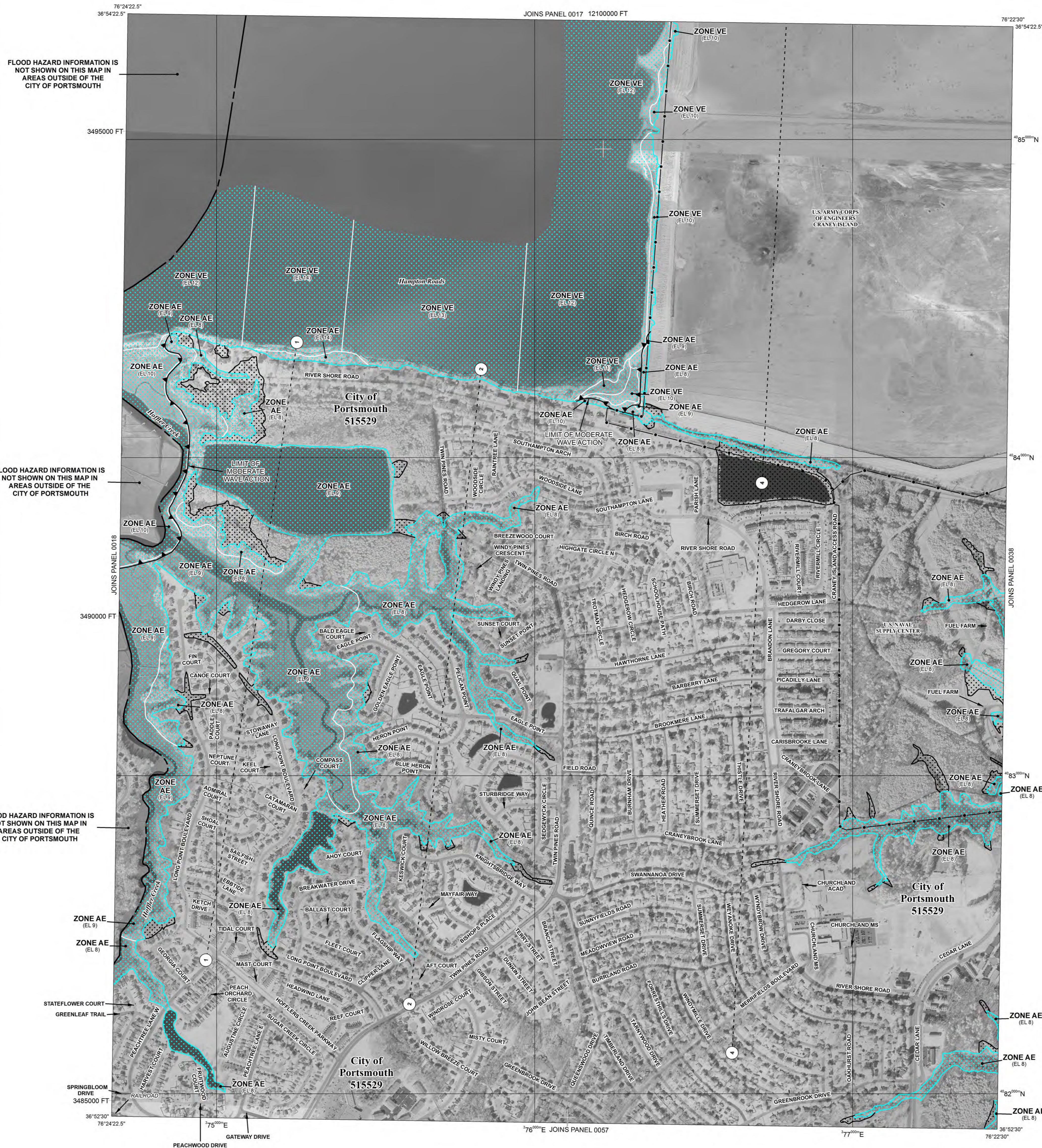
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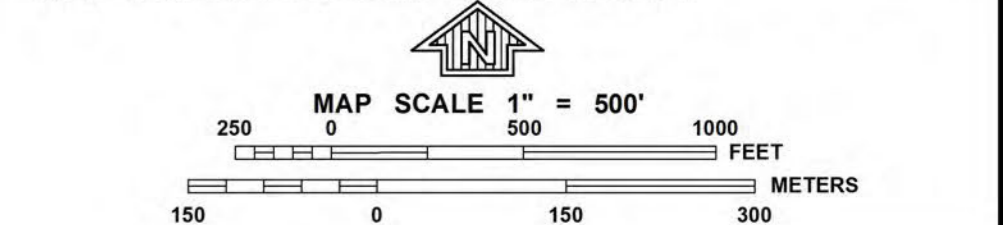
FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF THE CITY OF PORTSMOUTH

FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF THE CITY OF PORTSMOUTH

FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF THE CITY OF PORTSMOUTH

LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
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 - ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
 - ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
 - ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
 - FLOODWAY AREAS IN ZONE AE**
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
 - OTHER FLOOD AREAS**
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
 - OTHER AREAS**
ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.
 - COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
 - OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
 - 0.2% annual chance floodplain boundary
 - Floodway boundary
 - Zone D boundary
 - CBRS and OPA boundary
 - Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
 - Limit of Moderate Wave Action
 - Base Flood Elevation line and value; elevation in feet* (EL 987)
 - Base Flood Elevation value where uniform within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988
- Cross section line
 - Transect line
 - Culvert, Flume, Penstock or Aqueduct
 - Road or Railroad Bridge
 - Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 76°07'45", 32°22'30"
 - 76°07'45", 32°22'30"
 - 1000-meter Universal Transverse Mercator grid values, zone 18N
 - 600000 FT
 - 5000-foot grid values: Virginia State Plane coordinate system, South zone (FPSZONE 4502), Lambert Conformal Conic projection
 - Bench mark (see explanation in Notes to Users section of this FIRM panel)
 - M1.5 River Mile
- MAP REPOSITORY
Department of Planning, City Hall Building, 851 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
- INITIAL NFIP MAP DATE
May 15, 1970
- FLOOD HAZARD BOUNDARY MAP REVISIONS
None
- FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
- FLOOD INSURANCE RATE MAP REVISIONS
For description of revisions, see the Notice to Users page in the Flood Insurance Study report.
- To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0019D

FIRM
FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA
INDEPENDENT CITY

PANEL 19 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
COMMUNITY PORTSMOUTH, CITY OF NUMBER 515529 PANEL 0019 SUFFIX D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290019D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

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National Geodetic Survey
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1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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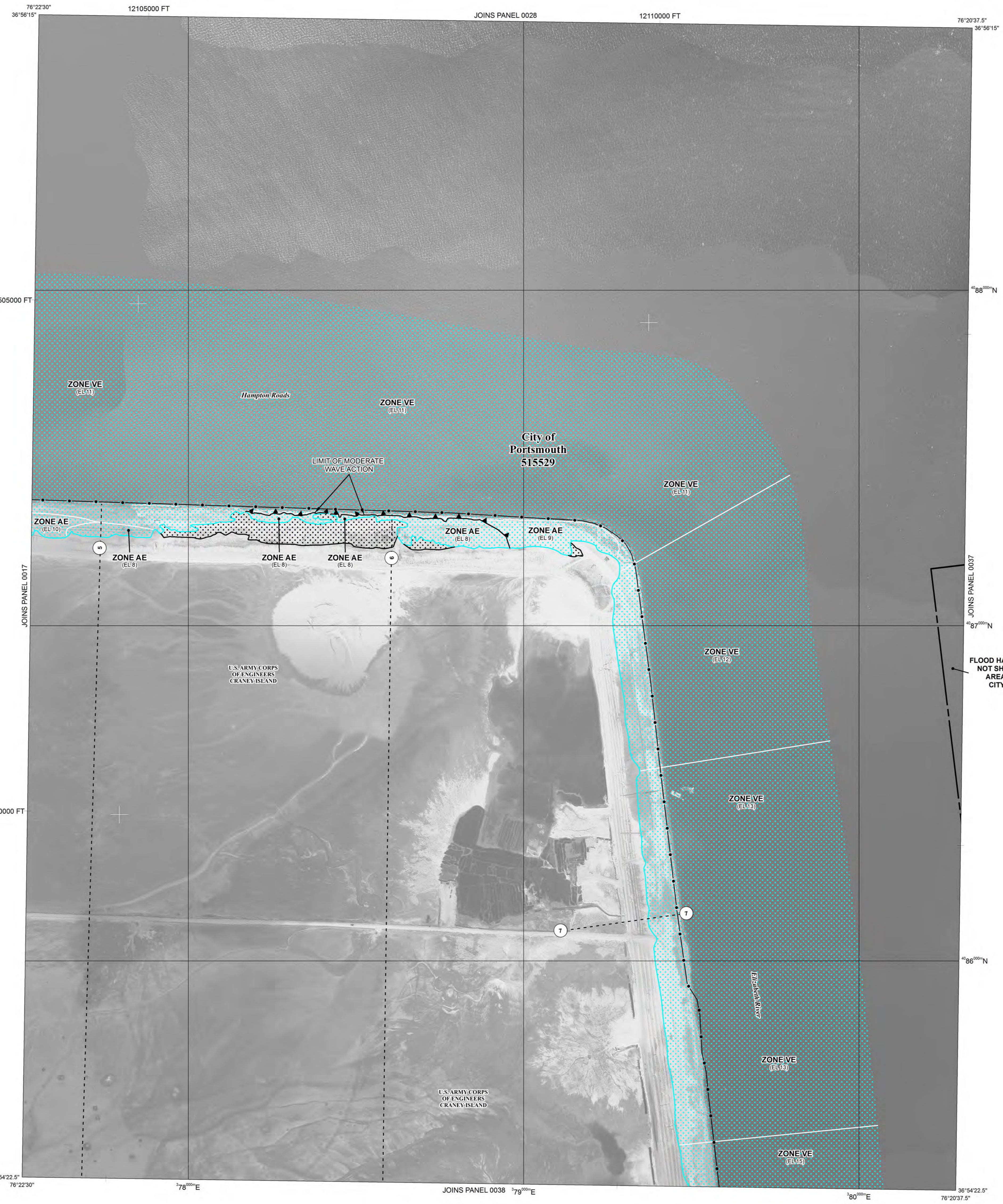
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LEGEND

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 - ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
 - ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
 - ZONE AV** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
 - ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
 - ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
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 - 0.2% annual chance floodplain boundary
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 - Zone D boundary
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 - 600000 FT
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 - Bench mark (see explanation in Notes to Users section of this FIRM panel)
 - DX5510 x
 - M1.5
 - River Mile
- MAP REPOSITORY**
Department of Planning, City Hall Building, 851 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
- INITIAL NFIP MAP DATE
May 15, 1970
- FLOOD HAZARD BOUNDARY MAP REVISIONS
None
- FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
- FLOOD INSURANCE RATE MAP REVISIONS
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- MAP SCALE 1" = 500'**
- 250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0036D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA

INDEPENDENT CITY

PANEL 36 OF 91

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0036	D

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MAP NUMBER
5155290036D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

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Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel locations that differ from what is shown on this map. Also, the road to floodplain relationships for unreviewed streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map showing the layout of map panels for this jurisdiction.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LIMWA)**. The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

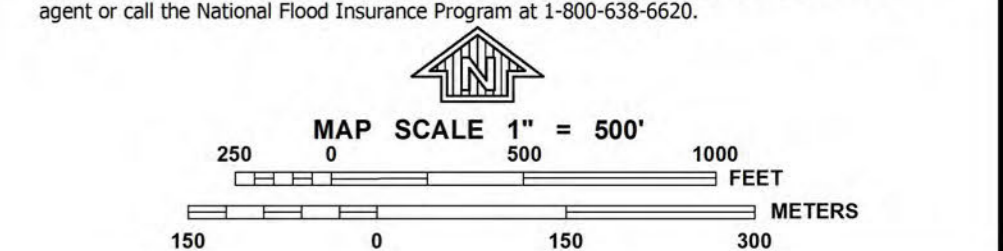
For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMX) at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/nfip>.



LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently described. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988
- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge
- 87°07'45", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 76°N 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT 5000-foot grid values: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
- DX5510 x Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile
- MAP REPOSITORY
Department of Planning, City Hall Building, 851 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
INITIAL NFIP MAP DATE
May 15, 1970
FLOOD HAZARD BOUNDARY MAP REVISIONS
None
FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
FLOOD INSURANCE RATE MAP REVISIONS
For description of revisions, see the Notice To Users page in the Flood Insurance Study report.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA
INDEPENDENT CITY

PANEL 38 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0038	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290038D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NINGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided in digital format by the City of Portsmouth Geographic Information System Office. This information was photogrammetrically compiled at a scale of 1" = 120' from aerial photography dated March 1999.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unreviewed streams may differ from what is shown on previous maps.

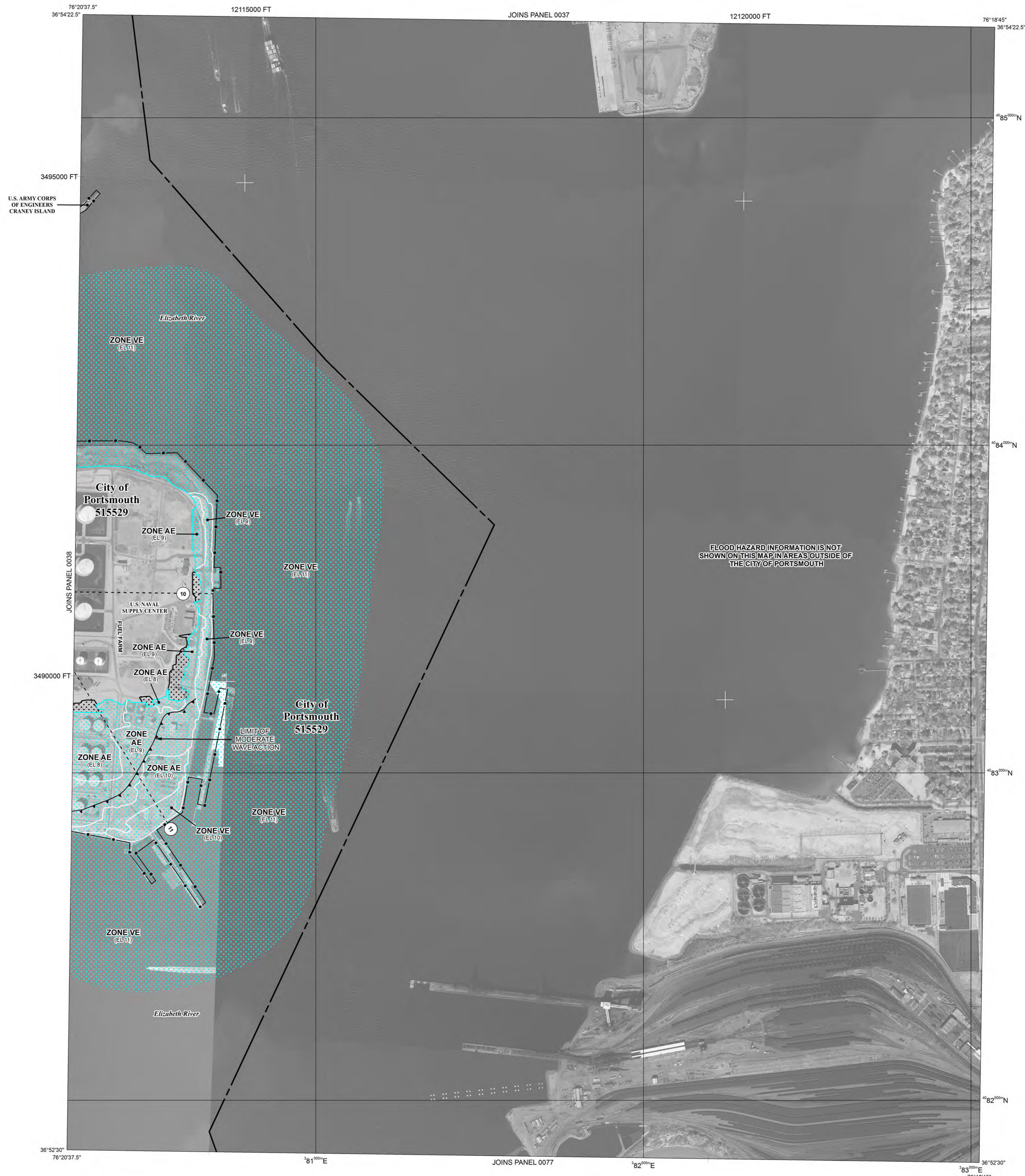
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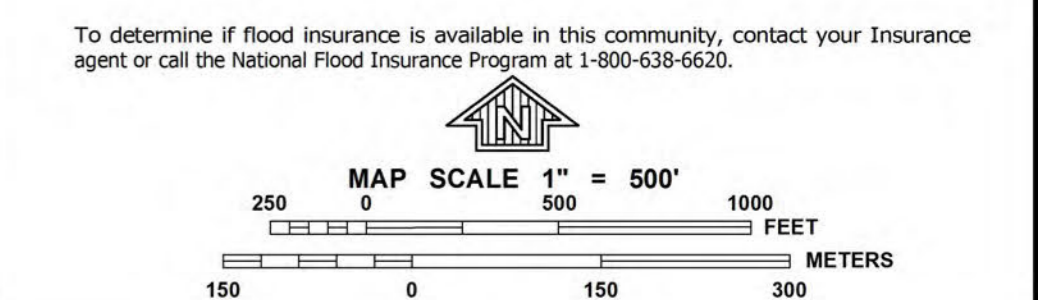
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LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
 - ZONE AE** Base Flood Elevations determined.
 - ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
 - ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of atypical fan flooding, velocities also determined.
 - ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
 - ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
 - ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
 - ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
 - ZONE D** Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
 - 0.2% annual chance floodplain boundary
 - Floodway boundary
 - Zone D boundary
 - CBRS and OPA boundary
 - Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
 - Limit of Moderate Wave Action
 - Base Flood Elevation line and value; elevation in feet* (EL 987)
 - Base Flood Elevation value where uniform within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988
- Cross section line
 - Transect line
 - Culvert, Flume, Penstock or Aqueduct
 - Road or Railroad Bridge
 - Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 76°04'45", 32°22'30"
 - 76°04'N
 - 1000-meter Universal Transverse Mercator grid values, zone 18N
 - 600000 FT
 - 5000-foot grid values; Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
 - Bench mark (see explanation in Notes to Users section of this FIRM panel)
 - DX5510 x
 - M1.5
 - River Mile
- MAP REPOSITORY**
Department of Planning, City Hall Building, 851 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
- INITIAL NFIP MAP DATE
May 15, 1970
- FLOOD HAZARD BOUNDARY MAP REVISIONS
None
- FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
- FLOOD INSURANCE RATE MAP REVISIONS
None
- For description of revisions, see the Notice to Users page in the Flood Insurance Study report.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0039D

FIRM
FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA
INDEPENDENT CITY

PANEL 39 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0039	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290039D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

NOTES TO USERS

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Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS-12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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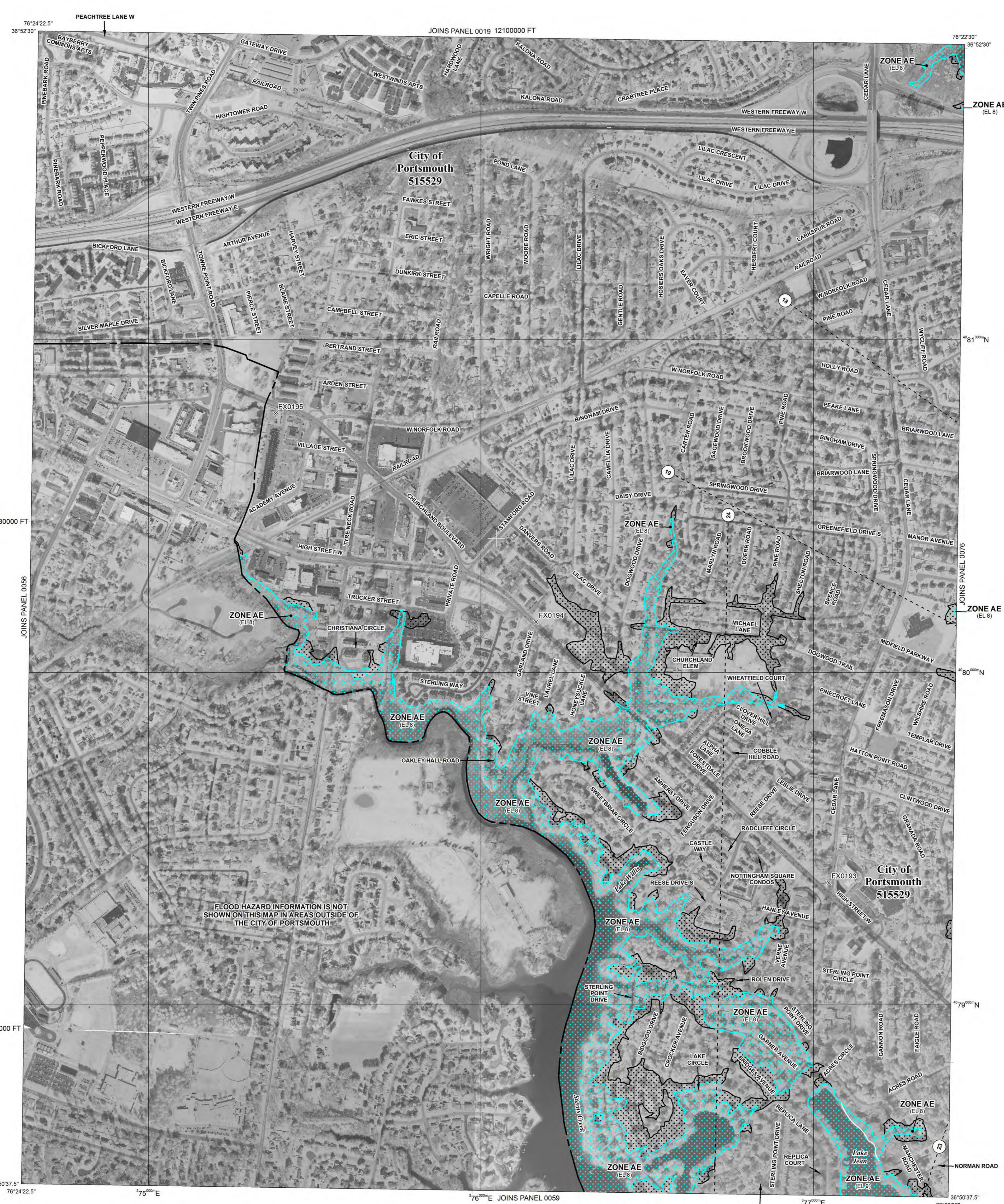
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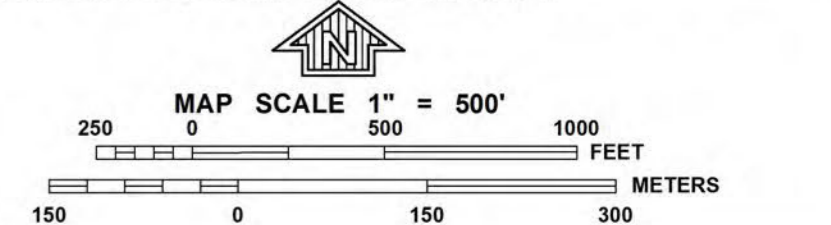
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LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AV, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
 - ZONE AE** Base Flood Elevations determined.
 - ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
 - ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
 - ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
 - ZONE AV** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
 - ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
 - ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
 - OTHER AREAS** Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
 - 0.2% annual chance floodplain boundary
 - Floodway boundary
 - Zone D boundary
 - CBRS and OPA boundary
 - Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
 - Limit of Moderate Wave Action
 - Base Flood Elevation line and value; elevation in feet* (EL 987)
 - Base Flood Elevation value where uniform within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988
- Cross section line
 - Transect line
 - Culvert, Flume, Penstock or Aqueduct
 - Road or Railroad Bridge
 - Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 18N
 - 5000-foot grid values: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
 - Bench mark (see explanation in Notes to Users section of this FIRM panel)
 - M1.5 River Mile
- MAP REPOSITORY**
Department of Planning, City Hall Building, 801 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
- INITIAL NFIP MAP DATE
May 15, 1970
- FLOOD HAZARD BOUNDARY MAP REVISIONS
None
- FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
- FLOOD INSURANCE RATE MAP REVISIONS
None
- For description of revisions, see the Notice To Users page in the Flood Insurance Study report.
- To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0057D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA INDEPENDENT CITY

PANEL 57 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0057	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290057D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

NOTES TO USERS

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Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

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NGS Information Services
NOAA/NNGS-12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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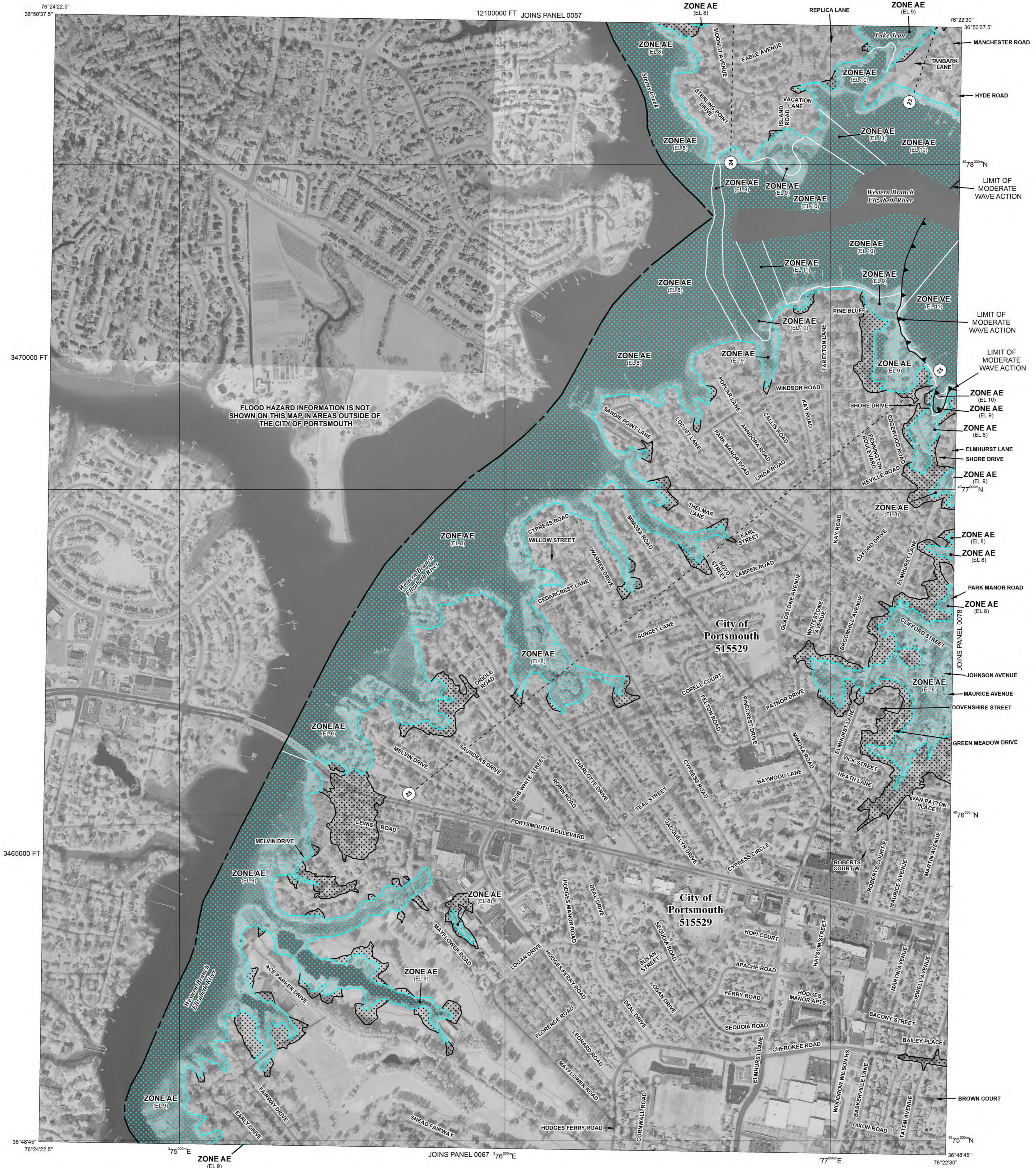
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LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A**: No Base Flood Elevations determined.
- ZONE AE**: Base Flood Elevations determined.
- ZONE AH**: Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO**: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR**: Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently described. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99**: Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V**: Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE**: Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X**: Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- ZONE D**: Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

OTHER AREAS

- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

- 76°00'N
- 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT
- 5000-foot grid values: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5
- River Mile

MAP REPOSITORY
Department of Planning, City Hall Building, 501 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)

INITIAL NFIP MAP DATE
May 15, 1970

FLOOD HAZARD BOUNDARY MAP REVISIONS
None

FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970

FLOOD INSURANCE RATE MAP REVISIONS
For description of revisions, see the Notice to Users page in the Flood Insurance Study report.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0059D

FIRM
FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA
INDEPENDENT CITY

PANEL 59 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0059	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290059D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

NOTES TO USERS

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Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA NINGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided in digital format by the City of Portsmouth Geographic Information System Office. This information was photogrammetrically compiled at a scale of 1" = 120' from aerial photography dated March 1999.

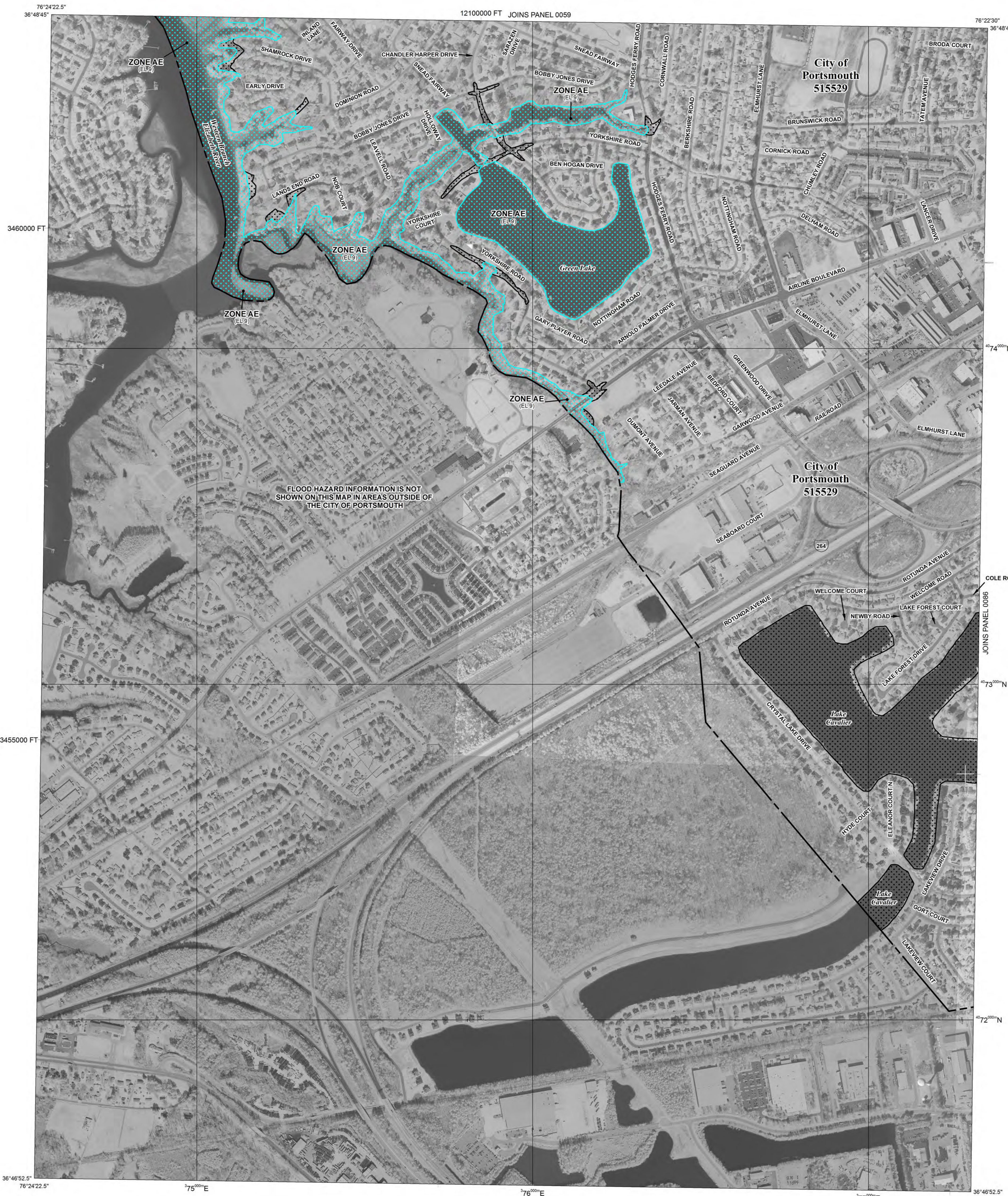
Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unreviewed streams may differ from what is shown on previous maps.

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LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
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 - ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently described. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
 - ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
 - ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
 - ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
- ZONE D** Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
 - 0.2% annual chance floodplain boundary
 - Floodway boundary
 - Zone D boundary
 - CBRS and OPA boundary
 - Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
 - Limit of Moderate Wave Action
 - Base Flood Elevation line and value; elevation in feet* (EL 987)
 - Base Flood Elevation value where uniform within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988
- Cross section line
 - Transect line
 - Culvert, Flume, Penstock or Aqueduct
 - Road or Railroad Bridge
 - Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 76°07'45", 32°22'30"
 - 76°07'N
 - 1000-meter Universal Transverse Mercator grid values, zone 18N
 - 600000 FT
 - 5000-foot grid values: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
 - Bench mark (see explanation in Notes to Users section of this FIRM panel)
 - M1.5
 - River Mile
- MAP REPOSITORY**
Department of Planning, City Hall Building, 851 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
- INITIAL NFIP MAP DATE
May 15, 1970
- FLOOD HAZARD BOUNDARY MAP REVISIONS
None
- FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
- FLOOD INSURANCE RATE MAP REVISIONS
None
- For description of revisions, see the Notice To Users page in the Flood Insurance Study report.
- To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.
- MAP SCALE 1" = 500'**
- 250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0067D

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTSMOUTH,
VIRGINIA
INDEPENDENT CITY

PANEL 67 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0067	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290067D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

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NOAA NINGS-12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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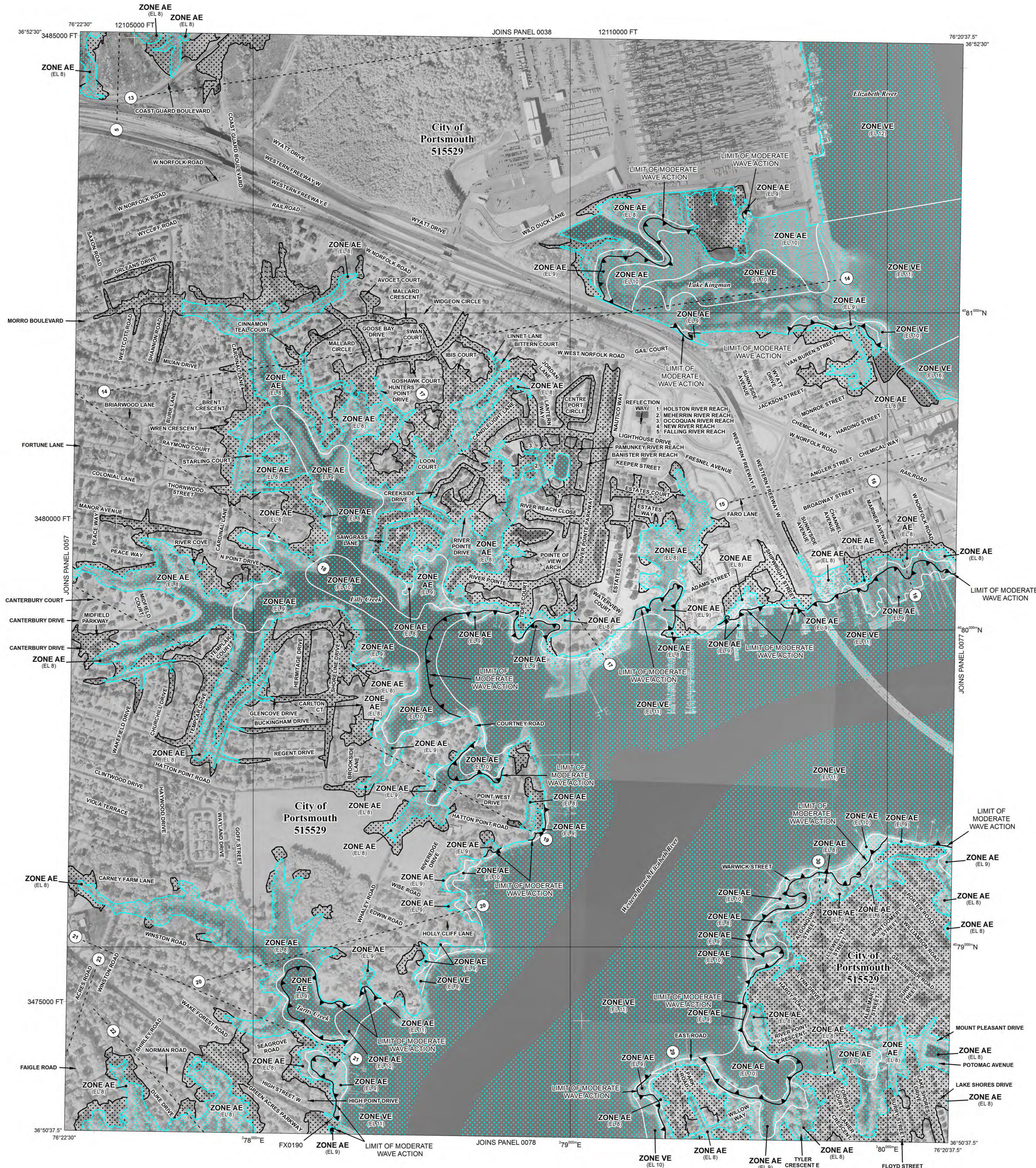
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LEGEND

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ZONE A
No Base Flood Elevations determined.

ZONE AE
Base Flood Elevations determined.

ZONE AH
Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AD
Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of atypical flooding, velocities also determined.

ZONE AR
Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99
Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V
Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE
Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X
Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE D
Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
Limit of Moderate Wave Action
Base Flood Elevation line and value; elevation in feet*
Base Flood Elevation value where uniform within zone; elevation in feet

* Referenced to the North American Vertical Datum of 1988

North arrow
Cross section line
Transect line
Culvert, Flume, Penstock or Aqueduct
Road or Railroad Bridge
Footbridge
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
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1000-meter Universal Transverse Mercator grid values, zone 18N
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5000-foot grid values: Virginia State Plane coordinate system, South zone (FPSZONE 4502), Lambert Conformal Conic projection
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M1.5
River Mile

MAP REPOSITORY
Department of Planning, City Hall Building, 801 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
INITIAL NFIP MAP DATE
May 15, 1970
FLOOD HAZARD BOUNDARY MAP REVISIONS
None
FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
FLOOD INSURANCE RATE MAP REVISIONS
For description of revisions, see the Notice to Users page in the Flood Insurance Study report.

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MAP SCALE 1" = 500'
250 0 500 1000
150 0 150 300
FEET
METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0076D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA
INDEPENDENT CITY

PANEL 76 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0076	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290076D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

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1315 East-West Highway
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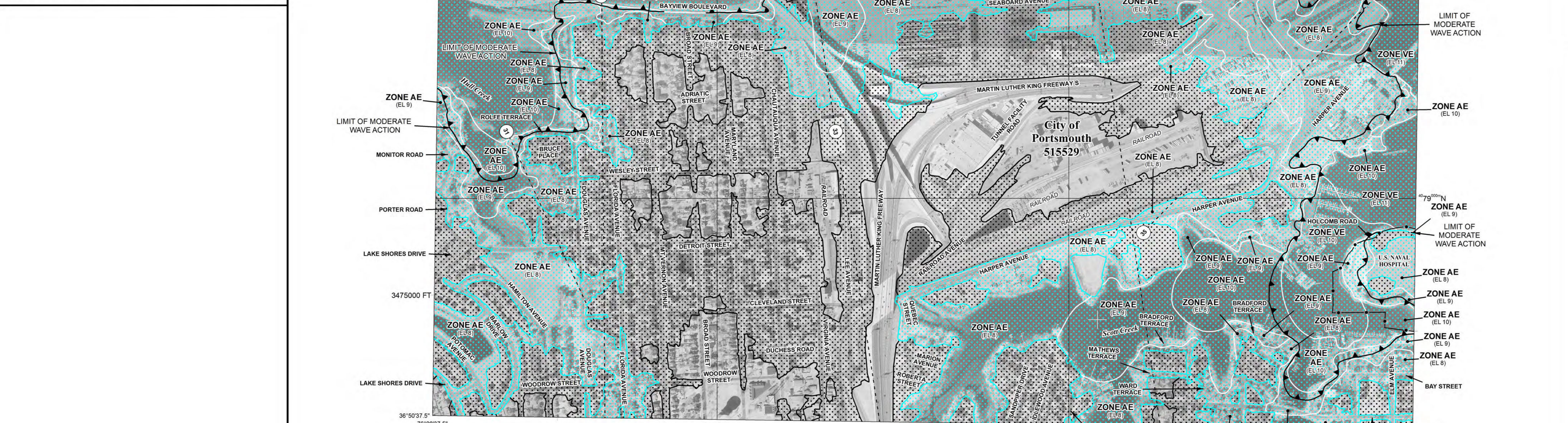
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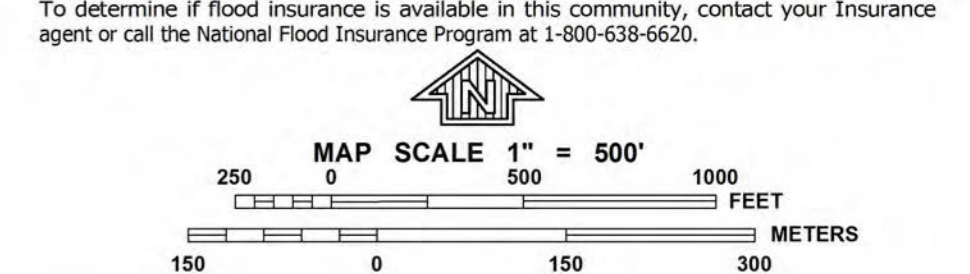
76°20'37.5" 36°52'30" 3485000 FT
12115000 FT
76°18'45" 36°52'30" 12120000 FT
3480000 FT
3475000 FT
3470000 FT
36°50'37.5" 76°20'37.5" 81°00"E 76°18'45" 36°50'37.5"



FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF THE CITY OF PORTSMOUTH

LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of atuvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988
- Transsect line
- Culvert, Plume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 76°18'45", 32°22'30" 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT 5000-foot grid values; Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
- DX5510 x Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile
- MAP REPOSITORY
Department of Planning, City Hall Building, 851 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
- INITIAL NFIP MAP DATE
May 15, 1970
- FLOOD HAZARD BOUNDARY MAP REVISIONS
None
- FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
- FLOOD INSURANCE RATE MAP REVISIONS
For description of revisions, see the Notice To Users page in the Flood Insurance Study report.
- To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0077D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA
INDEPENDENT CITY

PANEL 77 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0077	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290077D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA NIMS-12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided in digital format by the City of Portsmouth Geographic Information System Office. This information was photogrammetrically compiled at a scale of 1" = 120' from aerial photography dated March 1999.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unreviewed streams may differ from what is shown on previous maps.

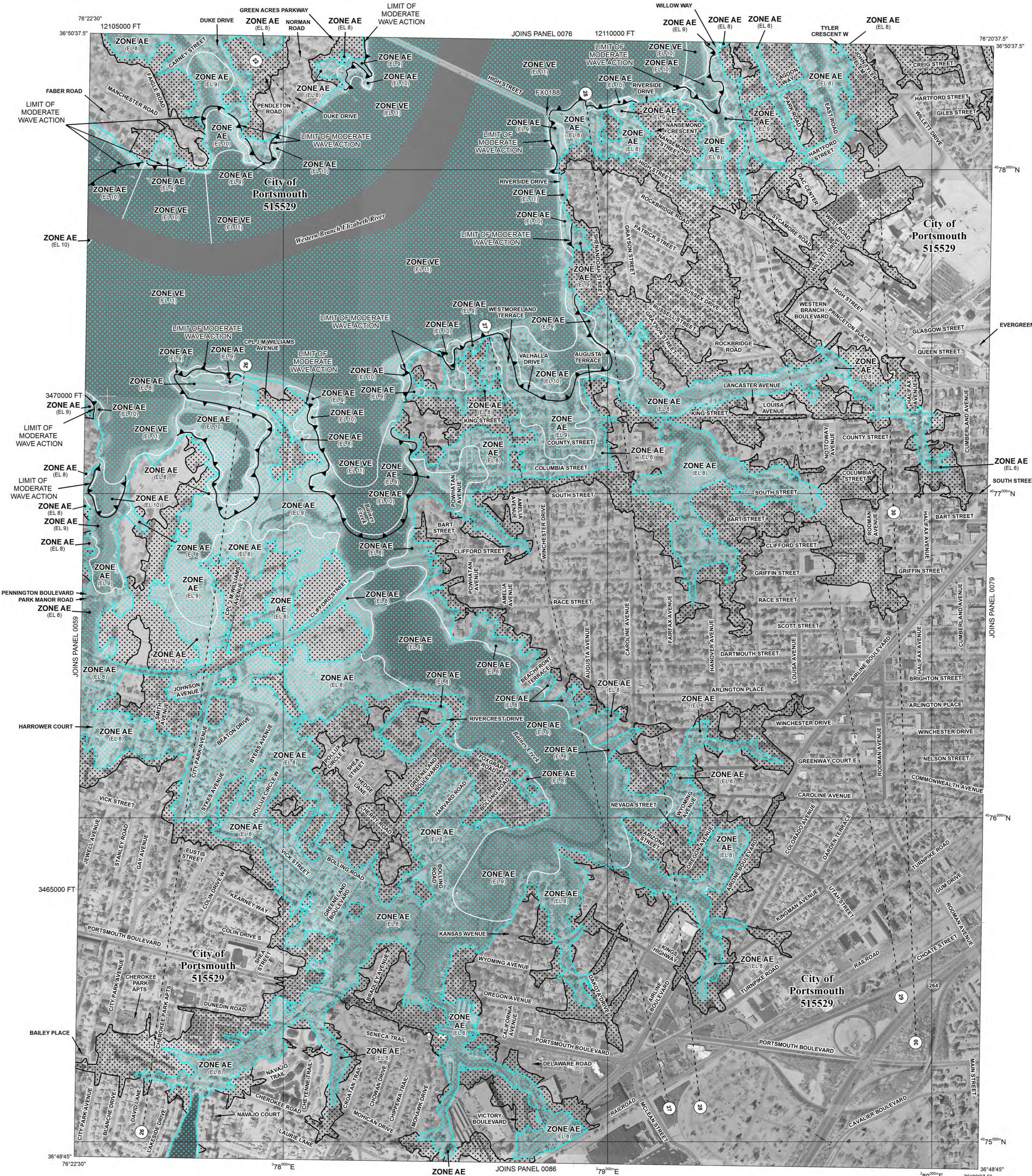
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map showing the layout of map panels for this jurisdiction.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LIMWA)**. The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

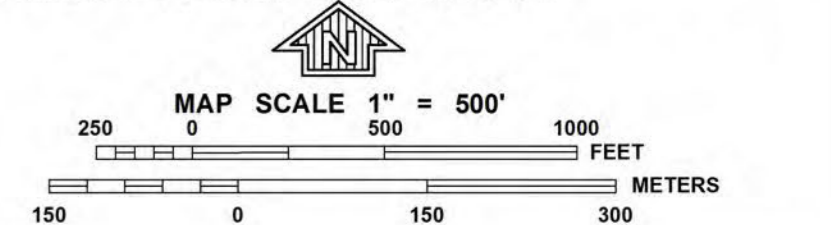
For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/nfp>.



LEGEND

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- ZONE A** No Base Flood Elevations determined.
 - ZONE AE** Base Flood Elevations determined.
 - ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
 - ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
 - ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently described. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
 - ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
 - ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
 - ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
 - OTHER AREAS** Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
 - 0.2% annual chance floodplain boundary
 - Floodway boundary
 - Zone D boundary
 - CBRS and OPA boundary
 - Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
 - Limit of Moderate Wave Action
 - Base Flood Elevation line and value; elevation in feet* (EL 987)
 - Base Flood Elevation value where uniform within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988
- Cross section line
 - Transect line
 - Culvert, Flume, Penstock or Aqueduct
 - Road or Railroad Bridge
 - Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 76°00'N
 - 76°05'N
 - 76°10'N
 - 76°15'N
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 - 76°35'N
 - 76°40'N
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 - 89°35'N
 - 89°40'N
 - 89°45'N
 - 89°50'N
 - 89°55'N
 - 90°00'N
- 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT
- 5000-foot grid values: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection.
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5
 - River Mile
- MAP REPOSITORY**
Department of Planning, City Hall Building, 501 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
- INITIAL NFIP MAP DATE
May 15, 1970
- FLOOD HAZARD BOUNDARY MAP REVISIONS
None
- FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
- FLOOD INSURANCE RATE MAP REVISIONS
For description of revisions, see the Notice To Users page in the Flood Insurance Study report.
- To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0078D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA

INDEPENDENT CITY

PANEL 78 OF 91

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0078	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290078D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

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NGS Information Services
NOAA, NNGS-12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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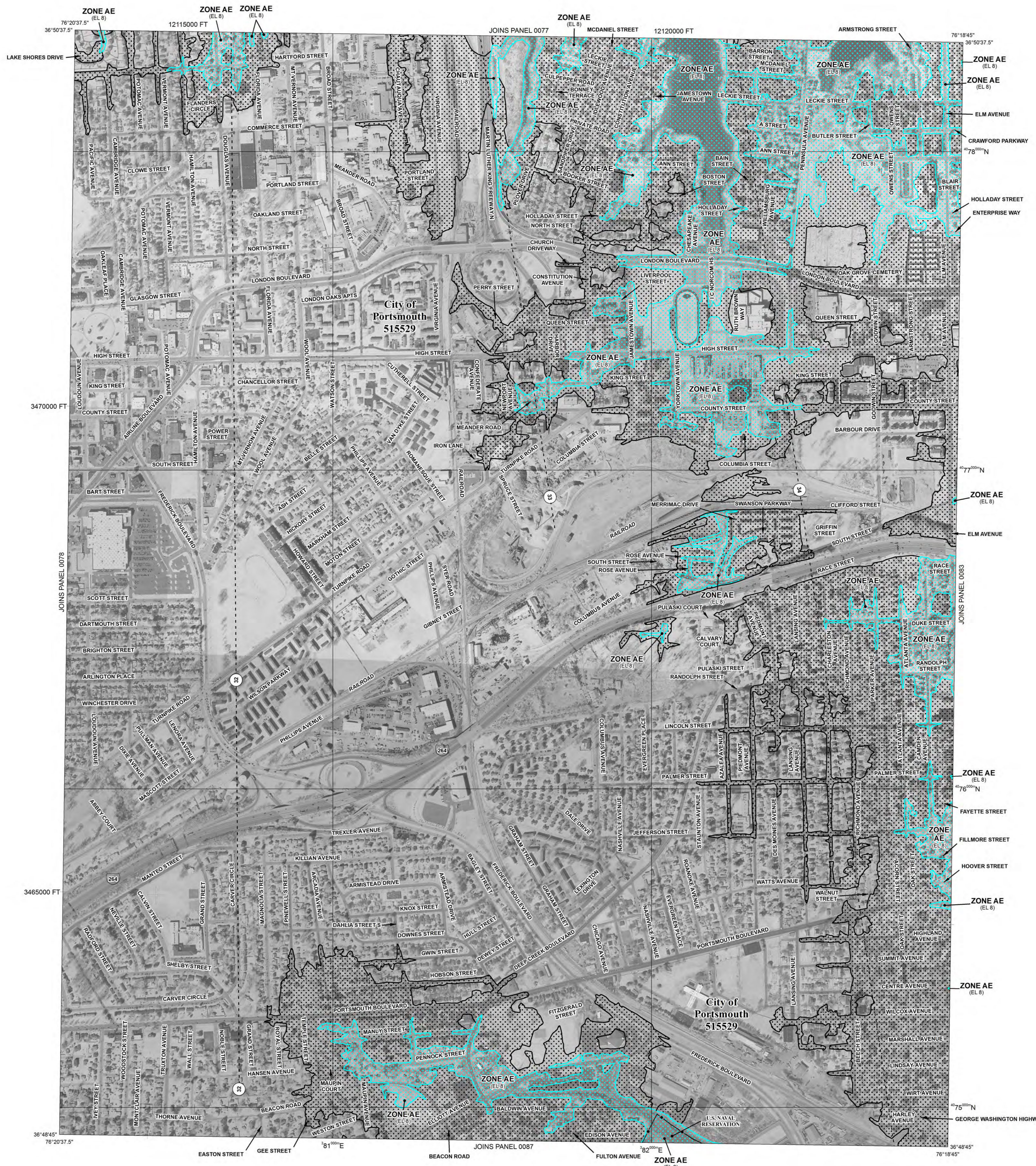
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LEGEND

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FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

- OTHER FLOOD AREAS**
 - ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
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- Zone D boundary
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- Base Flood Elevation line and value; elevation in feet* (EL 987)
- Base Flood Elevation value where uniform within zone; elevation in feet

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

1000-meter Universal Transverse Mercator grid values, zone 18N

600000 FT 5000-foot grid values; Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection.

Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 River Mile

MAP REPOSITORY
Department of Planning, City Hall Building, 801 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)

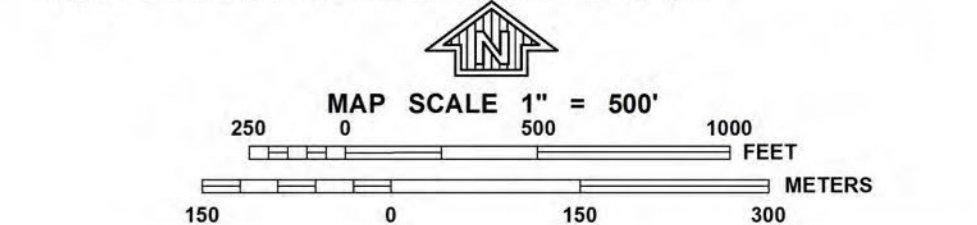
INITIAL NFIP MAP DATE
May 15, 1970

FLOOD HAZARD BOUNDARY MAP REVISIONS
None

FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970

FLOOD INSURANCE RATE MAP REVISIONS
For description of revisions, see the Notice To Users page in the Flood Insurance Study report.

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NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0079D

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTSMOUTH,
VIRGINIA
INDEPENDENT CITY

PANEL 79 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
PORTSMOUTH, CITY OF 515529 0079 D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290079D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

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This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

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Coastal Base Flood Elevations shown on this map apply only to landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA NINGS-12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov>.

Base map information shown on this FIRM was provided in digital format by the City of Portsmouth Geographic Information System Office. This information was photogrammetrically compiled at a scale of 1" = 120' from aerial photography dated March 1999.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unreviewed streams may differ from what is shown on previous maps.

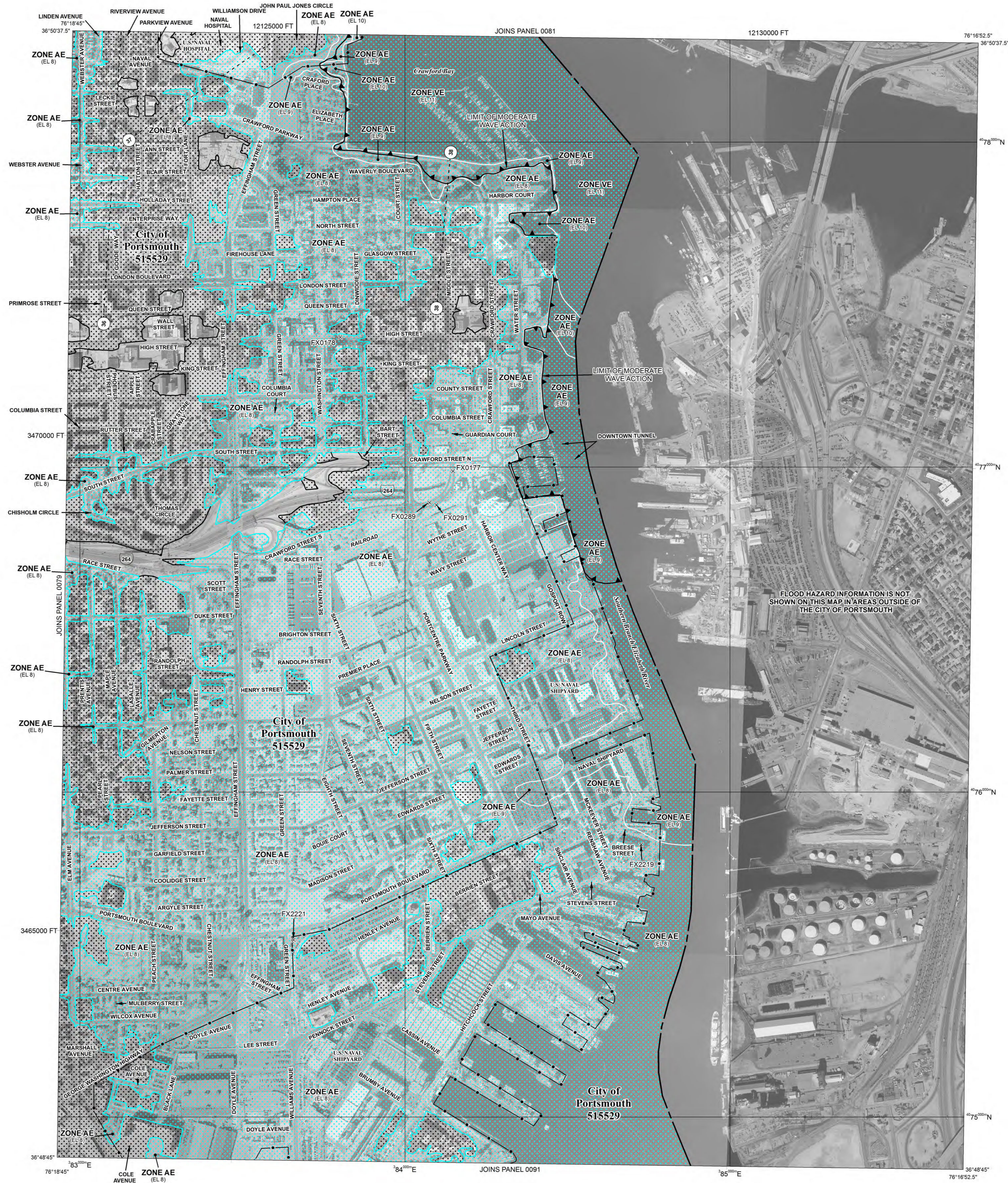
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map showing the layout of map panels for this jurisdiction.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LIMWA)**. The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

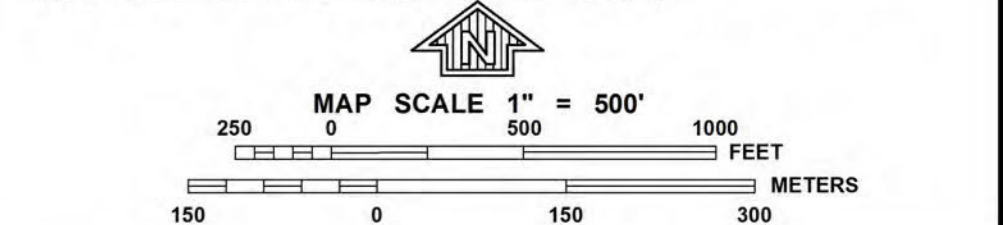
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If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/mfp>.



LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A**: No Base Flood Elevations determined.
 - ZONE AE**: Base Flood Elevations determined.
 - ZONE AH**: Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
 - ZONE AD**: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
 - ZONE AR**: Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently described. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
 - ZONE AB9**: Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
 - ZONE V**: Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
 - ZONE VE**: Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X**: Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
 - OTHER AREAS**: Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
 - 0.2% annual chance floodplain boundary
 - Floodway boundary
 - Zone D boundary
 - CBRS and OPA boundary
 - Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
 - Limit of Moderate Wave Action
 - Base Flood Elevation line and value; elevation in feet* (EL 987)
 - Base Flood Elevation value where uniform within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988
- Cross section line
 - Transect line
 - Culvert, Flume, Penstock or Aqueduct
 - Road or Railroad Bridge
 - Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 18N
 - 60000 FT
 - 5000-foot grid values: Virginia State Plane coordinate system, South zone (FPSZONE 4502), Lambert Conformal Conic projection.
 - Bench mark (see explanation in Notes to Users section of this FIRM panel)
 - M1.5
 - River Mile
- MAP REPOSITORY
Department of Planning, City Hall Building, 801 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
- INITIAL NFIP MAP DATE
May 15, 1970
- FLOOD HAZARD BOUNDARY MAP REVISIONS
None
- FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
- FLOOD INSURANCE RATE MAP REVISIONS
For description of revisions, see the Notice To Users page in the Flood Insurance Study report.
- To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0083D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA

INDEPENDENT CITY

PANEL 83 OF 91

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0083	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290083D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

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Coastal Base Flood Elevations shown on this map apply only to landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA NIMS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. Also, the road to floodplain relationships for unreviewed streams may differ from what is shown on previous maps.

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LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A**: No Base Flood Elevations determined.
- ZONE AE**: Base Flood Elevations determined.
- ZONE AH**: Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO**: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR**: Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99**: Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V**: Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE**: Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X**: Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X**: Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D**: Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- Base Flood Elevation line and value; elevation in feet* (EL 987)
- Base Flood Elevation value where uniform within zone; elevation in feet

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

- 76°07'45", 32°22'30"
- 76°07'45", 32°22'30"
- 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT
- 5000-foot grid values; Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5
- River Mile

MAP REPOSITORY
Department of Planning, City Hall Building, 851 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)

INITIAL NFIP MAP DATE
May 15, 1970

FLOOD HAZARD BOUNDARY MAP REVISIONS
None

FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970

FLOOD INSURANCE RATE MAP REVISIONS
None

For description of revisions, see the Notice To Users page in the Flood Insurance Study report.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0086D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF PORTSMOUTH, VIRGINIA INDEPENDENT CITY

PANEL 86 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	515529	0086	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290086D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

NOTES TO USERS

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Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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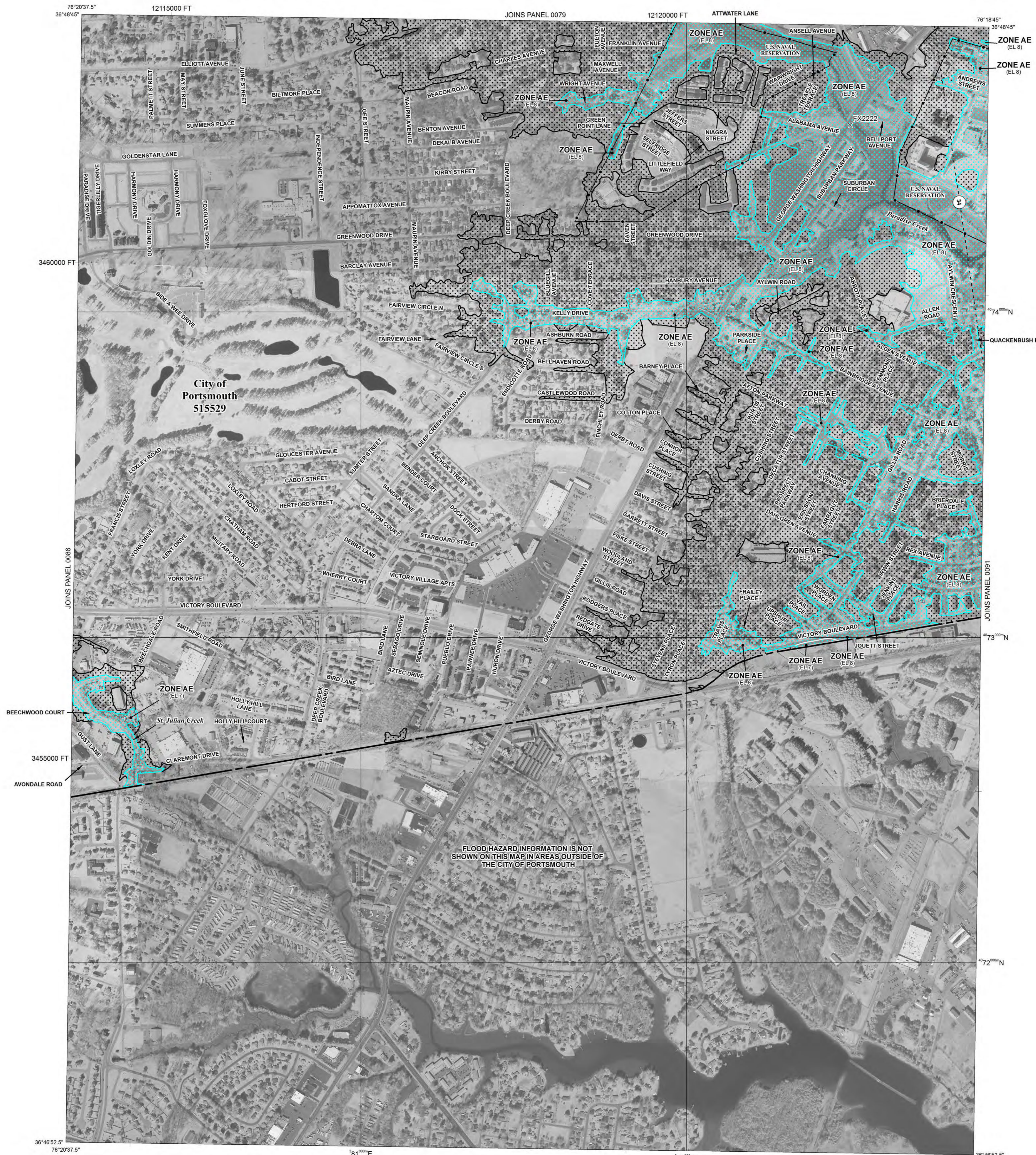
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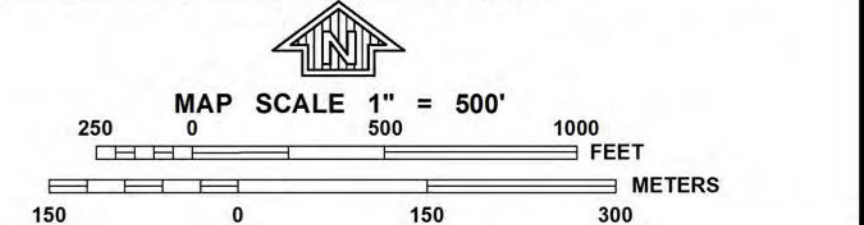
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FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF THE CITY OF PORTSMOUTH.

LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AV, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE AV** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS**
ZONE D Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- Base Flood Elevation line and value; elevation in feet* (EL 987)
- Base Flood Elevation value where uniform within zone; elevation in feet
- * Referenced to the North American Vertical Datum of 1988
- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
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77°00'N
78°00'N
79°00'N
- 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT
- 5000-foot grid values; Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conformal Conic projection
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- DX5510 x
- M1.5
- River Mile
- MAP REPOSITORY
Department of Planning, City Hall Building, 851 Crawford Street, 4th Floor, Portsmouth, Virginia 23704 (Maps available for reference only, not for distribution.)
- INITIAL NFIP MAP DATE
May 15, 1970
- FLOOD HAZARD BOUNDARY MAP REVISIONS
None
- FLOOD INSURANCE RATE MAP EFFECTIVE
May 15, 1970
- FLOOD INSURANCE RATE MAP REVISIONS
None
- For description of revisions, see the Notice To Users page in the Flood Insurance Study report.
- To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0087D

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTSMOUTH,
VIRGINIA
INDEPENDENT CITY

PANEL 87 OF 91
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
PORTSMOUTH, CITY OF 515529 0087 D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
5155290087D

MAP REVISED
AUGUST 3, 2015

Federal Emergency Management Agency

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped

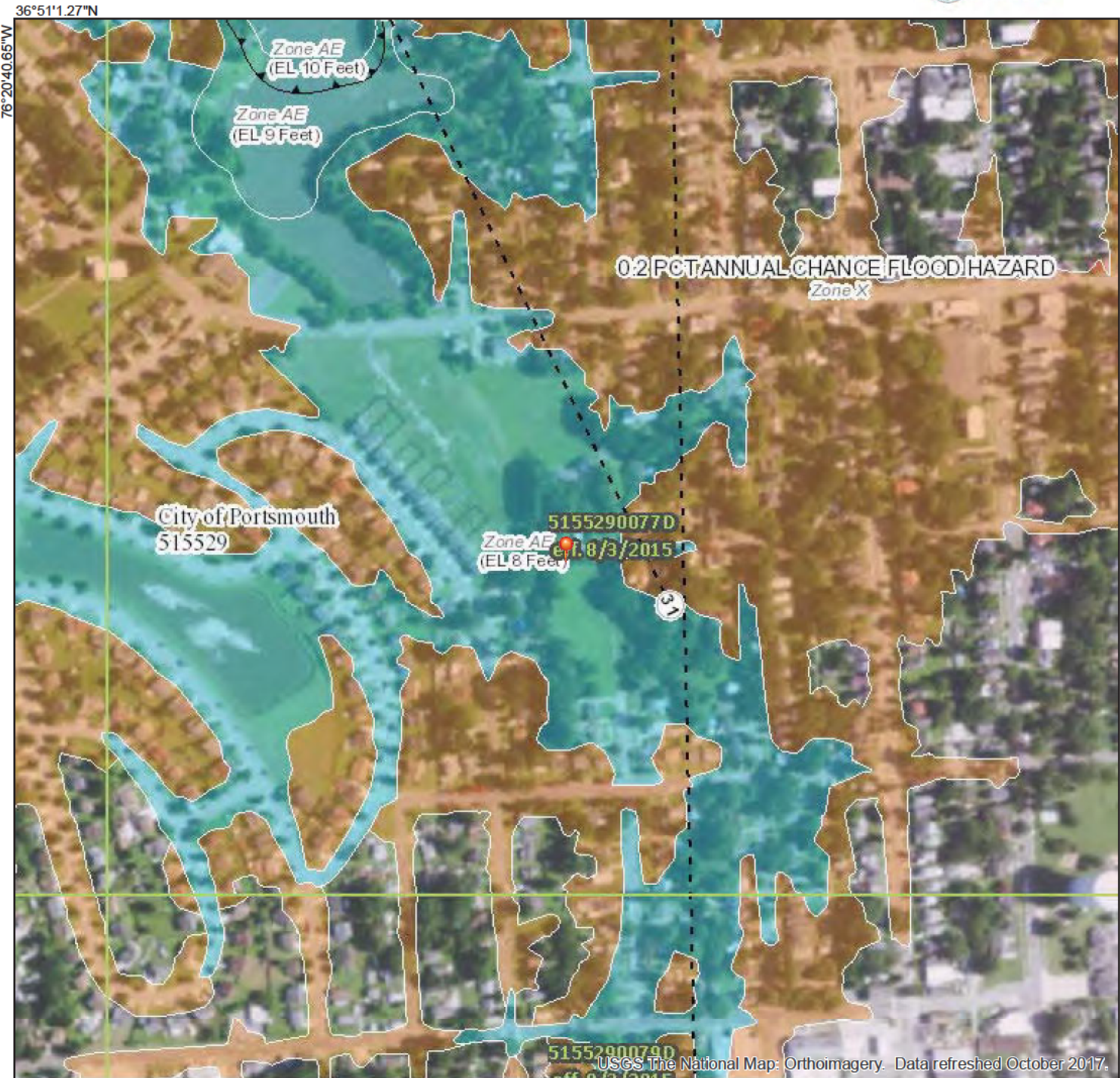


The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/1/2018 at 2:00:52 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



National Flood Hazard Layer FIRMette



36°51'2.73"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | | |
|-----------------------------|--|---|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE)
Zone A, V, A99 |
| | | With BFE or Depth Zone AE, AO, AH, VE, AR |
| | | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
| | | Future Conditions 1% Annual Chance Flood Hazard Zone X |
| | | Area with Reduced Flood Risk due to Levee. See Notes. Zone X |
| | | Area with Flood Risk due to Levee Zone D |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard Zone X |
| | | Effective LOMRs |
| GENERAL STRUCTURES | | Area of Undetermined Flood Hazard Zone D |
| | | Channel, Culvert, or Storm Sewer |
| OTHER FEATURES | | Levee, Dike, or Floodwall |
| | | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
| MAP PANELS | | 17.5 Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |
| | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |
| | | The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location. |

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/1/2018 at 2:01:42 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette



36°54'42.75"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

USGS The National Map: Orthoimagery. Data refreshed October 2017.

36°54'13.99"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/1/2018 at 2:52:04 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



76°20'34.48"W

National Flood Hazard Layer FIRMette



36°48'12.66"N



USGS The National Map: Orthoimagery. Data refreshed October 2017. Feet 1:6,000 36°47'43.85"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR	Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X	Future Conditions 1% Annual Chance Flood Hazard Zone X	Area with Reduced Flood Risk due to Levee. See Notes. Zone X	Area with Flood Risk due to Levee Zone D

OTHER AREAS	Area of Minimal Flood Hazard Zone X	Effective LOMRs	Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES			
	Channel, Culvert, or Storm Sewer	Levee, Dike, or Floodwall	

OTHER FEATURES	Cross Sections with 1% Annual Chance Water Surface Elevation	Coastal Transect	Base Flood Elevation Line (BFE)	Limit of Study	Jurisdiction Boundary	Coastal Transect Baseline	Profile Baseline	Hydrographic Feature

MAP PANELS	Digital Data Available	No Digital Data Available	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/1/2018 at 2:18:02 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



76°18'29.64"W

76°17'52.18"W

National Flood Hazard Layer FIRMette



36°56'38.17"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>

OTHER AREAS		Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
		Area of Undetermined Flood Hazard <i>Zone D</i>

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline

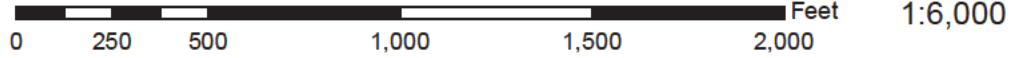
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/1/2018 at 2:32:24 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



USGS The National Map: Orthoimagery. Data refreshed October 2017.

36°56'9.41"N

76°22'23.25"W



National Flood Hazard Layer FIRMMette



36°47'50.79"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/1/2018 at 2:18:35 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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0 250 500 1,000 1,500 2,000 Feet 1:6,000

36°47'21.98"N

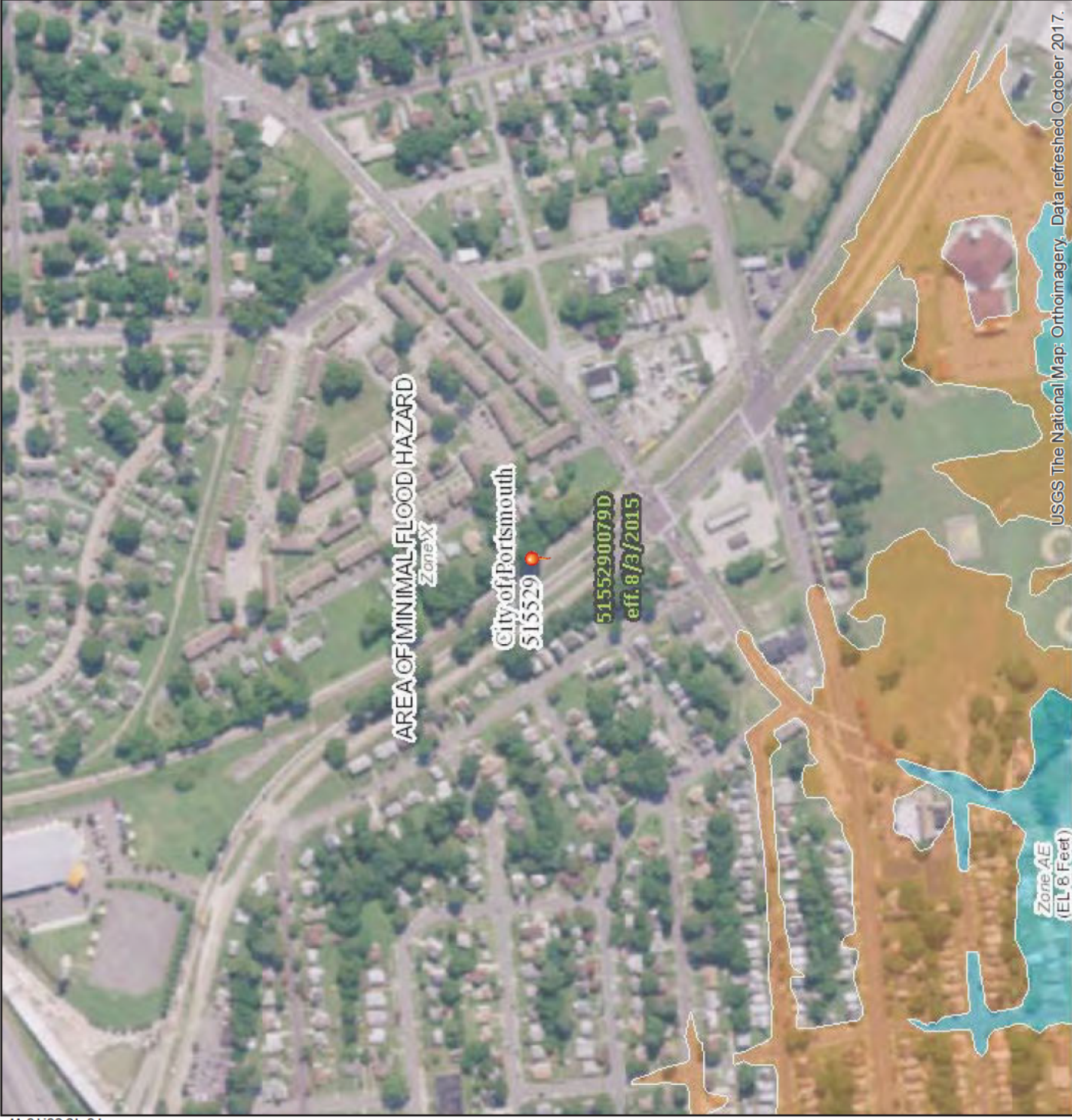
76°19'48.37"W

USGS The National Map: Orthoimagery. Data refreshed October 2017.

National Flood Hazard Layer FIRMette



36°49'21.83"N



76°19'18.70"W

USGS The National Map: Orthoimagery. Data refreshed October 2017. 36°48'53.03"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE)
Zone A, V, A199
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*

Future Conditions 1% Annual Chance Flood Hazard *Zone X*

Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*

Area with Flood Risk due to Levee *Zone D*

OTHER AREAS OF FLOOD HAZARD

NO SCREEN

Area of Minimal Flood Hazard *Zone X*

Effective LOMRs

Area of Undetermined Flood Hazard *Zone D*

OTHER AREAS

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

20.2
17.5

Cross Sections with 1% Annual Chance Water Surface Elevation

Coastal Transect

Base Flood Elevation Line (BFE)

Limit of Study

Jurisdiction Boundary

Coastal Transect Baseline

Profile Baseline

Hydrographic Feature

OTHER FEATURES

Digital Data Available

No Digital Data Available

Unmapped

MAP PANELS



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/1/2018 at 2:16:26 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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National Flood Hazard Layer FIRMette



36°49'13.92"N



USGS The National Map: Orthoimagery. Data refreshed October 2017. 0 250 500 1,000 1,500 2,000 Feet 1:6,000 36°48'45.12"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2
		17.5
		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
OTHER FEATURES		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/1/2018 at 2:47:30 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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76°18'6.78"W



National Flood Hazard Layer FIRMette



36°52'58.11"N



USGS The National Map: Orthoimagery. Data refreshed October 2017. Feet 1:6,000 36°52'29.33"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR	Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X	Future Conditions 1% Annual Chance Flood Hazard Zone X	Area with Reduced Flood Risk due to Levee. See Notes. Zone X	Area with Flood Risk due to Levee Zone D

OTHER AREAS	Area of Minimal Flood Hazard Zone X	Effective LOMRs	Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer	Levee, Dike, or Floodwall

OTHER FEATURES	Cross Sections with 1% Annual Chance Water Surface Elevation	Coastal Transect	Base Flood Elevation Line (BFE)	Limit of Study	Jurisdiction Boundary	Coastal Transect Baseline	Profile Baseline	Hydrographic Feature

MAP PANELS	Digital Data Available	No Digital Data Available	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/1/2018 at 2:36:27 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



76°21'49.63"W

76°21'12.18"W

National Flood Hazard Layer FIRMette



36°49'36.67"N



USGS The National Map: Orthoimagery. Data refreshed October 2017. 36°49'7.87"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway	

OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee. See Notes. Zone X
	Area with Flood Risk due to Levee Zone D

OTHER AREAS	Area of Minimal Flood Hazard Zone X
	NO SCREEN
	Effective LOMRs
	Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall

OTHER FEATURES	Cross Sections with 1% Annual Chance Water Surface Elevation
	20.2
	17.5
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature

MAP PANELS	Digital Data Available
	No Digital Data Available
	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/1/2018 at 2:15:54 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

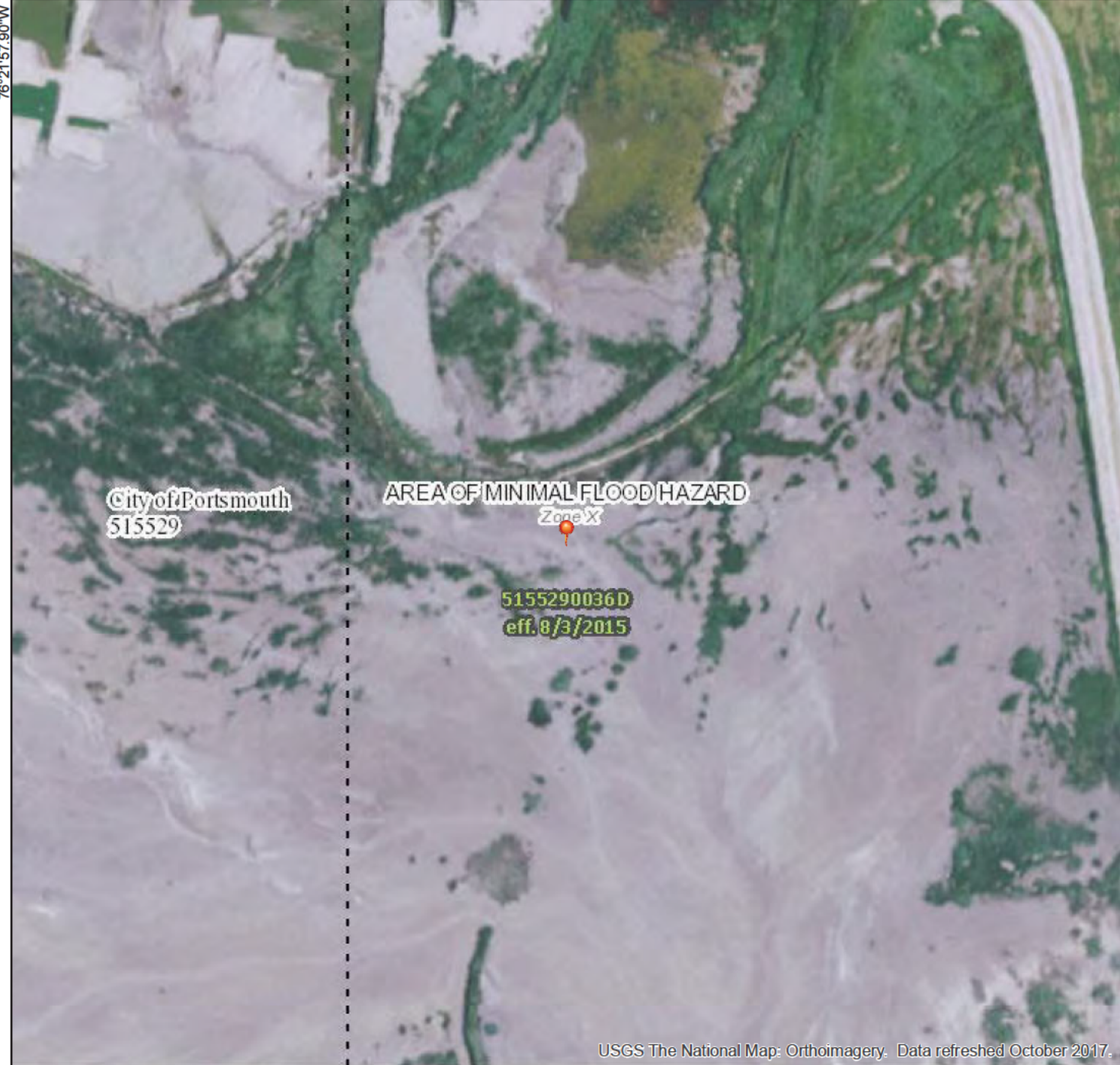
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

76°21'33.42"W

National Flood Hazard Layer FIRMette



36°55'20.34"N



USGS The National Map: Orthoimagery. Data refreshed October 2017. 36°54'51.58"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/1/2018 at 1:55:49 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

76°21'57.90"W

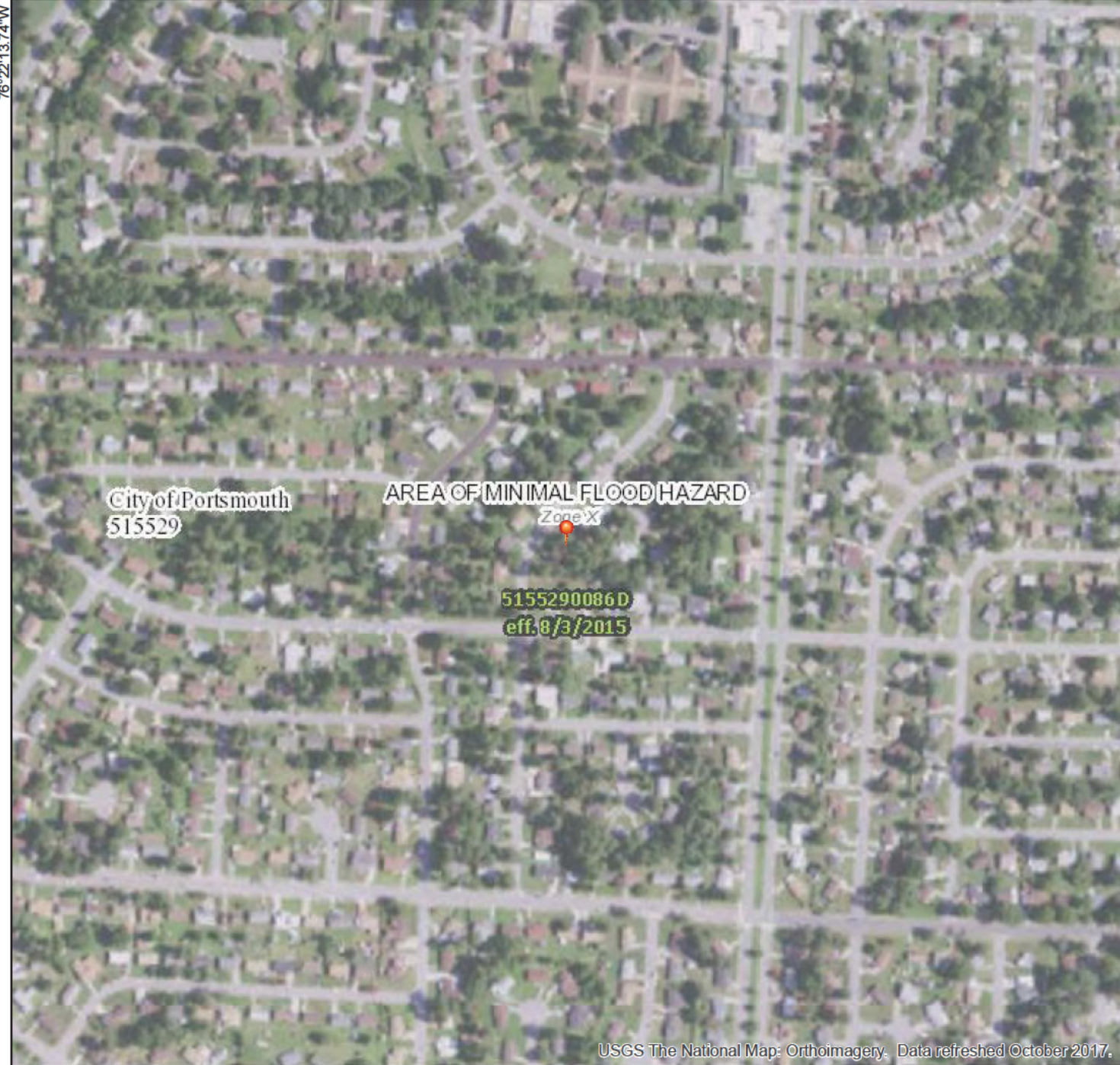
76°21'20.44"W

0 250 500 1,000 1,500 2,000 Feet 1:6,000

National Flood Hazard Layer FIRMMette



36°47'59.26"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



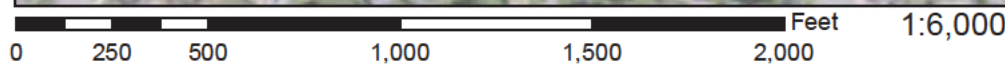
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/1/2018 at 2:40:46 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

USGS The National Map: Orthoimagery. Data refreshed October 2017.



36°47'30.45"N

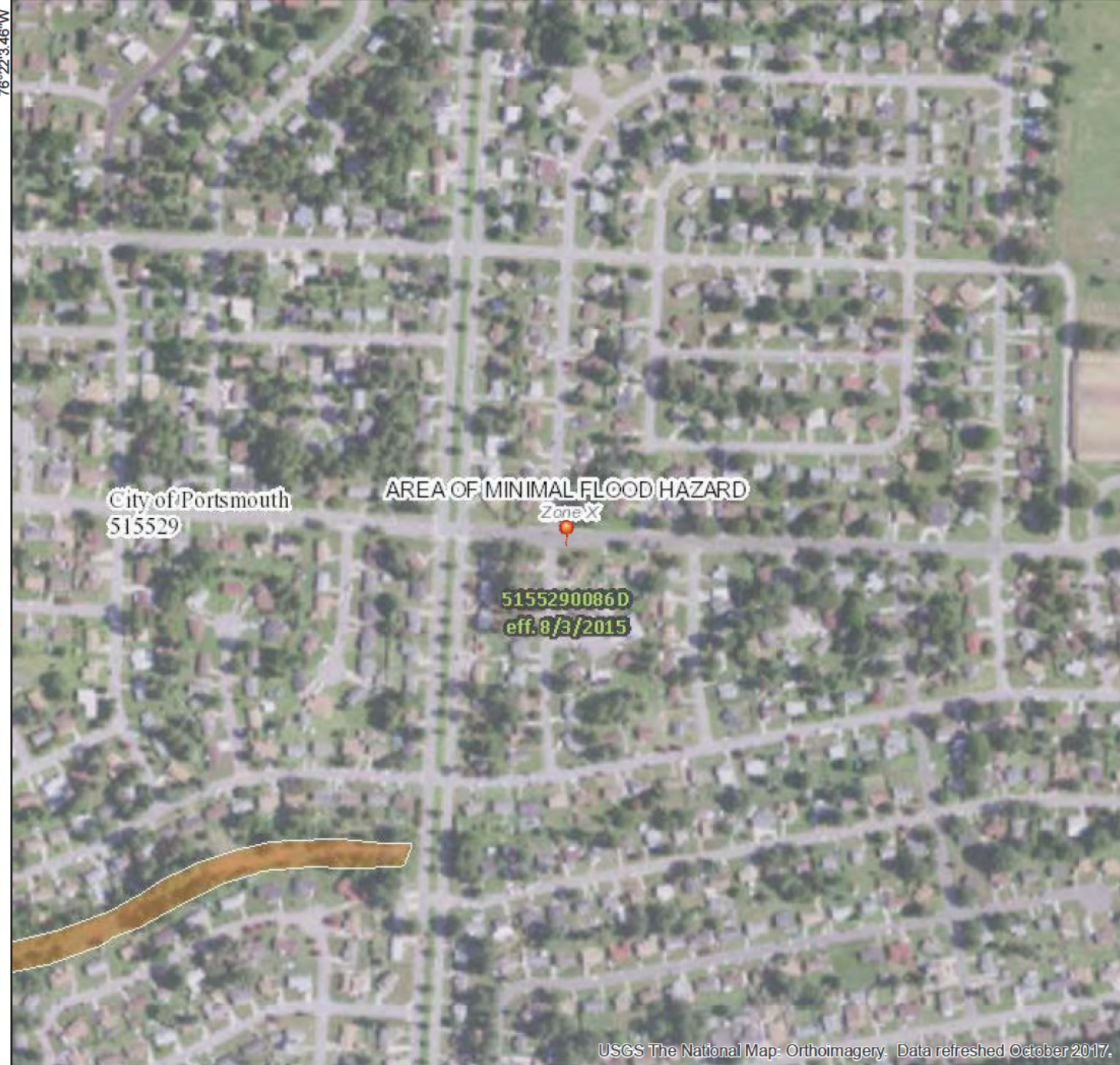
76°21'36.28"W



National Flood Hazard Layer FIRMette



36°47'48.81"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | | |
|------------------------------------|--|--|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE)
<i>Zone A, V, A99</i> |
| | | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i> |
| | | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i> |
| | | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i> |
| | | Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i> |
| | | Area with Flood Risk due to Levee <i>Zone D</i> |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i> |
| | | Effective LOMRs |
| GENERAL STRUCTURES | | Area of Undetermined Flood Hazard <i>Zone D</i> |
| | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |
| OTHER FEATURES | | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| MAP PANELS | | Jurisdiction Boundary |
| | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |
| | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |
| | | The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location. |



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

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76°22'3.46"W

76°21'26.01"W

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | | |
|------------------------------------|--|--|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE)
<i>Zone A, V, A99</i> |
| | | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i> |
| | | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i> |
| | | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i> |
| | | Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i> |
| | | Area with Flood Risk due to Levee <i>Zone D</i> |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i> |
| | | Effective LOMRs |
| GENERAL STRUCTURES | | Area of Undetermined Flood Hazard <i>Zone D</i> |
| | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |
| OTHER FEATURES | | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | 17.5 Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |
| MAP PANELS | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |

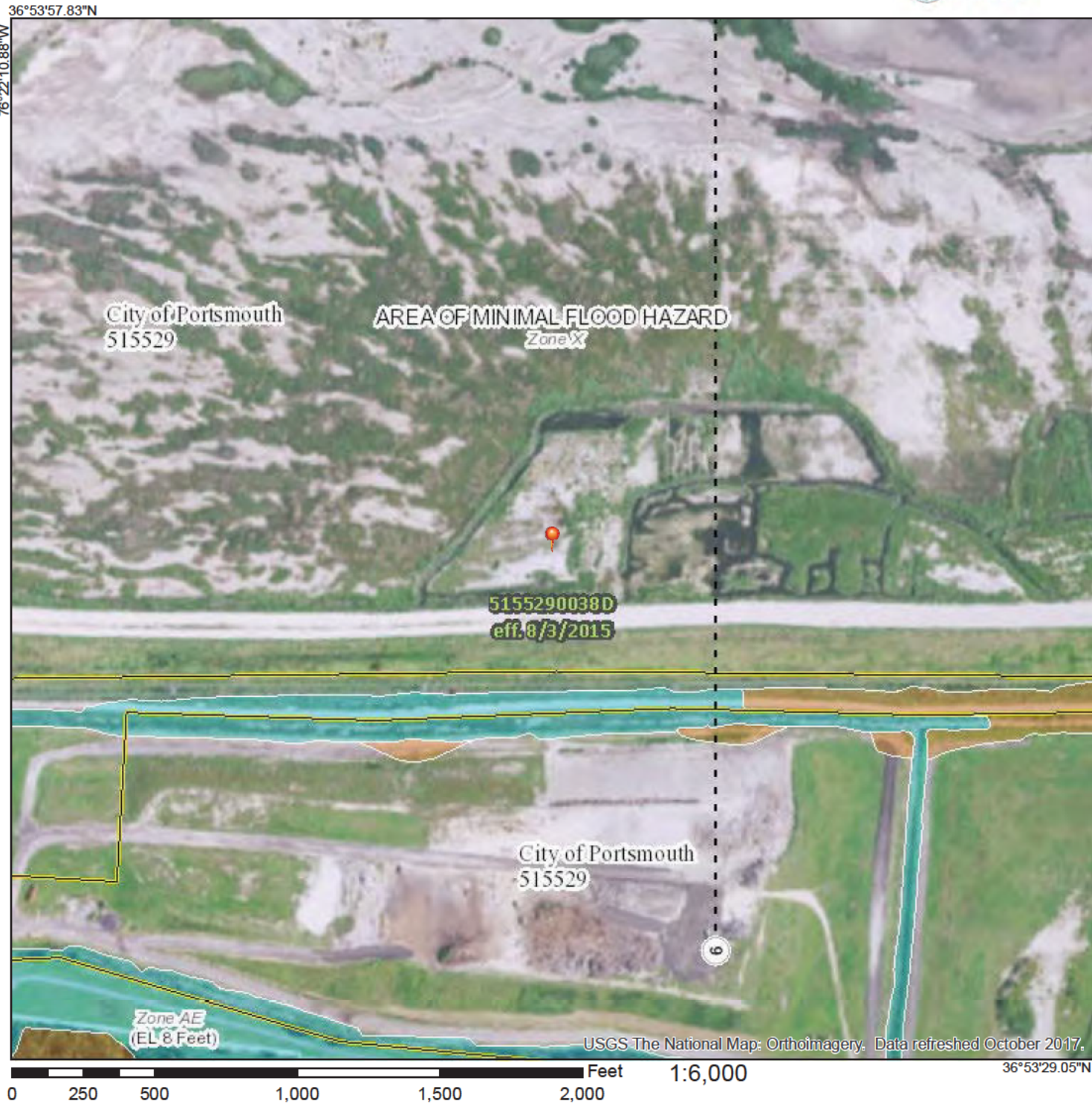


The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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USGS The National Map: Orthoimagery. Data refreshed October 2017.

36°53'29.05"N

76°21'33.42"W

National Flood Hazard Layer FIRMette



36°48'22.96"N



USGS The National Map: Orthoimagery. Data refreshed October 2017. 36°47'54.15"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR	Regulatory Floodway

		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS OF FLOOD HAZARD

	Area of Minimal Flood Hazard Zone X
	Effective LOMRs
	Area of Undetermined Flood Hazard Zone D

OTHER AREAS

	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall

GENERAL STRUCTURES

	20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
	17.5 Coastal Transect
	Base Flood Elevation Line (BFE)

OTHER FEATURES

	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature

MAP PANELS

	Digital Data Available
	No Digital Data Available
	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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76°18'6.17"W

0 250 500 1,000 1,500 2,000 Feet 1:6,000

National Flood Hazard Layer FIRMette



36°54'40.68"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

USGS The National Map: Orthoimagery. Data refreshed October 2017.

36°54'11.91"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
OTHER FEATURES		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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76°22'51.67"W

National Flood Hazard Layer FIRMette



36°53'48.03"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
MAP PANELS		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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National Flood Hazard Layer FIRMette



36°49'43.37"N

Legend

SEE FIS REPORT FOR

SPECIAL FLOOD HAZARD AREAS

OTHER AREAS OF MINIMAL FLOOD HAZARD

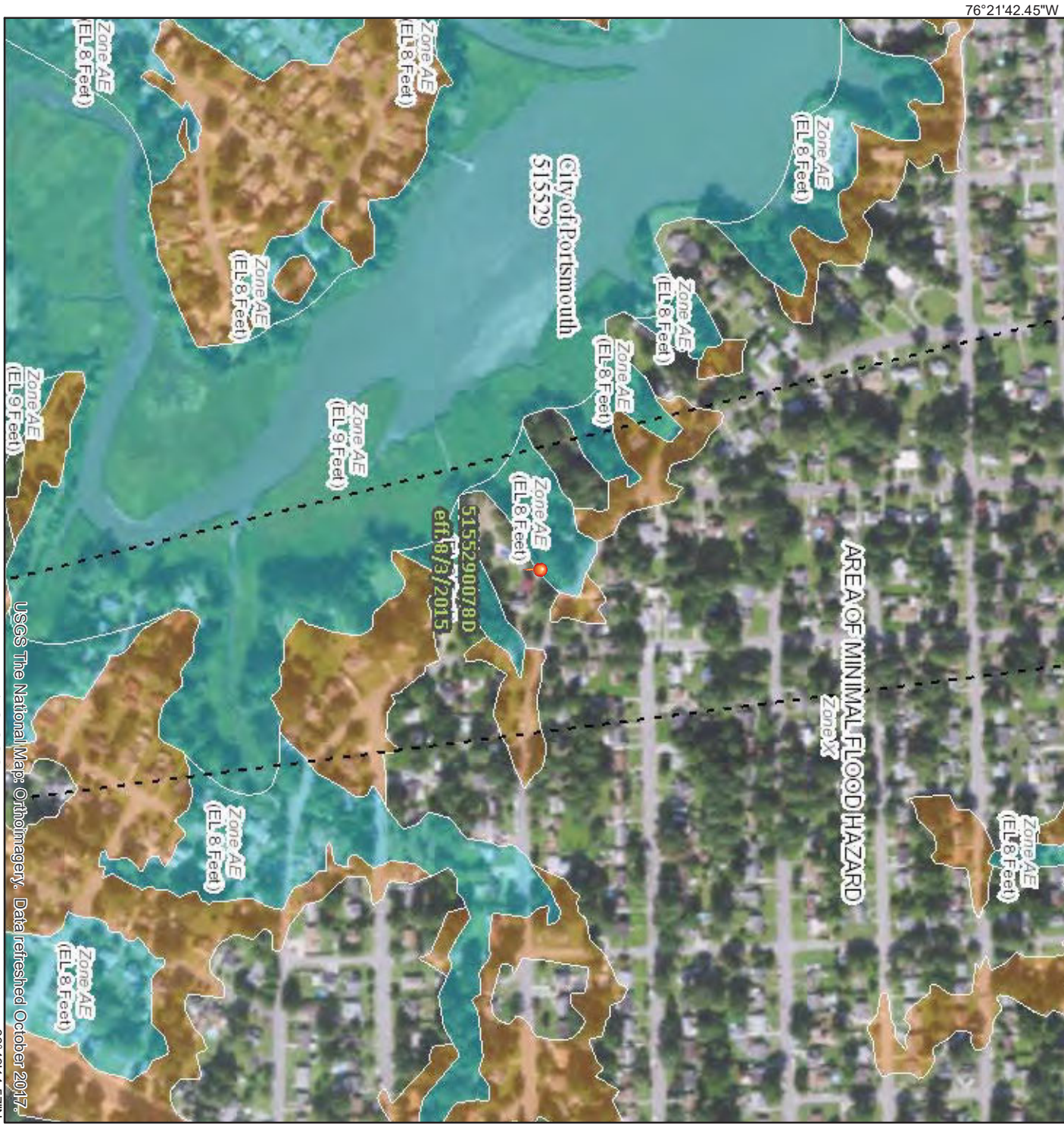
OTHER AREAS OF MINIMAL FLOOD HAZARD

OTHER AREAS OF MINIMAL FLOOD HAZARD

MAP PAN



This map digital flood The base accuracy The flood authoritat was expon reflect the time. The become s This map elements legend, so FIRMette pan unmappe regulat ory



0 250 500 1,000 1,500 2,000 Feet

USGS The National Map, Orthorectified. Data refreshed October 2017.

76°21'5.00"W

76°21'42.45"W

0

250

500

1,000

1,500

2,000

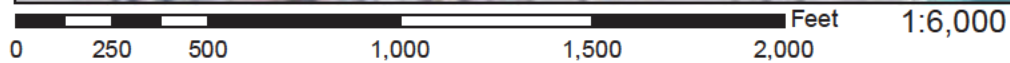
1,6,000

36°49'14.57"N

National Flood Hazard Layer FIRMette



36°52'47.11"N



36°52'18.33"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway	

OTHER AREAS OF FLOOD HAZARD	
	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee. See Notes. Zone X
	Area with Flood Risk due to Levee Zone D

OTHER AREAS	
	NO SCREEN Area of Minimal Flood Hazard Zone X
	Effective LOMRs
	Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES	
	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall

OTHER FEATURES	
	Cross Sections with 1% Annual Chance Water Surface Elevation
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature

MAP PANELS	
	Digital Data Available
	No Digital Data Available
	Unmapped

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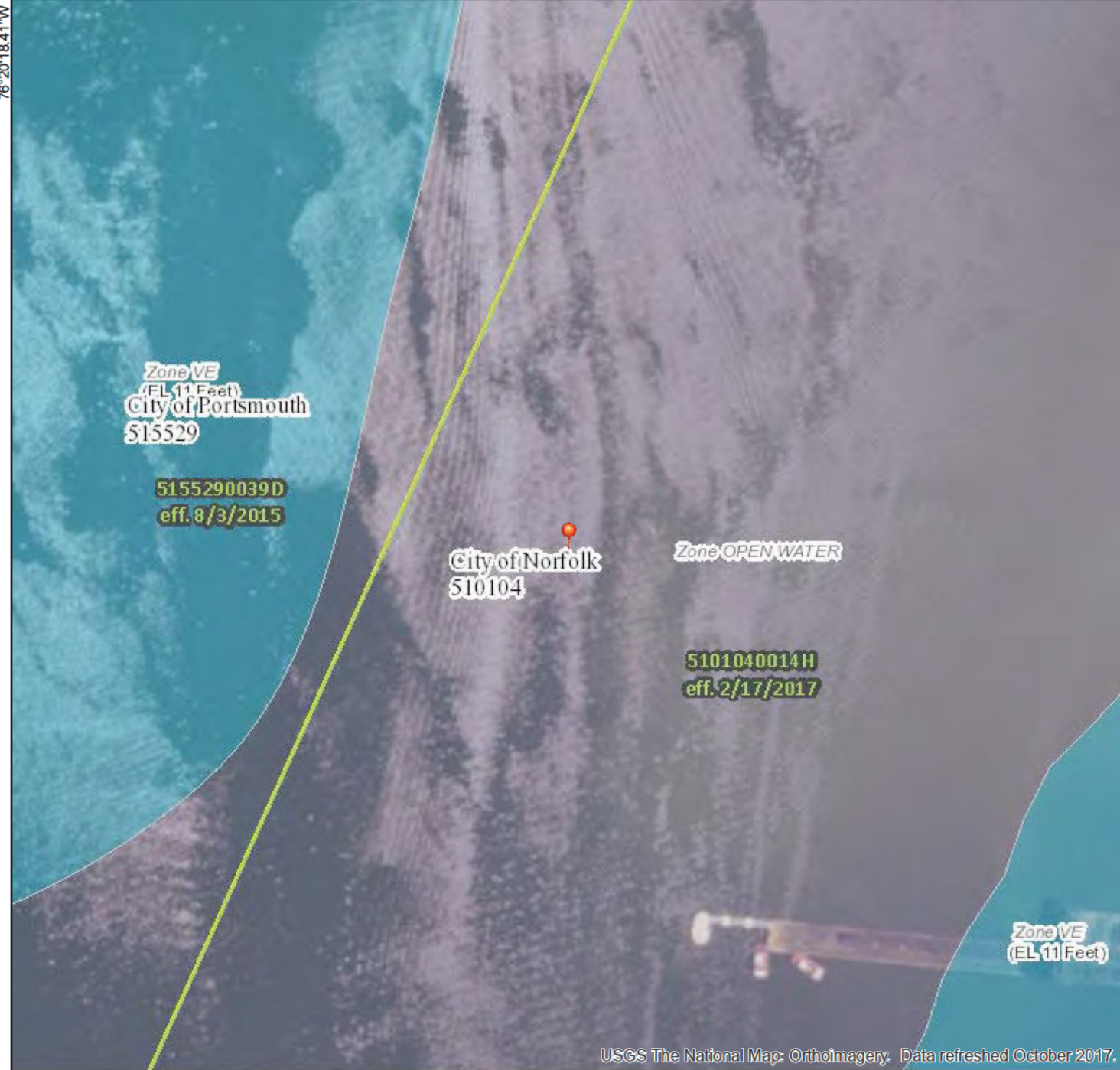
76°20'41.90"W

76°21'19.35"W

National Flood Hazard Layer FIRMette



36°53'11.84"N



USGS The National Map: Orthoimagery. Data refreshed October 2017. 0 250 500 1,000 1,500 2,000 Feet 1:6,000 36°52'43.06"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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76°19'40.95"W

National Flood Hazard Layer FIRMMette



36°49'14.90"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

USGS The National Map: Orthoimagery. Data refreshed October 2017.

36°48'46.10"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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76°23'39.49"W

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
MAP PANELS		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

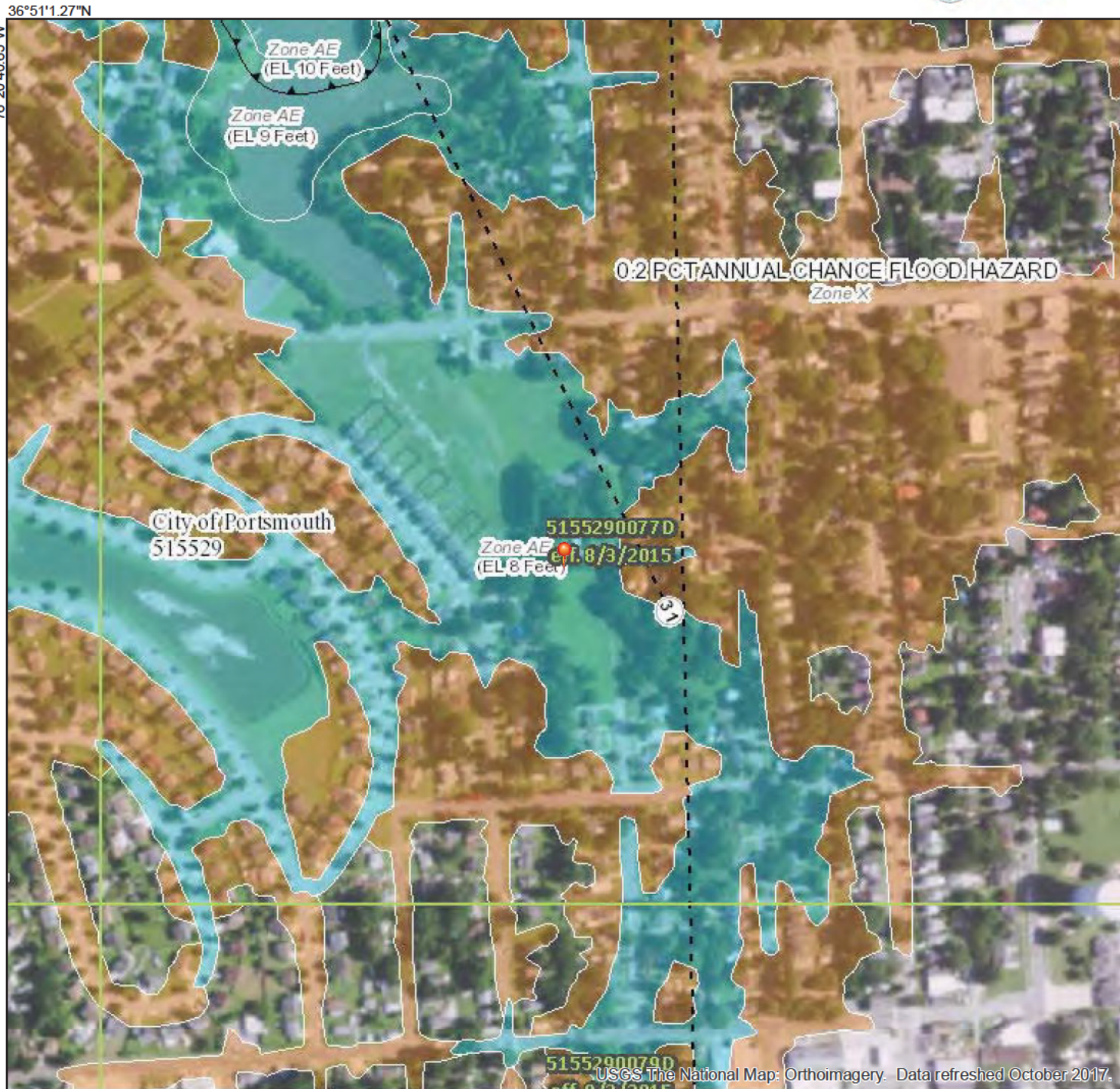


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implementation, potential funding sources, and an estimated target date for completion. The MAPs provide those individuals or agencies responsible for implementing mitigation actions with a clear roadmap that also serves as an important tool for monitoring progress over time. The collection of actions listed in the MAP also serves as a synopsis of activities for local decision makers.

In preparing the *Mitigation Action Plans*, committee members considered their overall hazard risk and capability to mitigate natural hazards, in addition to the mitigation goals. The prioritization of mitigation actions was based on the following five factors: (1) effect on overall risk to life and property; (2) ease of implementation; (3) political and community support; (4) a general economic cost/benefit review; and (5) funding availability.

MITIGATION GOALS

The goals of the Hampton Roads Hazard Mitigation Plan were crafted as part of three facilitated discussions and brainstorming sessions with committee members (see Section 2: *Planning Process*). As part of the 2017 update, the planning consultant reviewed the goals and objectives of the six plans being combined. Similar goals and objectives were grouped and assessed initially by the consultant to find the best representative language in each category. This set of combined goals and objectives was then presented at the first of three regional meetings to dissect and review, with live editing of the document taking place during each of the three meetings to reflect participants' current goals and objectives.

The groups reassessed each goal word for word, reprioritized the list, and edited overall for brevity. The original combination document ("Previous Plan Goals and Objectives") and updated ("2017 Goals and Objectives") goals are provided in Table 7.1 below, with notes about the discussion leading to the changes. The committee also reviewed and considered the regional mitigation goals expressed in several other documents as shown in Section 2. Each of the following goal statements represent a broad target to achieve through implementation of specific *Mitigation Action Plans*.

TABLE 7.1: UPDATED GOALS AND OBJECTIVES

PREVIOUS PLAN GOALS AND OBJECTIVES*	2017 GOALS AND OBJECTIVES
<p>Goal 1: Increase community resiliency/sustainability/ by reducing vulnerability to (all/high risk/natural) hazards. <i>Objective 1.1: Reduce hazard-related losses to the built environment.</i></p> <p>1.1.1: Implement structural and nonstructural mitigation measures to protect existing development; focus on repetitive flood loss property protection.</p> <p>1.1.2: Protect future development.</p> <p>1.1.3: Provide protection and access/egress for critical public and private utilities, facilities and services (also, bridges, utilities and evacuation routes).</p> <p>1.1.4: Ensure continuity of government operations.</p> <p><i>Objective 1.2: Reduce hazard-related impacts on lives.</i></p> <p>1.2.1: Use multi-objective approaches that achieve other community goals such as preservation of natural areas, open space, or energy-efficiency.</p> <p><i>Objective 1.3: Increase staff capability in Floodplain and Emergency Management.</i></p>	<p>Goal 1: Increase community resiliency by reducing vulnerability to hazards. <i>Objective 1.1: Reduce damage to repetitively flooded properties</i> <i>Objective 1.2: Protect existing and future development</i> <i>Objective 1.3: Protect critical facilities/infrastructure</i> <i>Objective 1.4: Maintain government services throughout hazard events</i> <i>Objective 1.5: Reduce hazard-related impacts on daily routines</i> <i>Objective 1.6: Preserve and enhance benefits of natural areas</i></p> <p>Why the Change? These statements are more concise with a very clear focus on the ways in which resiliency can lead to reduced vulnerability. The shortened statements work better for the variety of communities involved in the plan and their unique blend of hazards.</p>

TABLE 7.1: UPDATED GOALS AND OBJECTIVES	
PREVIOUS PLAN GOALS AND OBJECTIVES*	2017 GOALS AND OBJECTIVES
<p>Goal 2: Increase public awareness of vulnerability to high risk hazards and mitigation tools. <i>Objective 2.1: Provide information to residents/citizens, businesses and schoolchildren about hazards.</i> 2.1.1: Encourage property owners to assume responsibility for protection. 2.1.2: Promote flood insurance as a property protection measure. 2.1.3: Highlight mitigation successes.</p>	<p>Goal 2: Educate the public about hazard vulnerabilities and ways to reduce risk <i>Objective 2.1: Encourage property owners to assume responsibility for reducing vulnerability</i></p> <p>Why the Change? The groups agreed that government has a responsibility for implementing this goal, but that an additional way to educate is to help and encourage property owners to take appropriate mitigation actions on their own.</p>
<p>Goal 3: Integrate mitigation concepts into local and regional government actions <i>Objective 3.1: Institutionalize risk reduction principles into the community's daily activities, processes and functions.</i> <i>Objective 3.2: Integrate hazard information with environmental protection programs and other community planning initiatives.</i> <i>Objective 3.3: Unify local, regional and state planning efforts.</i> 3.3.1: Include separate section of regional actions in this and future hazard mitigation plans. <i>Objective 3.4: Improve hazard data collection and mapping.</i></p>	<p>Goal 3: Strengthen and develop partnerships for mitigating hazard impacts <i>Objective 3.1: Integrate mitigation concepts into local and regional government plans, policies and actions</i> <i>Objective 3.2: Improve and standardize hazard data collection and mapping</i> <i>Objective 3.3: Leverage shared resources in pursuit of funding for hazard mitigation projects</i> <i>Objective 3.4: Develop partnerships among local, regional, national, and international organizations</i></p> <p>Why the Change? Local emphasis on mitigation partnerships is timely. Those partnerships can happen inter-departmentally, within community government, or between government agencies across local and state boundaries. This goal better states the partnership angle and then objectives break down different ways in which the goal could be accomplished.</p>
<p>Goal 4: Maximize use of state, federal, local, private funds available for mitigation. <i>Objective 4.1: Analyze and establish additional cost-share opportunities.</i> <i>Objective 4.2: Minimize repeat community expenditures for incident response.</i></p>	<p>GOAL DELETED</p> <p>Why the Change? This goal was a rather apparent goal of all local governments and was quite broad for this plan. New Objective 3.3 better captures the intent of this original Goal 4 as it pertains to mitigation.</p>

* The goals and objectives in this column represent a blending of goals and objectives from the six existing plans being combined into this plan.

4. ASSESS THE HAZARD/ REVIEW THE PROBLEM

Background

Portsmouth, like other communities in southeastern Virginia, is vulnerable to multiple natural disasters. To help address the planning and recovery from the potentially disastrous effects of these events, a regional all hazards plan was prepared and adopted by the various Hampton Roads local governing bodies. The Southside Hampton Roads Hazard Mitigation Plan, dated 2011, is the result of a comprehensive planning process undertaken by the jurisdictions of Isle of Wight County, Norfolk, Portsmouth, Smithfield, Suffolk, Virginia Beach and Windsor. Local officials, citizens and other key stakeholders from across the region contributed to the planning process. This process was designed to help communities identify ways to better protect people and property from the effects of natural hazards, including an evaluation of risks for all hazards in the region. Table 5.46, from the hazard mitigation plan, summarizes the degree of risk assigned to each category for all identified hazards in the region based on the application of the Priority Risk Index (PRI) tool fully introduced in “Methodologies Used.” Assigned risk levels were based on historical and anecdotal data, as well as input from the

TABLE 5.46: SUMMARY OF QUALITATIVE ASSESSMENT

HAZARD	CATEGORY/DEGREE OF RISK				
	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION
Floods (100-Year)	Highly Likely	Catastrophic	Moderate	More than 24 Hours	More than 1 Week
Floods (Storm Surge)	Likely	Catastrophic	Moderate	More than 24 Hours	Less than 24 Hours
Sea Level Rise and Land Subsidence	Highly Likely	Critical	Moderate	More than 24 Hours	More than 1 Week
Hurricanes and Tropical Storms	Likely	Catastrophic	Large	More than 24 Hours	Less than 24 Hours
Severe Thunderstorms and Hail	Highly Likely	Minor	Large	Less than 6 Hours	Less than 6 Hours
Lightning	Highly Likely	Limited	Small	Less than 6 Hours	Less than 6 hours
Tomadoes	Likely	Critical	Small	Less than 6 Hours	Less than 6 Hours
Winter Storms and Nor'easters	Likely	Critical	Large	More than 24 Hours	Less than 1 Week
Shoreline Erosion	Likely	Minor	Small	More than 24 Hours	More than 1 Week
Earthquakes	Unlikely	Minor	Large	Less than 6 Hours	Less than 6 Hours
Droughts	Possible	Minor	Large	More than 24 Hours	More than 1 Week
Wildfires	Highly Likely	Minor	Small	Less than 6 Hours	Less than 24 Hours
Dam Failures	Unlikely	Critical	Small	Less than 6 hours	Less than 24 Hours
Tsunamis	Unlikely	Catastrophic	Moderate	Less than 6 Hours	Less than 6 Hours
Extreme Heat	Possible	Minor	Large	More than 24 Hours	Less than 1 Week
Mosquito Borne Diseases	Possible	Limited	Small	More than 24 hours	More than 1 week
Hazardous Materials Incidents	Highly Likely	Critical	Small	Less than 6 hours	Less than 24 hours
Urban Fires	Likely	Limited	Small	Less than 6 hours	Less than 6 hours
Terrorism	Possible	Critical	Moderate	Less than 6 hours	Less than 6 hours
Biological Threats	Possible	Critical	Moderate	Less than 6 hours	More than 1 Week
Radiological Threats	Unlikely	Critical	Moderate	Less than 6 hours	More than 1 Week

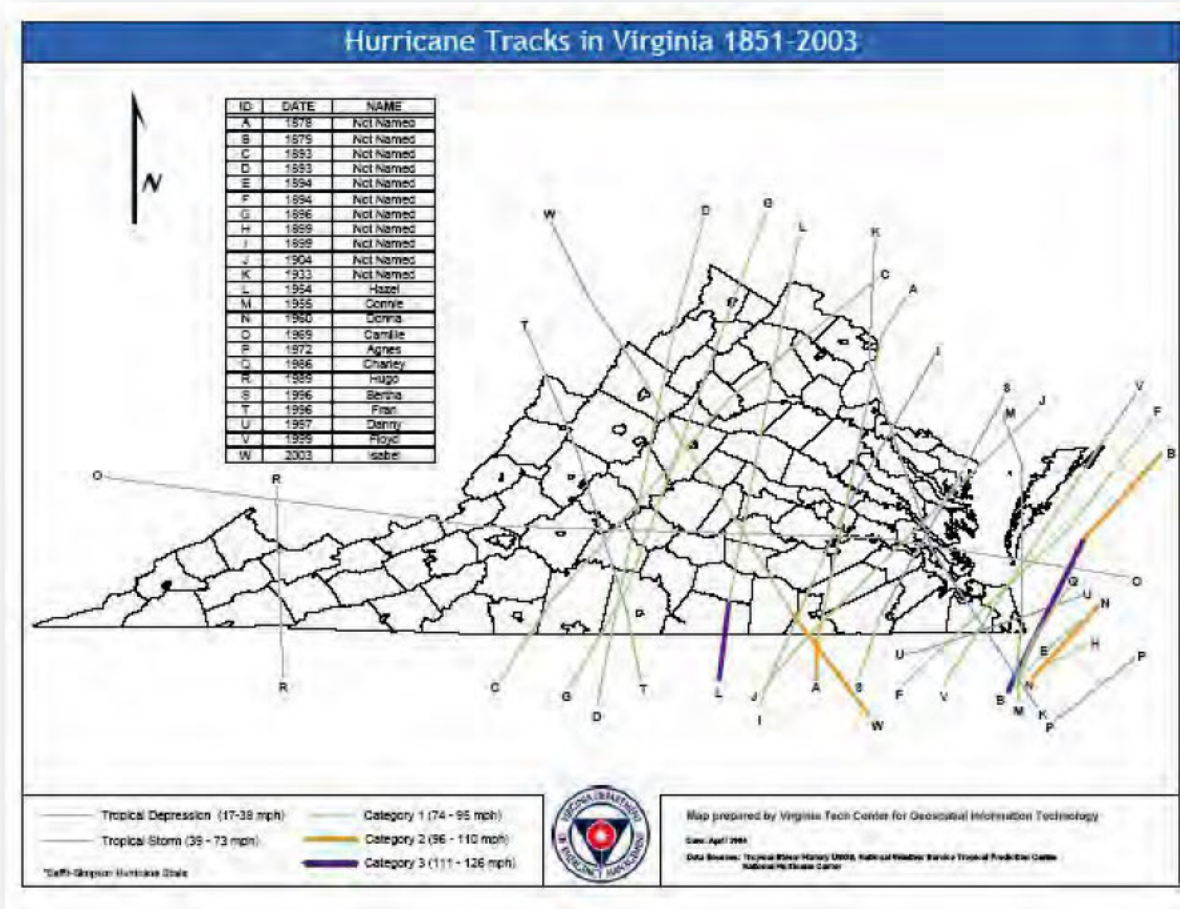
Source: Southside Hampton Roads Mitigation Planning Committee

Mitigation Planning Committee. The results were then used to calculate PRI values and make conclusions for the qualitative assessment.

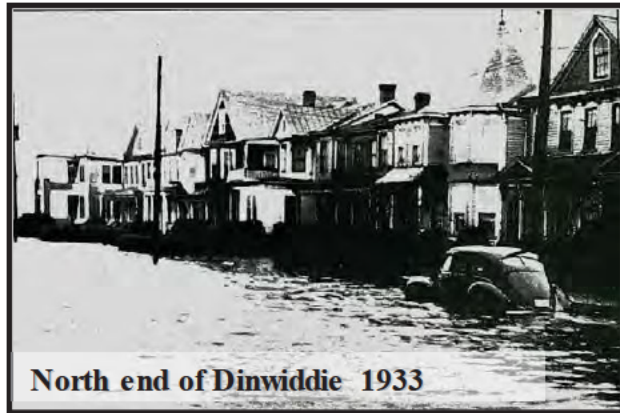
Table 5.46 shows the threat of flooding to the region, including Portsmouth, exists all year round. The threat of flooding, resulting from storm surge associated with winter/spring coastal storms and summer/fall hurricanes and urban flooding due to severe thunderstorms, have probabilities ranging from “Possible” to “Highly Likely”. Also, the city’s relatively low elevations and limited drainage gradient result in non-tidal related flooding of streets and private property located within and outside the floodplains.

Portsmouth’s Flooding History

Portsmouth and the Hampton Roads region have witnessed a number of hurricanes and coastal storms over the past 400 years. Possibly the most famous occurred in October 1749. The Bay rose to fifteen feet above normal, destroying waterfront buildings and reshaping a portion of Norfolk’s Chesapeake Bay shoreline by creating a spit of land (NOAA) approximately two miles long and a quarter mile wide. This area is known as Willoughby Spit in the city of Norfolk and has since become a substantial residential area.



The 20th and 21st century, thus far, have produced ten of the highest recorded water levels as recorded at the NOAA Sewells Point Gauge. The greatest of these storms, the **Chesapeake/Potomac Hurricane of August 23, 1933**, and currently the flood of record, occurred on August 23, 1933 (line K on the Hurricane Tracks in Virginia map) and resulted in the highest recorded tides in history at 6.4' NAVD88. Seventy years later,



North end of Dinwiddie 1933

Hurricane Isabel would record a surge of 6.27' NAVD88 at the Sewells Point Gauge). While this storm included minimal rainfall (1.24 inches in 24 hours), the storm surge produced by the storm coincided with the astronomical high tide, thus resulting in severe flooding. Most of downtown Portsmouth and other low-lying areas were under water. There was severe wind damage to many buildings and flood damage to many wharves and docks in the harbors.

	Ten Highest Water Events	Date	FT(NAVD88)
1	The Chesapeake/Potomac Hurricane of August 23, 1933	8/23/1933	6.407
2	Hurricane Isabel	9/18/2003	6.276
3	Nor' Ida	11/12/2009	6.063
4	Hurricane Irene	8/28/2011	5.925
5	Ash Wednesday Storm	3/7/1962	5.607
6	Hurricane Sandy	10/29/2012	5.148
7	Unnamed Hurricane	9/18/1936	5.105
8	Nor'easter	11/22/2006	5.043
9	Winter Storm	2/5/1998	4.957
10	Unnamed Storm	4/27/1978	4.797

http://tidesandcurrents.noaa.gov/est/est_station.shtml?stnid=8638610

Hurricane Isabel was responsible for over 320 claims for flood losses being filed in Portsmouth. These flood losses had a total value of approximately 3.4 million dollars. Isabel arrived in Portsmouth as a strong tropical storm/weak category 1 hurricane on September 18, 2003. While this storm was considered by many a weak system, it produced flooding conditions less than 1 foot of 1933 storm. In addition to the flooding conditions, extensive tree damage occurred throughout Portsmouth. The hardest hit neighborhoods included Cavalier Manor and Churchland.

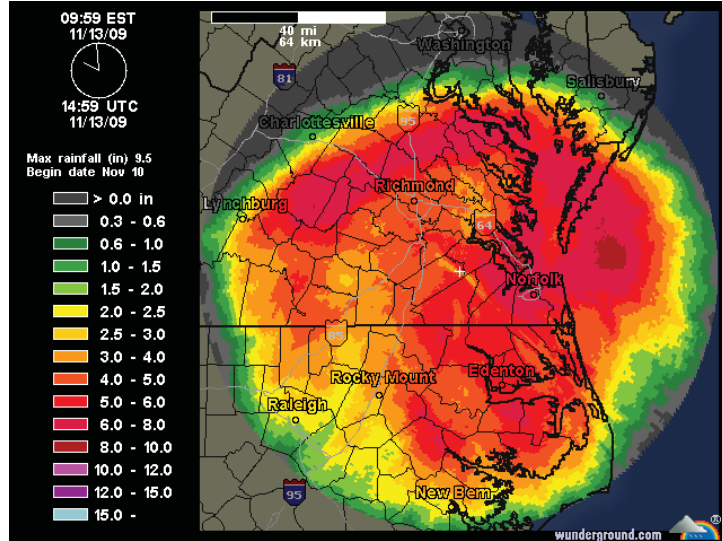
On November 11, 2009, the remnants of Tropical Storm Ida combined with a series of fronts to produce an extremely strong northeast storm, that became known as **Nor' Ida** and would remain over the area for the next five days. Because of the continuous piling on of high tides without release, the final tides on Friday, November 13, 2009 exceeded the flood levels of the Ash Wednesday storm, in March 1962 and were within 6 inches of the Chesapeake/Potomac Hurricane of August 23, 1933. The chief factors that caused the damages of this storm to be so

great were:

1. The reoccurring tides over a 4 day period
2. The tremendous amount of rain Nor' Ida dumped over the coast added to the storm surge.

Final damage figures for buildings alone are estimated to be over \$7,000,000.00. To date 120 property claims for flood damage are known to be paid as this is the increase in RL structures because of the storm.

This radar image shows rainfall totals that affected the area during this storm. Radar- estimated rainfall from the Norfolk radar shows a large area of 4 - 5 inches of rainfall over coastal Virginia and North Carolina.

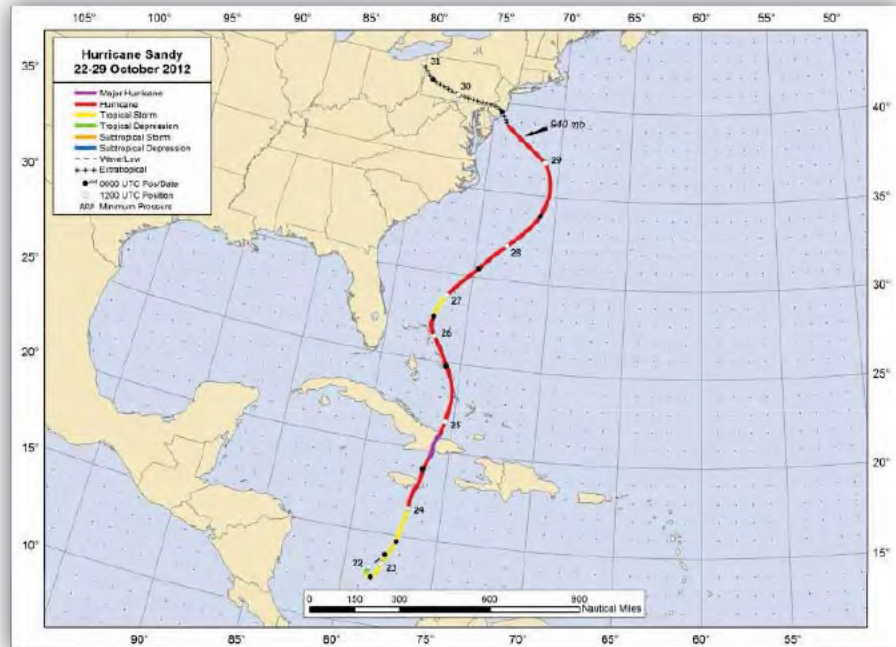


Hurricane Irene affected the Mid-Atlantic region between Saturday, August 27th and Sunday, August 28, 2011, creating water levels similar to Hurricane Isabel in Hampton Roads (National Hurricane Center, 2011).

Another benchmark storm, and one often referred to by longtime residents, is a coastal storm in March 1962 known as the **Ash Wednesday Storm**. This storm, like the one in 1933, produced relatively small amounts of rainfall (2.25 inches in 48 hours). However, the storm's track and slow movement resulted in a prolonged storm surge that inundated downtown Portsmouth. The flooding occurred when the winds did not allow the release of five tide cycles.



Hurricane Sandy will long be remembered for its devastating effects in Connecticut, New Jersey and New York. After crossing Jamaica, the storm paralleled the East Coast, before being funneled to the northwest by a trough sitting over the southeast. (NOAA, 2013) The tide gauge at Kings Point, NY recorded a crest of 14.31 feet. As large and devastating as the storm surge was, it was not the largest crest. The



Great New England Hurricane of 1938 caused a record crest of 16.75 feet. Except for communities like Saxis Island in Accomack County, Virginia was largely unscathed, recording storm surges approximately 4 feet. The storm serves as a reminder that large storms can impact the Northeast and it does not take a large category of storm to cause widespread, devastating impacts. For a chronological list of storms, please see Appendix D.

Of the ten major tidal flooding events that have occurred in Portsmouth, eight occurred between August and October, corresponding to the Atlantic hurricane season. The remaining two storms were late winter/early spring nor'easters. Four storms were unnamed suggesting that it does not take a large tropical storm or hurricane to produce damaging flood waters.

In fact, flooding can occur from heavy precipitation in a short period of time. Heavy downbursts can cause storm water to accumulate faster than it can drain, leaving motorists stranded, bring travel to a standstill and causing property damage.



While Portsmouth remains vulnerable to storms, many of the city's characteristics such as density development patterns, street patterns have changed, flood mitigation has been implemented in some areas and regulations have been developed to improve the resiliency of the City. The next section discusses the evolution of floodplain regulations in Portsmouth.

East Coast. FEMA Guidance in State and Local Mitigation Planning How-To Guide: Understanding Your Risks (p. 1-8), indicates that Atlantic Coast communities have a relatively low tsunami risk “and can probably avoid conducting a tsunami risk assessment at this time.” The lack of historical evidence of any damages caused by Tsunamis led the group to conclude that it is not a natural hazard to which the region is generally exposed, and thus, the hazard was excluded from the plan update.

44 CFR Requirement

Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Some of these hazards are interrelated (e.g., tropical/coastal storm events can cause flooding and tornado activity, and flooding can be associated with winter storms and erosion); thus, hazard discussions overlap where necessary throughout the risk assessment.

To a large extent, historical records are used to identify the level of risk within the planning area—with the assumption that the data sources cited are reliable and accurate. Maps are provided to illustrate the location and spatial extent for those hazards within the region that have a recognizable geographic boundary (i.e., hazards that are known to occur in particular areas of the region such as the 100-year floodplain). For those hazards with potential risk not confined to a particular geographic area (such as winter storms and tornadoes), historical event locations and/or general information on the applicable intensity of these events across the entire planning area is provided.

For most hazards analyzed in this section, some level of property damage was associated with any or all of the hazard events cataloged. However, for some historic events reports of property damage were not available. Therefore, totals of past property damages derived from historical records are best estimates and should not be used as a stand-alone indicator of hazard risk.

The terms “likely”, “highly likely” and “unlikely” are used to describe the probability of future occurrence for each hazard. Hazards termed “likely” to occur again in the future are expected to occur but may not have occurred with such high frequency in the past that future events are a certainty. Hazards termed “highly likely” have a history of occurrence or particular characteristics that make a future event almost guaranteed. “Unlikely to occur” indicates that committee members, based on review of past events, have the impression that any future occurrence will be a rare and unique event.

The *Vulnerability Assessment*, Section 5 of this plan, expands upon the foundation provided here and assesses the vulnerability of the region to these natural hazards.

SUMMARY OF PRESIDENTIAL DISASTER DECLARATIONS

A presidential disaster declaration is issued when a disaster event is determined to be beyond the response capabilities of state and local governments. Since 1953, the first year presidential disaster declarations were issued in the United States, the region has been named in twelve such declarations (Table 4.1). Under a presidential disaster declaration, the state and affected local governments are eligible to apply for federal funding to pay 75% of the approved costs for debris removal, emergency services related to the storm, and the repair or replacement of damaged public facilities. The types of natural hazards that led to these disaster declarations in Hampton Roads include ice storms, winter storms, hurricanes, and the Hurricane Katrina evacuation in 2005. The most recent declarations were for Tropical Depression Ida in 2009 and Hurricane Irene in 2011.

TABLE 4.1: PRESIDENTIAL DISASTER DECLARATIONS ISSUED FOR HAMPTON ROADS				
YEAR	DATE OF DECLARATION	DISASTER NUMBER	DISASTER TYPE	DESIGNATED AREAS
1972	September 8	339	Tropical Storm Agnes	Chesapeake, Hampton, Isle of Wight Co, James City Co, Newport News, Norfolk, Portsmouth, Suffolk, Virginia Beach, Williamsburg, York Co
1996	February 16	1086	Blizzard of 1996	All study area communities
1996	October 23	1135	Hurricane Fran	Hampton, Isle of Wight Co, James City Co, Newport News, Poquoson, Suffolk, Williamsburg, York Co
1998	October 9	1242	Hurricane Bonnie	Chesapeake, Norfolk, Portsmouth, Suffolk, Virginia Beach
1999	September 6	1290	Tropical Storm Dennis and Tornadoes	Hampton
1999	September 24	1293	Hurricane Floyd	All study area communities
2000	February 28	1318	Severe Winter Storms	Franklin, Isle of Wight Co, James City Co, Newport News, Southampton Co, Suffolk, Williamsburg, York Co
2003	September 18	1491	Hurricane Isabel	All study area communities
2005	September 12	3240	Hurricane Katrina Evacuation	All study area communities
2006	September 22	1661	Tropical Depression Ernesto	Isle of Wight Co, James City Co, Newport News, Poquoson, York Co
2009	December 9	1862	Tropical Depression Ida and a Nor'easter	Chesapeake, Hampton, Isle of Wight Co, Newport News, Norfolk, Poquoson, Portsmouth, Virginia Beach
2011	August 26	4024	Hurricane Irene	All study area communities

Source: FEMA, 2015

NATIONAL CLIMATIC DATA CENTER STORM EVENT DATABASE

Much of the data in the remaining tables of this section were taken from the NOAA NCDC database. NCDC receives storm data from the NWS which, in turn, receives their information from a variety of sources, including: city, county, state, and federal emergency management officials, local law enforcement officials, skywarn spotters, NWS damage surveys, newspaper clippings, the insurance industry, and the general public. Information on hazard events not recorded in this database is provided in narrative format for each hazard subsection to supplement the NCDC data and to provide a more accurate depiction of historic hazard events in the region.

Year of Loss	Date of Loss	Duration	\$ Losses (1)	Source	Event name	Damage/event description
1996	5/6/1996	<1	\$ 5,000	4		LIGHTNING STRIKE CAUSED POWER SURGES WHICH CREATED PROBLEMS WITH CITY'S CENTRAL COMPUTER PROCESSOR. DAMAGE WAS DONE TO CITY'S RADIO SYSTEM.
1997	5/1/1997	<1	\$ 25,000	4		Many homes were damaged by hail.
1998	4/9/1998	<1	\$ 2,000	4		Trees down on power lines. Thunderstorms/Wind
1998	6/16/1998	<1	\$ 6,000	4		Numerous tree limbs and debris blown onto Route 164 in Twin Pines area; Dugout roof at baseball field blown off at Churchland high school; Four pine trees blown down at Churchland high school.
1998	Aug 27-28	2	\$ 144,525	1	Hurricane Bonnie	Hurricane Bonnie moved just offshore of southeast Virginia on August 27th and 28th. Very strong winds and heavy rains associated with Bonnie's spiral bands hammered the Hampton Roads area Thursday evening into Friday morning. The highest sustained wind speed recorded was 81 mph at Cape Henry (anemometer elevation is 90 ft). Other sustained wind speeds were 78 mph at the Chesapeake Light Station Buoy just offshore (anemometer elevation is 90 ft), 53 mph at Langley Air Force Base, and 46 mph at the Norfolk International Airport. The highest gusts recorded were 104 mph at Cape Henry, 93 mph at the Chesapeake Light Station Buoy, 67 mph at Langley Air Force Base, and 64 mph at the Norfolk International Airport. Widespread power outages (up to 250,000 customers/750,000 people) were reported in the Hampton Roads area, along with reports of numerous trees down, trees down on homes, power lines down and some structural damage due to wind. Many windows were reported to have been blown out of hotels along the Virginia Beach oceanfront by the high winds. Some street flooding occurred in Norfolk, Virginia Beach, and Portsmouth due to heavy rain and a 2 to 4 foot storm surge. The peak tidal departure at Sewells Point in Norfolk was 3.5 feet above normal or 6.0 feet above MLLW. This resulted in moderate coastal flooding at the time of high tide. Rainfall amounts generally ranged from 1 to 3 inches across the Hampton Roads area with isolated amounts of 4 to 7 inches occurring in the Norfolk-Virginia Beach area. The lowest sea level pressure recorded was 999 mb at the Oceana Naval Air Station.
1999	2/28/1999	<1	\$ 5,000			Thunderstorm/wind; Trees and wires down on 2 houses.
1999	7/24/1999	<1	\$ 1,000			Thunderstorm/wind; Trees down.
1999	Sep 15-16	2	\$ 1,008,294	1	Hurricane Floyd	Hurricane Floyd was a Category 1 hurricane as it crossed the Wakefield WFO county warning area. Sustained tropical storm force winds with gusts to near hurricane force occurred over the northwest quadrant of the storm over interior portions of northeast North Carolina and along the coastal waters of the Wakefield marine area. The center of the storm crossed the county warning area along an Elizabeth City to Currituck county to Sandbridge Virginia Beach axis. The highest sustained wind speed recorded was 69 mph at Chesapeake Light (CHLV2). Other sustained wind speeds were 46 mph at Langley Air Force Base (LFI), 44 mph at Norfolk Naval Air Station (NGU), and 41 mph at Oceana Naval Air Station (NTU). The highest gusts recorded were 100 mph at the James River Bridge, 84 mph at Chesapeake Light, and 63 mph at Langley Air Force Base. Two confirmed tornadoes occurred in association with Floyd. There were approximately several thousand persons evacuated and housed in several shelters from coastal jurisdictions. Hundreds of trees and power lines were blown down across interior southeast Virginia and the immediate Hampton Roads area, resulting in widespread power outages. The tidal departure at Sewells Point in Norfolk was 3 9 feet above normal or 6.4 feet above MLLW. This resulted in moderate to locally severe coastal flooding approximately 2 hours before high tide on the 16th. The tide gage in downtown Norfolk recorded a tide of 7.1 feet above MLLW. Flooding was more widespread during Hurricane Floyd due to extremely heavy rainfall before and during the peak storm tide. Storm surge flooding of 5 to 7 feet occurred over central portions of the Chesapeake Bay inundating sections of Accomack county. Some homes were flooded with 3 to 6 feet of water. The lowest sea level pressure recorded was 970 mb at Chesapeake Light (CHLV2). Floyd will be remembered as an extremely wet hurricane for east-central Virginia. The presence of a stalled frontal boundary provided the focus for extremely heavy rains. Rainfall amounts averaged 10 to 20 inches in a 50 to 75 mile swath centered over the headwaters of the Chowan River Basin in interior southeast Virginia and northeast North Carolina extending into the middle peninsula. Numerous roads were washed out due to flooding. Primary routes out of service included US 460 near Wakefield, US 58 near Emporia and Franklin, and Interstate 95 south of Petersburg to Emporia.
1999	Oct 17-18	2	\$ 10,000	4	Hurricane Irene	Hurricane Irene was an intensifying Category 1 hurricane at the time of closest approach to the Wakefield county warning area during the overnight hours of Monday October 18th. Irene was the third tropical system of the 1999 hurricane season to affect the Wakefield county warning area, and brought another round of very heavy rain into southeast Virginia. The very heavy rainfall, locally up to 8 to 12 inches, resulted in widespread street flooding in the urbanized Hampton Roads area. The highest sustained wind speed recorded was 36 mph at the Oceana Naval Air Station (NTU). Other sustained wind speeds were 27 mph at Wallops Island (WAL), and 24 mph at the Norfolk International Airport (ORF). The highest gusts recorded were 48 mph at the Oceana Naval Air Station, 40 mph at the Norfolk International Airport, and 39 mph at Wallops Island. The tidal departure at Sewells Point was less than a foot above normal. The lowest sea level pressure recorded was 996.6 mb at the Oceana Naval Air Station (NTU).
2002	5/13/2002	<1	\$ 2,000	4		Thunderstorm/wind. Trees down.

2003	Sep 18-19	2	\$ 3,400,000	3	Hurricane Isabel	tropical storm force winds with frequent gusts to hurricane force occurred over Eastern Virginia, along and near the Chesapeake Bay and Atlantic Coastal Waters. Isabel made landfall near Ocracoke Inlet in North Carolina, tracked northwest into central Virginia just west of Richmond, then continued northward into western Pennsylvania. The highest sustained wind speed recorded was 72 mph at Chesapeake Light (CHLV2). Other sustained wind speeds were 69 mph at Gloucester Point (VIMS), 61 mph at the Chesapeake Bay Bridge Tunnel, 58 mph at Norfolk Naval Air Station (NGU), 57 mph at Sewells Point, and 55 mph at Oceana Naval Air Station (NTU). The highest gusts recorded were 107 mph at Gwynns Island (Mathews County), 100 mph at Reedville (Middlesex County), 93 mph at Chesapeake Light, 91 mph at Gloucester Point, and 83 mph at Norfolk Naval Air Station. Only one confirmed tornado occurred in association with Isabel. Mandatory evacuations were ordered for parts of Hampton Roads, with approximately several thousand persons evacuated and housed in numerous shelters across central and eastern Virginia. The unusually large wind field uprooted many thousands of trees, downed many power lines, damaged hundreds of houses, and snapped thousands of telephone poles and cross arms. Hundreds of roads, including major highways, were blocked by fallen trees. Over 2 million customers of Dominion Virginia Power were without electricity. Local electrical cooperatives also reported thousands of customers were without power. Storm surge varied significantly across the region. At Sewells Point, the maximum water level was 7.9 feet above MLLW. This represented a 5 foot storm surge. At Gloucester Point, the water level reached 8.32 feet, representing a 6.4 foot surge. A storm survey indicated a surge around 6.5 feet at Colonial Beach. On the Rappahannock, surge values between 5.5 and 6.0 feet occurred at Tappahannock and downstream near Dunnsville. Even higher surge values were noted up the rivers in eastern Virginia, such as the James, Potomac, York and Rappahannock. Storm surge values around 9 feet were estimated at West Point Virginia. At Richmond City Locks, a more than 8 foot surge was noted, and Smithfield also recorded an 8 foot storm surge. An estimated 8 foot surge also occurred near the intersection of the James and Appomattox Rivers in Hopewell. The lowest sea level pressure recorded was 987 mb at Portsmouth Virginia. Isabel will be remembered for the greatest wind and storm surge in the region since Hazel in 1954, and the 1933 Chesapeake-Potomac Hurricane. Also, Isabel will be remembered for the most extensive power outages ever in Virginia, and permanent change to the landscape from all the fallen trees and storm surge. Rainfall amounts ranged from 1.5 to 5 inches across eastern, and southeast Virginia. Toano in James City county reported 10.60 inches. Inland flooding due to heavy rainfall occurred over parts of eastern and southeast Virginia. Significant beach erosion occurred across Newport News and Hampton. In
2003	22-Feb	<1	\$ 2,000	4	Thunderstorm/wind. Trees down.	
2004	8/14/2004	<1	\$ 86,211	1	Tropical Storm Charley moved through northeast North Carolina and southeast Virginia during late Saturday afternoon and evening. Chesapeake Light (CHLV2) measured a sustained wind of 43 knots (49 mph), and a max gust of 62 knots (72 mph). Chesapeake Bay Bridge Tunnel measured a sustained wind of 39 knots (45 mph), and a max gust of 44 knots (51 mph). Sewell's Point measured a max gust of 43 knots (49 mph). Norfolk International Airport (ORF) measured a max gust of 39 knots (45 mph). Rainfall amounts between 2 and 3.7 inches occurred. There were scattered power outages.	
2005			\$ 322,698			
2006			\$ 499,816			
2007	6/6/2007	<1	\$ 75,000	4	Gusty winds lifted tents, snapped flag poles and damaged scenery that had been installed at Town Point Park in downtown Norfolk. Lightning damage 2 homes, one on Long Point Boulevard in Portsmouth, the other on Cascade Drive in Newport News. A house on Long Point Boulevard was struck by lightning. The resulting fire damaged a large part of the roof and caused some structural damage to the house.	
2008	4/28/2008	<1	\$ 60,000	4	Severe thunderstorms in advance of a cold front produced numerous tornadoes across central and eastern Virginia. The tornado moved from northeast Suffolk across northern portions of Portsmouth. The tornado maintained close contact with the ground and downed several trees and produced some structural damage. While in Suffolk, the tornado was rated as EF3, but in Portsmouth it was rated as EF1.	
2008	6/27/2008	<1	\$ 2,000	4	Large trees were downed near Mayflower and Leonard Roads. Two block area was closed due to trees on roads. Large trees were downed near Mayflower and Leonard Roads. Two block area was closed due to trees on roads.	
2009	6/5/2008	<1	\$ 2,000	4	Several trees were downed. Scattered severe thunderstorms along a frontal boundary produced damaging winds across portions of southeast Virginia.	
2009	6/9/2009	<1	\$ 3,000	4	Multiple trees were downed and roofs of several homes were damaged. Scattered severe thunderstorms in advance of a frontal boundary produced damaging winds and large hail across portions of central and southeast Virginia.	
2009	7/12/2009	<1	\$ 3,000	4	Trees were downed at Bide-A-Wee Golf Course. Scattered severe thunderstorms in advance of a cold front produced damaging winds and large hail across portions of central and eastern Virginia.	
2009	Nov 12-14	2	\$ 7,000,000	3	Tropical Depression Ida and a Nor'easter	
2010	8/5/2010	<1	\$ 51,764	4	The peak tide height at Sewells Point was 7.74 feet above MLLW, which was 5.51 feet above the astronomical tide. Numerous streets, homes and businesses were flooded in low lying areas of the county close or directly exposed to the Chesapeake Bay, especially in the Willoughby and East Ocean View areas. An intense Nor'easter produced moderate to severe coastal flooding across much of eastern and southeast Virginia and the Virginia Eastern Shore.	
2010	8/5/2010	<1	\$ 51,764	4	Tree was downed onto a residence in the Churchland section of Portsmouth. Scattered severe thunderstorms well in advance of a cold front produced damaging winds and large hail across portions of central and eastern Virginia.	
2011	7/25/2011		\$ 3,000	4	Downed power lines and trees on Fleet Street. Scattered severe thunderstorms associated with a trough of low pressure produced damaging winds across portions of central and eastern Virginia.	

2011	Aug 27-28	2	\$ 1,541,130	1	Hurricane Irene	Heavy rains associated with Hurricane Irene produced widespread low-land flooding across much of the county, including roadways which were washed out or closed. Storm total rainfall generally ranged from six to ten inches. Portsmouth reported 7.82 inches of rain.. Hurricane Irene moving northward over the outer banks of North Carolina and just off the Virginia coast produced heavy rains which caused widespread flooding across most of south central and southeast Virginia Saturday morning, August 27th into early Sunday morning, August 28th. Storm total rainfall generally ranged from four to as much as twelve inches.
2012	Oct 28-29	2	\$ 322,076	4	Tropical Cyclone Sandy	Water levels reached 3.5 feet to around 4.5 feet above normal adjacent to the Chesapeake Bay resulting in moderate to severe coastal flooding. Money Point reached a tide height of 7.29 feet MLLW. Sewells Point reached a tide height of 6.81 feet MLLW. Tropical Cyclone Sandy moving northward well off the Mid Atlantic Coast then northwest into extreme southern New Jersey produced very strong northeast winds followed by very strong west or northwest winds. The very strong winds caused moderate to severe coastal flooding across portions of eastern and southeast Virginia.
2012	6/25/2012	< 1	\$ 2,000	4		Minor structural damage to buildings. Scattered severe thunderstorms in advance of a cold front produced damaging winds, large hail and a tornado across portions of central and eastern Virginia.
2012	6/29/2012	< 1	\$ 2,000	4		Minor structural damage to buildings. A derecho produced a widespread path of damaging winds across much of central and eastern Virginia.
2012	6/30/2012	< 1	\$ 1,000	4		Minor structural damage to buildings. Scattered severe thunderstorms well in advance of a cold front produced damaging winds, large hail and one tornado across portions of central and eastern Virginia.
2014			\$ 1,173,248			
2016	24-Feb	< 1	\$ 2,000	4		Minor structural damage occurred where shingles were blown off a roof. Scattered severe thunderstorms in advance of a cold front produced damaging winds, large hail, and six tornadoes across portions of central and eastern Virginia.
2016	2-May	< 1	\$ 1,000	4		Shutters were blown off of the front of a house. Scattered severe thunderstorms in advance of a frontal boundary produced damaging winds and large hail across portions of central and eastern Virginia.
2016	Oct 8-13	5	\$ 5,158,352	1	Post Tropical Cyclone Matthew/Cold Front	Heavy rain caused an extended period of significant flooding across much of the city. Numerous roads were impassable or closed for several days, and many homes and businesses were impacted. The combination of a cold front moving through the Mid Atlantic and Post Tropical Cyclone Matthew tracking northeast just off the North Carolina and Virginia coasts, produced heavy rain which caused flooding across much of southeast Virginia from late Saturday afternoon, October 8th into Thursday afternoon, October 13th.
2017	5-May	< 1	\$ 1,000	4		Scattered severe thunderstorms in advance of low pressure and its associated cold front produced damaging winds and six tornadoes across portions of central and eastern Virginia.
2017	25-May	< 1	\$ 1,000	4		Scattered severe thunderstorms associated with a trough of low pressure produced damaging winds across portions of south central and southeast Virginia.
2017	14-Jun	< 1	\$ 100,000	4		Lightning strike damaged a church on Columbus Avenue. Scattered severe thunderstorms associated with a trough of low pressure produced damaging winds across portions of southeast Virginia.

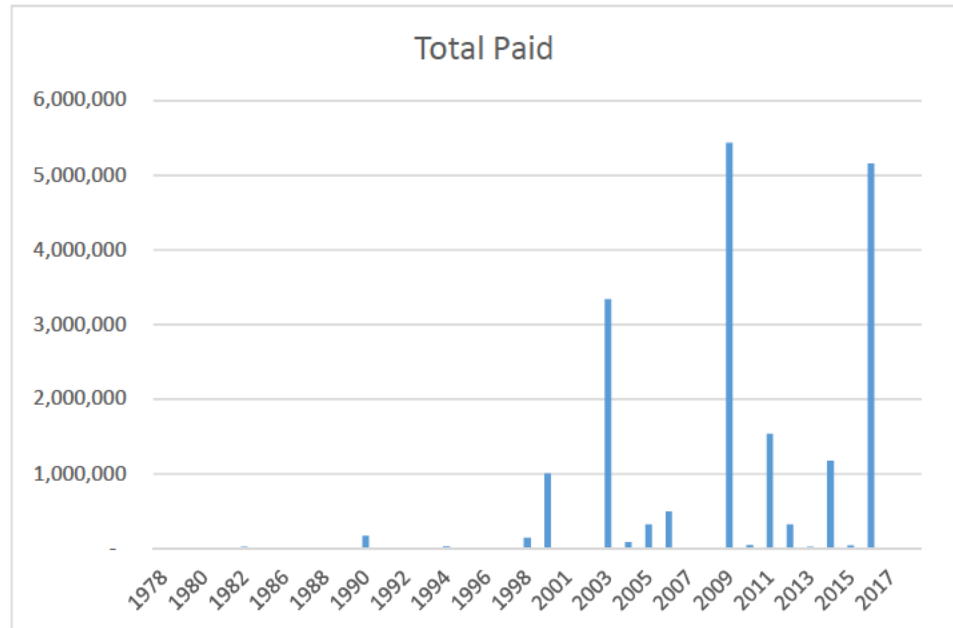
Sources

- 1 FEMA Flood insurance claims
- 2 Hampton Roads Hazard Mitigation Plan
- 3 City of Portsmouth, Virginia 2015 Floodplain Management and Repetitive Loss Plan Update
- 4 NOAA National Centers for Environmental Information

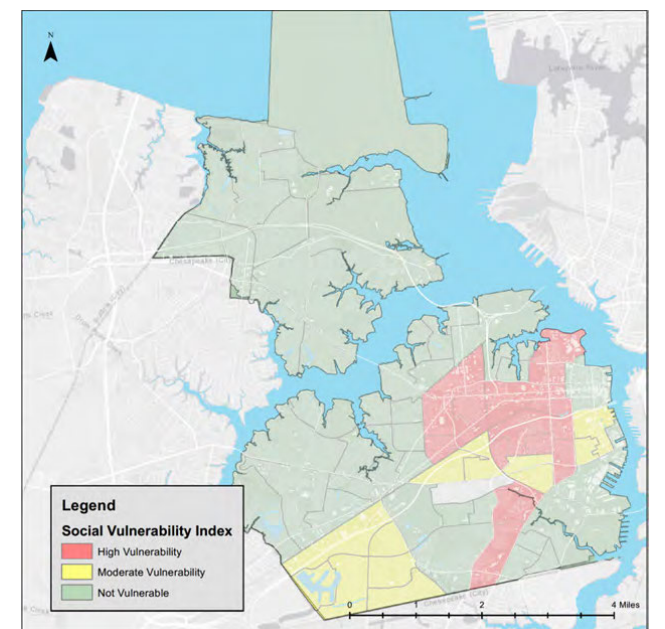
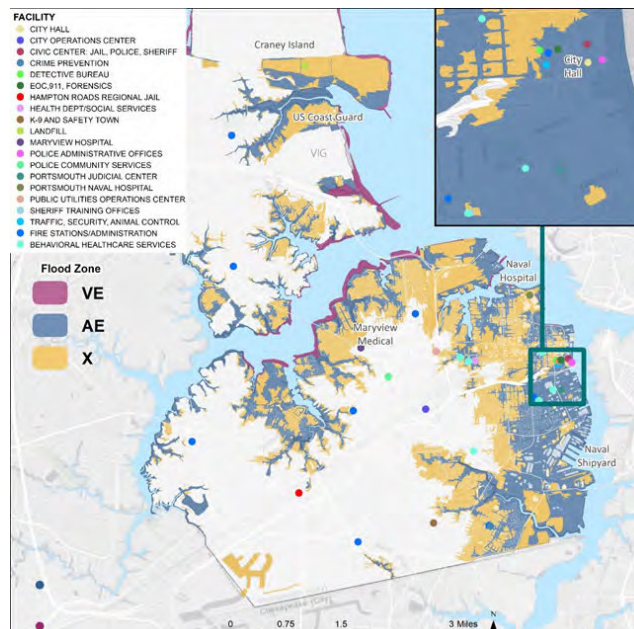
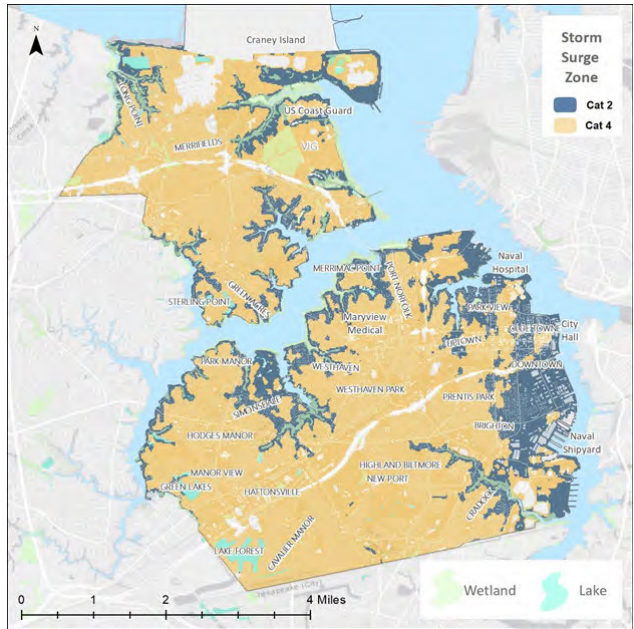
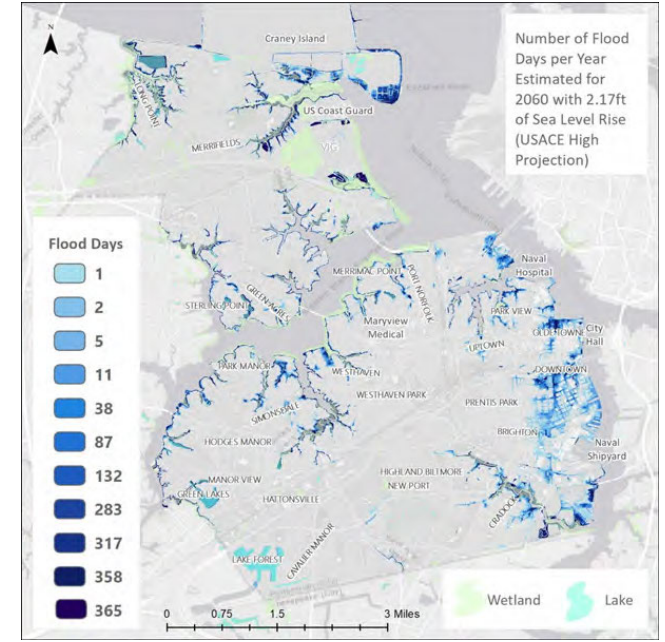
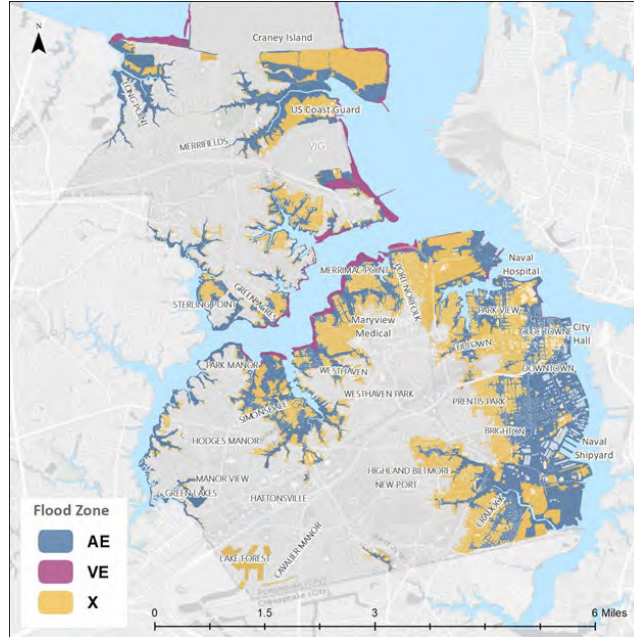
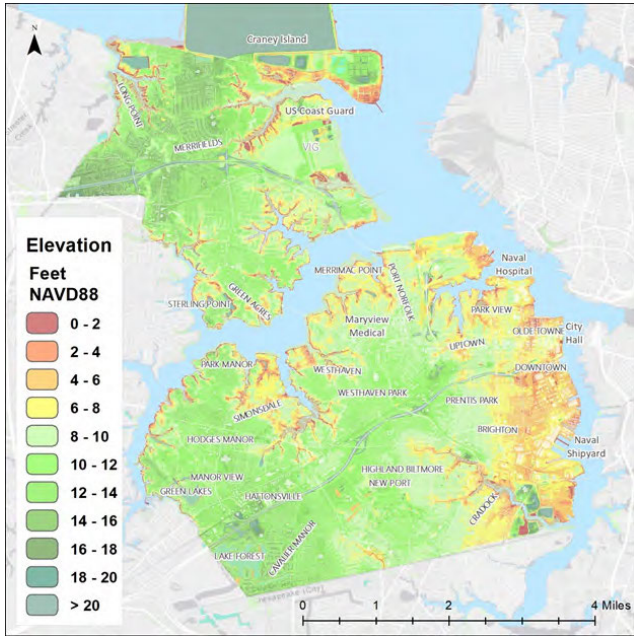
The dollar value of losses were taken from the spreadsheet that the City of Portsmouth sent to us, while the Event Name and Description are taken from the NOAA website whose link is on the online form for this section
 Could not find event on the NOAA webpage that described these significant recorded losses

Reported Flood Losses in Portsmouth, Virginia

Year of Loss	Total Paid
1978	2,202
1979	-
1980	191
1981	-
1982	20,919
1985	4,167
1986	514
1987	11,124
1988	6,195
1989	-
1990	173,448
1991	9,266
1992	11,480
1993	-
1994	26,219
1995	-
1996	-
1997	10,976
1998	144,525
1999	1,008,294
2001	2,413
2002	-
2003	3,337,380
2004	86,211
2005	322,698
2006	499,816
2007	9,557
2008	7,906
2009	5,436,870
2010	51,764
2011	1,541,130
2012	322,076
2013	19,750
2014	1,173,248
2015	39,558
2016	5,158,352
2017	6,687
2018	-
Grand Total	\$ 19,444,937.20

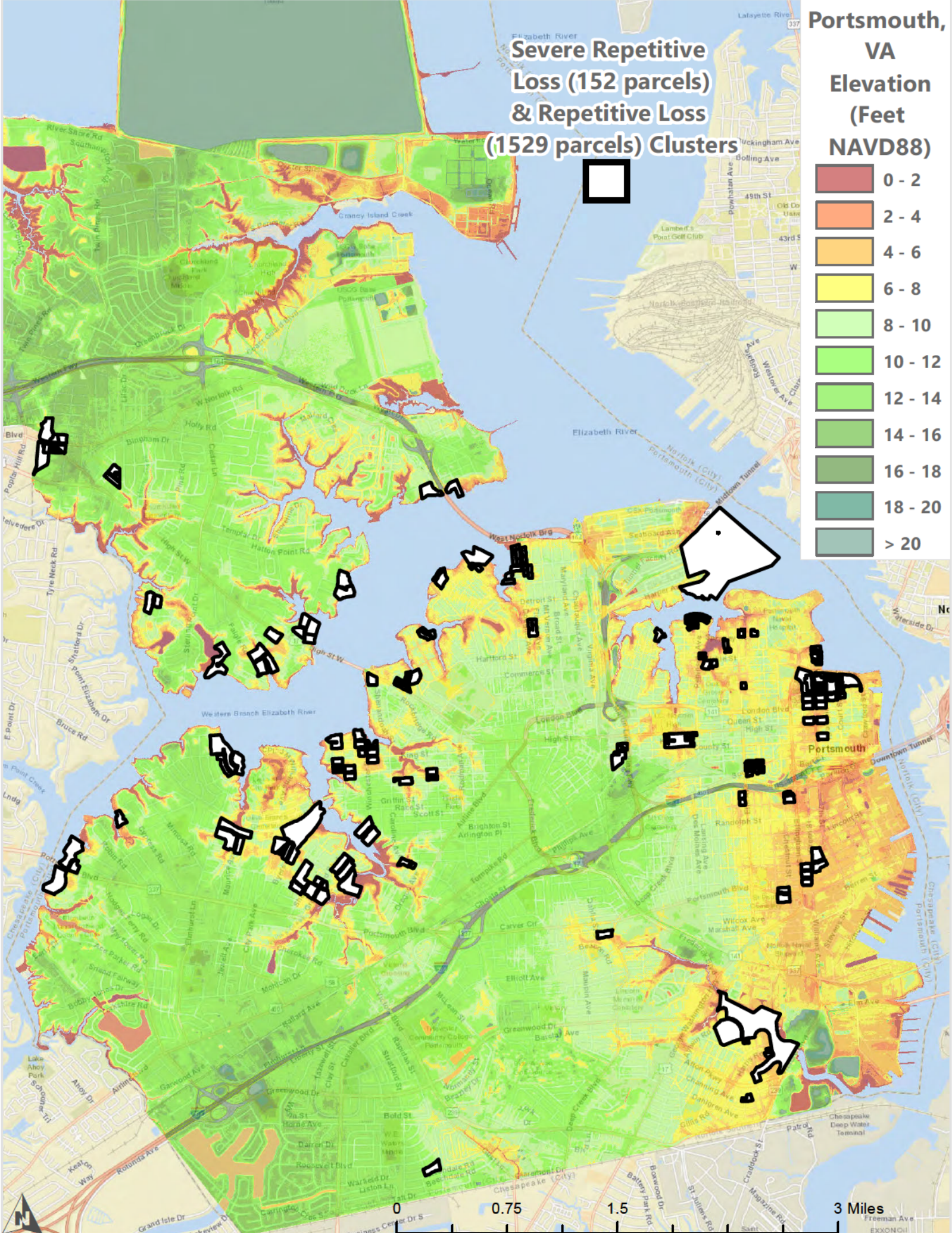
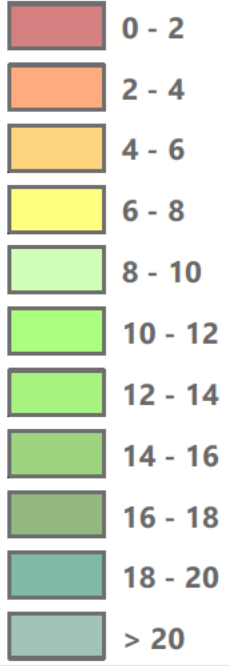


Selection of maps of Portsmouth VA
 data sources LiDAR, SLR models, NOAA tide data and NOAA Social Vulnerability Index map via Virginia Institute for Marine Science



Severe Repetitive Loss (152 parcels) & Repetitive Loss (1529 parcels) Clusters

Portsmouth, VA Elevation (Feet NAVD88)

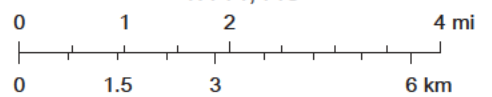


The National Map Advanced Viewer



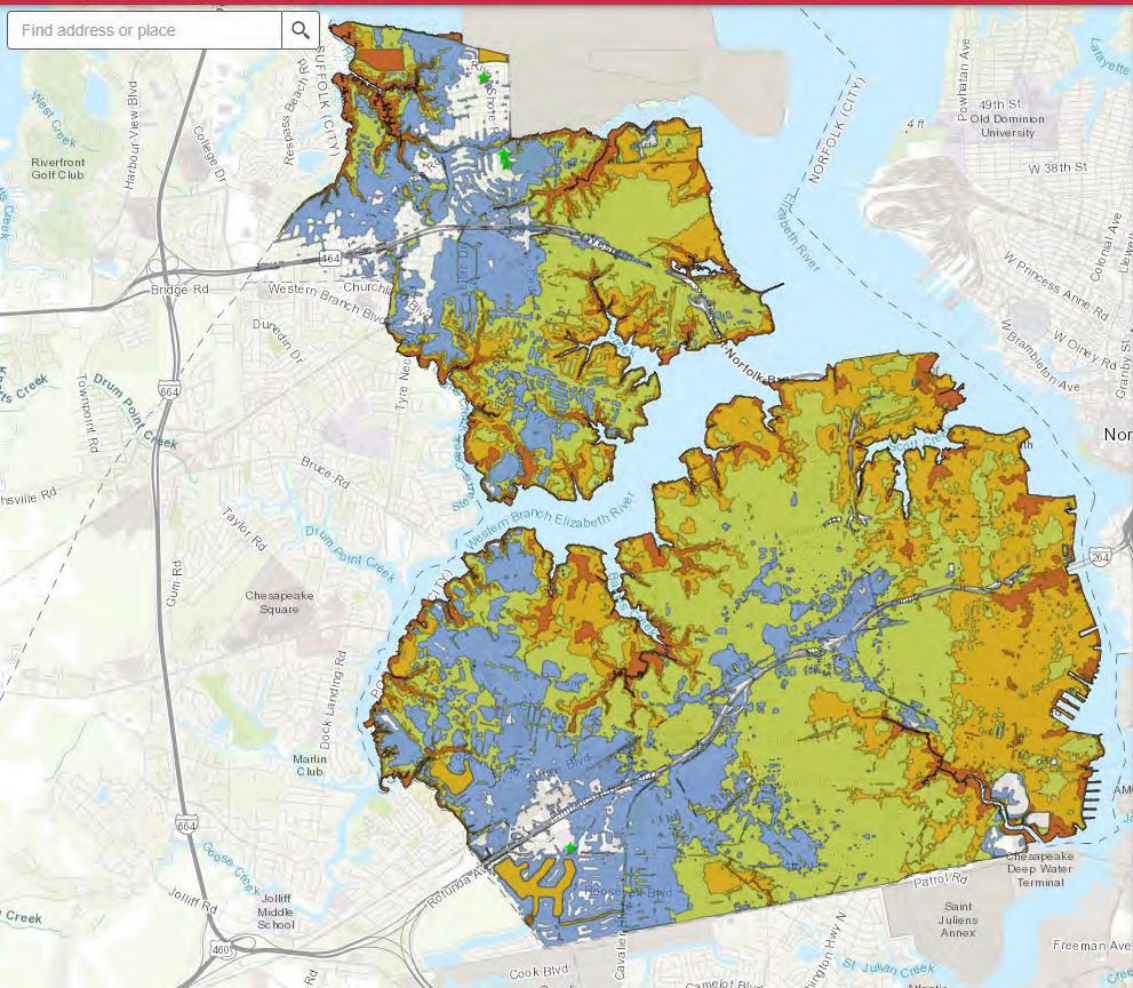
11/1/2018 12:51:27 PM

1:144,448



USGS The National Map: Orthoimagery and US Topo. Data refreshed April, 2018.

Find address or place



Legend

- shelters
- ★
- Storm Surge Category 1
-
- Storm Surge Category 2
-
- Storm Surge Category 3
-
- Storm Surge Category 4
-

National Storm Surge Hazard Maps

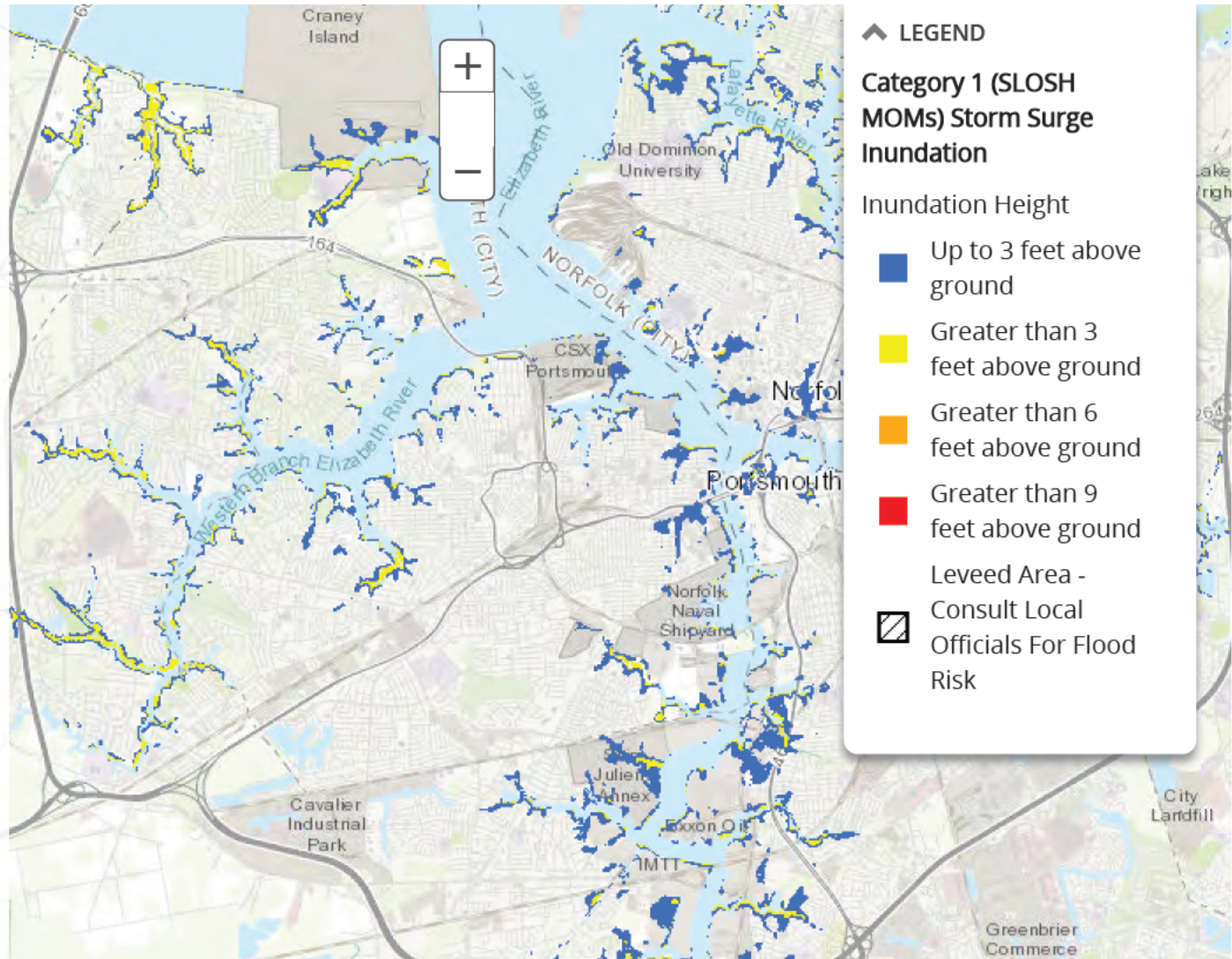
This is not a real-time product. For active tropical cyclones, please see hurricanes.gov and consult local products issued by the Na



Texas to Maine Puerto Rico

Category 1 Category 2 Category 3 Category 4 Category 5

This national depiction of storm surge flooding vulnerability help people living in hurricane-prone coastal areas along the U.S. East and Gulf Coasts and Puerto Rico to evaluate their risk to the storm surge hazard. The map makes it clear that storm surge is not just a beachfront problem, with the risk of storm surge extending many miles inland from the immediate coastline in some areas. If you discover via these maps that you live in an area vulnerable to storm surge, find out today if you live in a hurricane storm surge evacuation zone as prescribed by your local emergency management agency. If you do live in such an evacuation zone, decide today where you will go and how you will get there if and when you're instructed by your emergency manager to evacuate. If you don't live in one of those evacuation zones, then perhaps you can identify someone you care about who does live in an evacuation zone, and you could plan in advance to be their inland evacuation destination - if you live in a structure that is safe from the wind and outside of flood-prone areas.




LEGEND

Category 1 (SLOSH MOMs) Storm Surge Inundation

Inundation Height

- Up to 3 feet above ground
- Greater than 3 feet above ground
- Greater than 6 feet above ground
- Greater than 9 feet above ground

Leveed Area -  Consult Local Officials For Flood Risk

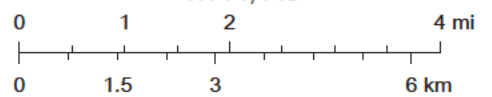
 Less than 3 feet above ground

The National Map Advanced Viewer



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USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census

USGS



U.S. Fish and Wildlife Service

National Wetlands Inventory

Portsmouth



November 1, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.