



HAZARD MITIGATION PLAN

HARFORD COUNTY

MARYLAND

July 2022

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BARRY GLASSMAN

HARFORD COUNTY EXECUTIVE

EXECUTIVE PROMULGATION

This plan is hereby promulgated as the Harford County Hazard Mitigation Plan. It addresses both natural and technological hazards and provides strategies and recommendations to minimize and/or prevent the occurrence of damage from those hazards. The Goals and objectives contained in this plan represent the policies of the Harford County Government. The Harford County Department of Emergency Services is designated as the lead department for mitigation planning and activities within Harford County, supported by the Department of Planning and Zoning. All county departments, agencies, and/or organizations are directed to work closely with these departments to comply with the objectives set out in this plan.

This plan is designed to comply with Applicable Federal and state mitigation requirements and criteria. It replaces all other mitigation plans and is effective immediately upon receipt and for implementation in accordance with its provisions.

8/26/2022 _____
Date County Executive, Barry Glassman

8/25/22 _____
Date Director of Administration, Ben Lloyd

Aug 24, 2022 _____
Date Emergency Manager, Richard A. Ayres, Sr.

Approved for form and legal sufficiency this 12 day of August 2022.

County Attorney, Melissa Lambert

MARYLAND'S NEW CENTER OF OPPORTUNITY

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RESOLUTION NO. 024-22

1 COUNTY COUNCIL
2 OF
3 HARFORD COUNTY, MARYLAND
4 Resolution No. 024-22
5 Legislative Session Day 22-023
6 Introduced by Council President Vincenti at
7 the request of the County Executive
8
9
10 A RESOLUTION to adopt a Harford County 2022 Hazard Mitigation Plan
11

RESOLUTION NO. 024-22

RESOLUTION NO. 024-22

1 WHEREAS, Harford County, Maryland is vulnerable to natural and human-caused hazards
2 which may result in loss of life and property, economic hardship, and threats to public health and
3 safety; and

4 WHEREAS, Harford County's prior Hazard Mitigation Plan of 2017 was previously
5 approved by the County Council by Resolution No. 020-17 and has underwent revisions to remain
6 current.

7 WHEREAS, Section 322 of the Disaster Mitigation Act of 2000 (DMA2K) requires state
8 and local governments to develop and submit for approval to the County Council a mitigation plan
9 that outlines processes for identifying their respective natural hazards, risks, and vulnerabilities;
10 and

11 WHEREAS, Harford County acknowledges the requirements of Section 322 of DMA2K
12 to have an approved Hazard Mitigation Plan as a prerequisite to receiving post-disaster Hazard
13 Mitigation Grant Program funds; and

14 WHEREAS, the Harford County 2022 Hazard Mitigation Plan has been developed by the
15 Harford County Department of Emergency Services in cooperation with other county departments,
16 the City of Aberdeen, the Town of Bel Air, and the City of Havre de Grace, and the citizens of
17 Harford County pursuant to standards contained in 44 Code of Federal Regulations (CFR), Part
18 201, as authorized by the Disaster Mitigation Act of 2000 (DMA2K); and

19 WHEREAS, a public involvement process consistent with the requirements of DMA2K
20 was conducted to develop the Harford County 2022 Hazard Mitigation Plan; and

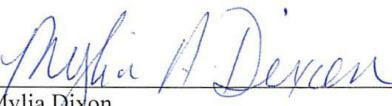
21 WHEREAS, the Harford County 2022 Hazard Mitigation Plan recommends mitigation
22 activities that will reduce losses to life and property affected by both natural and human-caused
23 hazards that face the County and its municipal governments.

RESOLUTION NO. 024-22

1 NOW, THEREFORE, BE IT RESOLVED by the County Council of Harford County,
2 Maryland, that the Harford County 2022 Hazard Mitigation Plan is hereby adopted as the official
3 Hazard Mitigation Plan of the County; and

4 BE IT FURTHER RESOLVED that the respective officials and agencies identified in the
5 implementation strategy of the Harford County 2022 Hazard Mitigation Plan are hereby directed
6 to implement the recommended activities assigned to them.

ATTEST:


Mylia Dixon
Council Administrator


Patrick Vincenti
President of the Council

ADOPTED: October 4, 2022

U.S. Department of Homeland Security
Federal Emergency Management Agency
Region 3

One Independence Mall
615 Chestnut Street, 6th floor
Philadelphia, PA 19106-4404



FEMA

November 18, 2022

The Honorable Patrick Vincenti
President, County Council
Harford County
220 South Main Street
Bel Air, Maryland 21014

Community: Harford County, Maryland
Plan Adoption Date: 10/04/2022
Plan Approval Date: 08/05/2022
Plan Expiration Date: 08/04/2027

Dear President Vincenti:

I am pleased to tell you FEMA has approved your Hazard Mitigation Plan (HMP). The plan meets the requirements of Title 44, Chapter 1, Section 201.6, of the Code of Federal Regulations ([44 CFR 201.6](#)). It addresses these required elements: planning process, risk assessment and hazard identification, mitigation strategy, maintenance and implementation, and adoption.

Participating communities are now eligible for [Hazard Mitigation Assistance \(HMA\)](#) grant programs. These programs can fund mitigation planning and projects that reduce disaster losses and protect life and property from future disasters. Approved HMPs can also earn points under the [Community Rating System](#).

Within 5 years, your community must revise its plan and obtain approval to remain eligible for HMA funding. You should review the plan annually to keep it relevant to mitigation goals in your community. Please consider the enclosed recommendations to further strengthen your plan during its next update.

I commend you and the planning team for your hard work and continued commitment to building a safer, more resilient community. For questions about your plan or mitigation grant funding, please contact Caitlin Whiteleather, State Hazard Mitigation Officer, at (410) 517-3600 (ext. 2581).

Sincerely,

Sarah Wolfe, Branch Chief
Floodplain Management and Insurance Branch
FEMA Region 3



CITY OF ABERDEEN

CITY OF ABERDEEN PROMULGATION

This Plan is hereby promulgated as the City of Aberdeen Hazard Mitigation Plan. It addresses both natural and technological emergencies or disasters and provides strategies and recommendations to minimize and/or prevent the occurrence or reoccurrence of damage from those emergencies or disasters.

The goals and objectives contained in this plan represent the policies of the City of Aberdeen Government. The Harford County Department of Emergency Services is designated as the lead agency for mitigation activities within the City of Aberdeen, supported by all municipal departments, agencies, or organizations to comply with the objectives set out in this plan.

This plan is designed to comply with applicable Federal and state mitigation criteria. It replaces all other mitigation plans and is effective immediately upon receipt and for implementation in accordance with its provisions.

8/17/22

Date

Patrick McGrady
Mayor
City of Aberdeen

U.S. Department of Homeland Security
Federal Emergency Management Agency
Region 3

One Independence Mall
615 Chestnut Street, 6th floor
Philadelphia, PA 19106-4404



FEMA

September 7, 2022

The Honorable Patrick McGrady
Mayor
City of Aberdeen
60 North Parke Street
Aberdeen, Maryland 21001

Community: City of Aberdeen,
Harford County,
Maryland
Plan Adoption Date: 08/17/2022
Plan Approval Date: 08/05/2022
Plan Expiration Date: 08/04/2027

Dear Mayor McGrady:

I am pleased to tell you FEMA has approved your Hazard Mitigation Plan (HMP). The plan meets the requirements of Title 44, Chapter 1, Section 201.6, of the Code of Federal Regulations ([44 CFR 201.6](#)). It addresses these required elements: planning process, risk assessment and hazard identification, mitigation strategy, maintenance and implementation, and adoption.

Participating communities are now eligible for [Hazard Mitigation Assistance \(HMA\)](#) grant programs. These programs can fund mitigation planning and projects that reduce disaster losses and protect life and property from future disasters. Approved HMPs can also earn points under the [Community Rating System](#).

Within 5 years, your community must revise its plan and obtain approval to remain eligible for HMA funding. You should review the plan annually to keep it relevant to mitigation goals in your community. Please consider the enclosed recommendations to further strengthen your plan during its next update.

I commend you and the planning team for your hard work and continued commitment to building a safer, more resilient community. For questions about your plan or mitigation grant funding, please contact Caitlin Whiteleather, State Hazard Mitigation Officer, at (410) 517-3600 (ext. 2581).

Sincerely,

Sarah Wolfe, Branch Chief
Floodplain Management and Insurance Branch
FEMA Region 3



TOWN OF BEL AIR

DEPARTMENTS OF PLANNING AND PUBLIC WORKS

705 E. CHURCHVILLE ROAD
BEL AIR, MARYLAND 21014
www.belairmd.org

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BOARD OF COMMISSIONERS

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TOWN OF BEL AIR PROMULGATION

This Plan is hereby promulgated as the Town of Bel Air Hazard Mitigation Plan. It addresses both natural and technological emergencies or disasters and provides strategies and recommendations to minimize and/or prevent the occurrence or reoccurrence of damage from those emergencies or disasters.

The goals and objectives contained in this plan represent the policies of the Town of Bel Air Government. The Harford County Department of Emergency Services is designated as the lead agency for mitigation activities within the Town of Bel Air, supported by all municipal departments, agencies, or organizations to comply with the objectives set out in this plan.

This plan is designed to comply with applicable Federal and state mitigation criteria. It replaces all other mitigations plans and is effective immediately upon receipt and for implementation in accordance with its provisions.

8 August 2022

Date

L. Jesse Bane

L. Jesse Bane
Town Administrator
Town of Bel Air

U.S. Department of Homeland Security
Federal Emergency Management Agency
Region 3

One Independence Mall
615 Chestnut Street, 6th floor
Philadelphia, PA 19106-4404



FEMA

August 22, 2022

The Honorable Kevin M. Bianca
Chair, Board of Commissioners
Town of Bel Air
705 East Churchville Road
Bel Air, Maryland 21014

Community: Town of Bel Air,
Harford County,
Maryland
Plan Adoption Date: 08/08/2022
Plan Approval Date: 08/05/2022
Plan Expiration Date: 08/04/2027

Dear Chair Bianca:

I am pleased to tell you FEMA has approved your Hazard Mitigation Plan (HMP). The plan meets the requirements of Title 44, Chapter 1, Section 201.6, of the Code of Federal Regulations ([44 CFR 201.6](#)). It addresses these required elements: planning process, risk assessment and hazard identification, mitigation strategy, maintenance and implementation, and adoption.

Participating communities are now eligible for [Hazard Mitigation Assistance \(HMA\)](#) grant programs. These programs can fund mitigation planning and projects that reduce disaster losses and protect life and property from future disasters. Approved HMPs can also earn points under the [Community Rating System](#).

Within 5 years, your community must revise its plan and obtain approval to remain eligible for HMA funding. You should review the plan annually to keep it relevant to mitigation goals in your community. Please consider the enclosed recommendations to further strengthen your plan during its next update.

I commend you and the planning team for your hard work and continued commitment to building a safer, more resilient community. For questions about your plan or mitigation grant funding, please contact Caitlin Whiteleather, State Hazard Mitigation Officer, at (410) 517-3600 (ext. 2581).

Sincerely,

A handwritten signature in black ink, appearing to read "Sarah Wolfe".

Sarah Wolfe, Branch Chief
Floodplain Management and Insurance Branch
FEMA Region 3



City of Havre de Grace

711 PENNINGTON AVENUE, HAVRE DE GRACE, MARYLAND 21078
WWW.HAVREDEGRACEMD.COM

410- 939-1800
410- 575-7043

CITY OF HAVRE DE GRACE PROMULGATION

This Plan is hereby promulgated as the City of Havre de Grace Hazard Mitigation Plan. It addresses both natural and technological emergencies or disasters and provides strategies and recommendations to minimize and/or prevent the occurrence or reoccurrence of damage from those emergencies or disasters.

The goals and objectives contained in this plan represent the policies of the City of Havre de Grace Government. The Harford County Department of Emergency Services is designated as the lead agency for mitigation activities within the City of Havre de Grace, supported by all municipal departments, agencies, or organizations to comply with the objectives set out in this plan.

This plan is designed to comply with applicable Federal and state mitigation criteria. It replaces all other mitigation plans and is effective immediately upon receipt and for implementation in accordance with its provisions.

8/5/22
Date

William T. Martin

William T. Martin
Mayor
City of Havre de Grace

U.S. Department of Homeland Security
Federal Emergency Management Agency
Region 3

One Independence Mall
615 Chestnut Street, 6th floor
Philadelphia, PA 19106-4404



August 18, 2022

The Honorable William T. Martin
Mayor
City of Havre de Grace
711 Pennington Avenue
Havre de Grace, Maryland 21078

Community: City of Havre de Grace,
Harford County,
Maryland
Plan Adoption Date: 08/05/2022
Plan Approval Date: 08/05/2022
Plan Expiration Date: 08/04/2027

Dear Mayor Martin:

I am pleased to tell you FEMA has approved your Hazard Mitigation Plan (HMP). The plan meets the requirements of Title 44, Chapter 1, Section 201.6, of the Code of Federal Regulations ([44 CFR 201.6](#)). It addresses these required elements: planning process, risk assessment and hazard identification, mitigation strategy, maintenance and implementation, and adoption.

Participating communities are now eligible for [Hazard Mitigation Assistance \(HMA\)](#) grant programs. These programs can fund mitigation planning and projects that reduce disaster losses and protect life and property from future disasters. Approved HMPs can also earn points under the [Community Rating System](#).

Within 5 years, your community must revise its plan and obtain approval to remain eligible for HMA funding. You should review the plan annually to keep it relevant to mitigation goals in your community. Please consider the enclosed recommendations to further strengthen your plan during its next update.

I commend you and the planning team for your hard work and continued commitment to building a safer, more resilient community. For questions about your plan or mitigation grant funding, please contact Caitlin Whiteleather, State Hazard Mitigation Officer, at (410) 517-3600 (ext. 2581).

Sincerely,

Sarah Wolfe, Branch Chief
Floodplain Management and Insurance Branch
FEMA Region 3

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EXECUTIVE SUMMARY

Mitigation activities are undertaken to reduce or eliminate losses of life and property. These actions can occur before, during, and after a disaster. Mitigation is needed to break the cycle of damage, reconstruction, and damage again. By investing in mitigation measures before a disaster occurs, Harford County intends to significantly reduce the need for large expenditures for emergency response, recovery, repair, and reconstruction after any disaster.

Mitigation measures encompass regulatory tools (laws, executive orders, ordinances, and codes), as well as changes in policies and procedures. Effective mitigation usually entails identification of capital projects, planning, and programs to educate the public. Partnerships forged between citizens, governmental agencies, and private organizations have long characterized emergency planning in Harford County and made possible the compilation of ideas and strategies found in this plan.

This plan represents current knowledge about hazards that could affect Harford County with greater emphasis placed on natural hazards. As a working document, it is intentionally designed to be reviewed, revised, and updated as necessary. Beginning with a description of the county, the plan focuses on the county's vulnerability to drought, flooding, high winds (including tornadoes), hurricanes/tropical storms, severe thunderstorms, earthquakes, wildfires, and winter storms, and other hazards. Each hazard is discussed in a separate section that includes a definition of the hazard, a summary of occurrences, the degree of the county's vulnerability to the hazard, the probability of reoccurrence and likely impacts, and the County's capacity to respond to and recover from it. Areas at high risk for each hazard are identified. The greatest risk to the county is flooding (riverine, tidal/coastal, and flash) which can result from many different identified hazards. Mitigation strategies for preventing or minimizing recurring damages are examined in a comprehensive context. Effective mitigation and hazard reduction efforts may include:

- Reducing flood risks by preventing the unwise construction of buildings in Special Flood Hazard Areas (SFHA).
- Using geographic information system (GIS) tools to identify properties at risk from any identified hazard.
- Maintaining effective communications capabilities for county and municipal agencies that have an emergency response/recovery mission/function.
- Protecting critical facilities and infrastructure from known hazards.
- Coordinating plans and actions among government departments and agencies, private businesses, non-profit organizations, municipalities, and surrounding jurisdictions.

Technological and man-made hazards and risks are discussed following the natural hazards portion of the plan. Harford County is located within 50 miles of four nuclear power plants and vulnerable to the ill effects of incidents/accidents at the Peach Bottom Atomic Power Station (PBAPS), Three Mile Island Nuclear Generating Station (TMI), Salem and Hope Creek Nuclear Power Plants, and the Calvert Cliffs Nuclear Power Plant. Other technological hazards are located at Aberdeen Proving Ground (APG), as well as the multitude of hazardous materials that are transported along interstate highways and railroad corridors. Mitigation activities for technological hazards fall under the direction of the Department of Emergency Services (DES) and are closely coordinated with military, law enforcement, fire, and public works, and Harford County's three municipalities (the City of Aberdeen, the Town of Bel Air, and the City of Havre de Grace).

There is a Memorandum of Understanding (MOU) between APG and Harford County Government which states that expertise will be shared as needed during times of crisis.

The revisions and updates incorporated into this plan also include information regarding completed mitigation-related actions, completion timelines for priority actions, and/or other revisions. Some projects have been pushed back due to tight fiscal constraints and availability of grant funding.

Upon formal County Council Resolution and Promulgation by Harford County, the City of Aberdeen, the Town of Bel Air, and the City of Havre de Grace, this Plan will be available to the public on the Harford County Departments of Emergency Services and Planning and Zoning Websites. The URL link to the Plan will be updated as Amendments/Revisions are made, as needed.

I. INTRODUCTION

A. Purpose

The purpose of the Harford County Hazard Mitigation Plan is to minimize and/or prevent the occurrence or recurrence of damage from natural and technological disasters. This plan contains strategies and recommendations to achieve the following goals:

- Ensure public safety and protection of the environment.
- Reduce losses to human life or property.
- Avoid unnecessary or repetitive expenditures.
- Lessen exposure to liability.
- Promote economic development by becoming a “Disaster Resistant Community.”
- Acknowledge hazard mitigation in county and state programs.

This plan examines and ranks natural and technological hazards to which Harford County is vulnerable and summarizes past occurrences. It also addresses the county’s capacity to respond to actual and threatened events. This plan is designed to meet the requirements of the Federal Emergency Management Agency (FEMA) for receiving disaster relief funds. It also qualifies as the county’s Floodplain Management Plan under the Community Rating System (CRS) of the National Flood Insurance Program (NFIP).

This plan, originally developed and approved in 2004, underwent revisions in 2008, 2012, 2017, and then again in 2022 to remain current. This 2022 edition of the Harford County Hazard Mitigation Plan includes all current updated federal and state guidance and includes all recommended changes, updates, and additions, as required.

This plan is a guide for funding requests and prioritizing work projects. Through public participation and education, partnerships between the business communities, local government, and the public, will continue. With flood mitigation as a major component, a comprehensive analysis of problems facing flood prone property and infrastructure is provided.

B. Endorsement

Harford County Government is an executive form of government and, as such, the County Executive promulgates all plans involving the five phases of emergency management: prevention, protection, mitigation, response, and recovery. Thus, this plan is formally promulgated by the Harford County Executive. The goals and objectives contained in this plan represent the policies of Harford County Government. The County Executive will direct the department directors to accomplish the goals, objectives, and actions set out in this plan.

The Harford County Council supports the mitigation strategies and goals contained herein and formally adopted this plan on October 4, 2022 after formal presentation during the September 20, 2022 Council meeting. The County Council may be called upon to adopt legislation or budget appropriations to carry out initiatives and projects. The local municipalities (the City of Aberdeen, the Town of Bel Air, and the City of Havre de Grace) have participated in the revision process and have also promulgated this plan.

C. Authorities

Below is a list of the various authorities for the formation of this plan. The policies in these documents are the basis for the development and implementation of the Harford County Hazard Mitigation Plan. Appendix A contains descriptions of the cited authorities and a glossary of mitigation-related terms.

The Disaster Relief Act (1974), the Robert T. Stafford Disaster Relief and Emergency Assistance Act (1988), and the Disaster Mitigation Act of 2000 (DMA2K) offer mitigation funding to state and local governments in the aftermath of significant disasters as declared by the President of the United States. To be eligible, these governments must assess their vulnerability to natural and technological hazards and determine mitigation measures that are appropriate to pursue.

The following elements serve as the basis for how Harford County addresses hazard mitigation activities:

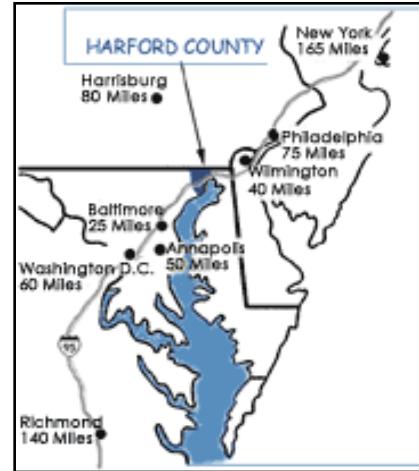
1. Harford County Emergency Operations Plan (EOP)
2. Harford County Debris Management Plan
3. Harford County Nuisance Flood Plan, January 2020

4. Dual Bridge Closure Freeway Incident Management Plan, January 2021
5. State of Maryland Local Hazard Mitigation Plan Guidance (MEMA)
6. Local Mitigation Plan Review Guide (FEMA, 2011)
7. 44 CFR Part 201
8. Disaster Mitigation Act of 2000
9. The Robert T. Stafford Disaster Relief and Emergency Act (Stafford Act), P.L. 100-707, of November 23, 1988
10. National Flood Insurance Act of 1968
11. The Disaster Relief Act of 1974, P.L. 93-288, as amended
12. Presidential Executive Orders 11988 and 12699
13. Federal Disaster Declaration, FEMA-3100-DR-MD (1993)
14. Federal Disaster Declaration, FEMA-1081-DR-MD (1996)
15. Federal Disaster Declaration, FEMA-1303-DR-MD (1999)
16. Emergency Declaration, FEMA-EM-3179-MD (2003)
17. Federal Disaster Declaration, FEMA-DR-1492-MD (2003)
18. Emergency Declaration, FEMA-EM-3251-MD (2005)
19. HMGPR-DR-1652-MD-001 (2008)
20. Federal Disaster Declaration, FEMA-DR-1875-MD (2009)
21. Federal Disaster Declaration, FEMA-DR-1910-MD (2010)
22. Federal Disaster Declaration, FEMA-DR-4034-MD (2011)
23. Federal Disaster Declaration, FEMA-DR-4038-MD (2011)
24. Federal Disaster Declaration, FEMA-DR-4091-MD (2012)
25. Federal Disaster Declaration, FEMA-DR-4261-MD (2016)
26. Reducing Risk in the Floodplain, (FEMA, January 2021)
27. Federal Disaster Emergency Declaration, FEMA-EM-3430-MD (2020-2022) (COVID-19)

II. COMMUNITY PROFILE

A. Physiography

Located in the northeastern portion of Maryland, Harford County is part of the Baltimore Metropolitan Region. Harford County is strategically situated for development because of its proximity to major transportation networks and Washington, DC. The Port of Baltimore is an important destination for importing goods for distribution across the nation. Still a predominantly agricultural community, suburban growth and development continue to change the landscape.



Bodies of water define many of Harford County's jurisdictional boundaries. The Susquehanna River runs along the eastern edge of the county until it merges with the Elk River and forms the Chesapeake Bay at Havre de Grace. The Chesapeake Bay hugs the southern coast; it is the receiving water body for all the runoff in the county. The Little Gunpowder River forms the western boundary, and the Mason-Dixon Line defines the northern border with Pennsylvania.

The total land area of the county is 448 square miles. The hilly topography (maximum elevation of 775 feet) gradually slopes down from the Piedmont Province to the Coastal Plain of the Chesapeake Bay. The coastline along the Chesapeake Bay features vast areas of tidal wetlands and estuaries. Many streams and rivers dissect the county, enhancing the landscape. The U.S. Army's Aberdeen Proving Ground (APG) occupies approximately 40 square miles in the southeastern part of the county, along the Chesapeake Bay.

Maryland is located approximately midway between the mild climate of the southeastern U.S. and the harsher climate of the northeast. In addition, the area is adjacent to the modifying influences of the Appalachian Mountains to the west and the Atlantic Ocean to the east. The climate of the area is temperate and moderately humid; the mean annual temperature is 55 degrees. Annual precipitation (in the form of rain, ice and snow) averages 42 inches per year.

B. Infrastructure & Development Trends

1. Development Envelope

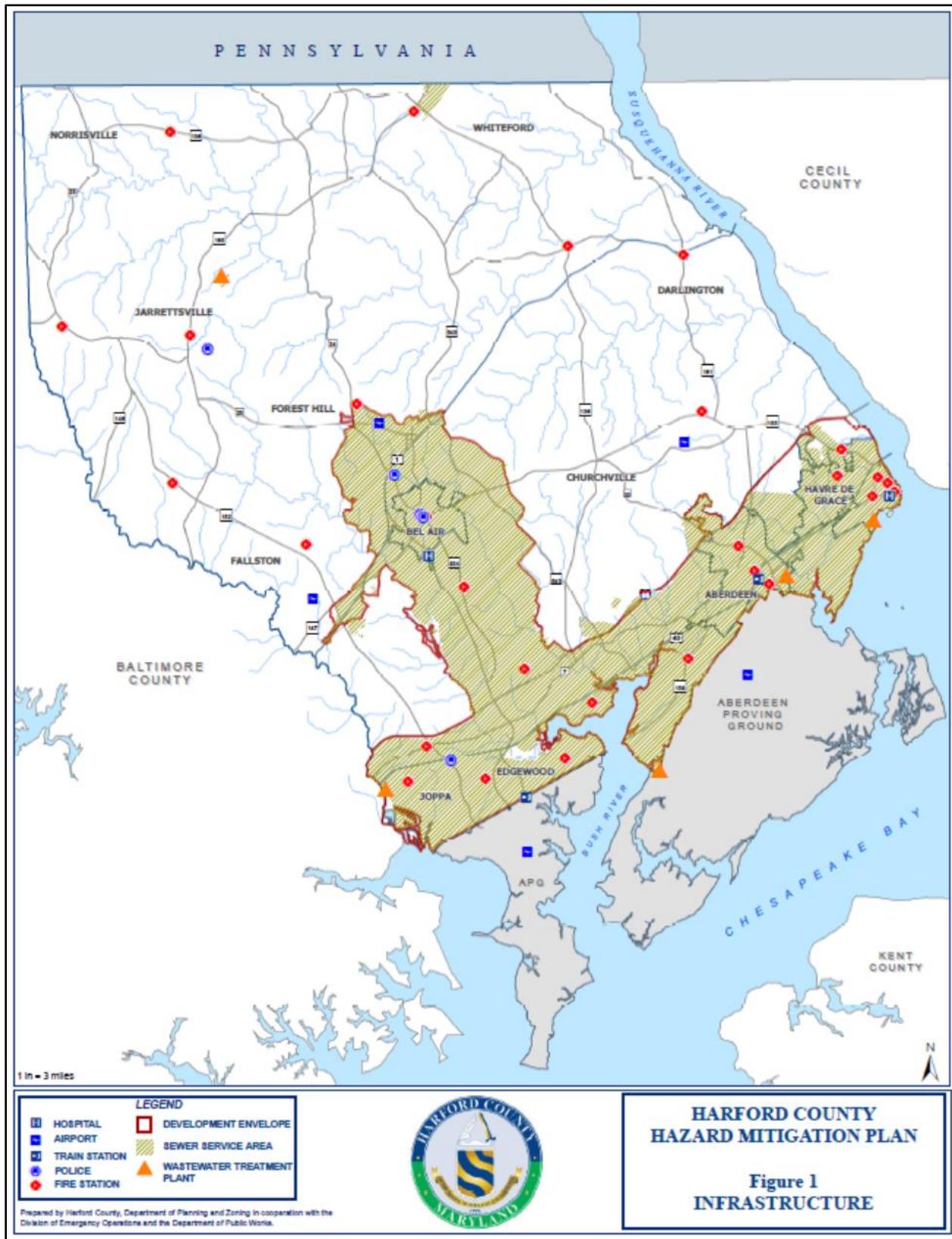
The county has directed that residential and commercial development be located within a designated growth area called the “development envelope” that extends along Route 40 (Interstate 95 parallels Route 40) and along Route 24 through the Town of Bel Air. A narrow corridor of property fronting Route 1 (Business), from Route 24 south to Route 152 is also included in this future development area. Approximately 70% of the county’s population resides within the “development envelope.” Figure 1 depicts the county’s critical infrastructure and the “development envelope.” Regulatory controls are in place that prohibits development in vulnerable areas, such as floodplains. These regulatory controls apply to the entire county, including areas targeted for development and are discussed in detail in Section III, Mitigation Summary and Section V, County Mitigation Capability (All Hazards).

2. Water & Sewer

a. The County’s Water Resource Element (WRE) Plan is contained within the County’s Master Plan, known as HarfordNEXT. Within the County’s development envelope, there are seven distinct and separately owned, operated and managed water purveyors who meet the needs of most the county’s population. For the purposes of this document these major water systems are collectively named the “Major Water Systems.”

These Major Water Systems are: Harford County Government (known as “The County System”), Maryland American Water Company (MAWC), City of Aberdeen, City of Havre de Grace, APG – Aberdeen Area (APG – AA), APG – Edgewood Area (APG – EA), and Green Ridge Utilities (GRU). Based on the 2020 Census, these purveyors served approximately 183,000 people.

The County System is the largest purveyor of water in the county with the largest service area of approximately 30 square miles. The County System served approximately 135,000 residential people in 2020 and had 42,739 customer connections. In 2020, the county had supply capability of 27.8 million gallons per day (mgd) and the county’s average daily demand was 12.9 mgd. The maximum daily demand was 15.9 mgd.

Figure 1 – HARFORD COUNTY CRITICAL INFRASTRUCTURE

The central water supply system serving Harford County is operated by the Department of Public Works, Division of Water and Sewer. The county's service area generally lies outside of the incorporated Town of Bel Air, the cities of Aberdeen and Havre de Grace, and excludes the federal land area of APG. In addition to serving the development envelope, the County System also has water purchase agreements for a set amount of water to several of the other major water suppliers: Aberdeen City – 0.9 million gallons per day (mgd), Aberdeen Proving Ground-Edgewood area – 1.5 mgd, Maryland American – 0.54 mgd, and Green Ridge Utilities – 0.35 mgd. Three different water treatment plants supply the county's service area: the Harford County Havre de Grace Water Treatment Plant, the Perryman Water Treatment Plant, and the Abingdon Water Treatment Plant. The raw water source for the Harford County Havre de Grace Water Treatment Plant is the Susquehanna River.

The Perryman Water Treatment Plant uses a well field comprised of seven deep wells drawing ground water from the Talbot Formation and Potomac Group of the Coastal Plain. Source water protection regulations within the Harford County Zoning Code provide protections to the Perryman Wellfield Protection District. These regulations include prohibition of potential contaminant uses within the wellfield district, limitation of impervious surfaces within the district, and promotion of recharge of the groundwater supply. The raw water source for the Abingdon Water Treatment Plant is the City of Baltimore's Susquehanna raw water transmission main. It provides raw water from either the Loch Raven Reservoir or from the Susquehanna River.

b. Municipal Systems

The City of Havre de Grace owns and operates its own 4.0 mgd water treatment plant and water distribution system. The source of this water is the Susquehanna River. Over 15,000 residents are currently served by this system as well as commercial and industrial customers. The water treatment plant produces water to supply the City of Havre de Grace as well as for small service areas just outside the city limits but within the Harford County development envelope.

The City of Aberdeen currently owns and operates a 1.5 mgd average (2.0 mgd peak) well field located near the boundary of APG – AA. Through a contract

purchase agreement with the county, the city may purchase up to 900,000 gallons per day from the county to supplement this supply. The City of Aberdeen system served approximately 16,200 residential people in 2021 and had 4,234 customer connections.

c. Private Systems

Maryland American Water Company (MAWC) provides service to the Town of Bel Air, as well as some adjacent county areas and serves approximately 15,029 residents. Its water treatment plant draws water from Winters Run (up to 1.4 mgd) and two wells (up to 0.355 mgd). In addition, MAWC may receive up to 540,000 gallons per day (gpd) through a contract purchase agreement with the county. The company's average day demand was 1.5 mgd and its maximum day demand was 1.7 mgd. The water supply withdrawals from Winters Run are limited during times of drought and during late summer and early fall when rainfall is not plentiful due to minimum stream "flow-by" requirements.

Green Ridge Utilities, Inc. provides water service to approximately 1,736 people via 855 customer connections outside of the Town of Bel Air and immediately adjacent to the county's water system in the Green Ridge community. The source water for the utility is a series of 20 active wells, as well as a contract purchase agreement with the county for 0.35 mgd of water. There are no foreseen future customers to its system. The service area has no plans for expansion.

d. Federal Systems

Aberdeen Proving Ground (APG) is divided into two areas: Aberdeen Area (APG – AA) and Edgewood Area (APG – EA) and is served by two independent water supply systems. APG – EA is served by a water treatment plant in the Van Bibber area which has an allocation permit to withdraw a maximum of 4.5 mgd of water from Winters Run. The Winters Run stream has a zero-safe yield as a water source, due to the required flow-by criteria which frequently necessitates the plant to stop production due to low flows in the stream during late summer and early fall. In seven of the last eight summers, this plant was unable to withdraw water from Winters Run due to low stream flows. Privatization of this federal facility is pending.

e. Wastewater

It is estimated that approximately 70% of the county's population is presently served by the county's central sewerage facilities or by a municipal owned treatment and collection system. In the development envelope, wastewater is collected and treated at six wastewater treatment plants, each with a capacity greater than 500,000 gpd. These major plants are: Harford County Government – Sod Run and Joppatowne Waste Water Treatment Plants (known as "The County System"), City of Aberdeen, City of Havre de Grace, APG – Aberdeen Area (APG – AA), and APG – Edgewood Area (APG – EA). The Spring Meadows WWTP is a small (0.01 mgd) plant outside the development envelope and was taken over by the County in 1976. It is also included as part of the County System.

In addition to the major publicly-owned wastewater treatment plants, there are multiple private waste water treatment systems, including those owned by the Board of Education serving public schools, mobile home parks, and other commercial/community establishments, plus a large population on private individual septic systems outside of the development envelope.

3. Transportation

Most primary roads and bridges are owned and maintained by the State of Maryland and Harford County. Local municipalities and/or private entities own all other roads and bridges. Roads and streets are functionally classified in Harford County by how they serve traffic in the network. The functional classification determines the requirements for each road type, including but not limited to number of lanes, lane width, intersection spacing, etc. During a snow emergency, the county and state clear the roads with emergency routes (arterials) first, main routes (collectors) second, and district routes (residential roads) third.

With few exceptions, many of the state and county roads have stream crossings where flooding may occur due to heavy rainfall. The few roads built above flood levels are Interstate 95, State Routes 152 and 155, and the southern portion of Route 24.

Another factor considered is high winds and the need for restrictions and/or temporary closures to bridges. Due to a high wind event in March 2018, the Northeast transportation corridor was shut down for several hours causing

catastrophic roadway impacts. A planning team, with representatives from Federal, States, and local transportation, emergency management, fire/EMS, and law enforcement agencies developed the Dual Bridge Closure Freeway Incident Management Plan, January 2021. The County also developed the Transportation Corridor Emergencies, Appendix 8, to the Harford County Emergency Operations Plan.

4. Fire/EMS and Law Enforcement

Volunteers provide fire suppression services for the entire county. A combination of paid and volunteer personnel provide EMS services for the entire county.

The Harford County Sheriff's Office and Maryland State Police (MSP) serve residents in the unincorporated area of the county, and the three municipalities have their own police departments. There is one central Emergency Operations Center (EOC) where the municipalities and personnel from APG work cooperatively with the county during a crisis.

5. Utilities

Power for electricity is provided by Delmarva Power, Baltimore Gas & Electric (BGE), and Constellation Energy. The Conowingo Dam, operated by Constellation Energy, is a hydroelectric generating facility across the Susquehanna River.

The Peach Bottom Atomic Power Station (PBAPS), located just five miles from the villages of Whiteford, Cardiff, and Dublin, is the closest nuclear power plant.

C. Demographics

The county's commercial, residential, and industrial development is concentrated along Interstate 95 and Route 24. This "development envelope" includes the cities of Havre de Grace and Aberdeen, the Town of Bel Air, and the Edgewood-Joppatowne areas.

Table 1 – Population Statistics for Harford County, MD (Decennial Census & American Community Survey)

	Total Population	0-17	18-24	25-44	45-64	65+	WHITE, NON-Hispanic	Black	Other
Harford County	260,924	58,520	21,541	64,339	75,301	41,223	190,128	37,706	33090
City of Aberdeen	16,254	3,356	1,682	3,791	4,895	2,530	8,342	5,013	2899
City of Havre De Grace	14,807	2,748	1,063	3,563	4,512	2,921	10283	2,564	1960
Town of Bel Air	10,661	2,089	882	2,765	2,733	2,192	8,657	607	1397
Aberdeen Proving Ground	1668	513	360	513	262	20	759	495	414

Population data was analyzed from the previously approved HMP. There have been no significant changes in declining populations or increased populations. The HMP Team will continue to consider population adjustments as we move forward.

III. MITIGATION SUMMARY

A. History of Mitigation Planning

Hazard mitigation planning has its roots in the civil defense programs of the early 1950s, along with emergency and disaster response programs. During the late 1960s, the program matured to include hazard planning. The National Flood Insurance Act, adopted by Congress in 1968, gave the federal government a major role in disaster relief and planning. The damage caused by Hurricane Agnes in June 1972 spurred Harford County's emergency planning program to include greater mitigation efforts. FEMA was created in 1979 by President Carter, which established a central federal office for national emergency management policy. The nuclear

accident at Three Mile Island Nuclear Generating Station in 1979 spurred planning for technological disasters.

With the adoption of its first Floodplain Management Program in 1983, the Harford County began limiting development in flood hazard areas and upgraded the building code to prevent flood losses. During the 1990s, the county enacted floodplain regulations that surpass the National Flood Insurance Program (NFIP) minimum standards and it began acquiring private residences that had experienced severe flood damage. Current regulations prohibit development in designated Special Flood Hazard Areas (SFHA) throughout the county. These policies remain a central pillar for effective mitigation efforts to this day.

As technology changed in the 1990s and the county's population increased dramatically (doubling from 1960 to 2000), the EOC was expanded and modernized. In 2014, the Harford County Department of Emergency Services (DES) moved into an entirely new building featuring a state-of-the-art 911 Communications and Dispatch Center and EOC.

The initial Harford County Hazard Mitigation Plan (1999) was written by the Department of Emergency Services (originally the Division of Emergency Operations). Beginning in 2001, the Departments of Planning & Zoning, Public Works, the Maryland Department of the Environment (MDE), and the Maryland Emergency Management Agency (MEMA) contributed to the plan, which was approved by FEMA in 2004 and formally promulgated.

The Harford County Hazard Mitigation Planning Committee was established in 2008 to maintain the plan and ensure compliance with the Disaster Mitigation Act of 2000 (DMA2K). The Hazard Mitigation Planning Committee was instrumental in completing required updates to the plan in 2008, 2012, and again in 2017. The Committee, with assistance from MEMA, continues to meet and discuss plan revisions and updates. This 2022 Harford County Hazard Mitigation Plan is a result of the continued commitment from all committee members to maintain a useful and relevant planning document that also meets all Federal and state mitigation planning requirements – requirements that are designed to identify hazards, evaluate the county's vulnerability to various disasters, identify effective mitigation activities and funding, and assign hazard mitigation goals and objectives to all stakeholders. Committee members contributed to the overall planning process via group meetings, individual meetings, phone calls, and email correspondence.

The Hazard Mitigation Planning Committee was actively involved in reviewing all identified hazards and hazard data in the 2017 Harford County Hazard Mitigation Plan and how it correlated into the 2022 plan update. Committee members contributed data for all hazards that impact Harford County and paired it with personal recollections of recent hazard events as a part of the assessment process. As part of the planning process, each committee participant reviewed the goals, objectives, and action items that were a part of the 2017 plan and updated the status of each for the 2022 plan.

The Hazard Mitigation Planning Committee includes the following representatives:

- Linda J. Ploener, Emergency Preparedness and Planning Branch Manager – DES
- Matt Kropf, Long Range Planner (Floodplains/GIS) – Dept. of Planning & Zoning
- Justin Mannion, GIS Specialist – DES
- Joel Gallihue, Chief, Long Range Planning (Floodplains/GIS) – Dept. of Planning & Zoning
- Joe Siemek, Director – Department of Public Works
- Bill Bettin, Deputy Director – Department of Public Works, Division of Water & Sewer
- Steve Walsh, Deputy Director – Department of Public Works, Division of Transportation
- Gary Blazinsky, Administrator – Office of Economic Development, Harford Transit
- Paul Magness, Deputy Director – Department of Parks and Recreation
- Donoven Brooks, Coordinator of Safety & Security – Harford County Public Schools
- Rich Truitt, Deputy Director – Department of Inspections, Licenses, and Permits (DILP)
- Erin Schafer, Chief – Department of Facilities and Operations
- Kevin Small, Director – Department of Planning, Town of Bel Air
- Steve Kline, Director – Department of Public Works, Town of Bel Air
- Robert Hartsock, Risk Management - City of Aberdeen
- Kyle Torster, Director of Public Works – City of Aberdeen
- Marisa Willis, Planner – City of Havre de Grace
- Shane Grimm, Director of Planning, City of Havre de Grace

- Jaleesa Tate, State Hazard Mitigation Officer – Maryland Department of Emergency Management
- Kevin Wagner, State NFIP Coordinator – Maryland Department of the Environment
- Essie Washington-Bennett, Emergency Manager/CBRNE Specialist – Aberdeen Proving Ground (APG), Directorate of Plans, Training, Mobilization, and Security

B. Documentation of the Planning Process

The continued collaboration of the Hazard Mitigation Planning Committee forms a solid foundation for sustaining the planning process. Information was collected from many county and municipal departments and agencies. Additionally, data and information from several state (MEMA, MDE) and federal (FEMA, U.S. Army Corps of Engineers) departments and agencies were collected. Sources of data to support this planning process have included earlier reports that were used as a basis for the previous iterations of the Harford County Hazard Mitigation Plan. These are the 1995 Hazards Analysis and Inventory and the Vulnerability and Risk Assessment that was revised in 2002 after the September 11, 2001 terrorist attacks in NYC, and revised annually. In 2016, Harford County completed a Threat Hazard Identification and Risk Assessment (THIRA) and continues to refine elements of the THIRA, as needed. Additional details regarding the Harford County THIRA are presented below in Section IV.A.

DES continues to serve as the lead in reviewing, discussing, and preparing defensive measures. Through meetings with the various county stakeholders, mitigation strategies and objectives are continually reviewed and updated. Much of this process involves looking beyond hazard mitigation and assessing how changes in legislation, development trends, and the dynamic nature of hazard occurrence has evolved since the last plan update in 2017.

Community input for the current, revised plan was sought through meetings with three standing committees appointed by the County Executive: The Environmental Advisory Board (EAB), the Planning Advisory Board (PAB), and the Local Emergency Planning Committee (LEPC). These executive committees provide public forums for discussion of many political, environmental, and hazardous issues that concern citizens. The members of these three committees represent a broad cross-section of public and private interests and their meetings are open to the public. Additional

information on each of these committees, along with copies of meeting notices, agendas, and sign-in sheets, are presented in Appendix B.

The draft 2022 Hazard Mitigation Plan was presented to the EAB on April 19, 2022 with an invitation to review and provide comments and feedback. Similarly, the draft 2022 Hazard Mitigation Plan was presented to the PAB on May 11, 2022, with an invitation to review and provide comments and feedback. At the May 18, 2022 LEPC meeting, details of the updated plan and the planning process was presented. During the Bel Air Comprehensive Plan and Hazard Mitigation Open House held on October 27, 2021, Mitigation Planning Team Members were available to discuss and present the draft plan to the public. Meeting attendees were invited to submit comments and feedback. Advertising for these meetings was done through press releases, listing on community calendars, the Harford County website, bulletin boards, direct marketing, and through social media. Efforts to involve other citizens (not involved with the PAB, EAB or LEPC) in the planning process were not successful due to the COVID-19 Pandemic and precautionary measures that were in place.

The entire Hazard Mitigation Planning Committee met on May 5, 2021, to discuss updating the goals, objectives, and action items listed in the 2017 plan. Subsequent conference calls, one-on-one meetings, and email correspondence were utilized to further develop and update the plan. Committee participants formulated the goals and objectives, reviewed the draft plan, and met with other entities to discuss issues and activities relevant to hazard mitigation in the community. Various county and local jurisdiction departments provided the committee with information on infrastructure, vulnerability, and potential mitigation projects.

IV. NATURAL HAZARDS

A. Identification

As previously stated, Harford County performed a comprehensive Hazards Analysis and Vulnerability Assessment in 1995, revised in 2002, 2008/2009, 2020, and January 2021, which featured an inventory of various natural and technological hazards. Past disaster declarations including federal reimbursements and public expenditures were also used to evaluate hazards. Dam inundation maps prepared by MDE and the U.S. Army Corps of Engineers (USACE) as well as Flood Insurance Rate Maps (FIRM), storm surge maps, and data provided by MEMA on past disasters were used for the analysis. These maps are on file at DES, the Department of

Planning & Zoning, and DPW. Flood maps are available on the GIS network. Each hazard was rated in a quantitative manner regarding the likelihood of its occurrence.

To evaluate potential changes to previous hazard identification efforts and risk assessment information, Harford County completed a Threat and Hazard Identification and Risk Assessment (THIRA) in early 2020. The Comprehensive Planning Guidance (CPG) 201 document provides a four-step process for conducting a THIRA:

1. Identify the Threats and Hazards of Concern – Determine the threats and hazards of primary concern to the community.
2. Give the Threats and Hazards Context – Review and update the descriptions for the threats and hazards of concern.
3. Establish Capability Targets – Develop the capability targets for each core capability.
4. Apply the Results – For each core capability listed below, estimate the resources required to achieve the capability targets using community assets and mutual aid, while also considering preparedness activities, including mitigation opportunities.

Developing an understanding of its risks from natural, technological, and human-caused threats and hazards, allows a community to make informed decisions about how to manage risk and develop needed capabilities. This Plan uses general descriptors for describing probabilities for each hazard. The terms and associated risks are defined as such:

- High: 90-100% each year
- Medium High: 60-89% each year
- Medium: 40-59% each year
- Medium Low: 11-39% each year
- Low: 1-10% each year

This 2020 THIRA correlates well to previous efforts and identifies the following threats and hazards of primary concern to Harford County (no assigned priority):

- Hurricane
- Pandemic Flu/Public Health Emergencies
- Active Assailant

- Severe Winter Storm / Severe Ice Storm
- Cyber Attack
- Tornado

The State of Maryland Hazard Mitigation Plan (MEMA) considers Harford County a HIGH risk for drought, severe thunderstorms, and severe winter storms and a medium-high risk for coastal hazards (coastal flooding), high wind events and tornadoes, riverine flooding, and public health emergencies (which the County has identified above with Pandemic Flu/Public Health Emergencies). Risk from wildfires was also listed in the State's Plan as a medium risk; however, while small brush fires may occur during extreme drought events, the County continues to view this risk as low. The identified natural hazards and their risks are listed below:

1. Drought (High Risk)
2. Severe Thunderstorms (High)
3. Severe Winter Storm (High)
4. Coastal Hazards (Medium-High)
5. High Winds and Tornadoes (Medium-High)
6. Flooding (Medium-High)
7. Wildfire (Medium in State Plan/Low in County Plan)
8. Soil Movement (While the State identifies this as a Medium Risk, Harford County identifies this as a Low risk)
9. Extreme Temperatures (while the State Plan identified this as Medium Risk, the County looks at this, based on historical data, as a Low Risk.)

Probability of future events and thus the need for appropriate mitigation measures has been predicted by evaluating past events, scientific data, and available technical resources. The ranking listed above and provided by MEMA is based on past occurrences of the hazards. The table below reflects Harford County Hazard Vulnerability, by County, City of Aberdeen, City of Havre de Grace, and the Town of Bel Air. The HMP Steering committee examined all natural hazards, and considered the history, the extent of the County affected in determining the vulnerability ranking.

Vulnerability of Natural Hazards By Jurisdiction

	Harford County	Aberdeen	Bel Air	Havre de Grace
Drought	Moderate	Slight	Slight	Slight
Severe Thunderstorm	High	High	High	High
Severe Winter Storms	High	High	High	High
Coastal Hazards	Moderate	Slight	None	High
High Winds and Tornadoes	Moderate	Moderate	Moderate	Moderate
Riverine Flooding / Flooding	Moderate	Moderate	Slight	High
Wildfire	Slight	Slight	Slight	Slight
Soil Movement	Slight	Slight	Slight	Moderate
Extreme Temperatures	Moderate	Moderate	Moderate	Moderate

The current Harford County Emergency Operations Plan (EOP) discusses response and recovery to “all hazards” and this Hazard Mitigation Plan identifies the most likely hazards that can impact Harford County. These hazards include:

- Drought
- Severe Thunderstorms
- High Winds and Tornadoes
- Flooding
 - Riverine
 - Coastal/Tidal
 - Flash
 - Dam Failure
- Severe Winter Storms
- Tropical Cyclones (Hurricanes, Tropical Storms, Tropical Depressions)
- Earthquakes
- Wildfires
- Technological

- Hazardous Materials
- Radiological/Nuclear

A generalized hazard profile for Harford County showing Special Flood Hazard Areas and the locations of historic tornado touchdowns is presented in Figure 2.

B. General History of Damages from Natural Hazards

In 1885, Harford County experienced a devastating flood (considered a 100-year storm) that washed-out bridges and flooded homes and farmland. The next major recorded flood occurred in 1933. In June 1972, flooding occurred from Hurricane/Tropical Storm Agnes along the Susquehanna River and other locations that reached 100-year flood levels. The City of Havre de Grace's water treatment plant and a small portion of its commercial areas were flooded but not ruined. In other portions of the county, flood levels during Hurricane/Tropical Storm Agnes reached the 60-year interval along Deer Creek and the 30-year storm level in the Winters Run watershed. Agnes caused the Susquehanna River at the Conowingo Dam to reach major flood stage at 36.8 feet, the highest recorded crest at this location. The breaching of the Conowingo Dam occurred, but the structure held fast during the storm. In 2003, Hurricane Isabel impacted Harford County causing damage from tidal surge associated with the storm. Many other significant weather events have resulted in damaging riverine, coastal, and flash flooding. In late August 2011 and early September 2011, Hurricane Irene and Tropical Storm Lee impacted the county with strong winds and heavy rain. The heavier rainfall from Tropical Storm Lee impacted the City of Havre de Grace as well as the shoreline along the Susquehanna and Chesapeake Bay as the Conowingo Dam opened 43 of the 50 flood crest gates. Hurricane Sandy tracked up the east coast and impacted Harford County, the City of Havre de Grace, City of Aberdeen, and the Town of Bel Air, with strong winds and heavy rain. Impacts from Sandy were limited to downed tree limbs and branches, sporadic power outages, and localized flooding. A detailed discussion of previous federal disaster declarations and further descriptions and analyses of historic flooding is presented in Appendix C and Appendix E.

C. Vulnerability

1. Mapping Vulnerable Areas

The county's Geographic Information System (GIS) is the primary mapping tool in Harford County and is available in all county offices. GIS contains structure, road, parcel, flood hazard (RiskMAP), and topographic data. Layers such as community facilities, critical facilities (police stations, fire stations, emergency services, hospitals, etc.), and known sites that have groups of citizens with mobility concerns have been identified and are mapped. This GIS information is used in conjunction with other information to identify areas subject to natural and man-made hazards, and to identify vulnerable facilities.

The EOC has maps of flood prone areas and other vulnerable structures and areas that were prepared with GIS. Sixteen maps, thirteen of which are tiled to the USGS quadrangle format and plotted at 1:24,000 scale, are presented in Appendix H. The other three maps are smaller-scale maps of each municipality.

Additionally, Harford County recently adopted (on 4/19/2016) new Digital Flood Insurance Rate Maps (DFIRMs) through a cooperative flood mapping study with FEMA called RiskMAP. The City of Aberdeen, the City of Havre de Grace, and the Town of Bel Air have also approved and adopted the most recent FEMA Digital Flood Insurance Rate Maps.

The RiskMAP process included a full coastal hazard analysis that updated base data and incorporates new methodologies in remapping the flood hazard areas in the county. New hydrologic methods were used in mapping the county's riverine floodplains. FEMA has produced a "Flood Risk Map: Harford County" which identifies flood data, base data, and flood risk information for the entire county (see Figure 3). The Flood Risk Report calculates approximate total losses by census block and is graphically shown on the map. The result of this project is better data and understanding vulnerabilities in the county that have been identified as "Areas of Mitigation Interest", which will help prioritize mitigation projects in the future.

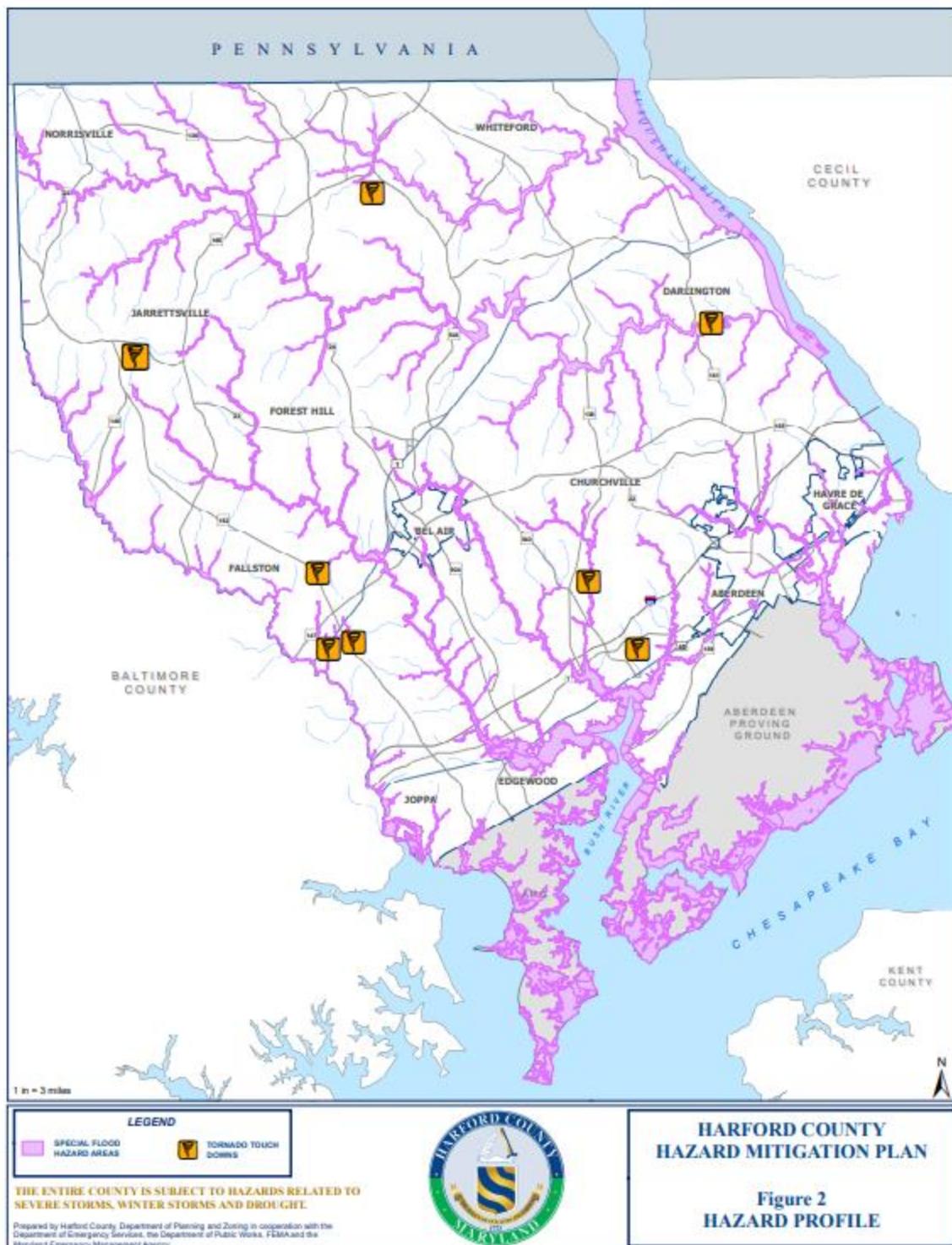
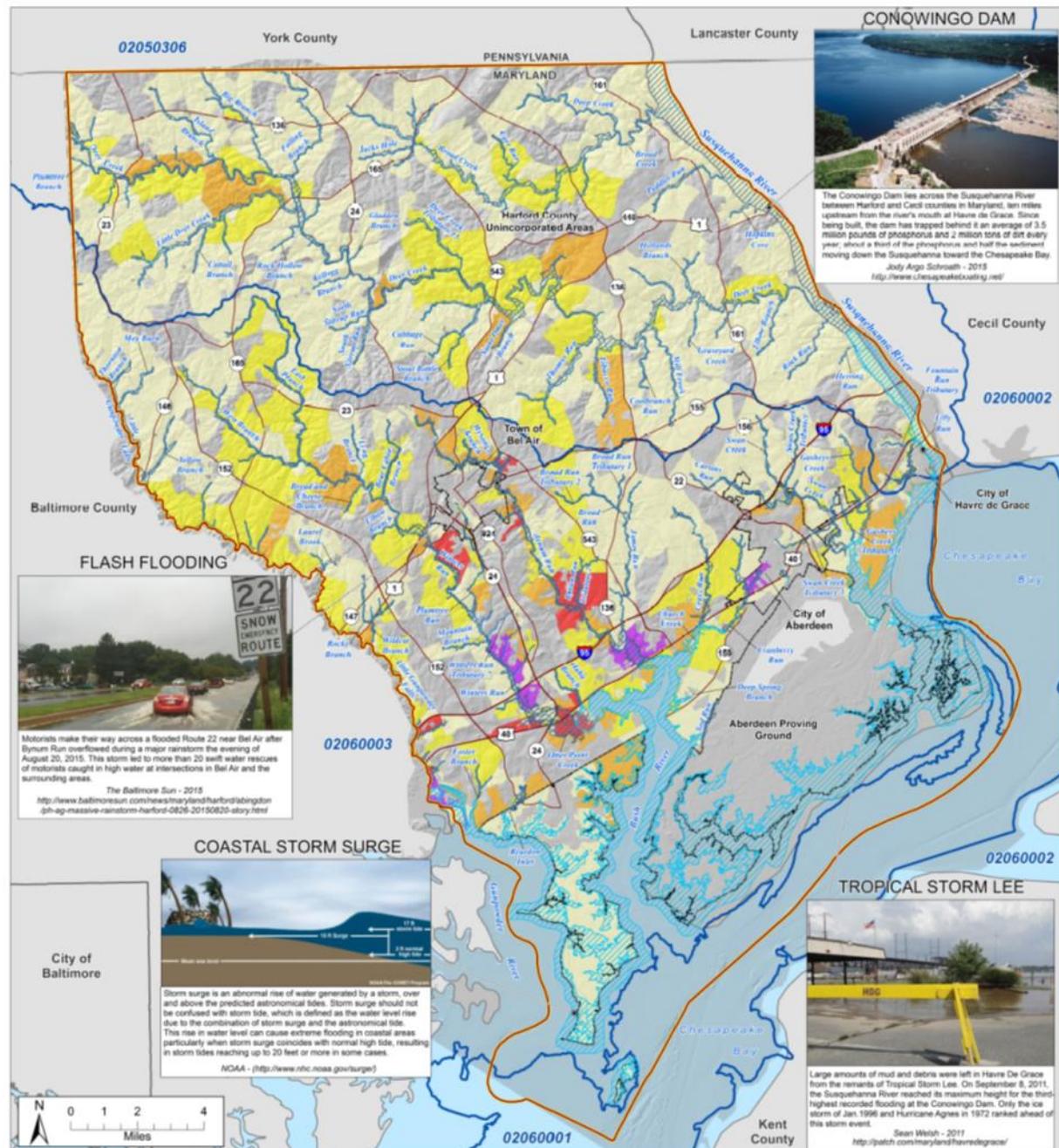
Figure 2 – HARFORD COUNTY HAZARD PROFILE

Figure 3

Flood Risk Map: Harford County, MD



The information depicted on this map, and additional flood risk layers are also available in digital GIS format at [HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)

2. Vulnerability to Storm/Tidal Surge

In addition to the new coastal analysis that was performed with the recent flood study and flood maps, DES has also obtained updated tidal surge maps prepared by the U.S. Army Corps of Engineers (USACE). These maps were updated in 2017 and show the maximum extent of storm surge flooding from many different storm scenarios, sometimes referred to as the maximum of maximums. The updated tidal/storm surge inundation zones are included on the fold out maps that are presented in Appendix H. A large portion of Harford County's shoreline that is most vulnerable to tidal/coastal flooding lies within the boundaries of APG and is not developed. The USACE data, along with new coastal analysis data available through the Flood Risk Report, will help the county identify additional properties that may need mitigation assistance.



Photo of City of Havre De Grace Flooding from Isabel, 2003.

3. Vulnerability from Dam Breaches

Figure 4 illustrates the location of the county's nine dams that are classified as high or significant hazard dams. The breaching of Conowingo Dam on the Susquehanna River poses the greatest danger because it would adversely impact the City of Havre de Grace. Dam inundation studies and emergency evacuation plans have been prepared for all the county's high and significant hazard dams. Information regarding Harford County's high and significant high hazard dams is summarized in Table 2. With the addition of new regulations and policy regarding High Hazard Potential Dams, the HMP Team will be assessing risk, vulnerability, and will further identify and prioritize mitigative actions to reduce identified vulnerabilities and risks to the public. The County, City of Aberdeen, City of Havre de Grace, and Town of Bel Air have current copies of all appropriate Emergency Action Plans for all HHPDs, per Federal and State mandates. In the future, this Plan will be revised to reflect multijurisdictional impacts from HHPD incidents.



Dam Breach at Little Deer Creek #2, McKnight Farm, 2014

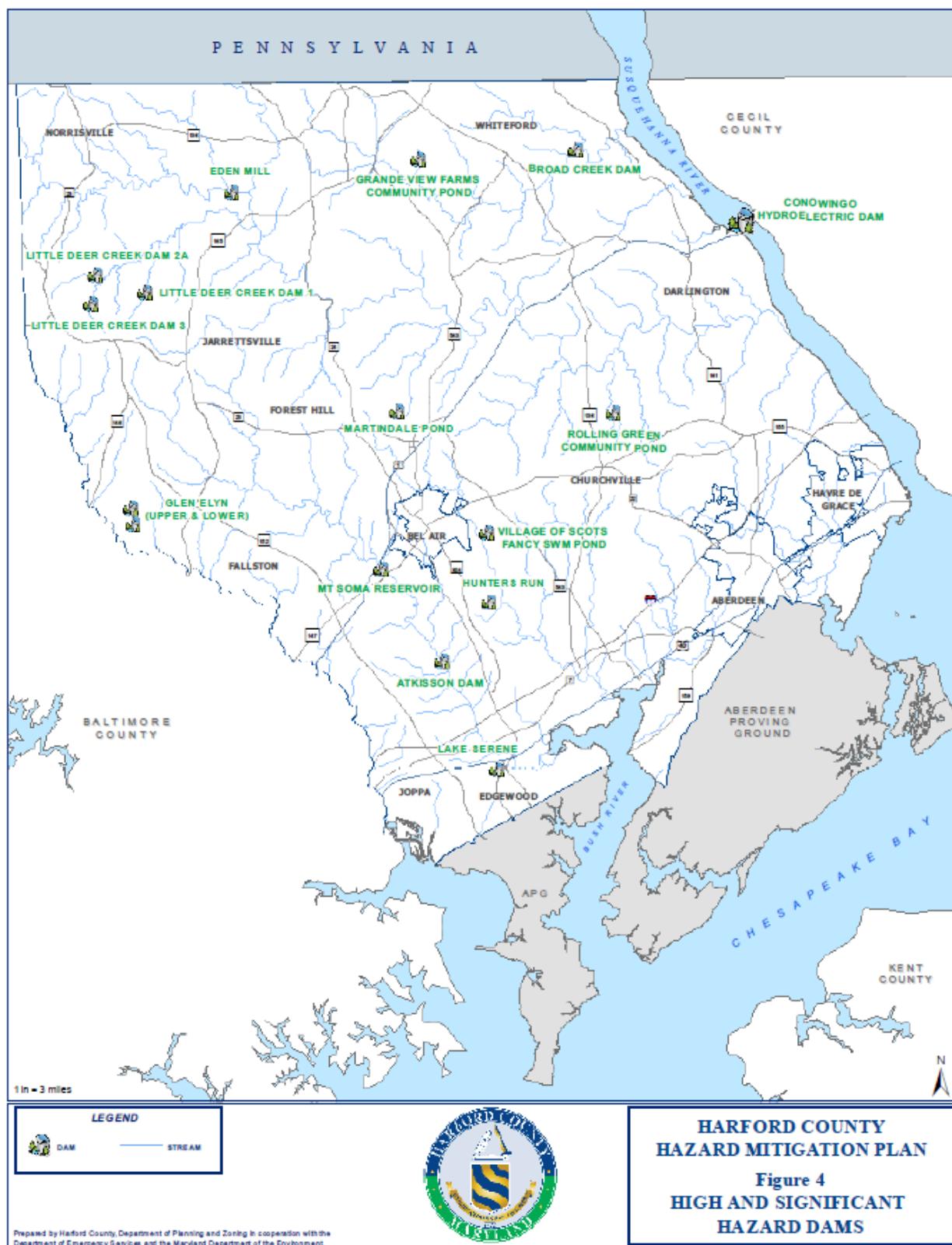


Debris on Eden Mill Dam, Tropical Storm Lee, 2011

Table 2 – HARFORD COUNTY HIGH AND SIGNIFICANT HAZARD DAMS

Dam Name	Owner	Hazard Category	Drainage Area in miles ²	River or Stream	Maximum Storage (acre/feet)	Who or what will be affected by sunny-day failure
Atkisson Dam	U.S. Army	High	47	Winter's Run	3,200	2 residences, 2 businesses. Singer Road, Route 7, I-95
Broad Creek, Lake Aaron Strauss	Boy Scouts of America	High	31	Broad Creek	958	120 seasonal residences
Conowingo Dam	Constellation	High	27,100	Susquehanna River	370,000	75 residences and 30 commercial buildings in Havre de Grace, 11 residences in Darlington.
Eden Mill	Harford County	Significant	85	Deer Creek	17	Fawn Grove Road, agricultural buildings
Edgewater Village (Lake Serene)	Harford County	High	0.3	Un-named tributary to Otter Point Creek	171	5 residences, 10 businesses
Hunter's Run	Homeowners Association	Significant	0.3	Tributary to Bynum Run		Wheel Road
Little Deer Creek # 1 (Cattail Dam)	Harford Soil Conservation District	Significant	0.7	Little Deer Creek	210	3 residences
Little Deer Creek # 2a	Harford Soil Conservation District	Significant	1.5	Little Deer Creek	35	3 residences
Little Deer Creek # 3	Harford Soil Conservation District	Significant	1.6	Little Deer Creek	582	3 residences

*Harford County will continue to work with MDE Dam Safety to update and assess all identified HHPDs to assess flooding potential from breach, non-breach, and residual risk. This will include additional impacts to economic, environmental, social, and multijurisdictional impacts from a dam incident.

Figure 4 – HARFORD COUNTY HIGH AND SIGNIFICANT HAZARD DAMS

4. Vulnerability of Critical Facilities and Infrastructure

A critical facility is defined as a facility in either the public or private sector that provides essential products and/or services to the public, is otherwise necessary to preserve the welfare and quality of life in the county, or fulfills important public safety, emergency response, and/or disaster recovery functions.

Critical facilities reviewed for this report include water treatment plants and systems, government buildings, emergency shelters, police and sheriff stations, hospitals, nursing homes, and road networks. Harford County used GIS layers and maps provided by MDE and the USACE to evaluate the county's critical facilities and determined which are most likely to be affected by hazards. Critical facilities located within the county have been identified but will not be specifically listed within this plan due to security concerns. A hazard that causes destruction to one or more critical facilities in Harford County will readily result in reconstruction costs that total in the millions of dollars and numerous additional costs related to the interruption of essential services and impact to the local economy.

5. Vulnerability of Water System

There are 13 water treatment facilities in the county; three are owned by the county, two are owned by the US Army, five are private, and three are owned by the municipalities. Only one of these 13 facilities are located in designated Special Flood Hazard Areas; the Van Bibber Water Treatment Plant (US Army) which has been flood proofed. With the FEMA mapping update, effective April 19, 2016, the Havre de Grace Water Treatment Plant was removed from the designated Special Flood Hazard Area. The seven sewage treatment plants in the county are removed from the floodplain. Three are owned by the county, two are owned by the municipalities, and two are operated by APG. Water and sewer lines, sewage pumping stations, and booster stations are commonly located in flood hazard areas. The county's 50 sewage pumping stations are flood-proofed to the greatest extent possible, as required by state regulations. The county maximized flood proofing and increased resiliency by installing grant-funded generators at most of the pumping stations.

The municipalities own another two-dozen sewage pumping stations. The breaching of Conowingo Dam would damage the City of Havre de Grace Water Treatment Plant. The breaching of Hunters Run Dam and Atkisson Reservoir would harm water and sewer lines and several pumping stations.

6. Vulnerability of Law Enforcement Facilities and Fire

The City of Aberdeen Police Station is on the edge of the floodplain and is elevated above base flood elevation. The Harford County Detention Center has a portion of its building in the floodplain. Only one fire station (including ambulance corps) out of 26 has its base of operations in a flood hazard area; this is the City Havre de Grace Fire Station on Revolution Street.

7. Vulnerability of Hospitals and Nursing Homes

The county's two hospitals are not subject to flooding. There are six nursing homes in the county; one of these, Citizens Care Center nursing home, is vulnerable to flooding from the 500-year storm or the failure of Conowingo Dam. All emergency shelters are located outside flood prone areas.

8. Emergency Preparedness

Lists, planning documents, and maps showing highest population densities and emergency shelters have been prepared for use during evacuations and are maintained at several locations for quick access. More detailed information on the precise location and vulnerability of the county's critical facilities is confidential information. Maps with the locations of hazardous material storage areas have also been prepared and are available through DES. The county's vulnerability to technological hazards and hazardous materials is discussed in Sections C.9, C.10, and C.11.

Harford County, the City of Aberdeen, the City of Havre de Grace, and the Town of Bel Air all have access to the County's emergency notification system, a web-based program that is utilized to send emergency messages via voice, email and text as well as to social media (Twitter and Facebook). During any significant weather event, the County Emergency Manager prepares and sends a message describing the type of event, a brief description of the potential hazards, and provides appropriate protective actions. If the National Weather Service sends

out a “tornado warning”, the emergency notification system will automatically send a message to appropriate areas within the County and municipalities, with a pre-recorded warning and protective action message.

9. Vulnerability Assessment Report

The recent information given to the county through the Flood Risk Report, the Department of Planning and Zoning in conjunction with DES, will continue to assess the most vulnerable structures and target them for mitigation. Flood Risk Project Refined losses were calculated using HAZUS Version 2.2. This information is an extremely valuable first step in identifying the most vulnerable properties in the county and local jurisdictions.

10. Potential Losses from Hazards

a. Losses from Hurricanes and Flooding:

Per the Flood Risk Report, the estimated potential losses for flood event scenarios for the 1% (100-year) Riverine Areas is \$59,000,000 and for Coastal Areas \$8,300,000 for a total of \$67,300,000 of losses. This information is based on “User-defined facilities” which summarizes individual building points and potential losses in this refined study. These numbers include buildings and content losses, along with inventory loss. They do not include business disruption costs. These numbers include losses from the three municipalities.

Following Hurricane Floyd in 1999, Public Assistance (PA) approved storms costs (mostly flooding related) totaled \$911,047.27. In September 2003, tidal flooding from Tropical Storm Isabel caused extensive damage along the coastal areas of the county. Total approved PA storm costs because of Isabel totaled \$1,702,152.55. This did not include costs for damage to structures, loss of business, loss of pay, deaths, injuries, clean-outs, and loss of power. Appendix C lists all the Federal Disaster Declarations for Harford County and the amount of approved PA funding from 1993 to 2022 (including COVID-19 EM Declaration providing funding for Emergency Protective Measures).

As population and the cost-of-living increases, the losses from hurricane, tropical storms, and flooding will increase proportionately.



City of Havre de Grace, Isabel, 2003

b. Losses from Severe Winter Storms

Severe winter storms impact Harford County, to include the City of Aberdeen, City of Havre de Grace, and Town of Bel Air, every few years and result in substantial costs to the county, mainly to clear roadways (i.e. equipment and workforce costs) and other emergency protective measures. The most notable recent winter storms have included February 2003 (the “President’s Day” Blizzard), December 2009, February 2010 (“Snowmageddon”), and January 2016 (Winter Storm Jonas). These winter storms all resulted in Harford County being approved for a Federal Disaster Declaration. Appendix C lists all the Federal Disaster Declarations for Harford County and the amount of approved PA funding from 1993 to 2016.

c. Losses from Drought

The county experienced drought conditions from 2000-2002. Crop losses were estimated at \$6,000,000 for 2001-2002 (Farm Service Agency production losses). The cost of purchasing water for the county was significantly increased in 2002 due to drought conditions.

d. Losses from Tornadoes

Historic costs show that each tornado touchdown (Enhanced Fujita [EF]-0 class) results in approximately \$10,000 in damages and increases exponentially as the EF rating increases. Section C, Hazard Identification and Discussion, provides additional details regarding past Harford County tornado events. As population and the cost-of-living increases, the losses from tornadoes will increase proportionately.

11. Quantifying Vulnerability to Flooding

Using GIS, the Department of Planning & Zoning estimated the number of structures located in the floodplain on the Digital Flood Insurance Rate Maps (DFIRMs). GIS was used to estimate the number of structures in the Special Flood Hazard Area (SFHA). GIS identifies all buildings, no matter how small, while FEMA is concerned only with primary residential structures, not accessory buildings. Buildings with a footprint less than 400 square feet were eliminated and the parcel layer was used to estimate the number of primary buildings. The estimates for number of buildings in the floodplain are:

NUMBER OF BUILDINGS IN FLOODPLAIN >400 SF			
BORDER	RESIDENTIAL	COMMERCIAL	TOTAL
ABERDEEN	67	31	98
BEL AIR	7	12	19
COUNTY	514	202	716
HAVRE DE GRACE	237	45	282
TOTAL	825	290	1,115

In total, it is estimated that there are approximately 1,062 buildings located throughout in the county in the SFHA. This new analysis uses building and permit data from October 2021 and the current effective flood maps from April 19, 2016.

Additionally, it was found in the Flood Risk Report that there were 920 structures that were identified in the S_UDF_PT data file that were quantified in the HAZUS 2.2 model run. This matches closely with the county's evaluation of flooding vulnerability listed above.

Flood damaged properties are generally scattered throughout the County and are not concentrated in one area. The County and associated municipalities have no "severe repetitive loss properties". Currently, there are a total of 6 repetitive loss properties (2 in Havre de Grace, 4 in the County). There are 5 repetitive loss areas in Harford County, one repetitive loss property was successfully mitigated in 2018. However, the County has decided to keep the repetitive loss area active due to other properties in the repetitive loss area being susceptible to flooding. That is why there is one additionally repetitive loss

area in the County. Havre de Grace does not have an official repetitive loss area for their two repetitive loss properties.

The County has been very successful over the years targeting repetitive loss properties for mitigation, usually through FEMA's Hazard Mitigation Grant Program (HMGP) for acquisition projects. The County has also successfully completed an elevation project in 2007 after Isabell in 2003. As part of participating in the Community Rating System, the County notifies all properties within repetitive loss areas (a total of 38 properties) on potential grant opportunities, and other flood mitigation strategies to protect their properties on an annual basis. Additional information regarding Harford County's Repetitive Loss Properties is presented on Figure 7 and in Appendix D of this document.

D. Hazard Identification and Hazard Extent

The Harford County Hazard Mitigation Planning Committee reviewed and discussed the following hazards that have impacted Harford County in the past. The HMP Planning Team members reviewed information, to include the information in the sections below, in support of the value assigned to risk, vulnerability, and potential hazard extent.

These hazards were all included in the 2022 Hazard Mitigation Plan, except for earthquakes and wildfires. A discussion on earthquake hazards was included due to the magnitude 5.8 earthquake that occurred in central Virginia in 2011. A discussion on wildfire hazards was included based on Harford County receiving a risk ranking of "medium" in the Maryland Hazard Mitigation Plan and the fact that brush fires have occurred in the county during periods of minimal precipitation and low relative humidity.

1. Drought

Definition: Drought is an extended period of dry weather of such magnitude that below average water levels occur in streams, rivers, reservoirs, and ground water aquifers. When these low water levels caused by abnormally dry weather are severe enough to adversely affect water supply and crop production then the dry weather spell is termed a drought. Droughts can cause damage not only to crops

but also to wildlife and livestock. In addition, during times of prolonged drought, land values can decrease and unemployment can increase.

Municipal water supplies are in short supply during a drought. Customary intake facilities for public water supplies may not be able to meet demands and other sources may be needed. Lawn watering and irrigation may be restricted.

Moreover, rationing may occur. In cases of prolonged drought, ground water levels may fall to the extent that wells run dry, affecting residential use as well as industrial and commercial use.

In Harford County, to include the City of Aberdeen, the City of Havre de Grace, and the Town of Bel Air, damages from drought are suffered most acutely in the agricultural community. Loss of crops, decreased milk production by dairy cows, low supply of hay, feed, and good pasture all affect the farmer's productivity and ability to supply food to the markets.

There have been five significant drought periods in Maryland as described in the Maryland Department of Emergency Management, Hazards 2000 report: 1929 – 1931, 1953 – 1956, 1958 – 1961, 1980 – 1983, and 1984 – 1988. In addition, 2000 - 2002 is considered a severe drought period. Per the NOAA National Centers for Environmental Information, Central Maryland (including Harford County), has reached a "severe" drought classification six times in the last 50 years (1981, 1986, 1991, 1999, 2002, and 2007) on the Palmer Drought Severity Index. Central Maryland has reached "extreme" drought on two separate occasions in the last 50 years (1986 and 2002). The City of Aberdeen is most vulnerable to drought, as they do not have any alternative water supplies. They must purchase water during times of severe drought.

The probability for a severe drought to occur in any given year is very low based on a review of historic occurrences. The mean occurrence of severe drought is approximately every 11 years. Since the last severe drought year was 2002, it should be at least expected that Harford County could soon experience severe drought conditions.

The historically observed impacts as identified below, provide a statewide (State of Maryland) overview. Data is provided by the US Drought Monitor Classification System.

Maryland 

Category	Historically observed Impacts
D0	Crop growth is stunted; planting is delayed
	Fire danger is elevated; spring fire season starts early
	Lawns brown early; gardens begin to wilt
	Surface water levels decline
D1	Irrigation use increases; hay and grain yields are lower than normal
	Honey production declines
	Wildfires and ground fires increase
	Trees and landscaping are stressed; fish are stressed
D2	Voluntary water conservation is requested; reservoir and lake levels are below normal capacity
	Specialty crops are impacted in both yield and fruit size
	Producers begin feeding cattle; hay prices are high
	Warnings are issued on outdoor burns; air quality is poor
D3	Golf courses conserve water
	Trees are brittle and susceptible to insects
	Fish kills occur; wildlife move to farms for food
	Water quality is poor; groundwater is declining; irrigation ponds are dry; outdoor water restrictions are implemented
D4	Crop loss is widespread; Christmas tree farms are stressed; dairy farmers are struggling financially
	Well drillers and bulk water haulers see increased business
	Water recreation and hunting are modified; wildlife disease outbreak is observed
	Extremely reduced flow to ceased flow of water is observed; river temperatures are warm; wells are running dry; people are digging more and deeper wells

The Drought Monitor Map identified areas of drought and labeled them by intensity. D1 is the least intense level and D4 the most intense. Drought is defined as a moisture deficit bad enough to have social, environmental, or economic effects.

D0 areas are not in drought, but are experiencing abnormally dry conditions that could turn into drought or are recovering from drought but are not yet back to normal.

The Drought Monitor Map indicates whether primary physical effects are for short- or long-term drought:

- S = Short-term, typically less than 6 months (Agriculture, Grasslands)
- L = Long-term, typically more than 6 months (Hydrology, Ecology)
- SL = Area contains both short- and long-term impacts

Drought Intensity categories are based on:

- The original five key indicators along with several dozen other objective indicators
- local condition reports and impact reports from more than 450 expert observers around the country
- drought impacts which subjectively support and validate the indicators used

2. Severe Storms/Thunderstorms

Definition: Thunderstorms commonly involve lightning, winds of varying intensity, heavy rain, and occasionally hail. Lightning strikes can start fires and kill people. A severe thunderstorm features hail that is one in diameter (or larger) and/or contains wind gusts that are greater than or equal to 58 miles per hour (mph). Thunderstorms may contain strong downburst winds that result from the sudden descent of cool or cold air toward the ground. As the air hits the ground, it spreads outward, creating high winds. Unlike a tornado, the winds move in a straight line, without rotation. The term “macroburst” refers to a large downburst than can extend greater than 2.5 miles with winds up to 134 miles per hour. A “microburst” refers to a downburst that covers a smaller area. The most severe thunderstorms may form hail that can pose a substantial damage risk to vehicles and roof surfaces. These severe storms may produce large amounts of rainfall in very short periods of time.

The following graphic describes Severe Thunderstorm Outlook Categories as utilized by the National Weather Service.

Understanding Severe Thunderstorm Outlook Categories						
LEVEL	CATEGORY	DETAILS	SUMMARY	How many severe storms are possible?	How bad could the worst storms be?	DEFINITIONS
	General Thunderstorm	Although severe weather is not expected, <i>all</i> thunderstorms can produce deadly lightning, gusty winds, and small hail.	No severe thunderstorms expected	None Numerous	Similar to storms your area experiences many times per year	Severe Storm Any storm that contains at least one of the following: Wind gusts of at least 58 mph Hail at least one inch in diameter Tornado
1	Marginal (MRGL)	Some storms could be capable of damaging winds and severe hail. Localized tornado threat could develop. <i>A few severe storms could be significant</i>	Isolated severe storms possible	None Numerous	Similar to storms your area may experience several times per year	
2	Slight (SLGT)	Increased confidence that some storms will contain damaging winds, severe hail, and/or tornado potential. <i>A few severe storms could be significant</i>	Isolated to scattered severe storms expected	None Numerous	Similar to storms your area may experience a few times per year	
3	Enhanced (ENH)	High confidence that several storms will contain damaging winds, severe hail, and/or tornadoes. <i>Several severe storms could be significant</i>	Scattered to numerous severe storms expected	None Numerous	Similar to intense storms your area may only experience once or twice per year	Significant Severe Any of the following hazards: Wind gusts of at least 75 mph Hail at least two inches in diameter
4	Moderate (MDT)	High confidence that many storms will contain damaging winds, severe hail, and/or tornadoes. <i>Several severe storms likely to be significant</i>	Scattered to numerous severe storms expected	None Numerous	Similar to intense storms your area may only experience once per year or less	
5	High (HIGH)	High confidence that an outbreak of storms will contain tornadoes, damaging winds, and/or severe hail. <i>Tornado outbreak and/or widespread damaging winds</i>	Numerous severe storms expected	None Numerous	Very intense storms your area may only experience once or twice in a lifetime	

spc.noaa.gov | weather.gov

Most of the damage is from falling trees or tree limbs that cause road blockages, power outages, and local flooding/flash flooding. The damage that occurs from thunderstorms and mitigation measures will be discussed in the “High Wind Hazard” section or the “Riverine Flooding” section.

Thunderstorms are a frequent occurrence throughout Harford County, especially in the spring and summer. A microburst occurred during an August 2001 thunderstorm that leveled several mobile homes on the Perryman Peninsula, spawned a waterspout, and damaged structures at Flying Point Marina. Damage was estimated at \$75,000.00.

In July 2005, a severe thunderstorm impacted the City of Havre de Grace producing an estimated ten (10) inches of rain in a very short period. Flood damages from the storm affecting the Lilly Run caused road closures on Erie Street and Juniata Street as well as loss of one home on Erie, heavy flood damage to several homes and damage to businesses near Erie and Juniata Streets. While this storm was not a federally-declared disaster, the Erie Street property was condemned and was subsequently demolished. The property was then elevated and a new home was built in accordance with current code requirements on the site. Damages to the other impacted properties was cleaned up, however, Lilly Run remains a concern.

The probability for a severe thunderstorm to occur in any given year is very high based on a review of historic occurrences. Per the NOAA Storm Prediction Center, the average severe weather days per year for Harford County is 26 days per year, most of which occur during the spring and summer months (April to September).

Additionally, in August 2018, a severe storm impacted several parts of the County causing flash flooding and damage to homes, roads, bridges, and one commercial marina. Rainfall amounts were estimated to approach 8" which fell in under 4 hours. Some of the more heavily impacted areas included Darlington, Abingdon, Bel Air, Aberdeen, and Churchville.



Trappe Church Road, August 2018

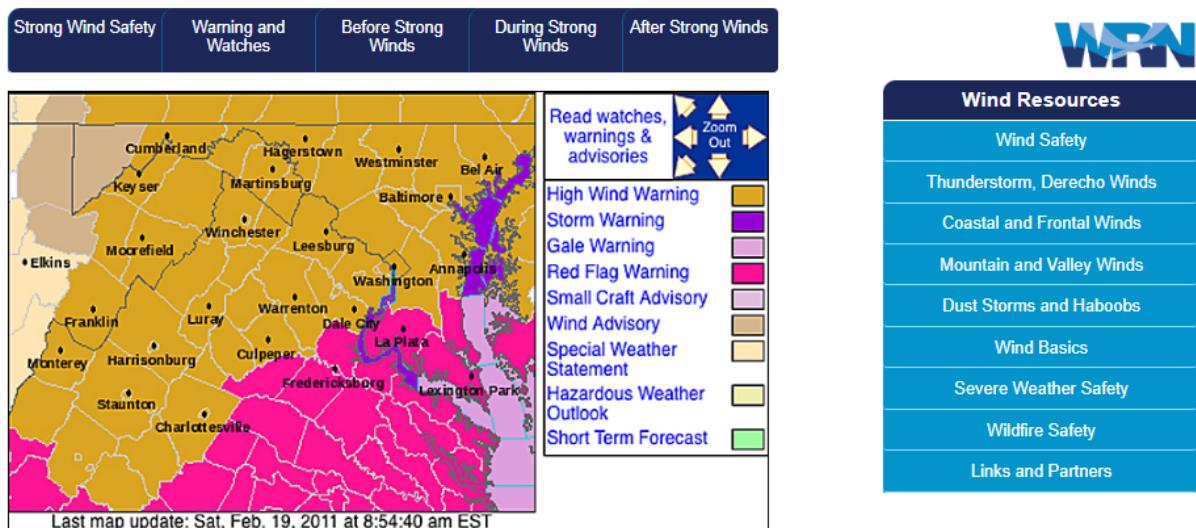


Starmount Court, August 2018

3. High Winds and Tornadoes

Definition: Severe winds are generally defined as winds with speeds greater than 57 miles per hour. The thunderstorm is the birthplace of the tornado. Thunderstorms often spawn waterspouts, microbursts, macro bursts, and other types of windstorms. Strong winds or tornadoes may accompany a rapidly moving cold front as well.

Per the National Weather Service, the following graphic further describes the typical types of weather products that are utilized to alert the public about high wind events:



The National Weather Service issues a number of Watches, Warnings and other products to alert the public about high wind events.

- **High Wind Warning: Take Action!** Sustained, strong winds with even stronger gusts are happening. Seek shelter. If you are driving, keep both hands on the wheels and slow down. NWS offices issue this product based on local criteria.
- **High Wind Watch: Be Prepared!** Sustained, strong winds are possible. Secure loose outdoor items and adjust plans as necessary so you're not caught outside. NWS offices issue this product based on local criteria.
- **Wind Advisory: Take Action!** Strong winds are occurring but are not so strong as to warrant a High Wind Warning. Objects that are outdoors should be secured and caution should be taken if driving. NWS offices issue this product based on local criteria.
- **Dust Storm Warning: Take Action!** A Dust Storm Warning is issued when visibility of 1/2 mile or less due to blowing dust or sand, and wind speeds of 30 miles an hour or more.
- **Severe Thunderstorm Watch: Be Prepared!** A Severe Thunderstorm Watch is issued when severe thunderstorms are possible in and near the watch area. Winds 58 mph or higher and/or hail 1 inch or larger are possible in a severe thunderstorm. Secure items outdoors that may blow around in high winds. Stay informed and be ready to take action.
- **Severe Thunderstorm Warning: Take Action!** A Severe Thunderstorm Warning is issued when severe thunderstorms is happening or is imminent in the warning area. Severe thunderstorms have wind 58 mph or higher and/or hail 1 inch or larger. Seek shelter inside a sturdy building, away from windows.
- **Gale Warning: Take Action!** Gale Warnings are issued for locations along the water when one or both of the following conditions is expected to begin within 36 hours and is not directly associated with a tropical cyclone: sustained winds of 34 to 47 knots (39 to 55 mph) or frequent gusts (duration of two or more hours) between 34 knots and 47 knots. Make sure your vessel is secure in port.
- **Hurricane Force Wind Warning:** Hurricane Force Wind Warnings are issued for locations along the water when one or both of the following conditions is expected to begin within 36 hours and not directly associated with a tropical cyclone: sustained winds of 64 knots or greater or frequent gusts (duration of two or more hours) of 64 knots (74 mph) or greater. Make sure your vessel is secure in port.

The impacts of high winds and tornadoes may include tree damage, utility line disruption, significant debris, and damages to mobile homes and buildings.

Mobile homes and other metal structures are considered the most vulnerable to high winds and may be destroyed – even from events of short duration. The most severe impacts would result from a high wind event in the colder months when widespread power outages may have the greatest effect on residential areas. Widespread high wind impacts left thousands of residents and businesses without power and communications for over a week in 1996 and again in 1999. The Fallston tornado of 2012 was particularly destructive and severely damaged several townhomes, businesses, vehicles, and other structures along Route 1 in Fallston. Although there were few injuries, this tornado produced a large amount of vegetative debris from damaged and downed trees. Later in June of 2012, a “derecho” occurred in the Central Maryland area that also impacted Harford County. A derecho is defined as a long-lived squall line of intense

thunderstorms that can contain wind gust of up to 80 miles per hour. Impacts from the 2012 derecho also produced a large amount of vegetative debris from damaged and downed trees, along with extensive power outages. The March 2, 2018, windstorm forced the closure of both the Route 40 and I-95 bridges across the Susquehanna, causing catastrophic traffic impacts, not only in Harford County, including the City of Havre de Grace and City of Aberdeen, but up and down the northeast corridor, impacting Maryland, Delaware, Pennsylvania, and other states. Traffic was gridlocked for up to 12 hours, with many vehicles stuck on unpaved roadways along both sides of the Susquehanna River.



Tree and Wire Damage from 2018 Wind Storm

The Enhanced Fujita (EF) Scale refers to the measurement system that is used to estimate tornado intensity after a careful survey of the damage and associated impacts.

The Enhanced Fujita (EF) Scale for Tornadoes	
EF Number	3 Second Gust (mph)
0	65 – 85
1	86 – 109
2	110 – 137
3	138 – 167
4	168 – 199
5	>200

Although tornadoes are rare in Harford County, there have been several notable occurrences and they are presented below:

Tornado Touch Downs in Harford County, MD

DATE	DEATHS	DAMAGE	EF-CLASS
2013, Aug. 13	0	Minimal	0
2013, Jul. 22	0	\$3,000.00	0
2012, Oct. 19	0	Minimal	0
2012, June 1	0	\$300,000.00	1
2011, Jun. 12*	0	\$30,000 (total)	0/0
<i>*two (2) separate tornados occurred</i>			
2009, Jun. 20	0	Minimal	0
2007, Jul. 16	0	\$10,000.00	1
2004, Sept. 18	0	\$100,000.00	1
2004, Sept. 18	0	\$350,000.00	2
<i>*related to remnants of Ivan</i>			
2004, Jun. 14	0	Minimal	0
1998, Jul. 30	0	\$15,000.00	0
1997, Mar. 29	0	\$10,000.00	0
1995, Nov. 11	0	\$25,000.00	0
1995, Oct. 21	0	\$30,000.00	0
1994, Nov. 1	0	\$275,000.00	1
1994, Nov. 1	0	\$27,500.00	0
1994, Nov. 1	0	\$0.00	0
1992, Aug. 28	0	\$0.00	0
1980, Jun. 29	0	\$497,500.00	2
1973, Jun. 16	0	\$9,250.00	1
1959, Jul. 19	0	\$140,250.00	2

The probability for tornadoes and/or high wind events to occur in any given year is medium-high based on a review of historic occurrences. Per the NOAA Storm Prediction Center, the average tornado days per year (days with at least one tornado report within 25 miles) for Harford County is 2 days per year, however, other wind events that generate a “high wind warning” or a “wind advisory” can occur up to several times per year. The “damage” cost numbers are from documentation developed by Emergency Management following each event.

4. Flooding

Definition: Flooding occurs when normally dry land becomes covered with water for an extended period. Flooding may cover a large area of land and may not be restricted to one property. FEMA defines flooding as “a general and temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waters or rapid unusual accumulation of runoff from any source.” Other hazards mentioned in this plan may feature one or more different forms of severe flooding including:

- Hurricanes/tropical storms/tropical depressions/remnants of tropical systems
- Local rainstorms
- Thunderstorms featuring intense rainfall
- Upstream weather systems that discharge flood waters
- Snowmelt from winter storms
- Dam failure

If rainfall continues long enough, streams and rivers will rise, riverbanks will be overtopped and lead to riverine flooding that spreads across the floodplain. If intensive rainfall occurs within a short period, streams and rivers will rise rapidly. Severe riverine flooding has disrupted electrical service, blocked roads and streets with debris, washed out bridges, and has led to drownings. In other cases, flood damage from rainstorms was limited to short-term power failures and wet basements of homes. There have been numerous cases of trees being uprooted and sizeable branches falling, both blocking roads, damaging property, and scattering debris in streams and creeks.

Flood damage to business properties can result in loss of income, wages, and tax revenues. Agricultural lands are frequently affected by soil erosion and loss of a season's harvest when crops are destroyed. Damage to residential property impairs citizens' safe housing and can severely affect individual financial security. Other effects can be outbreaks of human disease, widespread animal illness, broken gas and sewage lines, water supply pollution, and fire.

Rainstorms occurring upstream in Pennsylvania, Delaware, and New York will affect water levels in Deer Creek, Broad Creek, and the Susquehanna River. The

Little Gunpowder River originates in Baltimore County and southern Pennsylvania. Discharge records are available for Deer Creek, Winters Run, Bynum Run, and the Susquehanna River. Appendix E contains summaries of the discharge records for Deer Creek at Rocks and Winters Run near Benson. Days are listed when the discharge for either stream met or exceeded the discharge that occurred during Hurricane Floyd in September 1999. Because the Susquehanna River's flow is controlled by releases for the Conowingo Dam, its discharge records are not reflective of weather conditions and its data is not included in this report. It is interesting to observe that the high-water levels in Deer Creek and Winters Run correspond only occasionally to hurricane dates. This is because riverine flooding is most often caused by thunderstorms, sustained heavy rains or snowmelt.

Portions of the City of Havre de Grace are subject to the unusual flooding conditions caused by Lilly Run, which flows north and empties into the Susquehanna River against the current and prevailing flow. Lilly Run flooding is caused by heavy precipitation and by backwater from the Susquehanna River. This stream passes residential, educational, and commercial properties before it enters the Susquehanna River at the north end of the city. In 2006, a severe thunderstorm cell triggered flash flooding along Erie Street and Juniata Street in the City of Havre de Grace (Lilly Run impact), causing several homes to sustain substantial damage (one home destroyed, several heavily flooded) along with several businesses which were impacted by the flooding.

Flash flooding is a common occurrence during heavy rain and thunderstorms that may stay in place over an area (or areas). Flash flooding can cause a large amount of property and roadway damage in a short amount of time. It can also cause people to get suddenly caught and/or trapped by rapidly rising/moving floodwaters and may trigger swift water rescue operations. The Harford County Technical Rescue Team (TRT), which was established by DES in 2014, can perform a wide variety of water rescues. The number of water rescues per year can vary widely and usually averages about 15 per year. However, a very heavy rainstorm in 2015 impacted localized areas in and around the Town of Bel Air for an extended period and led to 20 water rescues in one day.



Sandy Hook Road Swift Water Rescue Team, Flash Flooding Event, April 2014

Harford County experienced a heavy rainfall event which caused flash flooding in several areas of the County, some of which had never experienced water levels like that in the past. The Emergency Operations Center was opened at 1815 hours on August 31, 2018 because of the flooding impact from a slow moving, heavy rainfall storm system that had entered into Harford County. At 1752 hours, the first swift water call for service occurred. Subsequently, there were an additional 20 calls that occurred in the evening hours of August 31, 2018 and throughout September 1, 2018. Multiple vehicles were swept away in heavy flood current requiring multiple swift water rescues. The amount of rainfall and damage to infrastructure caused several homeowners to evacuate their homes to relocate to other locations. Impacted areas included Trappe Church Road, Starmount Court, Arena Road, Glen Cove Marina, Glen Cove Road, Trappe Road, Splashing Brook Road, Rolling Green Drive, Priestford Road, Flintlock Drive, Fairway Drive, Calvary Road, Neal Road, Tarragon Court, Poole Road, Deer Drive, and Cullum Road. These roadways are located throughout Harford County (and some, located within the municipalities). In addition to home and roadway damage, several bridges and culverts experienced extensive damage.

The probability of riverine, tidal/coastal, and/or flash flooding in Harford County and the local jurisdictions is high due to its susceptibility to heavy rain events and/or coastal storms in all seasons of the year, with the greatest likelihood of occurrence being in spring and fall.

There are four dams in the county that are designated “high hazard” by the state and five that are designated “significant hazard”. The probability of a Harford County high or significant hazard dam failing is low, however, there are certain

low hazard dams that present a concern for potential failure. Although low hazard dams may create a very localized flood hazard in the event of failure, they are not identified in this plan.

In the event of an imminent or occurring dam failure, potentially impacted areas will be evacuated by law enforcement, fire company personnel, and other public safety officials. Dam inundation area maps have been prepared for each high and significant hazard dam and are available for review at the EOC or through MDE. The Federal Energy Regulatory Commission (FERC) guidelines require jurisdictions to evaluate dam failure under sunny weather conditions. If any of these dams breached during a rainstorm with pre-existing flood conditions, it may result in the “Probable Maximum Flood”, and the damage would be much worse.

Additionally, FEMA discusses Flood Zones in their online Glossary as follows:

Flood Zones

Flood hazard areas identified on the Flood Insurance Rate Map are identified as a Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, labeled Zone B or Zone X (shaded) are also shown on the FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded).

Harford County, and the City of Aberdeen, Town of Bel Air, and City of Havre de Grace utilize FIRM and SFHA data to facilitate identification of vulnerable areas within the County/municipalities which aids in development and implementation of strict building codes, identification of repetitive loss properties, and, other mitigative measures. The 100 Year Floodplain Zone Areas are identified on the USGS Quadrangle Maps found in Appendix H.

5. Severe Winter Storms

A winter storm can range from moderate snow over a few hours to blizzard conditions for an extended period. All winter storms feature low temperatures and heavy precipitation. A severe winter storm is one that drops four or more inches of snow during a 12-hour period, or six or more inches during a 24-hour span. A blizzard combines heavy snow with high winds, which will likely cause whiteout conditions. A severe ice storm would feature an accumulation of at least .25 inches (or more) of ice over a wide area of the county. An ice storm occurs when freezing rain falls from clouds and freezes immediately on impact. Additionally, when a winter storm is followed by unseasonably warm weather (as happened January 19, 1996), the snowmelt can cause severe riverine flooding.

The National Weather Service has developed this graphic which defines winter storm severity and impact scale:

Winter Storm Severity Index

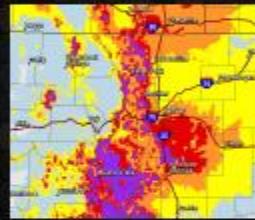
The Winter Storm Severity Index, or WSSI, is a new tool from the National Weather Service that forecasts the potential impacts of winter storms throughout the continental United States.

The WSSI can keep you informed on potential winter storm impacts in your community, including tree damage, property damage, transportation impacts, and disruptions to daily life.



POTENTIAL IMPACTS SCALE

- **No Impacts**
- **Limited Impacts**
- **Minor Impacts**
- **Moderate Impacts**
- **Major Impacts**
- **Extreme Impacts**



The WSSI is designed to help you prepare before the storm. Expected winter storms are given an 'Impact ranking' in 6 categories, ranging from 'No Impacts' to 'Extreme Impacts'.

The WSSI impact scale will help you quickly and easily know what to expect from a winter storm.



The WSSI is measured by analyzing the potential impacts of:

- **Snow amount:** Impacts due to the total amount of snow or the accumulation rate.
- **Snow load:** Infrastructure impacts due to the weight of the snow.
- **Ice accumulation:** Infrastructure impacts due to the effects and severity of ice and wind.
- **Flash freeze:** Potential for quick-forming ice from rapid temperature drops during or after precipitation.
- **Blowing snow:** Disruption due to blowing and drifting snow.
- **Ground blizzards:** Travel-related impacts of strong winds interacting with pre-existing snow.

The WSSI allows the user to make informed decisions based on the potential for significant weather-related impacts.



National Weather Service

weather.gov/wssi

All portions of the county, to include the City of Aberdeen, City of Havre de Grace, and Town of Bel Air, are subject to the effects of severe winter storms. A wide-range of winter weather conditions can occur in Harford County from a single storm, depending on temperatures and the track of the storm. However,

for a typical severe winter storm, the entire county will be impacted to a certain degree. The most severe impacts occur in residential areas that experience power outages and impassable roadways. These same impacts can affect local businesses that are unable to open due to the conditions. The ability to clear snow and ice from roadways may be hampered by the inability of workers to get in to do their jobs and/or the need for additional equipment. Reserves of salt/sand may be depleted if, as in 1996 and again in 2010, when snowstorm follows snowstorm. Heavy snow and/or ice accumulations on trees and wires have the potential to cause prolonged power and communication outages, especially when combined with strong wind gusts. Below is a summary of severe winter weather events that have impacted Harford County:

WINTER STORM EVENTS
Harford County Maryland

February 12-14, 1899	Blizzard
January 27-29, 1922	Blizzard
March 29-29, 1942 (Palm Sunday Storm)	Blizzard
December 3-4, 1957	Blizzard (10 inches)
February 15-17, 1958	Nor'easter (17 inches)
March 19-21, 1958	Nor'easter (23 inches)
December-February 1960-1961	Snowstorms
January 30-31, 1966	Blizzard (17 inches)
December 1, 1974	Blizzard
January 1977	Extreme cold
January 19-20, 1978	Winter storm
February 18-19, 1979	Blizzard
February 11-12, 1983	Blizzard
January and February 1987	Snowstorms
November 11, 1987	Snowstorm
December 10-12, 1992	Nor'easter
March 13-14, 1993	Snowstorm (12 inches)
February 10-11, 1994	Ice & snow storms
January 7-8, 1996	Blizzard, snow melt & flood
February 1996	Blizzard (20 inches with ice)
January 14-15, 1999	Ice storm
January 25, 2000	Nor'easter (15 inches)
February 18, 2003	Snowstorm (24 inches)
December 18, 2009	Blizzard (20.5 inches)
February 5-6, 2010	Blizzard (29 inches) – "Snowmageddon"
February 9-10, 2010	Blizzard (21 inches) – "Snowmageddon"

February 21, 2015	Ice and snowstorm (.25 inches of ice)
January 22-24, 2016 (Winter Storm Jonas)	Blizzard (up to 36 inches in NW Harford Co.)

February 2010 featured “back to back” blizzards that severely burdened the county's resources and its ability to restore normal operations. These storms, collectively referred to as “Snowmageddon” resulted in a single Presidential Disaster Declaration (the February 5-6 and 9-10 storms were combined under one Declaration. This powerful series of events was preceded by a blizzard in December 2009 that also resulted in a Presidential Disaster Declaration). Many storm-related costs focus on equipment and personnel for snow removal. Snow removal costs for major winter storms have historically totaled close to a half a million dollars per event. A summary of Presidential Disaster Declarations for major snow events are presented in Appendix C.

The probability for a severe winter storm to occur in any given year is high based on a review of historic occurrences. Based on a review of severe winter storms over the past 25 years, the mean occurrence of having severe winter storm in Harford County is approximately every 3 years. The worst-case scenario for a severe winter storm would involve an ice storm that deposits .25 inches of ice (or more) onto all exposed surfaces county-wide. Impacts from an event of this magnitude would cause, at a minimum, extensive and long-lasting power outages, severe traffic and public safety issues, and significant amount of vegetative debris (limbs, branches, and trees brought down by the weight of the ice).



Photo of Severe Winter Storm/Ice Storm, Harford County, 2014

6. Tropical Cyclones (Hurricanes, Tropical Storms, Tropical Depressions)

Definition: A tropical cyclone is a warm-core non-frontal synoptic-scale low pressure weather system, originating over tropical or subtropical waters, with organized deep convection and a closed surface wind circulation about a well-defined center. A hurricane is a tropical cyclone with maximum sustained surface winds greater than 74 miles per hour (mph). A tropical storm is a tropical cyclone with maximum sustained surface greater than 39 mph, up to 74 mph. A tropical depression is a tropical cyclone with maximum sustained winds of less than 39 mph.

The Saffir-Simpson Hurricane Wind Scale, as defined by the National Hurricane Center and Central Pacific Hurricane Center under the National Oceanic and Atmospheric Administration, is a 1 to 5 rating based only on a hurricane's maximum sustained wind speed. This scale does not take into account other potentially deadly hazards such as storm surge, rainfall flooding, and tornadoes.

The Saffir-Simpson Hurricane Wind Scale estimates potential property damage. While all hurricanes produce life-threatening winds, hurricanes rated Category 3 and higher are known as "major hurricanes". Major hurricanes can cause devastating to catastrophic wind damage and significant loss of life simply due to the strength of their winds. Hurricanes of all categories can produce deadly storm surge, rain-induced floods, and tornadoes. These hazards require people to take protective action, including evacuating from areas vulnerable to storm surge.

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 kt 119-153 km/h	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph 83-95 kt 154-177 km/h	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111-129 mph 96-112 kt 178-208 km/h	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130-156 mph 113-136 kt 209-251 km/h	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher 137 kt or higher 252 km/h or higher	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Harford County, the City of Aberdeen, City of Havre de Grace, and Town of Bel Air have been significantly impacted by tropical cyclones that have made landfall anywhere between the central Gulf Coast to New Jersey. Normally, the most severe impacts from tropical cyclones are to the south and east of Harford County, however, significant storm surges and heavy rainfall are still major concerns when a tropical cyclone impacts the Mid-Atlantic Region. Hurricanes and tropical storms are of such dimensions that all parts of the county are affected. Because they disrupt power and inundate roads, they can wreak havoc on the entire community. Rivers, streams, and creeks that run through or near developed areas pose a considerable potential for damaging inland flooding. The Department of Public Works maintains a list of expected early road closures due to flooding.

Typical tropical cyclone impacts may include downed trees and power lines, blocked roads, power outages, damaged bridges, and extensive property damage. Severe flooding has breached water supply and sewer lines, and polluted wells.

Damage to infrastructure has been serious, especially from Tropical Storm Agnes in June 1972 and Hurricane Floyd in September 1999. The Town of Bel Air was crippled by the widespread power outages caused by Hurricane Floyd. Restoring power outages in a timely manner was a major problem during Hurricane Floyd. Parts of the county were without electricity for a week. A tidal surge of up to 9 feet above normal tide from Tropical Storm Isabel (2003) heavily impacted the

waterfront areas along the Bush River and the City of Havre de Grace. After Isabel, many residents were left without power for up to two weeks. In August of 2011 and September 2011, Hurricane Irene, and the remnant of Tropical Storm Lee both affected the county, including the City of Aberdeen, City of Havre de Grace, and Town of Bel Air, with widespread power outages and vegetative debris. Flooding from the remnant of Tropical Storm Lee impacted the City of Havre de Grace as well as the shoreline along the Susquehanna and Chesapeake Bay as the Conowingo Dam opened 43 of the 50 flood crest gates. Luckily, very few residences experienced damage beyond the power outages which lasted up to 8 days in isolated areas. In 2012, Hurricane Sandy made landfall in southern New Jersey and Harford County experienced significant impacts in the form of downed trees and branches, downed power lines, widespread power outages, and blocked roadways. Appendix C contains additional descriptions of historic hurricane/tropical storm events, as well as, a summary of previous federal disaster declarations.

Notable Tropical Cyclone Events

Harford County, MD

Hurricane	Unnamed	August 1933
Tropical Storm	Hazel	October 1954
Tropical Storm	Connie	August 1955
Tropical Storm	Diane	August 1955
Tropical Storm	Agnes	June 1972
Tropical Storm	David	September 1979
Hurricane	Gloria	September 1985
Tropical Storm	Chris	August 1988
Tropical Cyclone	Danielle	September 1992
Tropical Storm	Beryl	November 1994
Hurricane	Bertha	July 1996
Tropical Storm	Fran	September 1996
Hurricane	Floyd	September 1999
Tropical Storm	Isabel	September 2003
Hurricane	Irene	August 2011
Tropical Storm	Lee	September 2011
Hurricane	Sandy	October 2012



Damage from Hurricane Irene, 2011

The tidal areas of the county, along the Lower Susquehanna River, the Chesapeake Bay, the Bush and Gunpowder Rivers, and Swan Creek are subject to storm surge. FEMA designates “V Zones” on Flood Insurance Rate Maps (FIRMs). “V Zones” are where coastal flooding with the added risk of wave action (velocity hazard) occurs where waves can be 3 feet or higher.

The table below summarizes the increases, decreases, and net change of Coastal High Hazard Areas for the County:

Area of Study	Total Area (sq mi)	Increase (sq mi)	Decrease (sq mi)	Net Change (sq mi)
Within Coastal High Hazard Area (Zone V)	18.8	17.3	0.3	17.0

This table shows a relatively large increase in mapped Coastal High Hazard Areas for Harford County. This is in large part due to major improvements in modelling, such as the use of the Advanced Circulation Model of Oceanic, Coastal and Estuarine Waters (ADCIRC). There are also currently 312 modelled transects as opposed to the previous study that had six.

The probability for a hurricane or tropical storm to severely impact all of Harford County in any given year is medium based on a review of historic occurrences. Medium probability for tropical cyclones means that Harford County can expect significant tropical cyclone impacts about one out of every four years, based on a review of hurricanes or tropical storms over the past 30 years. The worst-case scenario for a Harford County hurricane/tropical storm is likely a combination of

the worst impacts that historic storms have featured. For example, Tropical Storm Agnes brought excessive rainfall (19+ inches of rain over a large area) and Tropical Storm Isabel brought extensive tidal flooding (up to 9 feet of tidal surge). A storm that combines both impacts (or more) would truly be the worst-case scenario for Harford County.



Conowingo Dam, Tropical Storm Lee, 2011

7. Earthquakes

Earthquake, by definition, is a sudden and violent shaking of the ground, sometimes causing great destruction, as a result of movements within the earth's crust or volcanic action.

The US Geological Survey uses the Richter Scale to define the magnitude of an earthquake. The following information is from the USGS Earthquake Glossary:

The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude

scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

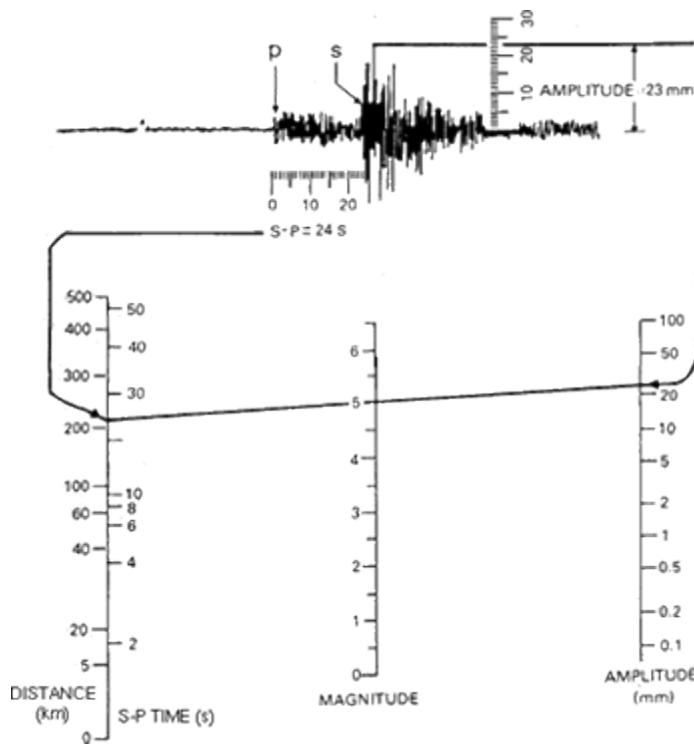


Image from Richter's (1958) book, Elementary Seismology.

While earthquake probabilities in and around Harford County and the local jurisdictions are very low, there have been a few noteworthy regional seismic events that have been felt by public safety officials and residents alike. Tectonic events that created the Appalachian Mountains also created a network of faults and seismic zones in the Mid-Atlantic Region, many of which can produce damaging ground movement. Generally, Central Maryland, including Harford County is considered "low" risk for earthquake impacts.

In 2011, a 5.8 magnitude earthquake struck central Virginia and was felt by many Harford County residents. This event was felt as far away as Eastern Canada. No injuries or damage from the earthquake were reported in Harford County. In 1883, two tremors were reported in Fallston with estimated Richter magnitudes of 2.7-2.9 and 3.1-3.3, respectively. In 1993, a tremor with an estimated Richter magnitude of 1.5 had an epicenter just south of Aberdeen. In 1996, a tremor with an estimated Richter magnitude of 2.2 occurred near Perryville in Cecil County.

A magnitude 5+ seismic event occurring in or near Harford County or a large magnitude event (6-7+ magnitude) event occurring in the Mid-Atlantic Region would have far reaching impacts for the area. A powerful earthquake of this intensity would cause extensive property damage, extensive damage to infrastructure (roads, bridges, utilities, hospitals, schools, public safety, etc.), and a significant interruption to local businesses and government services. Recovery from such an event would take many years.

8. Soil Movement

For the purposes of this plan, soil movement hazards refer to landslides, sinkholes, and coastal erosion because they are the primary geological hazards that have the ability to cause damage to property and potential loss of life.

Quoting the State of Maryland's Hazard Mitigation Plan, the following definitions are provided:

Landslides: a landslide is defined as the movement of a mass of rock, debris, or earth down a slope. Landslides can be triggered by natural or man-made circumstances, such as heavy rains, earthquakes, rapid snow melt, erosion, or construction. The two most common types of landslides that affect Maryland are earth/mudslides and rockslides.

Every landslide, or slope movement, is different and unpredictable. However, they are typically associated with other hazards, such as earthquakes and storms with heavy rainfall. Some landslides move slowly over time, while others are quick. Some geological areas are more prone to landslides, such as bases of steep slopes or hillsides. Flatter areas away from slope changes tend to be safer from landslides. Landslides can cause localized property loss and infrastructure damage.

Sinkholes: a sinkhole is an area of ground that has no natural external surface drainage, when it rains, water stays inside the sinkhole and typically drains into the subsurface. Sinkholes can vary from a few feet wide to hundreds of acres and from less than 1 to more than 100 feet deep. Some are shaped like shallow bowls or saucers whereas others have steep, vertical walls.

Sinkholes are dramatic because the ground's surface usually stays intact, while the subsurface layer dissolves. Once there is not enough support for the land above the dissolved space, a sudden collapse of the land surface can occur.

These collapses can be small and go unnoticed, or they can be large, destroying

structures, including buildings and roadways. As with landslides, certain geological areas are more prone to sinkholes than others. Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that can naturally be dissolved by groundwater circulating through them. As the rock dissolves, spaces and caverns develop underground. Severe erosion can cause extreme property loss or damage. Sinkholes typically cause very localized property loss and minimal infrastructure damage.

Coastal Erosion: Coastal erosion is the process by which local sea level rise, strong wave action, and coastal flooding wear down or carry away rocks, soils, and/or sands along a coastline. All coastlines affected by storms, tidal action, and other natural events are susceptible to erosion. The extent and severity of the problem is worsening with global sea level rise. Severe erosion can cause long-term, widespread property loss.

Harford County's eastern/southern shoreline is along the Chesapeake Bay. The Susquehanna, Bush, and Gunpowder Rivers all flow into the Bay. These shorelines may experience erosion/soil movement/coastal erosion during extreme weather events (i.e., tropical systems, severe storms). Aberdeen Proving Ground has much of the shoreline footprint at risk as their property runs from just south of Havre de Grace to the Baltimore County border, along the Gunpowder River.

While the state has identified Harford County as a Medium Risk for Soil Movement, the County considers this to be a Low Risk hazard. Landslides and sinkholes have not been recorded in Harford County or in the local jurisdictions. The State of Maryland indicated in their plan that landslides are more prevalent in the mountainous, western areas of the state. Additionally, the State's plan states indicates that the Hagerstown Valley, the Frederick Valley, and the Wakefield Valley are all expected to have a higher level of sinkhole activity due to the distribution of carbonate rocks and Karst featured soil types, as documented by the USGS.

9. Wildfires

Definition: FEMA describes a wildfire as an unplanned, unwanted fire burning in a natural area, such as a forest, grassland, or prairie. Wildfires can start from natural causes, such as lightning, but most are caused by humans, either

accidentally or intentionally. Wildfires can damage natural resources, destroy homes, threaten human lives and safety.

The USDA Forest Service defines the National Fire Danger Rating System as a system that allows fire managers to estimate today's or tomorrow's fire danger for a given area. It combines the effects of existing and expected states of selected fire danger factors into one of more qualitative or numeric indices that reflect an areas' fire protection needs. It links an organization's readiness level (or pre-planned fire suppression actions) to the potential fire problems of the day.

Knowledge of these levels can help forest visitors make decisions about whether or not to have a campfire or ride their OHV in a grassy area. Homeowners may choose to postpone burning a debris pile if they are aware of the fire danger level for that day. Contractors working in the forest may consider extra precautions when using equipment that might produce sparks. In some cases, the National Forest may even restrict certain activities based on the fire danger levels.

The National Weather Service, Sterling Forecast Office has a Fire Weather Page that is updated twice daily, at 5:20am and 2:10pm. NWS Sterling issues "Red Flag Warnings based on the following criteria (which is described under "Red Flag Criteria": Sustained winds 20 mph along with relative humidity less than 30 percent and fuel moisture less than or equal to 8 percent will initiate a call to the Maryland State Agency regarding a Red Flag Warning or Fire Weather Watch.

The risk and probability from severe wildfire conditions is considered low for Harford County, the City of Aberdeen, the City of Havre de Grace, and the Town of Bel Air. The basis for this is the absence of destructive wildfires during the past few hundred years of Harford County's existence. While brush and small woodland fires may occur during periods of unusually dry weather with low humidity, the impacts from such events tend to be localized and sporadic. Impacts from brush fires and small woodland fires are normally limited to localized road closures and/or the presence of smoke near residential and commercial areas which may cause respiratory distress in certain individuals.

10. Technological Hazards

Technological hazards are occasionally referred to as man-made hazards. Harford County is vulnerable to a variety of man-made emergencies or disasters that could occur at any time of the year and include hazardous material accidents, nuclear power plant accidents, exposure to nuclear radiation, terrorism/active shooter, nuclear attack, transportation accidents, and civil disorder.

11. Hazardous Materials (HAZMATs)

Hazardous materials are substances or materials that, because of their chemical, physical or biological nature, pose a potential risk to life, health or property if they are released. From industrial chemicals and toxic waste to household products, hazardous materials are a part of our everyday lives. Potential hazards can occur during any stage of hazardous materials use: storage, production, transportation, use and disposal. Hazardous materials incidents may affect urban, suburban and rural areas of the county and can range from a spill on a highway to the contamination of groundwater to a major release from a chemical plant or a storage facility. Regardless of the source, all have the potential to threaten life and property.

Hazardous materials of all types are transported daily in and around the county by air, water, road, rail, and pipeline. Of the 1.5 billion tons of hazardous materials transported each year, more than half moves by trucks along the nation's highways. It is estimated that in an average year, one out of every three trains and one out of every ten trucks is carrying hazardous materials. The highly sophisticated transportation system that serves the Central Maryland Region includes nearby Baltimore Washington International Thurgood Marshall Airport (BWI), local civilian and military airports, Amtrak passenger rail service, Norfolk Southern and CSX railroad freight services, Interstate 95, U.S. Routes 1 and 40 and numerous state roadways. There is also considerable boat and barge traffic on the Chesapeake Bay.

The City of Havre de Grace has unique hazardous material concerns due to its location along the Susquehanna River and along the Route 40, I-95 and CSX rail transportation corridors. Chemical spills into the Susquehanna River have the potential to threaten the county's water supply. Rail or tanker truck spills on the

Route 40 and/or I-95 corridors could have a profound potential impact. Smaller chemical stockpiles of sulfur dioxide and chlorine at the wastewater plant and chlorine bottles at the water treatment plant are covered by MDE regulations. In the Havre de Grace Industrial Park, the production of ammonia requires vigilance at that site. Local industries including Harford Memorial Hospital, Cytec, and Evonik have chemicals of special concern.

The Harford County Hazardous Materials Team responds to an average of 300 hazardous material incidents annually. There have been no major hazardous material accidents or incidents that have impacted residents of Harford County.

In addition, numerous hazardous materials, to include obsolete chemical warfare agents, are stored in or near Harford County. The local service station's supply of gasoline or diesel fuel can be hazardous, and hospitals regularly store radioactive and flammable materials as well as other hazardous substances used in medical treatments. Many farms and farm supply stores stock large quantities of pesticides that, if misused or exposed to a fire, could be lethal to workers or nearby residents. The southeastern portion of Harford County is heavily industrialized with regional warehouse distribution firms, chemical production facilities and manufacturing firms.

Another technological hazard involves APG which is in the southeastern portion of the county. APG is involved in the Installation Restoration Program where areas of the Post are being cleansed of chemical, incendiary, and explosive ordnance daily. Laboratories on APG are involved with various chemical agents in the pursuit of its chemical defense mission. All missions pose a certain level of threat to the surrounding communities in Harford County. There has been no chemical, explosive, or incendiary accidents or incidents involving APG that have (or could have) impacted residents of Harford County.

12. Radiological/Nuclear

The county is located within 50 miles of four nuclear energy facilities: Peach Bottom Atomic Power Station (PBAPS), Three Mile Island Nuclear Generating Station (TMI), the Salem/Hope Creek Nuclear Power Facilities, and Calvert Cliffs Nuclear Power Plant. Though the construction and operation of nuclear power plants are closely monitored, accidents are possible. An accident could result in increased levels of radiation that could affect the health and safety of the public living near the plant. Portions of Harford County are located within ten miles of

PBAPS, a designated “Emergency Planning Zone” where people could be harmed by direct radiation exposure.

Since the accident at TMI in March 1979, there have been no accidents or incidents involving nuclear power plants that have impacted Harford County.

13. Pandemic Flu/Public Health Emergencies

A public health emergency is defined as an occurrence or imminent threat of a widespread illness or health conditions that pose a substantial risk of significant human fatalities or permanent/long-term disabilities. Public health emergencies can be caused by an endemic, epidemic, pandemic, or outbreak, or a highly fatal biological agent or toxin release.

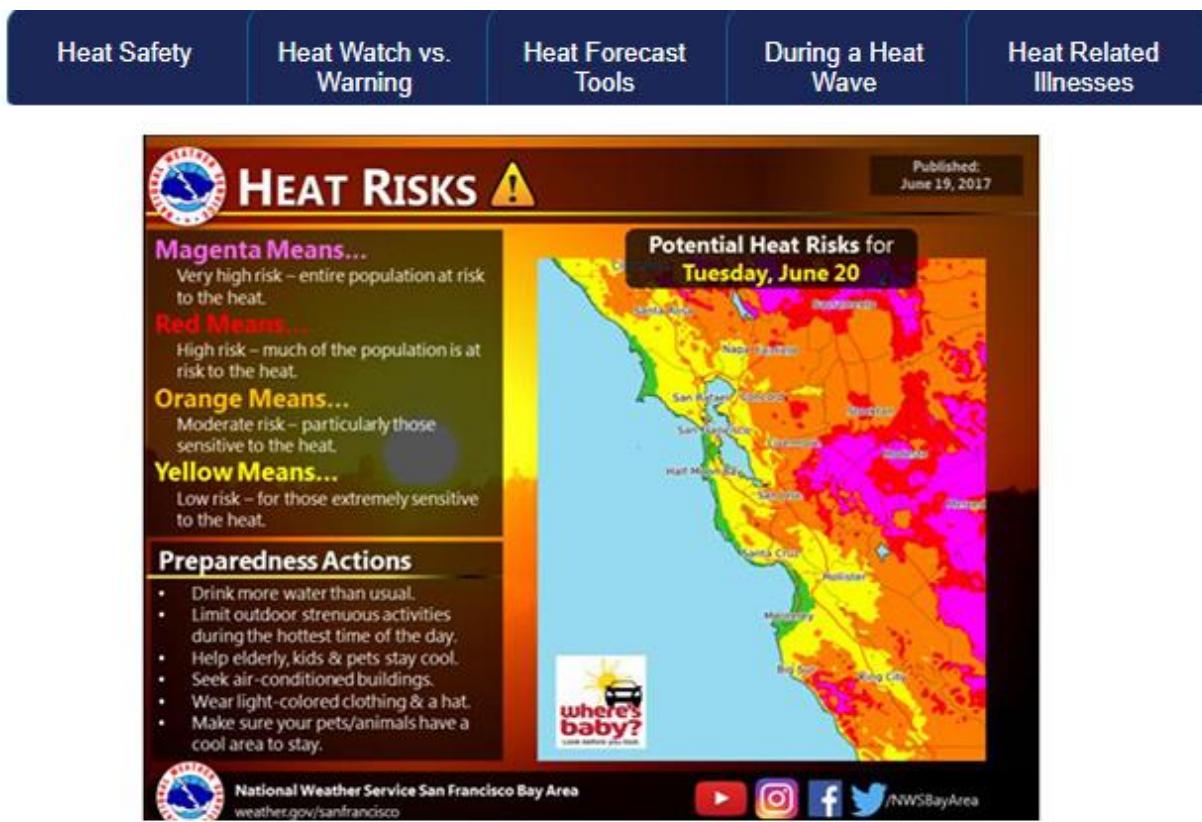
Beginning in 2005, Harford County began development of a Pandemic Flu Plan which incorporated various levels of infection, testing, vaccination processes, mortuary services, and planning for Continuity of Operations (COOP) within all County Departments and Agencies. Appendix 2 to the Harford County Emergency Operations Plan addresses specific roles and responsibilities to address mitigation, preparedness, response, and recovery actions.

In 2019, Harford County began the planning process regarding COVID-19. Workshops, planning meetings, and seminars were developed and presented by Epidemiologists, Hospital representatives, government agency representatives as well as some local business representatives to strategize the County’s approach to the COVID-19 Pandemic. The 2006 Plan was completely revised, public outreach became a top priority, and continued situational monitoring and updating became a daily occurrence. Testing and vaccination site planning and execution was accomplished in a coordinated, efficient manner. After Action meetings provided staff with the opportunity to identify shortfalls and revision to plans and procedures which have made facility operations run more efficiently.

14. Extreme Temperatures

The National Weather Service provides the following definitions: Extreme cold/wind chill: “A period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria

(typical value around -35°F or colder).” Excessive heat: “Excessive heat results from a combination of high temperatures (well above normal) and high humidity. An excessive heat event occurs and is reported in Storm Data whenever heat index values meet or exceed locally/regionally established excessive heat warning thresholds.”



NWS has multiple tools to assess the potential for heat stress due to extreme temperatures. The following tools can inform the issuance of NWS official heat watches, warnings, and advisories. Each of these tools integrate other weather parameters to provide a deeper level of information beyond what the actual air temperature can tell us.

Heat Index

The Heat Index is a measure of how hot it really feels when relative humidity is factored in with the actual air temperature. To find the Heat Index temperature, look at the Heat Index Chart above or check our [Heat Index Calculator](#). As an example, if the air temperature is 96°F and the relative humidity is 65%, the heat index--how hot it feels--is 121°F. The red area without numbers indicates extreme danger. The National Weather Service will initiate alert procedures

when the Heat Index is expected to exceed 105°-110°F (depending on local climate) for at least 2 consecutive days.

NWS also offers a [Heat Index chart](#) for areas with high heat but low relative humidity. Since heat index values were devised for shady, light wind conditions, exposure to full sunshine can increase heat index values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

Wet Bulb Globe Temperature (WBGT)

What is Wet Bulb Globe Temperature (WBGT)? Check out this [handout](#) and [video](#) to learn about WBGT.

WBGT uses temperature, humidity, wind, solar radiation, and other weather parameters. It's a particularly effective indicator of heat stress for active populations such as outdoor workers and athletes.

WBGT can be used to inform activity modifications during exercise or outdoor work. For instance, The American College of Sports Medicine bases its guidelines for the intensity of sport practices on WBGT, and it is therefore utilized by athletic programs in many school districts.

The Occupational Safety and Health Administration (OSHA) recommends protective measures for outdoor work:

- Acclimatize workers starting the first day working in the heat and after any extended absences
- Provide shade for outdoor work sites
- Schedule work earlier or later in the day
- Use work/rest schedules
- Limit strenuous work (eg., carrying heavy loads)
- Use relief workers when needed

For more information:

- [WBGT Forecast](#) | Video: [How to use this tool](#)
- [WBGT Informational Guide](#)
- [Why is it called Wet Bulb Globe Temperature?](#)
- [How does WBGT differ from Heat Index?](#)
- [How can Wet Bulb Globe Temperature be used?](#)
- [Who can benefit from the use of Wet Bulb Globe Temperature?](#)

Heat Risk

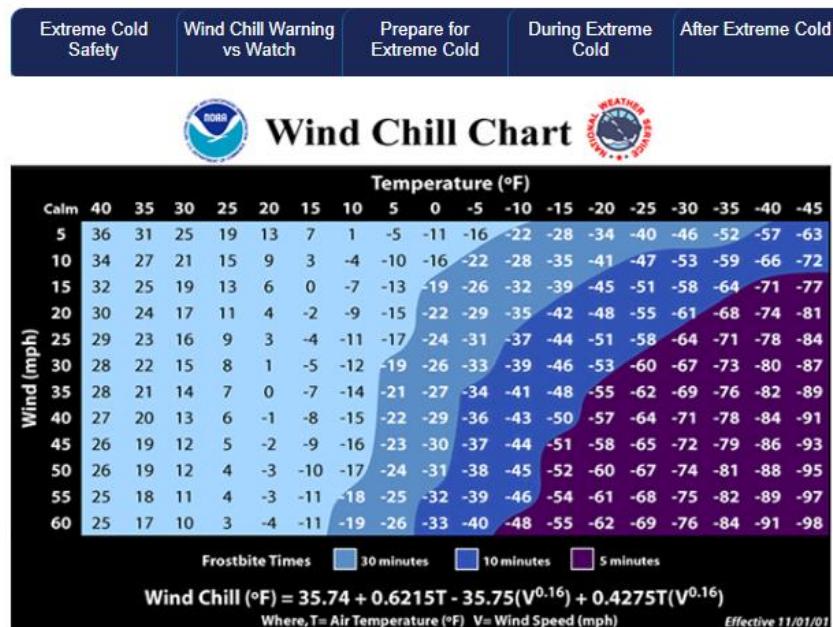
- The National Weather Service (NWS) prototype HeatRisk forecast provides a color and numeric value that places forecast heat for a specific location into an appropriate level of heat concern, along with identifying groups potentially most at risk at that level. The

HeatRisk is accompanied by recommendations for heat protection and is a useful tool for planning for upcoming heat and its associated potential risk.

- **Based on the high resolution NWS national gridded forecast database, a daily HeatRisk value is calculated for each location from the current date through seven days in the future.**
- The HeatRisk takes into consideration:
 - How significantly above normal the temperatures are at your location,
 - the time of the year (for example, is this early season heat that you likely haven't become used to, or late season heat that you have become more used to),
 - Duration of unusual heat (for example, are temperatures overnight at levels that would lower heat stress, or will warm overnight low temperatures continue to add to heat stress into the next day), and
 - If those temperatures are at levels that pose an elevated risk for heat complications, such as heat stress, based on peer reviewed science.
 - While humidity is not directly taken into account, an approximation is used by considering:
 - How unusually warm the overnight temperatures are (more humid air usually leads to warmer overnight low temperatures than are typical for an area)
 - How large the difference is between overnight lows and daytime high temperatures (the difference tends to be smaller the more humid the air is).

Wind Chill Chart

[Weather.gov](#) > [Safety](#) > Wind Chill Chart



The NWS Wind Chill Temperature (WCT) index uses advances in science, technology, and computer modeling to provide an accurate, understandable, and useful formula for calculating the dangers from winter winds and freezing temperatures. The index does the following:

- Calculates wind speed at an average height of 5 feet, the typical height of an adult human face, based on readings from the national standard height of 33 feet, which is the typical height of an anemometer
- Is based on a human face model
- Incorporates heat transfer theory based on heat loss from the body to its surroundings, during cold and breezy/windy days
- Lowers the calm wind threshold to 3 mph
- Uses a consistent standard for skin tissue resistance
- Assumes no impact from the sun, i.e., clear night sky.

Harford County and the local jurisdictions experience brief occurrences of extreme cold and excessive heat events, which, when they occur, may pose threats to many facets of society, including human health, the economy, and critical infrastructure. Harford County and the local jurisdictions have plans in place to address both Freezing Weather and Excessive Heat. These plans address vulnerable populations and provide locations for Warming/Cooling Centers, temporary emergency sheltering (especially for homeless populations), and other needs. Harford County refers to the National Weather Service (Baltimore/Washington Forecast Office) Complete Weather Briefing Page and the tab for Excessive Heat/Cold which provides daily updates to include graphic forecasting of max temperature, minimum temperature, wind speed/direction, heat index, wind chill, and wind gusts. It also provides dashboards and links to other current weather mapping and dashboards.

V. COUNTY MITIGATION CAPABILITY (ALL HAZARDS)

A. Response Capabilities

Harford County maintains a diverse assortment of emergency and disaster response capabilities. These capabilities are continually improved upon and exercised via a variety of regular exercises for both natural and man-made hazards. The City of Aberdeen, the City of Havre de Grace, and the Town of Bel Air have independent response capabilities as independent municipalities; however, when their DPW, Law Enforcement and/or administration exhaust their resources, they, as partners in preparedness, mitigation, response, and recovery, may request County assistance/support through the EOC and existing jurisdictional agreements.

In Harford County, emergency response assets include all elements of 11 volunteer fire and emergency medical service (EMS) companies, an ambulance corps, the Harford County Sheriff's Office (HCSO), two Maryland State Police (MSP) Barracks,

the City of Aberdeen, City of Havre de Grace, and the Town of Bel Air Police Departments, the Harford County Department of Public Works (DPW), the City of Aberdeen, City of Havre de Grace, and the Town of Bel Air Departments of Public Works, the City of Aberdeen, City of Havre de Grace, and the Town of Bel Air Administration, the State Highway Administration (SHA), the Maryland Department of the Environment (MDE), and the Department of Natural Resources (DNR). Numerous other assets from surrounding counties and the State of Maryland, as well as, surrounding states are available through a variety of agreements and compacts.

Harford County maintains a state-of-the-art Emergency Operations Center (EOC) at the Department of Emergency Services (DES). Completed in 2014, the 110,000 square foot DES facility features an EOC with ample space for public safety officials, and vast amounts of technology to assist in response and recovery operations. In case of power outages, the DES facility is fully equipped with uninterruptible power supply (UPS), three large back up diesel generators, and enough fuel to run the generators for several weeks. There are kitchens on the first and second floors to prepare food during continuous operations. The facility also has bunking accommodations for 911 center, EOC, and EOC partner departments and agencies staff. When the EOC is activated, experienced representatives, with decision making authority, from all agencies and jurisdictions are brought together to make decisions concerning both the use of assets and the well-being of citizens. The EOC becomes the coordination center before, during, and after any emergency or disaster and is equipped to operate continuously for many days until the conclusion or termination of the emergency. Meteorological data is available on a real-time basis from multiple sources (primarily the National Weather Service).

The Harford County EOC includes the EOC Commander, the County Executive (or his direct representative), emergency management staff (operations and planning), emergency public information staff, communications staff, logistics staff, administrative staff, and representatives of the Fire & EMS Association, Harford County Sheriff's Office, Maryland State Police, Health Department, Department of Public Works (Highways, Water & Sewer and Environment), Department of Community Services, Department of Inspections, License, and Permits (DILP), Department of Human Resources, Harford County Public Schools, Transportation, USDA, State Highway Administration, the American Red Cross, Department of Social Services, Department of Natural Resources, Department of Parks & Recreation,

Harford County Hospitals, the three Municipalities as needed, and all utilities, as needed. Other organizations or agencies can be requested in the EOC as needed.

The Havre de Grace Police Department is equipped with an EOC. This EOC is equipped to serve as a full-time multi-jurisdictional public safety/public works command post. An emergency generator supports the entire police building and strategic components of City Hall. The progressive radio, telephone, and data network communications system afford the city with the ability to coordinate resources and a response from city departments, allied county and state agencies, including the ability to activate the paging system for the local volunteer fire company.

B. Communication Capabilities

The county's emergency communications capabilities have recently been expanded and enhanced to be fully interoperable with surrounding jurisdictions and other external partners. Annex L to the Harford County Emergency Operations Plan (EOP) provides a complete index to communications capabilities. A recent improvement in the RACES (Radio Amateur Civil Emergency Services) system provides a redundant back up to existing public safety communications. Volunteer ham radio operators as part of RACES provide auxiliary and supplemental communications during power outages, particularly between hospitals, mass care shelters (if activated), and the EOC.

DES works with the Volunteer Fire and Emergency Medical Services Association of Harford County, the Sheriff's Office, and other county agencies to ensure adequate generators are available to maintain communications. The DES facility back-up power equipment mentioned above also ensures that the 911 Communications and Dispatch center can maintain public safety communications.

C. Public Information

Harford County has developed and maintains broadcast messages to the public to report impending storm events. Harford County has an extensive emergency public information program in place. This program reassures the public through the provision of accurate, timely and easily understood event-related information concerning protective actions, route restrictions, health notices, and emergency assistance information. In addition, it works to control rumors and coordinates

information releases with all participating public and private agencies, emergency responders, and all levels of government to support public officials and media representatives. This includes provisions for public education and information programs to include materials for the visually and hearing impaired and non-English speaking persons.

As part of its mitigation program, the county and the three municipalities (Havre de Grace, Aberdeen, and Bel Air) conduct vigorous public awareness campaigns to educate residents and businesses of dangers from all potential hazards and provide them with information on the actions they need to take necessary to save lives and protect property before, during and after an emergency or disaster of any type. During periods of drought, public information campaigns are increased to encourage reductions in water use and water consumption.

In 2008, DES purchased a web-based emergency notification/emergency outreach communications system which will rapidly contact all County, City of Aberdeen, City of Havre de Grace, and Town of Bel Air residents, businesses/and employees to include the through their landline, cell phone, pager, and via email and SMS text messaging, as well as posting messages on social media (Facebook and Twitter). It is a user-friendly tool that provides all county departments and agencies, as well as the three municipalities, the tools for reaching impacted contacts in a rapid manner.

Harford County has developed and maintains pre-scripted Emergency Alert System (EAS) messages to alert the public in the event of impending danger or the occurrence of an actual event. The EOC controls the release of these messages and is digitally linked to EAS radio stations within the county (103.7 FM WXYC (the LP-1 station) and 91.1 FM WHFC). In addition, the EOC is the master station for Harford Cable Network and can take control of Comcast channel 21, Armstrong channel 7, and Verizon channel 31 to broadcast emergency information to the public. The EOC also has a link to the National Weather Service and can broadcast Civil Emergency Messages over NOAA Hazard Alert Radios.

Harford County and the municipalities have a trained, Emergency Public Information Office (PIO) Team that supports the EOC in all mitigation, preparedness, response, and recovery efforts with the public to include the ability to open and operate a Joint Information Center (JIC) to interface with broadcast and print media, as well as, to maintain a social media presence.

Numerous pamphlets and brochures have been prepared and disseminated to all county branch libraries for release to the public. In 2016, DES developed a comprehensive “Emergency Preparedness Guide.” This publication contains a variety of information regarding what to do before, during, and after a storm and is revised, printed, and uploaded to the County Website annually (last revision-2021). Flood insurance information, assembling go-kits, emergency supply kits, emergency pet supply kits and other information is also included within this guide. Additional copies are handed out at a variety of public outreach events.

D. Equipment

Equipment required in debris clearance is owned and maintained by the Department of Public Works (DPW). DPW has contracts with private companies/individuals to assist with snow and ice removal, the spreading of salt/sand products, and debris removal. The City of Aberdeen, City of Havre de Grace, and Town of Bel Air also have equipment and contracts in place for use in debris clearance. If the municipalities exhaust their capabilities, additional County resources will be provided through resource requests made in the EOC. Additionally, Harford County has developed and formally adopted a Debris Management Plan which includes the three municipalities, and has contingency contracts in place with primary and secondary debris management contractors who may be called upon to facilitate debris removal and recovery efforts should the need arise.

Harford County Government and the three municipalities use Geographic Information Systems (GIS) with a complete planimetric and topographic database library. Additional data layers have been developed by numerous departments and agencies and GIS technology is now used extensively throughout county government for planning, analysis, emergency dispatch, hazard mitigation and reporting. The county and municipalities have continually modernized the GIS utilizing the latest mapping and aerial photography technologies making the system more accurate, and by applying the newest web technologies, far more accessible for staff and residents alike. Using sophisticated modeling and analysis techniques, hazard mitigation scenarios can be developed and refined using GIS, substantially improving accuracy and efficiency.

E. Infrastructure

1. Transportation

The classification of a roadway, the volume of traffic, or the costs of the improvement are factors that are considered in determining the design standard for flood safety of roads and bridges. Floodplain impacts and the safety of the traveling public are considered in the design process.

County bridges: DPW assesses the frequency and severity of flooding in the design of replacement bridge structures. Where federal funds are involved, designs must meet standards established by the Federal Highway Administration. State law requires all bridges and culverts to "safely pass" the 100-year flood discharge, which is based on ultimate land use.

State bridges: The State Highway Administration (SHA) assesses the frequency and severity of flooding in the design of replacement bridge structures. Where federal funds are involved, designs must meet standards established by the Federal Highway Administration. State law requires all bridges and culverts to "safely pass" the 100-year flood discharge, which must be based on ultimate land use. By itself, this measure is not intended to result in flood-free bridges but in minimal damage to public transportation infrastructure.

2. Water and Sewer Utilities

Chapter 131 of the Harford County Code allows necessary infrastructure in the floodplain or floodway (such as bridges and road abutments) if flood heights are not increased, and compensatory storage is provided. State activities are subject to State regulation under COMAR .08-803 and .08.05.03.

The Harford County DPW – Division of Water and Sewer is taking a pro-active approach to the construction of new water and sewer facilities through the adoption of the revised design guidelines. These guidelines were initially issued in February 2002 but have since been updated as of November 2014. These guidelines require the design to incorporate protective measures for all water and sewer mains that parallel or cross all streams. Depending on the site, these measures may include stipulated minimum bury depths below stream bottoms; concrete encasement of the pipe between stream banks; and stream bank

stabilization measures. All sewer manholes within the 100-year floodplain must also be equipped with watertight frame and covers to prevent storm water from entering the sewer system.

All sewage pumping stations and water booster pumping stations are continuously monitored by use of the telemetry systems. Operators are instantly alerted of pump failures, power outages, equipment failures, and intrusions, so they may quickly react and respond to emergency conditions. All major sewage pumping stations and water booster stations are equipped with emergency generators in case of a power failure. In such cases, the generators will automatically turn on for continuous operation of the facility. Standby generators are also available as needed to transport to smaller pumping stations in case of a power outage.

3. Utilities

Utilities within the county are working to place all utility services under ground as they are repaired and/or replaced. This will lessen the probability of severe weather causing lines to fall, producing communications and power outages along with causing fires, accidents and electrocutions. The County Code currently requires utilities to place all new construction service lines to new homes under ground.

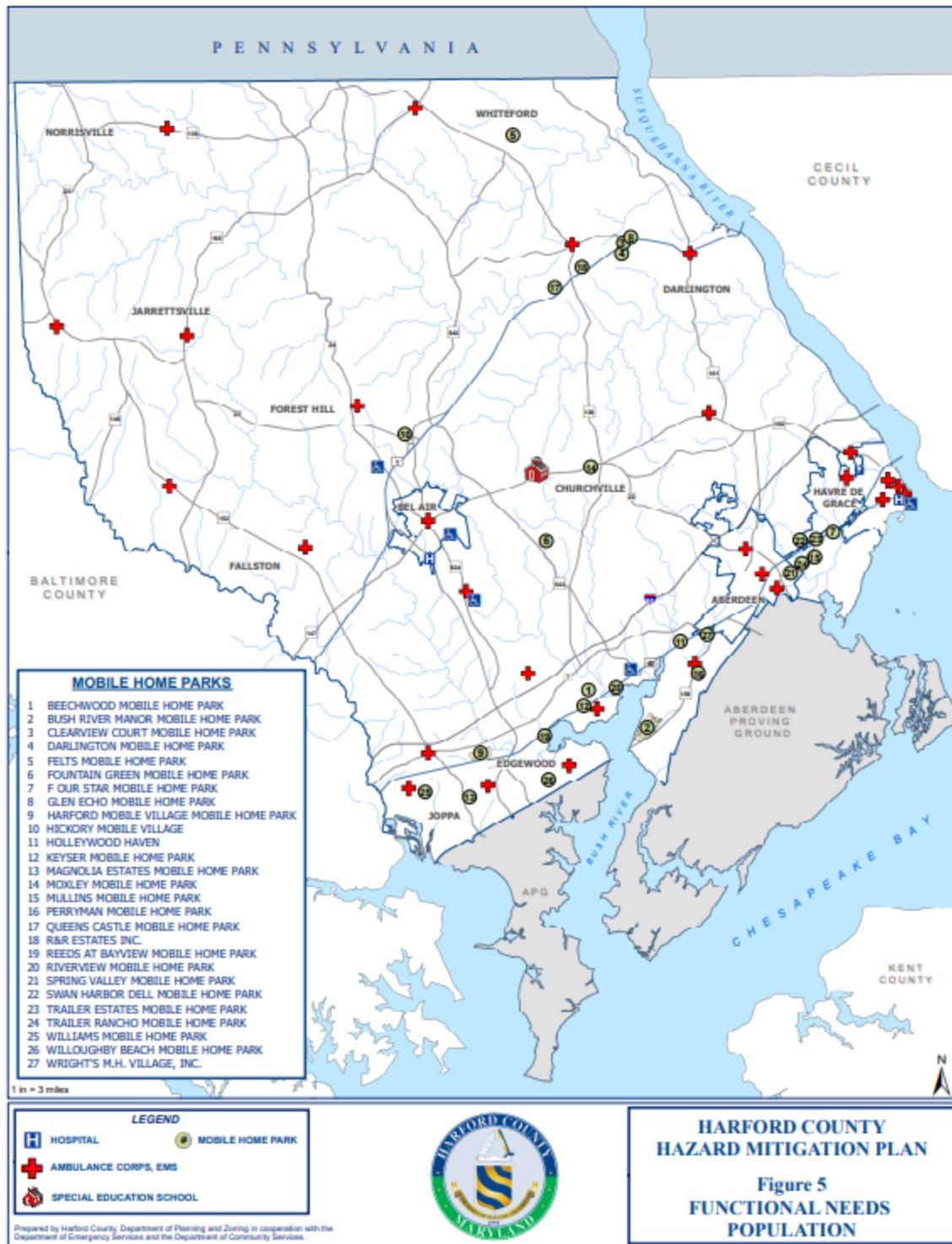
Priorities for restoration of power have been established and will be reassessed periodically. The county will continue working with utility companies to safeguard and harden facilities against terrorist activities.

F. Evacuation of Vulnerable Populations

There are two hospitals, six nursing homes, 35 assisted living centers, nine adult day care facilities, four senior centers and one special education school in the county. There are 29 mobile home parks, which are particularly susceptible to damage from high winds and tornadoes. These are all mapped in the GIS and identified in emergency action plans. Figure 5 shows the locations of some of these vulnerable populations.

DES currently utilizes the county website for information regarding residents with functional needs. The Office on Aging (Community Services) collects and maintains

data on the elderly using their annual budget. Outreach to this population is conducted through the Senior Centers, through media releases. Both the Department of Social Services and the American Red Cross provide advice and assistance to the EOC and the Office on Aging. The Department of Planning & Zoning collects data for “special places” from the U.S. Census. DES maintains a list of facilities with functional needs populations (hospitals, nursing homes, schools, correctional and mental health facilities, etc.). This list, which is updated quarterly, is utilized to identify buildings which require early evacuation or special protection. One nursing home borders the Special Flood Hazard Area along the Susquehanna River; it is elevated 1 foot above the base flood level.

Figure 5 – HARFORD COUNTY FUNCTIONAL NEEDS POPULATIONS

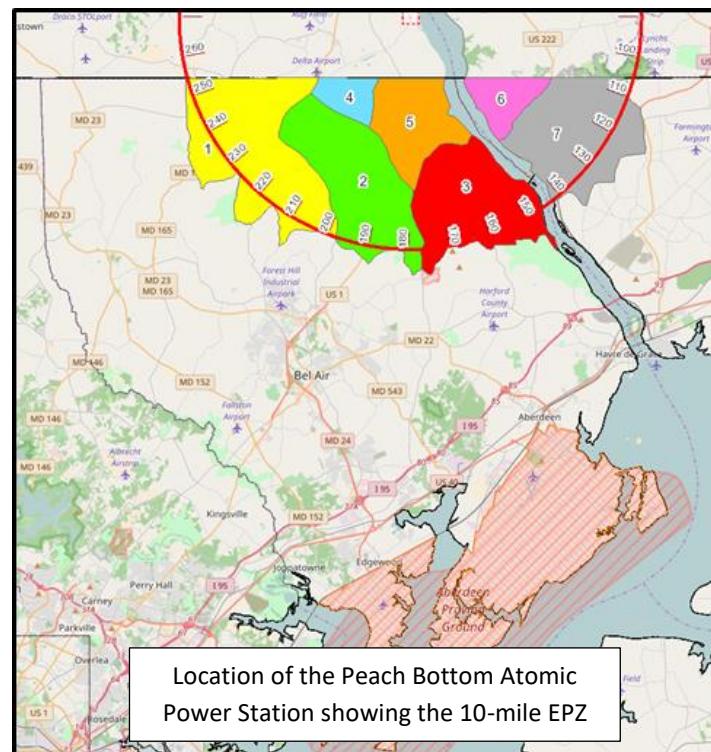
G. Preparedness/Mitigation for Man-Made Hazards

A variety of plans and procedures are in place, and exercised routinely, to ensure that the county can prepare for, provide an adequate response to, and recover from such events. For this mitigation plan, the focus will be on those technological hazards that the county may have a degree of control over and for which mitigation efforts make sense.

Harford County has a Hazardous Materials Response Team, a highly trained professional group that is specially equipped to respond to the release of any hazardous substance that threatens the citizens of the county, their property or the environment.

State regulations under Title 26, Department of the Environment, COMAR 13.06.01, specify that hazardous waste facilities located in floodplains "shall be designed, constructed, operated, and maintained to prevent washout by a 100-year flood, unless the owner or operator demonstrates to the MDE Secretary that procedures are in effect which will cause the waste to be removed safely, before flood waters can reach the facility, to a location where the wastes will not be vulnerable to flood waters."

The county, along with nuclear utilities and agencies of the state and federal governments, has developed emergency response plans for use in the event of a nuclear power plant accident. These plans define two zones: the ten-mile Emergency Planning Zone (EPZ), and the Ingestion Zone. Evacuation is most likely in the EPZ. The second zone, the Ingestion Zone, is a larger area that is also important for emergency management. It covers a 50-



mile radius where radiation released by the accident could possibly contaminate the soil and water, enter the food chain, and contaminate water supplies, food crops and livestock.

Harford County is within the Ingestion Zone of Salem and Hope Creek, Limerick, and Calvert Cliffs nuclear power plants.

VI. **MITIGATION GOALS AND ACTION PLAN**

A. Mitigation Strategy

Reducing the exposure of county residents to natural hazards by managing development and maintaining state-of-the-art facilities at the EOC are the two principal strategies behind the goals and objectives discussed below. While mitigating for technological hazards is difficult, there are many actions that can be taken to mitigate for and reduce the county's vulnerability to known natural hazards. The listed activities strive to lessen the impact of catastrophic events.

The action plan presents activities that can be accomplished within a five-year period. Harford County Government intends that the policies and activities set forth herein represent prudent efforts towards producing a storm-ready community. The Harford County Emergency Manager will lead these efforts with the Department of Planning & Zoning implementing the land use regulations and DPW taking the initiative for most of the capital projects. Harford County's mitigation efforts against the damaging effects of drought are focused on public education and development of multiple water supplies including both surface water and groundwater sources.

1. Completed Mitigation Activities

Harford County has been recognized for its outstanding flood mitigation activities as part of the NFIP. The NFIP Community Rating System (CRS) is a voluntary program for recognizing and encouraging community floodplain management activities exceeding the minimum NFIP standards. Designated as a Class 7 community through the CRS, a 15% discount is given to flood insurance policy holders.

NFIP #	Community	CRS CLASS
240042	BEL AIR, TOWN OF	6
240040	HARFORD COUNTY	7
240043	HAVRE DE GRACE, CITY OF	7

Hazard mitigation planning requirements under 44 CFR Part 201 are consistent with the CRS 10-step planning process found within Activity 510 of the CRS Coordinators Manual. Completing Activity 510 Floodplain Management Planning enables Harford County, and its municipalities, to improve their CRS rating, which can subsequently lower NFIP premiums for the entire community.

The Harford County Department of Planning and Zoning, the City of Aberdeen, the Town of Bel Air, and the City of Havre de Grace have each completed a survey of day-to-day NFIP activities, which are presented in Appendix G.

Data obtained from NFIP Insurance Report for Maryland as of January 21, 2022 is presented below:

Community Name	Total Current Policies	Total Current Coverage	# Claims since 1978	Total Payments since 1978
Harford County (unincorporated)	374	\$101,982,700	230	\$2,304,974
City of Aberdeen	61	\$16,678,600	34	\$134,483
Town of Bel Air	22	\$5,117,000	10	\$18,537
City of Havre de Grace	355	\$79,736,000	73	\$934,647

This table shows the total number of flood insurance policies that are currently in effect, the total coverage amount of those policies, claims paid since 1978, and the total of those payments.

The production of new DFIRMs through the recent RiskMAP process has facilitated floodplain management for all jurisdictions. Improved technology and data has greatly enhanced mapping the Special Flood Hazard Areas. New floodplain management regulations were adopted with the new maps that became effective on April 19, 2016. Mitigation activities will be developed with the use of the new data that has been given to the county in the Flood Risk Report. Enhanced tools, such as depth-grid analysis, helps to convey vulnerability and risk to the public. The county and the three municipalities will continue to use the latest information and technology in targeting mitigation

efforts. Mitigation efforts at the EOC included repairing and updating communications devices, installing new GIS computers, and updating weather-tracking equipment.

The primary mitigation strategy to reduce flood losses in the county is to enforce regulations that severely limit development in the floodplain and require any new buildings, including substantial improvements to be constructed two feet above base flood elevation (2-foot freeboard). The 2016 floodplain regulations require improvements to be counted cumulatively (cumulative substantial improvements) and require compensatory storage for the use of fill in the 100-year floodplain. Other activities awarded by the CRS program are:

- Educational outreach to floodplain residents, realtors, and insurance agents
- Map information service and flood protection information
- Outreach projects
- Preservation of open space in the floodplain
- Protection of flood storage and natural resources
- Acquisition of flood damaged homes
- Building code effectiveness rating of 4
- Definition of repetitive loss properties

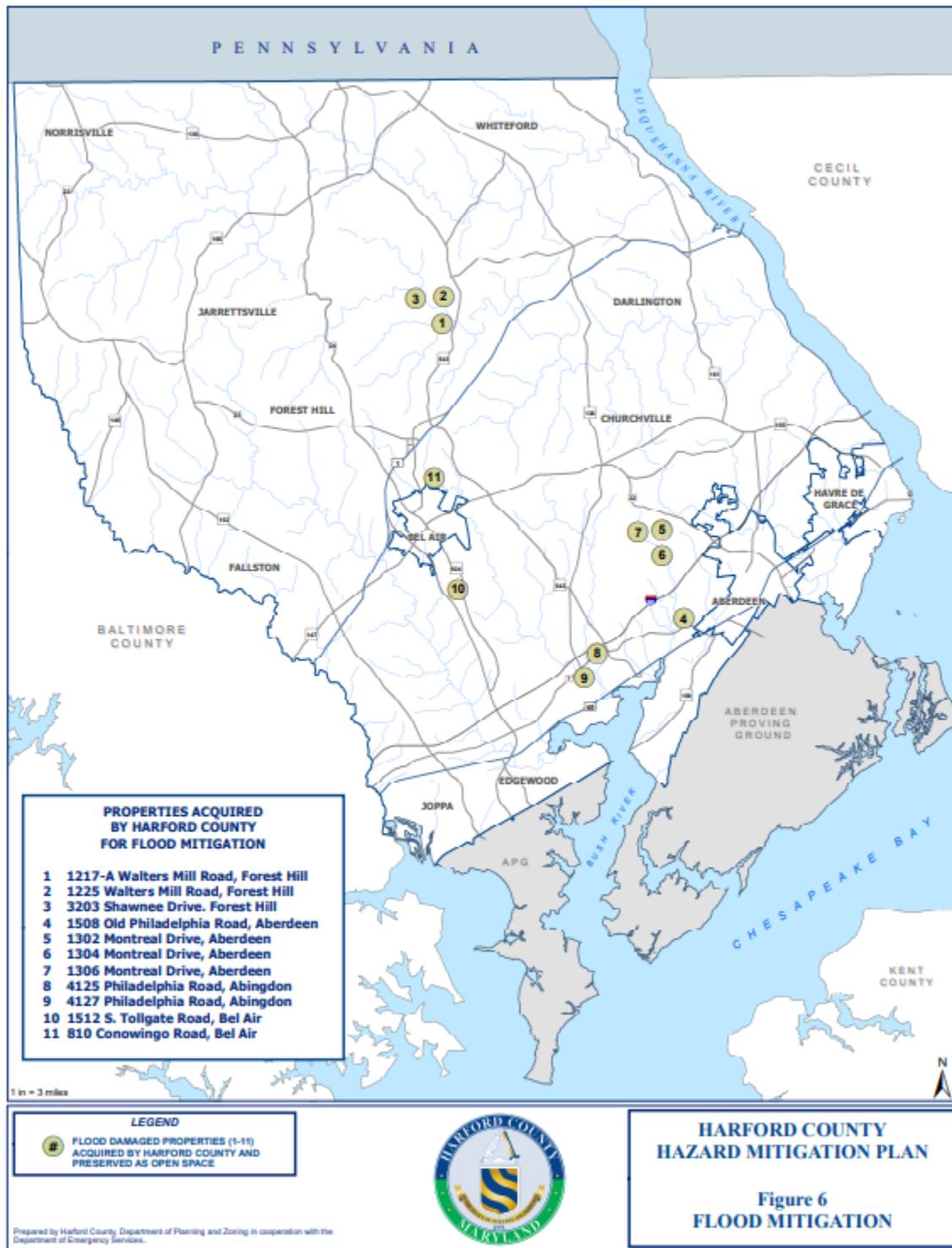
The county maintains a comprehensive list of county-owned buildings that are at risk for flooding. This detailed list is on file at the Office of Risk Management.

Harford County Government has purchased eleven (11) flood-damaged properties and converted the land into permanent open space, protected by deed restriction. These properties are scattered in four different areas as shown in Figure 6.

Harford County DPW Division of Water and Sewer is the lead agency for the county in developing a drought plan which provides the framework for how the water purveyors in Harford County will deal with drought events. The plan is a product of the Drought Task Force which is made up of representatives from the City of Aberdeen, the Town of Bel Air, Maryland American Water Company, and the City of Havre de Grace.

The DPW Division of Water and Sewer, Operations Section has adopted an Emergency Operating and Response Program related to the operation of the

Figure 6 – FLOOD MITIGATION



treatment plants and pumping facilities. This program includes a vulnerability analysis from natural disasters, equipment and process failures, power loss, metering and instrumentation failure, and hydraulic overload. Emergency response procedures are outlined for each of the above emergencies.

Beginning in 2000, the Harford County Division of Water and Sewer completed stream bank stabilization measures at 11 different sites along Winters Run and Bynum Run to prevent stream bank erosion from undermining major county sewer mains resulting in their collapse and the release of large quantities of raw sewage into the environment as well as for the stabilization of Bynum Run stream. Additionally, a program is in place which identifies vulnerable sanitary sewer mains susceptible to streambank erosion which may be impacted by future storm events. These areas are inspected after major storm events and capital projects are identified as necessary to mitigate the vulnerability. Design guidelines are now in place which requires the evaluation of proposed sewer mains near streams. New sewer mains are designed and constructed at locations which will have the least possible impact from stream bank erosion. As part of Harford County's adoption of the Source Water Protection section of the Zoning Code in 2008, permitted and prohibited uses within the overlay district are outlined in the ordinance.

a. Town of Bel Air

The Town of Bel Air participated actively in the preparation and production of this plan. It has received a Class 6 rating under the Community Rating. The Town of Bel Air recently updated its Floodplain Ordinance and incorporated new DFIRMs into its floodplain management program. By exceeding the NFIP minimum standards and conducting outreach activities, the town has earned this Class 6 CRS rating. The town's stringent storm water management practices also contributed to the Class 6 CRS rating. As a result of the revised flood study, several changes to the Special Flood Hazard Areas in the town limits were made. The Town of Bel Air revised in 2018, a Flood Mitigation Action Plan that was originally approved by MDEM and FEMA in 2011. The town annually inspects and clears debris from stream channels and storm water management ponds to maintain open stream channels and flood storage. The town completed upgrades to storm drain outfalls at 802 Linwood Avenue, 704 Linwood Avenue, 422 Linwood Avenue, Lee Way and the Pennsylvania Avenue intersection, 21 Linwood Avenue, and

331 Baltimore Pike. The Town of Bel Air is ready to convert its municipal building to an EOC during a time of need. The Police Department works closely with Public Works officials to manage disaster response efforts in emergency situations.

b. City of Aberdeen

The City of Aberdeen actively participates in the NFIP. The city adopted an updated Floodplain Management Ordinance No. 16-O-03 on March 28, 2016. There has been no update to this policy.

The city updated and adopted Ordinance No. 18-O-03, Wellhead Protection Ordinance and Plan on August 8, 2018. The purpose of the ordinance is to protect the public health, safety, and welfare through the preservation of ground water resources of community public water supplies to ensure a future supply of safe and healthful drinking water. The designation of the wellhead protection overlay district and careful regulation of activities within these districts will help reduce the potential for ground water contamination. Permitted and prohibited uses within the overlay district are outlined in the ordinance. The city also amended Stormwater Management regulations in Ordinance No. 18-O-25. This will ensure proper review, documentation, and bonding for Stormwater management facilities for future projects.

The city completed a vulnerability assessment for all water and wastewater infrastructure and have completed an Emergency Response Plan 2021. A Risk Management Plan has also been completed for the APG Wastewater Plant 2021. A Microtox System for toxicity screening was completed for the public water supply and wastewater influent. The city had GHD complete a Water System Risk and Resilience Assessment completed in June of 2021.

c. City of Havre de Grace

The City of Havre de Grace is located at the confluence of the Susquehanna River and the Chesapeake Bay. Its vulnerability and susceptibility to floods has been well documented throughout its history. In recognition of this, the city maintains aggressive management of flood prone activities and recently updated its Floodplain Management Ordinance on April 19, 2016. A two-foot

freeboard allowance is a building code requirement. Management efforts include:

- The use of updated DFIRMs, effective April 19, 2016.
- Cumulative improvements for determining elevating requirements
- Flood map data available to public with technical assistance
- Property fill limitations
- Educational assistance for obtaining flood insurance
- Active participation in NFIP and CRS; currently at a CRS Class 7

The Department of Planning has acquired GIS technology to assist in the implementation and monitoring of floodplain activities and to provide current technical information and topographic data for floodplain applications. Additionally, precise delineation of the Chesapeake Bay Critical Area boundaries will assist in the protection of this environmentally sensitive area by implementing storm water management activities that will reduce storm water run-off pollutants. Havre de Grace updated their Critical Area Ordinance, which includes the updated Critical Area Overlay District Map, prepared by the Maryland Critical Area Commission. The effective date of the updated Ordinance was October 5, 2021.

B. Capabilities

<u>Capabilities</u>	<u>Harford County</u>	<u>City of Aberdeen</u>	<u>City of Havre de Grace</u>	<u>Town of Bel Air</u>
Planning and Regulatory	County Code; Floodplain Ordinance; Building Codes; Nuisance Flood Plan; HMP; Emergency Operations Plan; Continuity of Operations Plan (All County Departments have individual COOPs); Continuity of Government Plan; Sediment and Erosion Control; Stormwater Management; Debris Management Plan; HarfordNEXT (Comprehensive Plan); Green Infrastructure Plan; Zoning Code/Subdivision Regulations	Code Enforcement Stormwater Mgmt; City Sediment Erosion Inspector; Disaster Recovery Plan; Emergency Action Plan; Floodplain Ordinance	City Codes for Floodplain Management; Current Building Codes; Stormwater Management; Subdivision, Grading/SEC; Zoning City COOP; County HMP	Zoning/Code Subdivision Regulations; Floodplain Ordinance; Building Codes; Continuity of Operations; Sediment and Erosion Control; Stormwater Management; Comprehensive Plan
Administrative	Environmental Advisory Board Planning Advisory Board Local Emergency Planning Committee Hazard Mitigation Planning Team All Harford County Departments/Agencies	Appearance and Preservation Committee; Board of Appeals; Economic Development Committee; Ethics Commission	Planning Commission; Board of Appeals; DPW Department; Planning Department; Administration; HMP Team	Tree Committee Appearance & Beautification Committee All Town Departments/ Agencies
Finance	Capital Budget, Grants, State and Federal (HMGP, FMA, BRIC, SHSGP FEMA Lifelines)	Capital projects; Grants (State/Fed); Finance Depart.	City Budget, State and Federal Grants	Capital Budget, Grants

Education and Outreach	Prepare Because You Care (PBYC Countywide fairs/events CRS Webpage Social Media Pages (Facebook/Twitter)	Boys and Girls Club Earth Day	CRS Outreach Projects; Special Events; City Website; Social Media	Town Events; Town Webpage; Town Social Media Page (Facebook)
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Further details to include Goals, potential funding sources, actions, and estimated timeline (again, based on available funding) are documented below and in Appendix F.

C. Goals

Under each Goal, Objectives are listed in order of priority. Appendix F further breaks down the goals, potential funding sources, and timeline. Additional or new goals may be added in the future based on guidance discussed in the new High Hazard Potential Dam (HHPD) portion of the FY 22 Local Mitigation Planning Policy Guide.

GOAL 1: REDUCE FLOOD RISKS

Objective 1a: Restrict development in the floodplain.

ACTION: Continue Floodplain Management Program.

ACTION: Continue CRS activities and continue to identify actions that improve CRS credit.

ACTION: Protect new and existing buildings from flooding by requiring elevation of new and substantially improved buildings.

Objective 1b: Reduce vulnerability to flood damages.

ACTION: Relocate or acquire residences located in the floodway.

ACTION: Elevate, move, acquire, and/or demolish flood damaged buildings.

ACTION: Implement appropriate mitigation measures for the county's repetitive loss properties and repetitive loss areas.

ACTION: Construct, or ensure construction of, new utilities in accordance with current Harford County Water and Sewer Design Guidelines (Guidelines updated November 10, 2014).

ACTION: Use RiskMAP HAZUS data to identify at-risk properties and target for mitigation actions.

ACTION: Ensure critical infrastructure is adequately protected from flood damage.

ACTION: Ensure that new county plans (such as the Green Infrastructure Plan) and policies reduce vulnerability to flood damage and improve resiliency.

Preventing new construction in the floodplain and removing existing residences from the floodway are high priority mitigation measures for all of Harford County. Continue existing mitigation practices by implementation of regulatory measures that restrict development in the flood plain and acquiring flood prone properties, particularly repetitive loss properties. Flood risks to new and existing construction will be reduced through a combination of regulatory measures (restrict development in the floodplain) and capital projects. Most of the capital projects, such as purchasing flood-damaged homes will be funded with federal, state, and local funding that become available after a disaster. As mentioned previously, the use of the Flood Risk Report through RiskMap will identify priority areas for mitigation projects.

GOAL 2: ENSURE EMERGENCY COMMUNICATIONS CAPABILITY FOR ALL PUBLIC SAFETY OFFICIALS, INCLUDING EMERGENCY PUBLIC INFORMATION

Objective 2: Maintain a state-of-the-art communication system for county-wide emergency response.

ACTION: Ensure all system updates and mobile/portable radio updates are completed in timely fashion.

ACTION: Collect and maintain data on vulnerable populations who require supplementary services during disasters.

This goal addresses risks for all hazards. Beginning in 1995, major improvements were made to the Emergency Operations Center (EOC). These efforts have continued, with the opening of the new Department of Emergency Services (DES) building in 2014 that features a state-of-the-art 911 Communications and Dispatch Center and EOC. Additionally, an upgraded, fully interoperable radio communications system was launched. Communication between Harford County Government, the three municipalities, and the US Army's Aberdeen Proving Ground is an essential component to public safety. All forms of communication: electronic, vocal, written, and radio must be adequately maintained. Improving coordination with the municipalities concerning emergency calls and the dispatching of ambulance and fire units is an effort that continues as technology continues to evolve.

GOAL 3: PROTECT INFRASTRUCTURE – WATER AND WASTEWATER SYSTEMS**Objective 3a: Protect water and wastewater systems from terrorist activities.**

ACTION: Pursue security upgrades (e.g. secure SCADA, locking system, video surveillance, perimeter controls).

ACTION: Chlorine conversion to alternative disinfectant.

ACTION: Evaluate need for dual booster station for 4th zone as part of comprehensive water model study.

Objective 3b: Protect water and wastewater systems from flood damages.

ACTION: Flood-proof existing water and sewer utilities which may be in danger of damage from flooding.

ACTION: Identification of vulnerable sanitary sewer mains susceptible to streambank erosion and re-check after major storm events.

ACTION: Reduce storm-water inflow into sanitary sewers to provide greater capacity and reduce amount of treated wastewater.

Objective 3c: Develop a mitigation plan for drought.

ACTION: Adopt a local water conservation plan.

ACTION: Plan for alternative water supplies.

ACTION: Participation in Regional Conowingo Task Force (Baltimore/York, PA).

ACTION: Maintain drought coordination with all local water purveyors.

Objective 3d: Protect against technological hazards that could result in accidental release of hazardous chemicals.

ACTION: Review and update W&S input to county emergency plans.

Protecting infrastructure, such as water and wastewater supply, distribution, and collection systems from all natural hazards is an important emergency planning objective. While most county buildings and services are not sited in flood-prone areas, water and wastewater facilities are often located along the banks of streams and rivers. Sewer lines, which are gravity fed, run through lowlands and along stream valleys to sewage treatment plants. Flood-proofing of these vulnerable buildings and structures, where feasible, is an important infrastructure protection objective. However, the force of floodwater and high wind can tear up even the most well-built structures. To the greatest extent possible, Harford County Government flood-proofs these essential services. The capital budget of the Department of Public Works funds these projects. Since the events on September 11, 2001, a focus has been placed on mitigating effects from terrorist activities. Harford County has completed a federally-approved vulnerability assessment on its water system. A plan was developed

based on that assessment. The implementation of this plan is multifaceted and extensive effort continues.

In addition to mitigating the effect of storm damage and terrorist activity on water and wastewater systems, it is essential to plan for severe drought. Harford County has an active task force with all local water purveyors participating to assess current and future water supply needs. In addition, this task force has worked to have a coordinated water conservation plan which includes reduction of water use, use of alternative sources and interconnections.

Water and wastewater systems are extremely complex and rely on automatic controls and human interface with hazardous chemicals. Hazards from malfunctioning equipment are addressed in the county's Emergency Response Plan, which is updated annually. This plan requires continuous in-house training with certified instructors. In addition, DPW is looking to mitigate and lessen the safety hazard through alternative systems as addressed in our objectives.

GOAL 4: PROTECT TRANSPORTATION SYSTEMS

Objective 4a: Ensure safe passage on major roads during storm events.

ACTION: Identify roads, culverts, or bridges in need of significant repair or replacement annually.

ACTION: Continue implementation of road classification system.

ACTION: Upgrade, add and/or replace snow removal equipment to meet changing requirements.

ACTION: Review Harford County Capital Improvement Program annually.

Protecting transportation systems addresses risks associated with all hazards. By necessity, roads transgress rivers and streams, making them vulnerable to flooding, blockage, or washout. Disrupted road networks and trapped citizens create havoc during emergency situations. State and county regulations require that major public roads, such as arterial roads, convey the 1% annual storm. Emergency access routes are designated and given priority during storms. One of the objectives of the Floodplain Management Program and the Transportation Classification System is to ensure that arterial roads are constructed above base flood elevation and can withstand flooding. The action plan reflects this intent.

The Standard Operating Procedure for the Department of Public Works – Bureau of Highways states that snow removal operations are expected to: keep traffic

moving, ensure that commerce and industry continue at a near normal pace, prevent (or decrease) accidents, injuries, and deaths and provide access for emergency vehicles response. These procedures apply to any emergency response, whether flooding, hurricanes, other natural disasters, or snow.

GOAL 5: EDUCATE AND INFORM THE PUBLIC ABOUT NATURAL DISASTERS

Objective 5a: Improve public awareness of natural disasters and response activities.

ACTION: Ensure that DES keeps adequate copies on the Harford County Emergency Preparedness Guide in stock.

ACTION: Maintain in all public and private schools and public buildings, NOAA hazard alert radios.

ACTION: Participate in all national awareness campaigns (i.e. National Severe Storm Awareness Week, Hurricane Awareness Week, etc.)

ACTION: Use RiskMAP tools such as depth grid analysis to communicate depth of flooding, or risk over 30-year periods.

ACTION: Target owners of non-conforming structures and repetitive loss properties for assistance regarding flood-proofing options.

Objective 5b: Reduce exposure to drought.

ACTION: Educate the public on water conservation methods before and during periods of drought.

Public outreach efforts serve to educate and protect the citizens of Harford County against all natural hazards. Harford County Government has several outreach programs already in effect: the Community Rating System (CRS), national campaigns (Severe Storm Awareness Week, Hurricane Awareness Week, etc.), water conservation efforts, a variety of brochures and other items published on the DES website, and the recently developed "Harford County Emergency Preparedness Guide." Social media has developed into a valuable tool for relaying hazard awareness and emergency preparedness messages to the public. Water conservation efforts include monitoring quarterly water consumption and alerting customers of unusually high consumption; free leakage assessments for county residents; tracking and identification of water losses from the system; monitoring and prosecuting unauthorized water usages from hydrants; and by imposing water restrictions as necessary. Keeping these efforts going and coordinating educational efforts with the school system provide the bulk of the county's storm readiness strategy.

GOAL 6: INVOLVE LOCAL STAKEHOLDERS IN MITIGATION EFFORTS**Objective 6a: Continue joint efforts for all hazard response, recovery, and mitigation projects**

ACTION: Coordinate with surrounding jurisdictions (Maryland & Pennsylvania).

ACTION: Meet with executive committees (Environmental Advisory Board [EAB], Planning Advisory Board [PAB], and Local Emergency Planning Committee [LEPC]).

ACTION: Maintain and update Memoranda of Agreement and Mutual Aid Agreements with surrounding jurisdictions.

ACTION: Plan for debris management activities and maintain contracts for primary and back-up debris management handling and disposal including grinding and recycling of materials.

Objective 6b: Streamline debris management and recovery efforts

ACTION: Maintain the FEMA approved Debris Management Plan.

Harford County Government works closely with APG and the local municipalities in the emergency planning and preparedness arena. The county maintains dialogue with the Town of Bel Air, the City of Aberdeen, and the City of Havre de Grace regarding all hazards emergency plans, emergency response, disaster recovery, emergency communications/public notification initiatives, and hazard mitigation.

GOAL 7: IDENTIFY, LOCATE, AND ASSESS HAZARDOUS MATERIAL RISKS WITHIN THE COMMUNITY TO ESTABLISH VULNERABILITIES AND PREVENT ACCIDENTS OR INCIDENTS**Objective 7a: Protect the public from hazardous material incidents**

ACTION: Support and sponsor Local Emergency Planning Committee (LEPC) meetings and activities.

Under the Superfund Amendments Reauthorization Act (SARA), Title III, DES is the central repository for all information involving the storage or movement of hazardous materials within the county. DES has established a dialogue with the business community and Aberdeen Proving Ground and obtains the required information on an annual basis. Using this information, the county updates its vulnerability assessments and visits individual sites to ensure that plans and procedures are in place to prevent releases into the public arena and injuries to employees. A vulnerability, hazard, and risk assessment has been completed for

all potential chemical, biological, radiological, nuclear, and explosive (CBRNE) hazards. All assessments and resulting planning, to include mitigation activities, will continue throughout the future. Public outreach is a key component in hazardous materials risk mitigation efforts.

TOWN OF BEL AIR

GOAL 1: REDUCE FLOOD RISKS

Objective 1a: Restrict Development in the floodplain

ACTION: Maintain Floodplain Management Program.

ACTION: Maintain CRS activities.

Objective 1b: Reduce vulnerability to flood damages

ACTION: Elevate, move, acquire, and/or demolish flood damaged buildings.

ACTION: Evaluate flooding problems along Plumtree Run.

ACTION: Upgrade storm water management system: Plumtree Stream Bank Restoration @ 401 and 555 S Atwood. Plumtree Stream Bank

Restoration @ 610 & 620 W. Mac Phail and 655 Market Place.

ACTION: Conduct a storm water treatment system evaluation.

ACTION: Identify solution to sewer line exposure along Plumtree interceptor line - Plumtree Run Stream Bank Restoration.

ACTION: Lining sewer mains and manholes town-wide.

ACTION: English Country Manor Stream Bank Restoration

ACTION: Rockfield Park & John Carroll High School Collaborative Stream Bank Restoration Project

CITY OF ABERDEEN

GOAL 1: REDUCE FLOOD RISKS

Objective 1a: Restrict development in the mapped floodplain

ACTION: Aberdeen adopted the DFIRMs and updated our Floodplain Management Ordinance No. 16-O-03 on March 28, 2016. The DFIRMs have an effective date of April 19, 2016.

Objective 1b: Street Flooding

ACTION: Aberdeen actively works with State Highways for repairs to State-owned roadways that experience frequent flooding. The city completed jetting of pipes in the Route 40 and West Bel Air Road area.

GOAL 2: PROTECT INFRASTRUCTURE – WATER AND WASTEWATER SYSTEMS

Objective 2a: Protect water systems from flood damages

ACTION: Develop/revise vulnerability assessments and emergency response plan for all water and wastewater infrastructure (COMPLETED). This is reviewed on an annual basis.

ACTION: Emergency Response Plan (Risk Management Plan) for the Aberdeen Advanced Wastewater Treatment Plant updated as of 12/1/2021.

ACTION: Maintenance of SCADA Systems on all water and wastewater facilities – updates are continuous and Aberdeen Water and Wastewater are all 100% monitored by SCADA Systems.

ACTION: Review/Revise risk management plans for APG wastewater plant (COMPLETED in 2021). Will be reviewed again in 2022.

ACTION: Raise all critical process equipment and facilities above flood/storm surge elevations at APG. New chemical building is elevated and has secondary containment system. Methanol storage is raised and secondary containment as well. A lot of the older buildings are at ground level.

ACTION: Adopt Wellhead Protection Plan and Ordinance (COMPLETED). Wellhead Protection Ordinance No. 18-O-22 adopted in August 2018. No amendments have been made to the ordinance since this time. All new development is consistent with the mapped wellhead protection areas and the Wellhead Protection Ordinance.

ACTION: NOI sent for HMGP for emergency backup power supply for the city's AWWTP 2021.

ACTION: Completion of GHD Water System Risk and Resilience Assessment where our highest-ranking risks are outlined as follows:

Threat-asset pair	Relative risk
Wells – Drought	1 – Extreme
City of Aberdeen WTP – Contamination of finished water – accidental or intentional	1 – Extreme
City of Aberdeen WTP – Cyber-attack – process control system	1 – Extreme
Harford County interconnection & Edmund Street BPS – Drought	1 – Extreme
Zone 1 tank (any 1) – Contamination of finished water – accidental or intentional	2 – High
Zone 2 tank (any 1) – Contamination of finished water – accidental or intentional	2 – High
City of Aberdeen WTP – Sabotage or assault on utility – physical	2 – High
City of Aberdeen WTP – Severe storms	2 – High
Plater Street BPS – Severe storms	2 – High

ACTION: The city has also identified several other projects for future consideration.

- WTP Security
- I-95 Elevated Water Storage Tank
- Northeast EWT Altitude Valve Engineering and Construction
- Water Main Connection to Zone 3
- Production Wellfield Maintenance
- Replace Swan Meadows Water Lines
- Swan Creek Force Main
- Ray Ave Booster Station
- Raw Water Filtration
- Generator Feed Gasden Rd
- Generator Replacement Edmund St Booster
- Upgrade Giles Ln. Sewage Pump Station
- Upgrade Windemere Sewage Pump Station
- Upgrade Chestnut St Pump Station
- WWTP Security System
- Route 40 Sewer Lining
- Digester Methane Flare
- Chlorine to Gas to Sodium Hypochlorite Disinfection
- MPS Check Valves
- Spring Valley Generator
- Digester Cleaning
- Digester Sludge Heat Exchanger Replacement
- Upgrade Belt Press to Rotary Fan Press
- APG Rehab Building 250 Water Plant
- Plumb Point Production Well Expansion

GOAL 3: EDUCATE AND INFORM THE PUBLIC ABOUT ALL HAZARDS**Objective 3a: Increase public awareness of flood hazards**

ACTION: Conduct annual mailings to floodplain residents regarding the flood hazard. The City of Aberdeen website contains updated information regarding the new FEMA mapping and the adopted Floodplain Management Ordinance. As part of the public hearing/notice process in 2016, the City of Aberdeen notified all property owners that have property in the Special Flood Hazard Area.

ACTION: Continue Drought Task Force participation.

GOAL 4: REDUCE LOSSES DUE TO DROUGHT

Objective 4a: Establish supplemental water source

ACTION: Review agreement with county for back-up water supplies. The City of Aberdeen maintains contracts with Harford County for back-up water sources.

ACTION: Creation of the Aberdeen-Havre de Grace Water Purchase Agreement for the City of Aberdeen to purchase up to 900,000 gallons of water per day from the City of Havre de Grace.

CITY OF HAVRE DE GRACE**GOAL 1: REDUCE FLOOD LOSSES****Objective 1a: Restrict development in the floodplain**

ACTION: Maintain Floodplain Management Program and CRS.

ACTION: Update the Floodplain Management Ordinance, as needed.

ACTION: Update the Water Resources component of the Comprehensive Plan.

Objective 1b: Reduce vulnerability to flood damages

ACTION: Obtain funding for mitigation projects.

ACTION: Continue electronic Citizen communications regarding extreme weather events that may cause flooding or other property damage.

ACTION: Expand the City's Living Shoreline projects.

Objective 1c: Reduce Lilly Run flooding

ACTION: Construct Phase I of the Lilly Run flood mitigation project.

ACTION: Develop other possible area projects to lessen flooding along Lilly Run.

GOAL 2: PROTECT INFRASTRUCTURE – WATER AND WASTEWATER SYSTEMS

ACTION: Install SCADA Systems in Water Treatment Plant and all wastewater pump stations.

Objective 2a: Establish supplemental water source during drought.

ACTION: Upgrade Water Treatment Plant to improve efficiency and capacity.

ACTION: Design new water intake system.

ACTION: Solve problem of high salinity levels in drinking water during drought.

ACTION: Continue to put information on water conservation in the City Newsletter, on the City Website, and on Social Media.

ACTION: Find alternative uses for greywater.

Objective 2b: Secure water systems from terrorism and vandalism

ACTION: Implement enhanced security at water treatment, wastewater treatment plants & DPW shop.

Objective 2c: Reduce inflow and infiltration in wastewater treatment plant

ACTION: Smoke test sewer system to check for illegal connections from sump pumps and downspouts.

ACTION: Mill and recrown roads and upgrade SWM piping.

ACTION: develop Drainage System Maintenance procedures for debris removal and problem site maintenance.

GOAL 3: EDUCATE AND INFORM THE PUBLIC ABOUT ALL HAZARDS**Objective 3a: Increase public awareness of flood hazards.**

ACTION: Continue to prepare flooding handouts and mailings specific to properties in and out of flood prone areas.

ACTION: Plan annual public meetings to promote flood awareness, flood insurance, and property protection solutions.

GOAL 4: PROTECT INFRASTRUCTURE**Objective 4a: Protect structures from terrorist activities.**

ACTION: Maintain safety and security measures at City Hall, Police Department, water treatment plant, and wastewater treatment plant.

ACTION: Ensure functionality of panic button system in City Hall.

ACTION: Continue to provide funding and equipment, and implement training for “active shooter” preparedness.

D. Future Mitigation Strategy

Maintaining current mitigation programs and “staying the course” will best serve the county’s goal of protecting the public. The county will also look to increase resiliency and protection of critical infrastructure through the development of the county’s Green Infrastructure Plan and implementation of the county’s comprehensive master plan, HarfordNEXT. As part of the HarfordNEXT Plan, several goals and objectives were included as part of the “Promoting Healthy Communities” section that outlines Harford County’s strategy to protect life and property. The HarfordNEXT Plan makes a clear reference to many tenets of hazard mitigation, including the importance of assessing hazards and vulnerability, updating emergency plans, effective floodplain management, protecting critical infrastructure, public outreach and education, creating resilient communities, and pursuing available hazard mitigation grant funding when available.

The Department of Planning and Zoning will continue to work with DES staff to further analyze structures and properties that could potentially have the most loss in terms of flood. In using the Flood Risk Report data, the county can focus on mitigation opportunities and actions on properties that could benefit from mitigation actions. For example, by focusing on the top 10% of projected building loss, there is a potential of \$11,852,561 building loss, along with \$21,119,140 of content loss to these 92 properties. By targeting these properties, the county can be proactive with mitigation opportunities to the properties that have the most potential loss.

Mitigation projects that have the greatest potential to lessen the threat to life, health, and property have been highlighted as a part of the prioritization process. This process will occur continuously and not just as part of the post-disaster assessment and reconstruction. The highest priority will be given to projects that are legislatively mandated and those that feature a high cost-benefit analysis. The final criteria will involve a thorough cost/benefit analyses developed based on FEMA standards for implementing mitigation objectives. In the Goals, Objectives, and Actions table presented in Appendix F, the Hazard Mitigation Planning Committee has ranked all the action items mentioned previously in this plan in terms of priority (low, moderate, or high).

For projects related to flooding, projects will be ranked by the amount of damage during the flood event and the impact to the citizens or community as reflected in the FEMA cost/benefit ratio. The Flood Risk Report will serve as a guide to help prioritize the best flooding mitigations projects. Relocation or acquisition of flood prone or flood damaged buildings are accomplished as funding becomes available and usually in response to flood events.

VII. MANAGEMENT SCHEME

The Harford County Executive has promulgated this plan and is prepared to execute its legislative responsibilities, if required. It is not necessary and is not consistent with Harford County's governing policies to have this plan formally adopted by the County Council, especially as this is a working or "living" document that is subject to frequent updates and/or revisions; however, upon FEMA approval, this plan will be formally presented before the County Council for Resolution.

The goals and objectives contained in this plan are intended to either prevent or reduce the occurrence of an emergency or risk to human life and property and are needed to strengthen Harford County's long-standing commitment to emergency management, protection of infrastructure, injury prevention and rescue.

As previously discussed, during the development of this plan, meetings with individual citizens, public interest groups, and the professional staff representing numerous governmental agencies provided the information for the completion of this plan and the development of an overall work program. Not all the initiatives described in this plan will be accomplished at the same rate of speed. Some actions will be achieved relatively quickly, while many others will be ongoing for a longer period. When the initiatives set forth in this plan are accomplished, they will help meet the challenge of becoming a "disaster resistant community".

The Harford County Department of Emergency Services (DES) will be the "Lead Agency" for managing the Hazard Mitigation Plan, assisted in this endeavor by the Department of Planning and Zoning. The Harford County Hazard Mitigation Planning Committee is responsible for all updates and revisions to the Hazard Mitigation Plan. The committee will ensure that current mitigation strategies/initiatives as well as programmatic goals are addressed. The Harford County Emergency Manager will initiate updates or revisions as needed, ensuring implementation of the plan by the designated responsible agencies named herein, and ensure that the goals and objectives of the plan are met.

The Local Emergency Planning Committee (LEPC), the Environmental Advisory Board (EAB), and the Planning Advisory Board (PAB) will continue to be the vehicles for public participation. Copies of this plan are available for review to the public as required under current Maryland law. Upon County Resolution and final FEMA Approval, this plan will be posted to the Harford County Government Website. Both the Department of Emergency Services and the Department of Planning and Zoning will have links to the document on their respective main web pages. The Department of Planning and Zoning will make notice of public or committee meetings that involve the Hazard Mitigation Plan through approved media resources. Interested members of the public may attend such meetings and be screened like all members attending the meeting will be; i.e., picture identification and a listing of individual's name, address, affiliation, telephone number and email, if appropriate.

The plan will be formally reviewed and updated each year. This review will be conducted over the three-month period similar to the development process, using the

Harford County Hazard Mitigation Planning Committee, the LEPC, the EAB, the PAB, community outreach initiatives, and elected officials. Changes to the plan will be provided to copyholders and MDEM by the end of the respective quarter. Continuous monitoring of progress towards identified goals, objectives, and action items will be a part of the annual plan review process. The plan will receive an interim update as soon as a new need or goal is identified and will be coordinated with the appropriate organization(s) involved.

The Disaster Mitigation Act of 2000 requires that the county implement the plan through existing programs. This can be accomplished by achieving the goals set forth in this plan, as well as, those set forth in the previously discussed “Promoting Healthy Communities” section of the HarfordNEXT Plan.

Every five years, DES and the Department of Planning and Zoning will conduct a formal, comprehensive review of the entire plan with the assistance of the public, all county departments, the City of Aberdeen, City of Havre de Grace, and the Town of Bel Air as well as other interested state or federal agencies. Public input will continue through the executive committees described in Appendix B (LEPC, EAB, and PAB). These committees represent a broad spectrum of expertise and citizen involvement.

APPENDIX A

DEFINITIONS

Disaster Preparedness Improvement Grant Program - Authorized under Section 201 of the Stafford Act. Annual matching awards not to exceed \$50,000 are provided to State organizations to improve or update their disaster assistance plans and capabilities.

Emergency - Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosion, or other catastrophe in any part of the United States which requires federal emergency assistance to supplement state and local efforts to save lives and protect property, public health and safety or to avert or lessen the threat of a disaster.

Emergency Planning Zone (EPZ) - An area surrounding a known hazard site. Its distance is determined by the nature of the hazard and anticipated damage to the public. It is located on geographic landmarks. For example, the area within 10-miles of a nuclear facility is most susceptible to direct radiation exposure.

Executive Order 11998 - Executive Order 11998 requires federal agencies to avoid direct or indirect support of floodplain development and to minimize harm to floodplains. Federal decision-makers are obligated to comply with these orders, accomplished through an eight-step decision-making process.

Enhanced Fujita (EF) Scale - A classification system that describes the wind speed and damages of tornadoes.

- EF-0: 65-85 mph, chimney damage, tree branches broken
- EF-1: 86-110 mph, mobile homes pushed off foundation or overturned
- EF-2: 111-135 mph, considerable damage, mobile homes demolished, trees uprooted
- EF-3: 136-165 mph, roofs and walls torn down, trains overturned, cars thrown
- EF-4: 166-200 mph, well-constructed walls leveled
- EF-5: over 200 mph, homes lifted off foundation and carried considerable distances, autos thrown as far as 100 meters

FEMA-State Agreement - An agreement between the Federal Emergency Management Agency and the State of Maryland. It states the understandings, commitments, and conditions for assistance under which FEMA disaster assistance shall be provided. This agreement imposes binding obligations on FEMA, states and their local governments in the form of conditions for assistance that are legally enforceable.

Floodplain - The land area adjacent to a body of water that is susceptible to inundation resulting from a 100-year event. The 100-year flood event means a flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is depicted on Flood Insurance Rate Maps.

Flood Insurance Rate Maps - Flood Insurance Rate Maps (FIRMs) are published by FEMA and are used to rate the cost of flood insurance. They show streams, roads, Special Flood Hazard Areas, Flood Insurance Rate Zones (Zones A, AE, AO, V, VE, X500 and X), base flood elevations and floodways. The maps are accompanied by a Flood Insurance Study, which documents the engineering behind the floodplain delineations. Digital versions of the FIRMs are called D-FIRMs.

Hazard Mitigation - This includes any action taken to reduce or permanently eliminate the long-term risk to human life and property from natural hazards.

Hazard Mitigation Survey Team - The Hazard Mitigation Team may consist of federal (FEMA), state (MDEM), or local personnel. It is activated as a result of a disaster to identify immediate mitigation opportunities and issues to be addressed in the Section 409 Hazard Mitigation Plan. The Hazard Mitigation Survey Team may include representatives of other federal agencies, as appropriate.

Ingestion Zone - An area within a 50-mile radius of a nuclear facility where radioactive materials may contaminate water supplies, food crops, and livestock.

Major Disaster - Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosion, or other catastrophe in any part of the United States which in the determination of the President, causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Disaster Relief and Emergency Assistance Act of 1988, above and beyond emergency services by the Federal government, to supplement the efforts and available resources of states, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering, caused thereby.

National Flood Insurance Program (NFIP) - Harford County participates in the NFIP and the Community Rating System (CRS) programs so that county residents and property owners may purchase flood insurance and receive disaster assistance. The effective maps are dated April 19, 2016; the municipalities are included.

Repetitive loss property - A property that has suffered flood damages and received two or more payments from the National Flood Insurance Program during a ten-year period that exceed \$1000.00 each.

Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 - Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23, 1988; amended the Disaster Relief Act of 1974, PL 93-288. The Act provides for federal assistance to State and Local governments when a major disaster or emergency overwhelms their ability to respond effectively to save lives; protect public health, safety and property; and, restore their communities.

Special Flood Hazard Area - The Special Flood Hazard Areas (SFHA) are depicted on Flood Insurance Rate Maps and are subject to flooding from the 1% annual event. Zones A, AE, AO, V and VE are designated “Special Flood Hazard Area” in Harford County. Federal Flood Insurance requirements apply for all SFHAs.

SARA Title III - Superfund Amendments Reauthorization Act (SARA) was passed by the U.S. Congress in 1986. There are four major sections of the act that affect industry and the community: emergency planning for chemical incidents, emergency release notification, chemical inventory reporting and toxic release reporting.

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APPENDIX B
HAZARD MITIGATION PLANNING MEETINGS

1. Environmental Advisory Board (EAB)

The EAB is composed of representatives of organizations concerned with environmental issues. They work on Chesapeake Bay program initiatives, review major county plans by considering their environmental ramifications and consider other matters that may affect the environment as directed by the County Executive. Their members are chosen from the following organizations.

- Existing conservation and environmental groups
- Agricultural community
- Homebuilder's associations
- Consulting Engineers
- Technical professions
- Major County Institutions
- Citizens at large

2. Local Emergency Planning Committee (LEPC)

The LEPC is composed of representatives from local government, business and industry that use or are involved with hazardous materials. The LEPC is tasked with preparing a hazardous material plan and reviewing hazardous material incidents. It reports to the State Emergency Response Commission (SERC) and is mandated by the Emergency Planning and Community Right to Know Act of 1986. Its members represent the following community interests:

- Department of Emergency Services
- SARA, Title III, Public Information Coordinator
- Fire Departments & Ambulance Corps
- Harford County Sheriff's Office
- Local government (City of Aberdeen, City of Havre de Grace, Town of Bel Air, Harford County Council)
- Media and Public Information Officers
- Health Department
- Harford County Public Schools

- Hospitals
- Aberdeen Proving Ground, U.S. Army
- Hazardous Materials Response Teams
- Facilities that use and/or store hazardous materials
- General Public
- Transportation

3. Planning Advisory Board

They are appointed by the County Executive; no more than three members can be from the same political party. They make recommendations to the Director of Planning & Zoning and the County Council regarding master plans, zoning maps, and other planning and zoning related matters.

4. Hazard Mitigation Planning Committee

The Hazard Mitigation Planning Committee maintains a collaborative effort to update and revise this Hazard Mitigation Plan and includes staff members from the Department of Emergency Services, the Department of Planning and Zoning, the Department of Public Works, the Department of Inspections, Licenses, and Permits, the Department of Parks and Recreation, the Department of Administration – Facilities and Operations, Harford County Public Schools, the Department of Economic Development, the City of Havre de Grace, the Town of Bel Air, and the City of Aberdeen. Additional input was provided through the working group members from various departments and agencies within the county, the three municipalities, the State of Maryland, and Aberdeen Proving Ground.

BARRY GLASSMAN
COUNTY EXECUTIVE



HARFORDCOUNTYMD.GOV
410.638.3350

ENVIRONMENTAL ADVISORY BOARD

The Board shall consist of eleven members, all of whom shall be residents of Harford County. Members of the Board shall be selected generally to be representative of organizations concerned with environmental issues. Members shall be drawn from the following: existing conservation and environmental groups, the agricultural community, the homebuilders' associations, consulting engineers, technical professions, major county institutions and citizens at large. Members of the Board shall be appointed by the County Executive and confirmed by the County Council.

Members of the Board shall serve terms coterminous with the County Council and the County Executive, unless, by resolution, the County Council and the County Executive end the Board's tenure on or before the first of July in any given year.

The Director of Planning, the Director of Parks and Recreation, the Director of Public Works and the local health officer or their designees shall be ex officio, nonvoting members of the Board.

One (1) member of the Environmental Advisory Board shall serve as an ex officio to the Planning Advisory Board.

The Officers of the Board shall consist of a Chairperson, appointed by the County Executive, and a Vice Chairperson, elected annually by the members of the Board from among its voting members.

Commissioner	District	Term Expires
		December 5, 2022

CONSERVATION & ENVIRONMENTAL GROUPS

Sally B. LaBarre
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Environmental Advisory Board

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District E

EX OFFICIO MEMBERS
Planning & Zoning – Matt Kropf
Parks & Recreation – Paul Magness
Public Works – Joseph Siemek
Health Department – John Resline

Revised: April 27, 2022

About the Board

The purpose of this board is to advise the County Executive and County Council on environmental issues of concern to citizens of Harford County. It was created by Harford County Code, Article IV, Section 9-12. The board will encourage the preservation and protection of the natural environment of the county. They will work with federal, state, or local agencies, boards and commissions or private organizations in furthering the goal of preserving and protecting the environment of the county.

Members of the board are appointed by the County Executive and confirmed by the County Council. Terms of appointments are coterminous with the County Executive. From the Harford County Government Website (<http://www.harfordcountymd.gov/958/Environmental-Advisory-Board>):

Regular Meetings

- 6:30 p.m.
- The 3rd Tuesday of every month
- 220 S Main Street, First Floor Conference Room, Bel Air, MD 21014

BARRY GLASSMAN
HARFORD COUNTY EXECUTIVE



JENNY B. JARKOWSKI
DIRECTOR OF PLANNING & ZONING

ENVIRONMENTAL ADVISORY BOARD

220 S. Main Street, Bel Air – 1st Floor Conference Room & Virtual via Teams

April 19th, 2022

6:30–8:00 PM

AGENDA

- Welcome
- Review / Approval of March 15th 2022, Meeting Summary
- Harford County Critical Area Code and Program Update – Mr. Joel Gallihue, Harford County Department of Planning and Zoning
- Harford County 2022 Hazard Mitigation Plan Update – Mr. Matt Kropp, Harford County Department of Planning and Zoning & Ms. Linda Ploener, Department of Emergency Services
- County Updates
- New Business
- Adjourn

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HARFORD COUNTY ENVIRONMENTAL ADVISORY BOARD

MEETING SUMMARY – April 19th, 2022

Members Present: Sally LaBarre, Jackie Koehn, Lynn Davis, Michael Charlton, Pamela Pape-Lindstrom, Lynn Faulkner, Paul Gartelmann, Dennis Kirkwood

Ex-officio Members Present: Paul Magness, Matt Kropp, John Resline, Jeff Schoenberger, Joel Gallihue

Welcome

Paul G welcomed the EAB, which most of the members were attending through Teams.

Review / Approval of March 15th, 2022 Meeting Summary

A motion to approve the March 15th meeting summary was made. The motion was seconded; the Board unanimously approved the meeting summary.

Harford County Critical Area Code and Program Update – Mr. Joel Gallihue, Chief Long Range Planning, Harford County Department of Planning and Zoning

Mr. Gallihue explained that the State of Maryland has recently updated the State's tidal wetlands and shorelines throughout the State. The previous tidal wetland maps are from 1973. Changes to shorelines and tidal wetland boundaries have made small changes to the Chesapeake Bay Critical Area, which is measured 1000' from tidal wetlands and shoreline areas.

Mr. Gallihue gave an overview of the 3 land use designations in the Critical Area (Intensely Developed Areas, Limited Development Areas, and Resource Conservation Areas). He then showed slides of the areas that have had slight changes. He explained that State has notified all the affected property owners in the County, and that there was a public meeting.

Mr. Gallihue explained how the Critical Area Code has also been changed to follow the State's Model Ordinance. Definitions were updated, violation procedures were streamlined, fee-in-lieu, and mitigation rates were updated or simplified.

Harford County 2022 Hazard Mitigation Plan Update -Mr. Matt Kropp, Dept. of Planning and Zoning & Mrs. Linda Ploener, Dept. of Emergency Services

Mrs. Ploener explained how Harford County is due to update the current Hazard Mitigation Plan by July 2022. This is a mulit-jurisdictional plan that includes the three municipalities. To remain in good standing, and to be eligible for disaster assistance and any federal disaster related grants, the local jurisdiction must have an approved Hazard Mitigation Plan.

Mrs. Ploener summarized the timeline of the update of the Plan, which began back in January of 2021. There were many rounds of meetings with all appropriate Departments and Agencies, including MDEM. COVID-19 limited direct public engagement; however, attempts were still made by having a booth at Bel Air's Comprehensive Plan Update meeting and discussing the Plan update with the public.

Mr. Kropp explained how the County reviewed the State's recently updated 2021 Hazard Mitigation Plan and updated the County's hazards and reviewed the County's ability to respond. Over the last 5 years, COVID-19 (Public Health Emergency) has been the major new challenge. Extreme temperatures and Soil Movement have been added for Harford County. New planning and regulatory programs have been included (Nuisance Flood Plan, Green Infrastructure Plan, and Dual Bridge Closure Plan). EAB members discussed the growing importance of extreme weather events.

Mr. Kropp wrapped up the presentation by discussing the County's Floodplain Management Program, and the mitigation efforts that continue. The County has been very successful in targeting repetitive loss properties for acquisition/demolition. In May of 2019, a repetitive loss property on Conowingo Road was successfully mitigated with a HMGP grant. The County continues its participation in the Community Rating System (CRS) which rewards citizens with discounted flood insurance due to enhanced outreach and regulations at the County level.

Departmental Updates

Jeff Schoenberger reported that the Arbor Day Tree Planting that was held on April 15th was a success. He stated that there will be a Household Hazardous Waste and Document Shredding on May 7th at Scarboro.

Mr. Magness reported that the new 1.2 segment of the Ma and Pa trail, that connects Williams Street and the new parking lot at North Avenue, will officially open Saturday April 23rd. The final 1.6-mile segment between North Avenue and Blake's Venture in Forest Hill is expected to be completed sometime in 2024.

Mr. John Resline reported that the Health Department is scheduling Spring Rabies Vaccination Clinics on Sunday April 24 at Susquehanna Hose Company, and Sunday May 1 at Aberdeen VFD, and Jarrettsville VFC. He also stated that wet-season perc tests have finally started.

Mr. Gallihue reported that the Baltimore Metropolitan Council has begun a study to look at improving bike/pedestrian accessibility between Aberdeen and Havre de Grace. There is also a study to identify a trail connection between the Harford Community College and the Ma and Pa.

New Business

Matt stated that the EAB has previously provided review / comment on the Critical Area Code and Program during past revisions and updates. The Department would like to have a similar review and letter for this update.

Adjourn: Meeting was adjourned at 8:00 pm

From the Harford County Government Website
(<http://www.harfordcountymd.gov/801/Planning-Advisory-Board>):

Planning Advisory Board

Regular Meetings

- 6 p.m.
- The 2nd Wednesday of every month
- 220 S Main Street, First Floor Conference Room, Bel Air, MD 21014

Members -

- Aaron Penman, Term expires: December 3, 2022
- Geoffrey R. Close, Term expires: December 3, 2022
- James D. Thornton, Term expires: December 3, 2022
- Diane Sengstacke, Term expires: December 3, 2022

About the Board

The Planning Advisory Board consists of 5 qualified voters of the county. No more than 3 members can be from the same political party. Members are appointed by the County Executive and confirmed by the County Council. Members will serve coterminous with the County Executive. The County Executive will designate a member of the board as chair.

A summary of their duties include:

1. The board will make recommendations to the Director of Planning and the County Council relating to master plans, zoning maps, rules and regulations relating to planning and zoning.
2. At least every 8 years, the board will prepare general guidelines for use by the Department of Planning and Zoning in the preparation or revision of master plans.

The Planning Advisory Board is currently not accepting applications. Please call Jenny B. Jarkowski at 410-638-3103 for more information.

BARRY GLASSMAN
HARFORD COUNTY EXECUTIVE



JENNY B. JARKOWSKI
DIRECTOR OF PLANNING & ZONING

Planning Advisory Board

AGENDA

220 S. Main Street Bel Air MD 21014

First Floor Conference Room

June 8, 2022

6 PM

- I. Welcome/Introductions
- II. Approval of April 2022 Minutes
- III. 2022 Hazard Mitigation Plan Update - Matt Kropf
- IV. Other Business
- V. Public Comment

MARYLAND'S NEW CENTER OF OPPORTUNITY

410.638.3103 | 410.879.2000 | TTY Maryland Relay 711 | www.harfordcountymd.gov

220 South Main Street, Bel Air, Maryland 21014

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BARRY GLASSMAN
HARFORD COUNTY EXECUTIVE



JENNY B. JARKOWSKI
DIRECTOR OF PLANNING & ZONING

**Planning Advisory Board
Meeting Summary
June 8, 2022**

Attendance:

James Thornton
Diane Sengstacke
Aaron Penman

P&Z Staff:

Jenny Jarkowski
Jennifer Freeman

Also in Attendance:

Matt Kropf – Planning and Zoning
Linda J. Ploener – Emergency Services

1) The meeting was called to order at 6:00 p.m.

2) **Minutes/Summary**

The PAB members approved the summary of the April 2022 PAB meeting.

3) **2022 Hazard Mitigation Plan Update**

Linda Ploener and Matt Kropf presented. This is a mandatory plan that needs to be submitted. They explained hazard mitigation is any action taken to reduce or eliminate long-term risk to people and property from disasters, thereby lessening the impact of disasters. There needs to be a FEMA approved plan to receive assistance including funding. Local HM plans need to be updated every 5 years to comply with the Disaster Mitigation Act of 2000. They explained that this a multi-jurisdictional plan that includes the three municipalities. They went over the timeline that is being followed for the updated plan. They also went over what information is required for the plan: Hazards, Critical Facilities, Floodplain Management, Capability Assessment, and Plan Integration. They talked about the top 7 hazards: Drought, Flood, Severe Thunderstorms, Tornado, Public Health Emergencies, High Winds, and Severe Winter Storm. They discussed the coordination of the various departments to develop the updated plan along with the outreach efforts. They talked about the National Flood Insurance Program and

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Page 2
Planning Advisory Board
Meeting Summary –June 8, 2022

Community Rating System. The HMP describes all available data and how we utilize it for targeting mitigation projects.

Ms. Sengstacke asked if public input would have any impact. Ms. Ploener said yes. Mr. Thornton asked when does FEMA accept the plan. Ms. Ploener said they will give their approval in July. Mr. Thornton asked is APG is involved at all. Ms. Ploener said they are invited into our process. Mr. Thornton asked if they try to come up with solutions during Capital project budget to help the situation. Or is it too infrequent? Ms. Ploener said they run a cost benefit analysis to meet FEMA's funding standards. Mr. Kropp said they have purchased properties with FEMA funds. They are now open space. Mr. Thornton asked how those properties are identified. Mr. Kropp said that properties have to have 2 or more significant flood losses in a 10-year period, they are identified as repetitive loss properties by FEMA. Mr. Thornton asked if there was a list that was public. Mr. Kropp said that there are "repetitive loss areas" that are generalized enough that they can be made public. Mr. Penman said it sounds like it needs to be constantly updated so it can be ready every five years. Mr. Kropp said yes. Mr. Penman asked if the County also has to fund disasters or is it all FEMA. Ms. Ploener said it usually is a 75/25 percent match. Mr. Thornton said the county that is best prepared gets more money. Ms. Ploener said yes. Ms. Ploener and Mr. Kropp stated that for the first time, the updated Hazard Mitigation Plan will be posted online, available on both Departments webpages.

4) Other Business

There will be no PAB meetings in July or August.

This meeting was adjourned at 6:48 PM.

**Planning Advisory Board Meeting
Sign-In Sheet
Wednesday, June 8, 2022**

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From the Harford County Government Website
(<http://www.harfordcountymd.gov/247/Local-Emergency-Planning-Committee-LEPC>):

Local Emergency Planning Committee (LEPC)

Regular Meetings

- 3 p.m.
- 3rd Wednesday of Each Month
- Harford County Department of Emergency Services
2220 Ady Road
Forest Hill, MD 21050

Facility coordinators are encouraged to attend all Harford County Local Emergency Planning Committee meetings. Please call 410-638-4900 for additional information on LEPC meetings.

Commitment

The Harford County LEPC is strongly committed to the safety of Harford County's citizens by assuring proper resources and planning for environmental emergencies. The LEPC is an active group of emergency responders, planners, business representatives, health care providers, elected officials, citizens, and media that work together for the preservation of our environment.

What is the LEPC?

On October 16, 1986, the Superfund Amendments and Reauthorization Act (SARA) was signed into law. Title III of this act is also known as the [Emergency Planning and Community Right to Know Act \(EPCRA\)](#). This act was to empower citizens and emergency responders with the Right to Know what chemicals existed in the communities where they lived and worked. It mandated planning for chemical emergencies and established a chain of command to assure that the requirements were met.

State Level

The governor of each state is required to appoint a State Emergency Response Commission (SERC). The SERC then divided up the state into Local Emergency Planning Districts (LEPD) and for each LEPD there was to be a LEPC appointed. The LEPC had to have representatives from specific areas that would have knowledge and interests in environmental emergency planning.

To all Harford County Local Emergency Planning Committee members and guests - The next meeting of the Harford County LEPC is this Wednesday, 18 May 2022 at 3:00 PM. It will be held virtually on Microsoft Teams.

[Click Here to join the meeting](#) or call in (audio only) [+1 240-534-3787](tel:+12405343787) with the Phone Conference ID: 541 352 022#. Earlier this morning while working on the agenda, I found two different hyperlinks for the meeting within the Teams calendar. As best the Help Desk and I could tell, both opened the same meeting. The telephone number was just tested and it does connect to the same meeting as the above hyperlink opens. Hopefully no one has meeting connection problems this month. Some of you may have gotten an email earlier today about this same meeting caused by my updating the Teams LEPC file. My apology for cluttering your inbox, if that was true.

The HazMat report of incidents for March and April is attached. As we have seen previously, the number of incidents is small compared to historic levels, with no evidence of failures to report.

There have been a number of changes in the email list, so please check the Cc line and let me know of any corrections. A number of known bad addresses were deleted, but no valid addresses were deleted. Thus some individuals may be getting this email when it no longer should be going to them. If you know the email address of someone who is not on the list but should be, or who is on the list and should not be, please let me know.

“See you” Wednesday afternoon. – Dick Schwanke, Chairperson.

Meeting Agenda 18 May 2022, beginning at 3:00 PM

1. Call to Order Chairperson Dick Schwanke
2. Introductions Around the “table” for all
3. Hearings: None scheduled for May 2022
4. Approval of Minutes - Chairperson Dick Schwanke
5. Guest Speaker(s) – none scheduled for May 2022
6. REPORTS and UPDATES
 - a. Past hearing(s) follow-up Lead Investigator (if needed)
 - b. Report of Incidents - Special Ops. Chief, Mike Brunicke
 - c. Emergency Management - Emergency Manager, Linda Ploener
 - d. SARA Title III Report – SARA Title III Coordinator, Rob Glassman
 - e. Maryland Dept Environment - MDE CRTK Project Manager, Pat Williams
 - f. EPA Updates – EPA Region III Coordinator, Mike Welsh
 - g. Hazmat Team Report Special Ops. Chief – Mike Brunicke
 - h. Harford Legislative Update - County Council Member - Joe Woods
 - i. Grants Update Report – SARA Title III Coordinator, Rob Glassman
 - j. Health Department - Environmental Health Officer, Joe Delizia
 - k. Hospital Update - UCMC Emergency Manager,
 - l. Law Enforcement Updates - HC Sheriff’s Department, Captain Michael Schleper
 - m. Energy Update - BGE
 - n. Cyber & Infrastructure Security - DHS Protective Security Advisor, Allen Frenette
 - o. Other reports and updates (as needed) – Chairperson, Dick Schwanke
7. RECURRING BUSINESS
 - a. Tier II Reporting procedures for 2021 – difficulties with current reporting cycle?
 - b. COVID / Vaccine Projections for Harford County and Maryland - HC Health Dept.
 - c. Meeting schedule and format for 2022: July, September, November

8. NEW BUSINESS

- a. Hazard Mitigation Plan – Linda Ploener, Matt Kropp
- b. To be announced, if more suggested
- c. Other new business from members

9. Items from members for the good of the organization Around the “table” for all

Next Meeting – 20 July 2022 (see Recurring Business b.)

Expected Attendees for May 18, 2022 Meeting:

Department of Emergency Services: Deputy Director/Emergency Manager Richard A. Ayers, EM Branch Manager Linda J. Ploener, Special Operations Branch Manager Michael Brunicke, Brunicke, Michael Special Operations Planning Specialist Rob Glassman, HAZMAT Team Crew Chief Clarence Ross HAZMAT Crew Chief John Simpson

Harford County Council: Joseph Woods

Harford County Public Schools: Zachary Lovelace

Harford County Department of Public Works: Michele Dobson

Harford County Sheriff's Office Michael Schleper: Donald Gividen, Jack Simpson

Maryland Department of the Environment: Pat Williams

Harford County Health Department: Joe Deliza

HQ DHS: Lisa Dunaway

CISA: Allen Frenette

EPA: Mike Welsh

Baltimore City OEM: Michelle Smith, Crystal Bright

BGE: Ervin McDaniel, Frank Tiburzi, Daniel Aker, Kevin Ritz

GFS: Jeremy Rebman

Pepsi: Tyson Gilbertson, Tyson

Ashley Treatment: E. Trautman

Colonial Pipeline: Derek Fabrick

Clorox: Chuck Marzen

Harford Community College: Dick Schwanke (LEPC Chair)

LEPC Meeting Sign-In Sheet and Meeting Minutes

HARFORD COUNTY LEPC MEETING NOTES

Date -May 18th 2022

Committee Chair – Dick Schwanke

Meeting called to order – 3:07 pm

Attendance roll call:

Dick Schwanke - Chair

Rob Glassman – SARA Title III Coordinator HC

Mike Brunicke – Special Ops Chief HC

Linda Ploener – Emergency Planner HC

Rick Ayers - Emergency Manager HC

Clarence Ross – Special Ops Deputy Chief HC

Zach Mitchell – BGE

Matt Kropf – Planning and Zoning HC

Michele Dobson – DPW HC

Allen Frenette – Cyber Security

Chuck Marzen – Clorox

Joe Deliza – Health Department HC

Approval of minutes

Dick Schwanke

Guest Speakers

None scheduled for May 18, 2022

Reports and updates:

1. Past Hearing(s) follow-up Lead Investigator

Nothing to report

2. Report of Incidents – Mike Brunicke

List of recent incidents was sent out. Mike spoke about a specific call at 211 Pylesville rd (North Harford HS) involving a chemical odor from a trash can and an unconscious student. This was a full team response. The student was evaluated by EMS but not transported.

Michele Dobson had a question about the chemical in black mulch color after seeing a Hazmat call in HDG listed on the incident sheet. Mike did not know the exact chemical but told her he would get back to her.

3. Emergency Management – Linda Ploener / Rick Ayers

Presented the Hazard Mitigation Plan along with Matt Kropp. Powerpoint presentation shown and briefed. Questions included a discussion regarding flood and flooding (Nuisance Flood Plan), Soil Movement being added to the list of identified hazards, repetitive loss properties, and the Mitigation Plan visibility.

Rick Ayers – Everyone did well during the Peach Bottom drill, and wanted to thank everyone for their help and being prepared. Rick also mentioned that grant money seemed to be really strong post 911, however we have seen a reduction in USAI grant money over the years. We are trying to keep current grant projects going but really cannot start any new ones at this time.

4. SARA Title III report – Rob Glassman

Starting Site visits again. Starting with Tanner Industries on May 25th with Clarence Ross. Working with Clorox for a visit in June or July. The Purpose is to re-establish relationships with area businesses and make sure they are in compliance.

5. MDE

No one in attendance

6. EPA Updates –

No one in attendance

7. Hazmat Team Report – Mike Brunicke

The hazmat team assisted the Health Department with their part of the Peach Bottom drill. The hazmat team also took part in the drill at the reception center at Fallston Highschool. Everything went well

8. Harford Legislative update –

No one in attendance

9. Grants Update Report – Rob Glassman

Nothing to report. Mike suggested taking grants off of the meeting due to the fact that

10. health department - Joe Deliza

Two rabies clinics completed. One at the end of April, and one at the beginning of May. A total of 800 animals were vaccinated. 160 dead Black Vultures have been collected from near the Conowingo Damn area , packed in barrels and taken to Baltimore City for cremation. Eastern shore very concerned and watching due to the amount of chicken farms.

11. Hospital Update –

On one in attendance

12. Law enforcement –

No one in attendance

13. BGE – Zachary Mitchell –

Thankful for being able to attend the meeting. EP team getting prepared for storm and hurricane season.

14. Cyber & infrastructure Security – Allen Frenette

Talked about upcoming class to EOC on IED's . May 24th they are having a MD Shields up class on shoring up cyber security

Recurring Business

Dick Schwanke – Any difficulties with current reporting cycle for Tier II reports ?

Rob Glassman – Not that I was told , or contacted about.

Pat Williams from MDE not in attendance to advise any further

Dick Schwanke – Covid / Vaccine projections for HC Health Department.

Joe Deliza – 143 new covid cases a day, boosters are still available by appointment. Covid will most likely never go away and keep mutating.

New Business

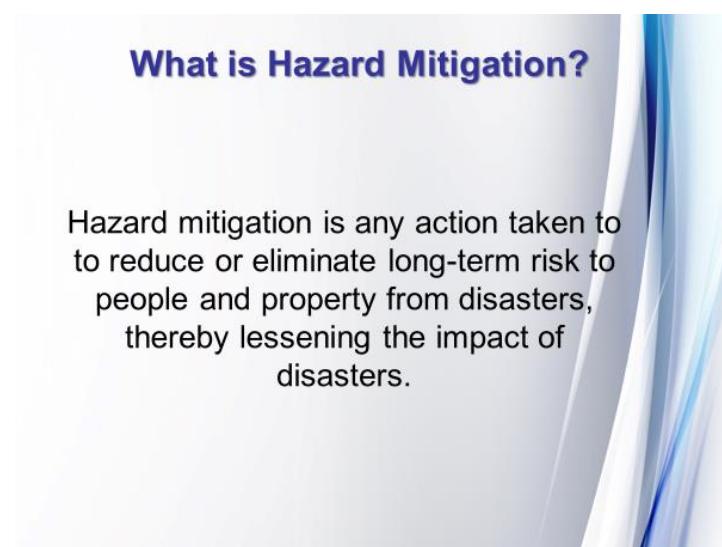
Hazard mitigation plan – covered by Linda and Matt at the beginning of the meeting

Michele Dobson – I need assistance with tracking down possible PCB sources for levels found in the bush river. Rick Ayers asked her to send information to Rob Glassman for help.

Next meeting – July 20th, 2022 in person or in person / teams, either at DES or HCC.

Meeting adjourned – 4:33 pm

The LEPC Presentation Slide Deck (For Reference and Documentation)



What is a Hazard Mitigation Plan?

- A plan that identifies risks and vulnerabilities and develops long-term strategies for protecting people and property from future hazard events. Mitigation plans are key to breaking the cycle of damage, reconstruction, and repeated damage.
- Will increase awareness of threats, hazards, and vulnerabilities.
- Will help build partnerships for risk reduction involving government, organizations, businesses, and the public.
- Will identify long-term, broadly-supported strategies for risk reduction.
- Helps prioritize mitigation projects that could be eligible for federal funding (i.e. buyouts, elevations, storm water improvements, etc.)
- Designed to make Harford County more disaster resilient!

What is a Hazard Mitigation Plan?

A FEMA-approved hazard mitigation plan is a condition for receiving certain types of non-emergency disaster assistance, including funding for mitigation projects.

Typically, Harford County has been awarded funds for flooding and severe winter snow storm events.

*Without an approved up-to-date Hazard Mitigation Plan, the County is not eligible for FEMA disaster assistance or FEMA grants.

The Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 (DMW2K) amended the Robert T. Stafford Act to ensure close coordination of state and local mitigation activities.

Local HM Plans must be updated every five years to comply with the Disaster Mitigation Act of 2000 (DMA2K)

The Harford County Hazard Mitigation Plan

Timeline:

- Review of 2017 plan (January 2021)
- Kick-off meeting (May 2021)
- Information/updates gathered (March 2021- March 2022)
- FEMA initial plan review (February / March 2022)
- Draft HM plan presented to LEPC/EAB/PAB (April-May 2022)
- HM plan finalized (May 2022)
- HM plan submitted to MEMA/FEMA for review and approval (June 2022)
- Plan promulgation (July 2022)

The Hazard Mitigation Planning Team

Initial Steps:

- Describe purpose of the HM plan
- Develop HM plan update schedule
- Establish planning responsibilities
- Review the current HM plan (County Departments, 3 municipalities)
- Review recent/current mitigation projects
- Develop outreach strategy (Covid-impacted)
- Documentation



The Harford County Hazard Mitigation Plan

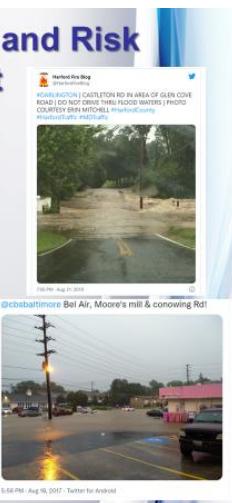
Each jurisdiction's hazard mitigation plan must contain information on each of the following:

TOPIC	STANDARD
Hazards	Flooding, coastal hazards, winter weather, tornado, and wind events
Critical Facilities	Fire stations, hospitals, and medical clinics, police stations, 911 centers, emergency operation centers, and schools (K-12 & colleges)
Floodplain Management	Floodplain identification and mapping, floodplain management and flood insurance. Also denote qualifying CRS mitigation actions
Capability Assessment	Provide responses regarding existing policies, regulations, programs, and practices utilized
Plan Integration	Be compatible with other local comprehensive master plans, zoning plans, and emergency operations plans

Hazard Vulnerability and Risk Assessment

Considerations:

- What has changed in Harford County during the last five years? (COVID-19, State HMP)
- New/evolving hazards? (Public Health Emergencies, Extreme Temperatures, Soil Movement)
- New/evolving capabilities? (Public Health capacities)
- Planning/regulatory changes?
(Nuisance Flooding Plan, Green Infrastructure Plan, and Dual Bridge Closure Plan)



Hazard Vulnerability and Risk Assessment

- Risk = Threat x Vulnerability x Impact (Cost)
- Top seven hazards (MEMA 2021):
 - Drought (High Risk)
 - Flood (High Risk)
 - Coastal (Medium-High)
 - Severe Thunderstorms (High-Risk)
 - Tornado (High-Risk)
 - Public Health Emergencies (Medium-High)
 - High Winds (Medium-High)
 - Severe Winter Storm (Medium-High)

NFIP and CRS

- The National Flood Insurance Program (NFIP)
 - Align flood protection strategies with NFIP
 - Changes in local floodplain management and mapping (none since April 2016)
 - Status of repetitive loss properties
- Community Rating System (CRS)
 - How is this described in the HM plan
 - Which credits have we earned by regulatory / outreach?
 - Identify ways to earn additional credits

Floodplains / RiskMap

- Harford County Comprehensive Plan
- DFIRMS
- Repetitive Loss Properties
- Critical Facilities
- Depth of Flooding data (10-year, 50-year, 100-year)
- HMP describes all available data and how we utilize it for targeting mitigation projects

Floodplains / Hazard Mitigation



810 Conowingo Road, Bel Air
Demolition / Acquisition Project



FEMA Hazard Mitigation Grant was used to acquire this repetitive loss property, remove all impervious surface and restore the property as permanent open space, completed in 2019.

Thank You!

Any Questions?

During and after the presentation, a question was asked regarding the adding of Soil Movement to the list of identified hazards. Mr. Kropp and Linda Ploener discussed what was added into

the revision regarding soil movement and that is an applicable hazard in Harford County. We also provided discussion regarding repetitive loss and repetitive loss properties, both those that have been purchased by the County and are now “Open Spaces” and those properties that have been identified, but, are still privately owned. Another question was asked regarding visibility and whether or not individual addresses have been included. We discussed the fact that the plan is scheduled to be uploaded to the County website (links through both Planning and Zoning as well as Emergency Management) for public visibility, and that no individual addresses have been listed, just street names to protect individual privacy. One other question was asked regarding flooding at which point Matt and Linda discussed the Nuisance Flood Plan and how the County expanded the Plan to include roads and areas that have also been included and how that information was identified. We worked with County and local Fire/EMS, Law Enforcement, County and Local DPW staff, and others to develop the listing of all the streets/areas that have been listed in the Plan.

Harford County Hazard Mitigation Committee Meeting Agenda for Kick-off Meeting

HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE

KICK OFF MEETING

May 5, 2021

Agenda:

- Introductions
- Brief Overview (Linda/Matt)
- State Hazard Mitigation Plan Update (Jaleesa)
 - County HMP impacts?
- General Timeline (Linda)
 - February 2022 Draft
- Community Rating System (Matt & municipalities)
 - Plan changes to increase CRS points
- Public Input (All)
 - Increase our public participation
 - COVID impacts
- Open Discussion
 - Plan Next Meeting

Meeting Minutes

HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE KICK OFF MEETING

May 5, 2021

Attendees:

Linda Ploener, Emergency Services
Matt Kropp, Planning and Zoning
Steve Kline, Town of Bel Air
Robert (Bob) Hartsock, City of Aberdeen
Marisa Willis, City of Havre de Grace
JaLeesa Tate, MEMA State Hazard Mitigation Officer
Kayhla Cornell, MEMA Mitigation Planner
Nevil Stambaugh, MEMA Mitigation Planner
Jesse Delph, MEMA Planner

Introductions were conducted.

Matt Kropp and Linda Ploener thanked all for joining the meeting. Some technical issues regarding use of Microsoft Teams, but, all are participating so that is great!

Matt and Linda tag-teamed the overview and drafted agenda for the group. Specifically, discussed timeline for plan revision/update, mentioned that most of the other counties across the state utilized contractor staff to produce their mitigation plans, but, that timing didn't work for us so we are again completing the document "in house". Deadline for completed draft is the end of FEBRUARY 2022. That way, we have time to submit the draft for review and comment by both MEMA and FEMA prior to finalizing and Promulgation/Resolution by the Town, Cities, and County Executive/County Council. All documentation must be complete prior to July 2022 when current plan approval expires.

Matt discussed the Community Rating System (CRS) and the benefit of increasing points in the CRS which ultimately benefits the county and those who register for Flood Insurance. The higher the CRS Points, the better the discounted rate for Flood Insurance benefits.

Discussed incorporating some of the plans that have been developed since the last Plan revision in 2017 which include:

Nuisance Flood Plan

The Freeway Incident Traffic Management (FITM) Plan, Simultaneous Closure of The Millard E. Tydings Memorial Bridge and Thomas J. Hatem Memorial Bridge

Emergency Operations Plan, Appendix 8, Transportation Corridor Emergencies

Including COVID-19 Pandemic impacts, planning, as well as some of the natural and man-made impacts that have occurred between 2017 and now were also discussed.

These include:

The 2018 Severe Weather (heavy rainfall) incident, August 31, 2018 (SBA Declaration) and other weather incidents

COVID-19 (declared County, State, and Federal Disaster)

Civil Unrest events

JaLeesa then provided a powerpoint presentation regarding the State's Hazard Mitigation Plan update process which began March 2020 and is continuing.

Key takeaways include:

FEMA is very focused on Outreach Efforts! (Social Media, etc... Public Interest/input)

A review of previously identified hazards and including new hazards to be assessed

Soil Movement

Public Health Emergencies

Dam Failures, Releases (also mentioned FEMA Hi-Hazard Dam Planning Grant?)

Extreme Temperatures (Hot and Cold)

Human Elements (COVID, Terrorism, Civil Unrest, etc)

JaLeesa discussed adding 2 new goals to their Plan and discussed the 2021 State Hazard Mitigation Plan Actions which include: Structure/infrastructure products, Natural Systems (nature), Local Plans, Education (public outreach, etc.) and Disaster Risk Reduction

She also provided information regarding their New Virtual State Mitigation Plan Room with Virtual Survey Monkey tools which allows for feedback.

She discussed the timeframe for our submission, review, and feedback. We need a solid 90 days scheduled into our timeline for MEMA and then FEMA comment. Once we submit and FEMA completes their review, we will receive an "adoption pending approval" letter which will then allow us time to complete the Promulgation letter adoption and County Council Resolution process to formalize and finalize our efforts.

Matt discussed some of the documented recommendations provided in our 2017 approval letter from FEMA. Those discussed mainly outreach, community participation, etc...

JaLeesa suggested reaching out to Chambers of Commerce, Homeowners Associations, and other community groups for possible inclusion/input into the plan revision. We will also tap into Social Media (Facebook, Twitter, County Webpages) to help get word out about the Plan revisions.

We finalized the meeting with the following:

As you all meet with other staff regarding the Plan revision process, please document the meetings (even if it's only bullet points in an email). The more meeting documentation (attendees, date, discussion topics/talking points, next steps) we provide in our Plan, the better off we will be. That is one FEMA requirement we need to complete as best we can!!!

From Matt and Linda, we will reach out next to our County Departments and Agencies regarding revision overview and the need for their input.

Linda will provide .pdf version of current plan. Also sending links to FEMA's Mitigation Planning webpages for additional information/resources. All must review our current Plan and provide updates back to Linda/Matt via email for incorporation into current revision. Sooner rather than later!!!

Please contact Linda or Matt with any questions, needs for information, etc...

Next meeting with Aberdeen/Bel Air/Havre de Grace will be August 4th, 2021 at 9:00am via TEAMS.

HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE

KICK OFF MEETING W/DEPARTMENTS

June 3, 2021

Agenda:

- Introductions
- Brief Overview (Linda/Matt)
- General Timeline (Linda)
 - February 2022 Draft
- Community Rating System (Matt)
 - Plan changes to increase CRS points
- Public Input (All)
 - Increase our public participation
- COVID impacts
- Open Discussion
 - Plan Next Meeting

HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE
KICK OFF MEETING W/DEPARTMENTS
June 3, 2021

Attendees: Linda Ploener, DES
Matt Kropp, P & Z
Steve Walsh, DPW Highways
Jeff Schoenberger, DPW Environmental
Bill Bettin, DPW W & S
Paul Magness, P & R

We made sure introductions were completed, as needed, then kicked into the Plan revision overview.

Discussed the Plan revision schedule, participants, need for updated information, how the Plan impacts the County (Community Rating System, Federal Disaster funding, etc...).

Good discussion regarding incorporation of public involvement via Survey Monkey tool, need for outreach efforts as well as the need for business partnerships/input.

Discussed use of WebEOC File Library for planning tools and current Plan for review and update as well as other supporting documentation. FEMA requires Meeting Agenda and Minutes be attached at back of Plan. Will Maintain all documentation in-house and will also post in WebEOC for County and Municipality representatives' use.

The need for continued use of Teams Meeting tool for virtual meeting use due to pandemic constraints and convenience.

Tentatively scheduled meeting for August to bring group together again to discuss their agency updates, comments and feedback regarding current plan and the revision process.

HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE

KICK OFF MEETING

August 4, 2021

Agenda:

- Introductions
- Brief Overview (Linda/Matt)
- Status of process for attendees – Identifying updates, additions, deletions, etc...
- General Timeline (Linda)
 - February 2022 Draft – timing regarding plan finalization promulgation approval
- Public Input (All)
 - Increase our public participation – Ideas?
 - COVID impacts
- Open Discussion
 - Plan Next Meeting

**HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE
MEETING**
August 4, 2021

Attendees:

Linda Ploener, Emergency Services
Matt Kropp, Planning and Zoning
Steve Kline, Town of Bel Air
Marisa Willis, City of Havre de Grace
JaLeesa Tate, MEMA State Hazard Mitigation Officer

Welcoming remarks from Matt/Linda.

Matt Kropp and Linda Ploener then thanked all for joining the meeting. Still dealing with a few technical issues regarding use of Microsoft Teams, but, all are participating so that is great!

Matt and Linda tag-teamed the purpose of today's meeting.

Checked on status of each representative's review of current plan, thoughts towards what they will want incorporated into the 2022 Plan update.

Specifically, discussed timeline for plan revision/update. Need ALL updated information NO LATER THAN JANUARY 7, 2022, for incorporation into current 2022 Draft Document. Deadline for completed draft is the end of FEBRUARY 2022. That way, we have time to submit the draft for review and comment by both MEMA and FEMA prior to finalizing and Promulgation/Resolution by the Town, Cities, and County Executive/County Council. All documentation must be complete prior to July 2022 when current plan approval expires.

Discussed the potential for utilizing "creative" ways to hold "Public Meetings" for Plan review/discussion with residents/businesses.

JaLeesa suggested a "virtual" Hazard Mitigation Plan meeting. Use Eventbrite or other registration tool and host on Google (or other virtual tool). FEMA will want to see list of attendees, documentation, photos, etc... indicating meeting(s) were conducted. Linda indicated that she was using the Potassium Iodide Tablet Distribution that will be taking place up in the northern part of the County as an opportunity to bring out the Mit Plan for folks to see/discuss/review... JaLeesa said that photos or other documentation showing event would be great.

Marisa indicated that she knows of a few upcoming events in Havre de Grace that they'd like for us (Linda/Matt) to participate with table. We're waiting dates/events info.

Steve Kline also indicated that October 27th, the Town of Bel Air was hosting their Master Plan Open House. We asked if we could also join in as this would be a great way to show/document a "combined outreach" effort. Steve indicated in a follow up email that we are included!

Will reach out to Bob Hartsock from Aberdeen to see if he knows of planning events within the City of Aberdeen so that we may also participate.

Linda indicated that she would be providing all participants with a copy of the County's Nuisance Flood Plan.

Please contact Linda or Matt with any questions, needs for information, etc...

Next meeting with Aberdeen/Bel Air/Havre de Grace will be scheduled for the fall 2021 via TEAMS. The Date/Time will be sent as soon as meeting is scheduled.

HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE
KICK OFF MEETING
September 7, 2021

Agenda:

- Introductions
- Brief Overview (Linda/Matt)
- Status of process for Department reps – Identifying updates, additions, deletions, etc...
- Documentation Timeline (Linda)
 - February 2022 Draft – timing regarding plan finalization promulgation approval
- Public Input (All)
 - Open Discussion
 - Plan Next Meeting

**HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE
MEETING**

September 7, 2021

Attendees:

Linda Ploener, Emergency Services
Matt Kropp, Planning and Zoning
Steve Walsh, DPW Highways
Jeff Schoenberger, DPW Solid Waste
Bill Bettin, DPW Water and Sewer
Paul Magness, Parks and Rec

Welcoming remarks from Matt/Linda. Sorry again, for the technical difficulties and the delay to the start of our meeting.

Matt and Linda tag-teamed the purpose of today's meeting which was to check on status of individual department/division/agency review of current Plan for changes and or updates. Also to ask if new projects have been identified.

Provided an updated timeline regarding needed information/documentation from each of the Planning Team representatives. Specifically, discussed timeline for plan revision/update.

Requested information from all before December 25, 2021, but, absolutely require ALL updated information NO LATER THAN JANUARY 7, 2022, for incorporation into current 2022 Draft Document. Deadline for completed draft is the end of FEBRUARY 2022. That way, we have time to submit the draft for review and comment by both MEMA and FEMA prior to finalizing and Promulgation/Resolution by the Town, Cities, and County Executive/County Council. All documentation must be complete prior to July 2022 when current plan approval expires.

Again discussed the potential for utilizing "virtual" "Public Input Meetings" for Plan review/discussion with residents/businesses.

May use Eventbrite or other registration tool and host on Google (or other virtual tool). FEMA will still want to see list of attendees, documentation, photos, etc... indicating meeting(s) were conducted. Linda indicated that she was using the Potassium Iodide Tablet Distribution that will be taking place up in the northern part of the County as an opportunity to bring out the Mit Plan for folks to see/discuss/review...

Discussed potential of identifying additional "critical infrastructure" facilities/locations (especially Parks and Rec locations) for use as CPODs, Temporary Debris sites, etc...

Discussed looking at what Ida had done to other counties across the area and suggested that team members look at creative ways to help mitigate from future damages; identify projects,

list in Plan which will give weight towards potentially being selected for HMGP grants as they become available.

Paul discussed Eden Mill and the biannual spill gate openings. He also stated that they are looking at doing an engineering study of Eden Mill.

Cyber Security was also briefly discussed as a potential for HMGP funding.

Steve Walsh indicated that he would be providing a list of potential projects.

Matt talked about the October 27th Town of Bel Air Master Plan Open House. Matt and Linda will be setting up a table/display to provide residents with the opportunity to see the Mitigation Plan; provides us an opportunity for “community input.”

Linda mentioned that additional documentation that will be discussed in the Mitigation Plan includes: Nuisance Flood Plan, Transportation Corridor Emergencies Appendix to the County EOP, the Stand Alone Bridge Closure Plan, the Debris Management Plan, and updates to any other appropriate documents.

Please contact Linda or Matt with any questions, needs for information, etc...

Next meeting will be conducted jointly with municipalities and department/agency/division reps on November 18, 2021 at 9:00am via Teams meeting.

HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE
KICK OFF MEETING
November 18, 2021

Agenda:

- Greetings
- Brief Overview (Linda)
- Status of process for reps – Identifying updates, additions, deletions, etc...
- Public Input (All)
-Open Discussion

**HARFORD COUNTY HAZARD MITIGATION PLAN UPDATE
MEETING**

November 18, 2021

Attendees:

Linda Ploener, Emergency Services

Steve Walsh, DPW Highways

Jeff Schoenberger, DPW Solid Waste

Bill Bettin, DPW Water and Sewer

Paul Magness, Parks and Rec

Marisa Willis, Havre de Grace

Bob Hartsock, Aberdeen

Absent: Matt Kropp, Planning and Zoning; Steve Kline, Bel Air

Welcome to all from Linda. Matt Kropp on Leave today and unable to join in meeting.

Linda explained purpose of meeting – to seek status of review by all Mitigation Plan Team Members.

Seve Walsh discussed road and bridge projects and indicated that he would be submitting information on the projects along with revised narrative.

Jeff Schoenberger pointed out that we needed to revise page 84 where it discusses annual formal review before PAB, EAB, and LEPC. I explained that I do present information regarding Mitigation Plan during the alternate month LEPC meetings, but, that we do not present before either of the County boards annually. We do present the Plan at all 3 during the Finalized revision process, but, again, not annually.

Paul Magness talked about the possibility of including All County (and that would include the municipalities) facilities/amenities that could be within or close to the floodplain on the maps incorporated into the Plan. Think that would just be adding a GIS Layer, but, have to touch base with Matt regarding how to accomplish this task.

Further discussion regarding how to provide revisions/edits to me. I then stated that I would send out the finalized word document so that all may edit. I requested that all highlight edits/additions so that it makes it easier for me to incorporate and not lose data!

Discussed the need for public input based on FEMA guidance and policy. Still trying to figure that out. Also mentioned that Jaleesa Tate, MDEM SHMO, is leaving MDEM and no replacement has been named as yet.

Marisa Willis did not have microphone to talk, but, used chat tool and requested that we possibly look at projections for sea level rise over next 50 years. Jeff commented that plan is a

5-year plan, but, I also mentioned that short and long-term goals should be mentioned and indicated that I would look to see if there is data available for future discussion. Marisa also indicated that she has sent some minor updates (I have them), and is working on changes to their goals. She is hoping to send them to me by December 3rd.

Did not discuss next meeting date during this meeting.

TOWN OF BEL AIR, MARYLAND

COMPREHENSIVE AND MITIGATION PLAN OPEN HOUSE







Subject 2021 COMPREHENSIVE PLAN

Town of Bel Air

SIGN IN SHEET October 27, 2021

NAME	ORGANIZATION/ADDRESS	PHONE/E-MAIL
Debra Hanley	314 East Broadway Elderly + Needy Committee 124 Archer	443-286-7236 DHanley@BVSL.net
Fran Johnson	Elderly + Needy Comm.thr	410-740-6561 fran.wayne@verizon.net
Lisa Arkland	405 Poplar Grove Plaza Bel Air 21014	443-528-5021 Lisa.Arkland@yousai.ca
Justin Kotlowski	1938 Wye Mills Ln. Bel Air, MD 21015	410-237-0089 Justin.Kotlowski@gmail.com
Paula Etting	507 N Shamrock Rd. Bel Air 21014	410-441-8854 paulaetting@comcast.net
Harry O'Neill	418 N MAIN ST BEL AIR MD 21014	410-688-4762 beaconlab@yahoo.com
Mary Chavee Patti Parker	604 Wendellwood Dr. Bel Air 21014 908 Rock Spring Rd	410-698-0297 gmchavee826@gmail.com 443-616-4113 pparker@belairmd.org
Matt Kropp	Harford County Dept. of Planning + Zoning	410-638-3103 ext 1364 MTKropp@HarfordCountyMD.gov
Jonathan West	411 W. Gordon St	410-638-9264 jonathanweststar@gmail.com
Trish Heidenreich	TOBA - ECOV. Dept.	trishidenreich@belairmd.org
Peggy Lucas	(APC) 516 Robinson St	PeggyLucas@belairmd.org
Amy Chmielewski	TOBA	amy.chm@gnosis.com

NAME	ORGANIZATION/ADDRESS	PHONE/E-MAIL
ERIN HUGHES	TOBA	410-984-7150 ehughes@belairmd.org
Steve Kline	TOBA	SKline@belairmd.org
Joe Snee	SLHS	jsnee@slhs.law.com
Coleen West	RESIDENT	
Gil Kennedy	Hancock Credit Union	
Phil Trzody	Independent	
Paul Thompson	ADW Inc	ADW.P.Thompson@comcast.net ADWInc.com

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APPENDIX C
INFORMATION ON FEDERAL DECLARATIONS AND MAJOR WEATHER EVENTS

A list of federal declarations that have been approved for Harford County:

Event	Date	Declaration Received	Approved Storm Cost	Total Reimbursements
Blizzard of 1993 (FEMA-3100-DR-MD)	March 1993	PA	\$571,467	\$441,348
Blizzard of 1996 (FEMA-1081-DR-MD)	January 1996	PA	\$603,978	\$466,594
Hurricane Floyd (FEMA-1303-DR-MD)	September 1999	PA, IA	\$911,047.27	\$703,599.17
Blizzard "President's Day Snowstorm" (FEMA-EM-3179-MD)	February 2003	PA	\$752,080.30	\$578,424.08
Tropical Storm Isabel (FEMA-DR-1492-MD)	September 2003	PA, IA	\$1,702,152.55	\$1,314,194.20
Hurricane Katrina (Evacuation Support) (FEMA-EM-3251-MD)	August/September 2005	PA	\$2,499.58	\$2,677.57
Winter Storm (FEMA-DR-1875-MD)	December 2009	PA	\$999,755.34	\$746,816.54
Winter Storm/Blizzard "Snowmageddon" (FEMA-DR-1910-MD)	February 2010	PA	\$1,571,858.51	\$1,178,893.97
Hurricane Irene (FEMA-DR-4034-MD)	August 2011	PA	\$1,480,044.64	\$1,097,476.56
Tropical Storm Lee (FEMA-DR-4038-MD)	September 2011	PA	\$1,035,033.93	\$766,340.39
Hurricane Sandy (FEMA-DR-4091-MD)	November 2012	PA	\$1,713,876.13	\$1,281,855.07
Winter Storm/Blizzard "Jonas" (FEMA-DR-4261-MD)	January 2016	PA	\$2,443,227.99	\$1,832,421.04

PA = FEMA Public Assistance Program, IA = FEMA Individual Assistance Program

These cost totals do not include costs for damage to residences, private structures, loss of business, loss of pay, deaths, injuries, and loss of power.

Additional details regarding hurricanes/tropical storms that have impacted Harford County:

- **Unnamed Hurricane, August 26, 1933**

A raging hurricane moving northwest from the West Indies, accompanied by 65 mile-per-hour winds and torrential rains, struck Maryland in August 1933 creating millions of dollars' worth of damage. The gale poured over six inches of rain upon the countryside,

coming on top of the 3.36 inches of rain that fell during the two proceeding days. The June 1933 storm was the worst since 1896. The Havre de Grace Republic reported that several bungalows (small homes) along Concord Street were ripped off their foundations and washed away. The Cannery was flooded; areas east of Market Street were under water. The depth of flooding at the Concord Light House was 8 feet. Water Street was under 6 feet of water and the waves damaged the Abbott Brothers Plant and neighboring residences. The Philadelphia Road (Route 7) was closed at Swan Creek where it was under several feet of water. Trees in all sections of the City were uprooted and strewn across the highway causing road closures, power failures and disruption in telephone service. The new Pier at Havre de Grace Yacht Club (located at Concord Point) was destroyed. Countless boats broke their moorings, including the U.S. Navy's Eagle, which was anchored on the Bush River. It went aground one-mile north of its berth. Damage was estimated in the millions for the State of Maryland and at \$100,000 for the City of Havre de Grace (1933 dollars).

- **Hurricane/Tropical Storm Agnes, June 21-23, 1972**

Hurricane Agnes occurred during the month of June 1972. Harford County, Maryland had never experienced such a damaging storm, and to this day no other storm has created such widespread havoc. Although the wind was great, a major part of the damage came from the inland flooding that inundated the county's landscape.

The many tributaries located throughout the County were overflowing and creating lakes as the enormous amount of water gathered along the rivers and streams. The biggest river in the county is the Susquehanna. The Conowingo Dam, located less than 10 miles upstream from Havre de Grace, Maryland, was filled to capacity. Agnes caused the Susquehanna River at the Conowingo Dam to reach major flood stage at 36.8 feet, the highest recorded crest at this location. With all the gates open, the integrity of the dam was questioned. The Philadelphia Power Company narrowly missed having to create a hole in the structure to lessen the pressure that was being exerted against the dam wall. An immense amount of water had been building as backwater due to the continuous downpour that dumped more than 16 inches of rainwater in three days. The structure held and a greater catastrophe was averted. Downstream from the dam lie the Town of Port Deposit (Cecil County) and the City of Havre de Grace. Both areas would have been flooded and undoubtedly many properties would have been destroyed. The Town of Port Deposit was flooded leaving many buildings with mud and silt from the floodwaters.

The storm waters raged on for three plus days causing streams and creeks to swell far beyond their retaining banks. It was not uncommon to see buildings, cattle, pressure tanks, and large trees floating in the rushing waters. Creeks that were normally lazy flowing with a depth of 1 to 4 feet deep, became fast flowing and deep waters that had the power to rip trees from the ground and buildings from the foundation. At Route 543 and Walter's Mill Road, the floodwaters rose to a depth of 8 feet on the first floor wall of Walter's Feed Mill and 4 feet up on the grain bins that contained many thousands of bushels of corn. At the Rock Run Mill, water surrounded the mill as water rose to a depth of 50 inches on the outside walls. In some instances, bridge abutments and road surfaces were damaged as the ground around them was eroded away.

Following the hurricane, the Director of Public Works estimated the cost to make such repairs would be \$2,500,000. This damage assessment was for county property and not the private property that was damaged. The cost to rectify the private sector damage could have exceeded the estimate given by the Public Works Department Director.

- **Hurricane/Tropical Storm Isabel, September 18-19, 2003**

Isabel formed in the central Atlantic Ocean in early September 2003. The storm reached Category 5 status on September 11 but weakened considerably before it made landfall near Cape Hatteras on September 18 with maximum sustained winds of 105 miles per hour (mph). The track of Isabel moved west of the Chesapeake Bay over western Maryland, thus causing the massive front right quadrant of the circulation and its northerly tropical storm force winds over most of the Chesapeake Bay. As the winds pushed water north in the Chesapeake Bay, this resulted in a much larger than expected storm surge in many areas along the Bay. Areas in Dorchester, Queen Anne's, Anne Arundel, Baltimore County, and Baltimore City experienced severe impacts from the surge of coastal flooding. Harford County, protected in part by Aberdeen Proving Ground (APG), experienced significant coastal flooding in several areas including Joppatowne, Edgewood, Abingdon, Perryman, and Havre de Grace. The coastal flooding forced several dozen residents living along the Bush River and those near the Chesapeake Bay in Havre de Grace to evacuate. The promenade boardwalk in Havre de Grace was destroyed. Impacts from rain and wind from Isabel was not as significant as expected, however, many residents were left without power for several days from wind gusts that exceeded 60 mph.

- **Hurricane Irene and Tropical Depression Lee, August - September, 2011**

Hurricane Irene brushed the Mid-Atlantic Region beginning on August 27, 2011 causing high winds and heavy rains. Impacts included many downed trees and tree limbs, leading to widespread power outages and an excess of vegetative debris to clean up.

Tropical Depression Lee followed shortly after Irene, hitting the area on September 8 2011. Lee brought up to 10 inches of rain in some areas of central Maryland and led to widespread flash and areal flooding. Flooding in the City of Havre de Grace was of major concern as both heavy rainfall and Susquehanna River levels lead to hazardous conditions. A complete evacuation of Citizens Nursing Home in the City of Havre de Grace was conducted to safeguard residents from encroaching flood waters. The Conowingo Dam had opened 43 of the 50 flood crest gates, which was the highest number of gates to be opened since Agnes in 1972.

- **Hurricane Sandy, October 2012**

In late October 2012, Hurricane Sandy made landfall in southern New Jersey. This placed Harford County on the outer envelope of tropical storm force winds. Impacts from Sandy were very similar to those from Irene one year prior. Significant impacts from Sandy consisted of downed trees and branches, downed power lines, widespread power outages, and blocked roadways.

APPENDIX D
REPETITIVE LOSS PROPERTIES, COMMUNITY ASSISTANCE VISIT (CAV) REPORT, and 2014
ORDINANCE REVIEW CHECKLIST

The County has been very successful in mitigating NFIP repetitive loss structures over the years (see figure 7). Currently, there are only six repetitive loss properties in the County (2 in Havre de Grace, and 4 in the County). For CRS purposes, the County identified repetitive loss areas around all NFIP repetitive loss structures in the County. In May 2020, the County successfully completed a demolition/acquisition of a Conowingo Road repetitive loss property. Even with the property successfully mitigated, the County decided to keep the “repetitive loss area” due to the vulnerability of flooding of other structures in the area. Therefore, the County has 6 repetitive loss structures (2 in Havre de Grace, and 4 in the County) and 5 designated “repetitive loss areas”. These repetitive loss area properties get additional outreach and mitigation every year as part of the County’s CRS program. In addition, Harford County has successfully completed mitigation (demolition / acquisition) to other flood prone properties that were not designated repetitive loss structures.

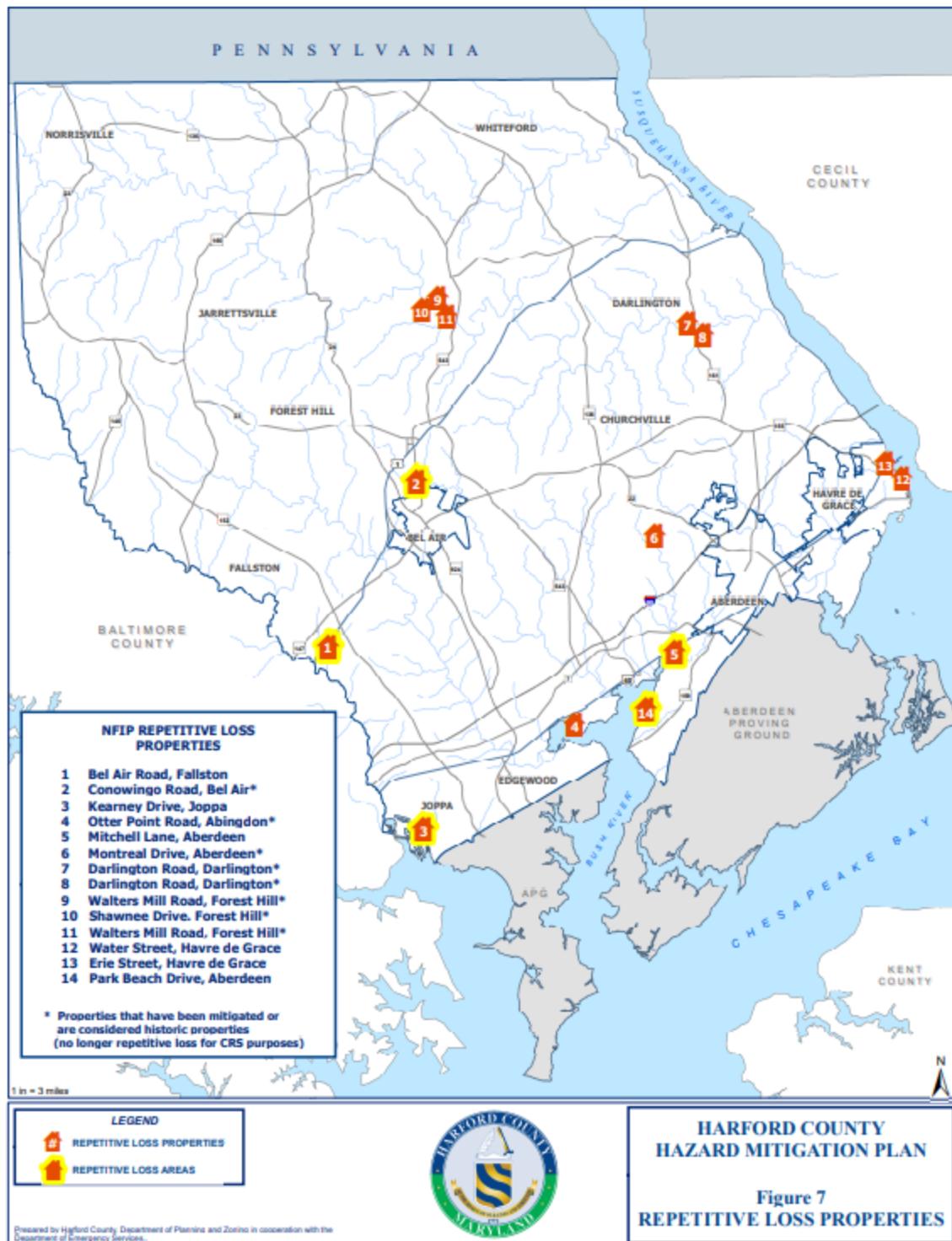
The Department of Planning & Zoning reviews annually the list of “repetitive loss” structures under the National Flood Insurance Program (NFIP). Per the *2013 CRS Coordinator’s Manual 501.a*, repetitive loss properties are those properties for which two or more claims of more than \$1,000 have been paid by the NFIP within a ten-year period since 1978. Severe repetitive loss properties are those 1-4 family properties that have had four or more claims of more than \$5,000 or two to three claims that cumulatively exceeds the building’s value. Since the early 1980’s, Harford County has made significant progress in targeting these properties for acquisition. As of 2017, there are only 4 remaining repetitive loss properties. As a condition of CRS, “Repetitive Loss Areas” have been identified and letters are sent to property owners in these areas.

One of the properties is currently under review by the State of Maryland as a potential acquisition project under FEMA’s HMGP program. The county will continue to investigate and apply for grants to assist property owners in flood proofing or removing their structures. The county will also continue to use data from the Flood Risk Report to target mitigation actions. The four repetitive loss areas are detailed below:

Address	Town	Flooding Source	Type of Use
Bel Air Rd	Fallston	Wildcat Branch	Commercial

Conowingo Rd	Bel Air	Bynum Run	Commercial
Kearney Dr	Joppa	Little Gunpowder River	Residential
Mitchell Ln	Aberdeen	Church Creek	Residential

Figure 7 – REPETITIVE LOSS PROPERTIES



COMMUNITY ASSISTANCE VISIT (CAV) REPORT



Maryland

Department of the Environment

Larry Hogan
Governor
Boyd Rutherford
Lieutenant Governor
Ben Grumbles
Secretary

December 23, 2016

The Honorable Barry Glassman
County Executive
Harford County
220 South Main Street
Bel Air, MD 21014

Re: Community Assistance Visit (CAV)
Harford County, CID #240040

Dear Mr. Glassman:

Thank you for the courtesy and cooperation your staff extended to me at the Community Assistance Visit (CAV) meeting held on March 15, 2016. I met with Matt Kropp, Floodplain Manager, and other County staff at the Harford County Administration Building to discuss Harford County's floodplain management program, and its participation in the National Flood Insurance Program (NFIP). The Federal Emergency Management Agency (FEMA), or the NFIP State Coordinating Office, holds these meetings periodically with all NFIP member communities to assess:

- The effectiveness of local floodplain management ordinances and enforcement practices; and
- Your community's needs for technical assistance and coordination.

During the CAV meeting, it was apparent Harford County is committed to carrying out its floodplain management program. Please see the enclosed report for more details.

If you have any questions, please contact me at 301-689-1495 or kevin.wagner@maryland.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin G. Wagner".

Kevin G. Wagner, CFM
Natural Resources Planner
NFIP State Coordinating Office

Enclosure

cc: Matt Kropp, Floodplain Manager, Harford County
Dave Guignet, State NFIP Coordinator, Maryland Department of the Environment
Molly Kaput, Mitigation Planning Specialist, FEMA Region III

Federal Emergency Management Agency CAV Report

Community:	HARFORD COUNTY *	State:	MARYLAND
County:	HARFORD COUNTY	CID:	240040
		Date of CAV:	03/15/2016

Date of CAV:	03/15/2016		
Agency Conducting CAV:	STATE		
CAV Conducted by:	Kevin G. Wagner, CFM		
CAV Reviewed by:	Molly Kaput		
Referred CAV to FEMA:			
Date CAV Closed:	12/23/2016		
CAC Needed:	No	CAV Needed:	Yes
Date CAC/CAV Needed:	03/15/2020	CRS Candidate:	No
FY:	2020		

Problems with the community's floodplain mgt. regs?	NONE
Harford County updated their floodplain management ordinance, adopted on February 19, 2016, and it became effective on April 19, 2016. The ordinance was reviewed and approved by FEMA. It includes many higher regulatory standards including a two foot freeboard requirement for new construction and substantial improvements; a repetitive loss definition; cumulative substantial improvement provision; subdivision access roads shall be at or above the BFE; on-site sewage disposal systems are prohibited in the floodplain; electric panelboards must be elevated at least 3 feet above the BFE; new manufactured homes are not allowed in floodways or V Zones; and critical and essential facilities are not allowed in V Zones, Coastal A Zones (CAZs) or floodways.	
Problems with the comm. admin and enforcement procedures?	NONE
The Director of Planning & Zoning is designated as the community's Floodplain Administrator in the floodplain management ordinance, but Matt Kropp is the Floodplain Manager and handles the technical assistance and permit review. When a permit application is flagged as being in the floodplain, the Floodplain Manager is notified to review it and advise the applicant of any floodplain management ordinance requirements. In addition to a local permit, a Waterway Construction permit is required from MDE for any activity in a wetland, waterway, or 100-year nontidal floodplain. The County uses a floodplain checklist they call the "Blue Form" to help ensure all the floodplain management requirements are met from permit and plan review through the inspection process.	
Engineering or other problems with the maps of Flood Insur. Study?	NONE
The Flood Insurance Study (FIS) for Harford County, Maryland and Incorporated Areas, and associated Flood Insurance Rate Maps (FIRMs), became effective on April 19, 2016. It included a new coastal flood analysis that was part of a Risk MAP project for FEMA Region III.	
Other problems in the community's floodplain mgt. program?	NONE
The County issued 8 permits for development in the Special Flood Hazard Area (SFHA) between 2011-2016. No issues were observed, but compliance should be based on the FIRM and ordinance in effect at the time of permit issuance. Because of the new coastal flood analysis, some areas previously designated as SFHA are no longer.	
Problems with the Biennial report data? (if yes, change the Biennial Report data as appropriate)	N/A
FEMA no longer sends Biennial Reports to the community to complete.	
Programmatic issue or problems identified? (Programmatic problems relate to the nation or region, not just a community)	YES
The County does not regulate development within Aberdeen Proving Ground (APG), a U.S. Army facility.	

Federal Emergency Management Agency CAV Report

Potential violations of the comm. floodplain mgt. regulations?	NO
No.	
(Have remedial actions been taken?) No	
Community Background Notes:	
<p>Harford County is located in the central part of Maryland about 40 miles north of Annapolis, the State capital. The county seat is Bel Air. Harford County is bounded to the east by the Susquehanna River, to the west by the Gunpowder River, to the north by the Pennsylvania line and to the south by the Chesapeake Bay. Although mostly riverine/nontidal floodplain, the County has tidal and coastal floodplain to the southeast along the tidal tributaries of the Chesapeake Bay. However, most of this area is part of Aberdeen Proving Ground, a U.S. Army facility.</p>	
<p>The last CAV was completed on June 17, 2009.</p>	
<p>Harford County is a Class 7 Community Rating System (CRS) community, and policyholders receive a 15% discount on policies located in the Special Flood Hazard Area (SFHA).</p>	
General Notes:	
<p>Matt Kropf is a Certified Floodplain Manager and handles the day-to-day operations of the County's floodplain management program. Matt is very knowledgeable about FEMA and the National Flood Insurance Program (NFIP). Matt's a real asset to the County and its floodplain management program.</p>	
Mitigation Grants Notes:	
<p>The County has participated in several acquisition projects with FEMA, Maryland Emergency Management Agency (MEMA) and/or MDE over the years. During the floodplain tour, we met with the property owner of a repetitive loss property, Fork Auto Body at 2705 Bel Air Road, and he may be interested in a mitigation project.</p>	
E.O. 11988 Notes:	
<p>Executive Order 11988, "Floodplain Management", (May 24, 1977) was amended by Executive Order 13690, "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input" (January 30, 2015). If federal dollars are spent on development in the SFHA, there may be additional floodplain management considerations required by the EO.</p>	
Other Findings Notes:	
<p>CAV meeting attendees:</p> <p>Jenny King, Deputy Planning Director, Harford County; Meaghan Alegi, Senior Asst. County Attorney, Harford County; Shane Grimm, Chief of Long-Range Planning, Harford County; Hazel Harris, Chief of Zoning Administration, Harford County; Matt Kropf, Floodplain Manager, Harford County; Kevin Wagner, Natural Resources Planner, Maryland Department of the Environment.</p>	
Community Action Needed Notes:	
<p>The County should consider working with the property owner of Fork Auto Body, 2705 Bel Air Road, to see if he would like to pursue a mitigation project with FEMA. If so, the County should coordinate with their Department of Emergency Services and with the State Hazard Mitigation Officer (SHMO) at MEMA.</p>	

Initial Follow-ups:

Due	Ext.	Completed	Source	Type
04/12/2016	No	04/11/2016	STATE	OTHER FOLLOW-UP ACTIVITIES

Federal Emergency Management Agency
CAV Report

Due	Ext.	Completed	Source	Type
Notes				Send flood insurance policy and claims data and Privacy Act info.
04/12/2016	No	03/25/2016	Community	OTHER FOLLOW-UP ACTIVITIES
Notes				Send copy of floodplain inspection checklist.

FEMA REGION III ORDINANCE REVIEW



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Community Overview

Community:	HARFORD COUNTY *		State:	MARYLAND			
County:	HARFORD COUNTY		CID:	240040			
Program:	Regular	Emergency Entry:	05/05/1972	Regular Entry:	03/02/1983		
Status:	PARTICIPATING			Status Effective: 05/30/1989			
Current Map:	04/19/2016	Study Underway:	YES	Level of Regs:	DE		
FIRM Status:	REVISED			Initial FIRM:	03/02/1983		
FHBM Status:	SUPERCEDED BY FIRM			Initial FHBM:	04/04/1975		
Probation Status:							
Probation Effective:		Probation Ended:					
Suspension Effective: 05/04/1989		Reinstated Effective: 05/30/1989					
Withdrawal Effective:		Reinstated Effective:					
CRS Class / Discount: 07 / 15%			Policies in Force: 374				
Effective Date: 10/01/2000			Insurance in Force: \$101,982,700.00				
CAV Date:	03/15/2016	Workshop Date:	12/10/2021	No. of Paid Losses: 230			
CAC Date:	GTA Date: 10/22/2021		Total Losses Paid: \$2,304,974.46				
<input type="checkbox"/> Tribal Community	Community Website: http://www.harfordcountymd.gov/		Sub. Damage Claims Since 1978: 17				
<input checked="" type="checkbox"/> Community Violations Tracker	<input type="checkbox"/> HMGP Projects		Data Sharing Agreement Type:				
<input checked="" type="checkbox"/> ICC Claims	<input type="checkbox"/> FMA Projects		Data Sharing Agreement Date:				

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Community Overview

Community:	ABERDEEN, CITY OF		State:	MARYLAND	
County:	HARFORD COUNTY		CID:	240041	
Program:	Regular	Emergency Entry:	05/22/1974	Regular Entry:	07/16/1981
Status:	PARTICIPATING			Status Effective:	07/16/1981
Current Map:	04/19/2016	Study Underway:	YES	Level of Regs:	D
FIRM Status:	REVISED			Initial FIRM:	07/16/1981
FHBM Status:	SUPERCEDED BY FIRM			Initial FHBM:	12/06/1974
Probation Status:					
Probation Effective:	Probation Ended:				
Suspension Effective:	Reinstated Effective:				
Withdrawal Effective:	Reinstated Effective:				
CRS Class / Discount:				Policies in Force:	
				61	
Effective Date:				Insurance in Force:	
				\$16,678,600.00	
CAV Date:	08/07/2013	Workshop Date:	07/31/2018	No. of Paid Losses:	
CAC Date:		GTA Date:	07/15/2021	34	
<input type="checkbox"/> Tribal Community	Community Website: http://www.aberdeen-md.org/			Total Losses Paid:	
<input type="checkbox"/> Community Violations Tracker				\$134,483.72	
<input type="checkbox"/> ICC Claims				Sub. Damage Claims Since 1978:	
				0	
				Data Sharing Agreement Type:	
				Data Sharing Agreement Date:	
				<input type="checkbox"/> HMGP Projects	
				<input type="checkbox"/> FMA Projects	



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Community Overview

Community:	BEL AIR, TOWN OF		State:	MARYLAND			
County:	HARFORD COUNTY		CID:	240042			
Program:	Regular	Emergency Entry:	01/17/1974	Regular Entry:	09/16/1981		
Status:	PARTICIPATING			Status Effective: 09/16/1981			
Current Map:	04/19/2016	Study Underway:	YES	Level of Regs:	D		
FIRM Status:	REVISED			Initial FIRM:	09/16/1981		
FHBM Status:	SUPERCEDED BY FIRM			Initial FHBM:	07/19/1974		
Probation Status:							
Probation Effective:		Probation Ended:					
Suspension Effective:		Reinstated Effective:					
Withdrawal Effective:		Reinstated Effective:					
CRS Class / Discount:			Policies in Force: 22				
Effective Date: 05/01/2017			Insurance in Force: \$5,117,000.00				
CAV Date:	04/26/2018	Workshop Date:	09/30/2021	No. of Paid Losses:	10		
CAC Date:	07/07/1994	GTA Date:	09/27/2021	Total Losses Paid:	\$18,537.17		
<input type="checkbox"/> Tribal Community	Community Website: http://www.belairmd.org		Sub. Damage Claims Since 1978: 0				
<input checked="" type="checkbox"/> Community Violations Tracker	<input type="checkbox"/> HMGP Projects		Data Sharing Agreement Type:				
<input type="checkbox"/> ICC Claims	<input type="checkbox"/> FMA Projects		Data Sharing Agreement Date:				



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Community Overview

Community:	HAVRE DE GRACE, CITY OF		State:	MARYLAND			
County:	HARFORD COUNTY		CID:	240043			
Program:	Regular	Emergency Entry:	02/26/1975	Regular Entry:	03/15/1977		
Status:	PARTICIPATING			Status Effective: 05/12/1977			
Current Map:	04/19/2016	Study Underway:	YES	Level of Regs:	DE		
FIRM Status:	REVISED			Initial FIRM:	03/15/1977		
FHBM Status:	SUPERCEDED BY FIRM			Initial FHBM:	07/26/1974		
Probation Status:							
Probation Effective:		Probation Ended:					
Suspension Effective: 04/15/1977		Reinstated Effective: 05/12/1977					
Withdrawal Effective:		Reinstated Effective:					
CRS Class / Discount: 07 / 15%				Policies in Force:	355		
Effective Date: 05/01/2018				Insurance in Force:	\$79,736,000.00		
CAV Date: 07/31/2013		Workshop Date:	09/30/2021	No. of Paid Losses:	73		
CAC Date:		GTA Date:	11/05/2021	Total Losses Paid:	\$934,647.01		
<input type="checkbox"/> Tribal Community		Community Website: http://www.havredegracemd.com/		Sub. Damage Claims Since 1978:	5		
<input checked="" type="checkbox"/> Community Violations Tracker		<input type="checkbox"/> HMGP Projects		Data Sharing Agreement Type:			
<input type="checkbox"/> ICC Claims		<input type="checkbox"/> FMA Projects		Data Sharing Agreement Date:			

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APPENDIX E
DISCHARGE/STREAM GAUGING RECORDS

Dates when either creek met or exceeded the flow during Hurricane Floyd (Sept. 16, 1999).

Year	Day	Deer Creek at Rocks <u>Station #01580000</u> Mean daily flow (cfs)	Winters Run near Benson <u>Station # 01581700</u> Mean daily flow (cfs)	Comments
1933	August 23	13,600	N/A	
1972	June 22	6,610	3,000	Hurricane Agnes
1972	June 23	2,010	380	Hurricane Agnes
1975	September 25	1460	977	
1975	September 26	2390	663	
1978	January 26	4040	1670	
1978	March 26	1800	891	
1979	January 21	2730	1190	
1979	January 24	2240	748	
1979	February 25	2560	1000	
1979	February 26	2730	1120	
1979	September 6	2770	939	
1979	Sept 22	2120	728	
1979	Oct 1	2100	280	
1982	February 3	1960	900	
1984	July 1	1480	1120	
1985	February 12	2890	1800	
1989	May 6	2850	909	
1993	Nov 28	3,210	1,310	
1993	Dec 5	2180	1140	
1999	Sept 16	1430	1890	Hurricane Floyd
2003	Dec 11	1640	922	
2005	Oct 8	2990	2260	Tropical Storm Tammy

Year	Day	Deer Creek at Rocks <u>Station #01580000</u> Mean daily flow (cfs)	Winters Run near Benson <u>Station # 01581700</u> Mean daily flow (cfs)	Comments
2006	June 27	1880	1610	
2006	June 28	1600	1340	
2006	Nov 16	1650	855	
2009	Dec 26	1680	886	
2010	Sept 30	2400	1920	Tropical Storm Nicole
2011	Sept 7	2490	468	Tropical Storm Lee
2011	Sept 8	2990	531	Tropical Storm Lee
2011	Nov 23	1450	545	
2012	Oct 29	1820	1050	Hurricane Sandy
2012	Oct 30	2190	820	Hurricane Sandy
2015	Mar 11	1440	384	
2015	Sept 30	1510	451	Hurricane Joaquin
2017	Aug 15	1410	2370	
2017	Aug 18	1880	2800	
2018	Jul 26/27	1720	2730	
2018	Aug 21	3850	1160	
2018	Aug 31	4600	1350	
2018	Nov 24	4230	2200	
2019	Mar 21/22	4250	2030	
2019	Jul 11	433	2340	
2019	Nov 1	3680	2090	
2020	Jun 5	9900	1170	
2020	Aug 7	388	2250	
2021	June 3	2060	3610	

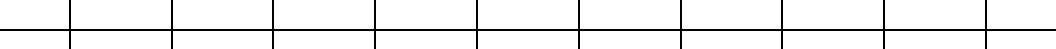
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APPENDIX F
GOALS, OBJECTIVES, and ACTION ITEMS

APPENDIX F
GOALS, OBJECTIVES, and ACTION ITEMS

GOAL 1: REDUCE FLOOD RISKS						TIME LINE																				
	MANAGEMENT				SUPPORT AGENCIES	JULY 2022	DEC 2022	JULY 2023	DEC 2023	JULY 2024	DEC 2024	JULY 2025	DEC 2025	JULY 2026	DEC 2026	JULY 2027										
	PRIORITY	FUNDING	LEAD AGENCY																							
OBJECTIVE 1a: Restrict development in the floodplain																										
Hazards: severe thunderstorms, riverine flooding, severe winter storms, hurricanes																										
ACTION: Continue Floodplain Management Program.	HIGH	Budget	P&Z	DPW, DILP	DILP, Aberdeen, Bel Air, and Havre de Grace																					
ACTION: Continue CRS activities, and continue to identify actions that improve CRS credit.	MOD	Budget	P&Z	DPW, DILP																						
ACTION: Protect new and existing buildings from flooding by requiring elevation of new and substantially improved buildings.	HIGH	Budget	P&Z	DILP, Aberdeen, Bel Air, and Havre de Grace																						
OBJECTIVE 1b: Reduce vulnerability to flood damages																										
Hazards: severe thunderstorms, riverine flooding, severe winter storms, hurricanes																										
ACTION: Relocate or acquire residences located in the floodway.	MOD	GRANTS FEMA MDEM	P&Z	DPW, DILP	DPW, DES, Adm., DILP																					
ACTION: Elevate, move, acquire, and/or demolish flood damaged buildings	MOD	GRANTS FEMA MDEM	P&Z	DPW, DES, Adm., DILP																						
ACTION: Implement appropriate mitigation measures for the County's repetitive loss properties and repetitive loss areas.	HIGH	MDEM, FY Budget	P&Z	DPW, DES, Adm., DILP																						
ACTION: Construct, or ensure construction of, new utilities in accordance with current Harford County Water and Sewer Design Guidelines (Guidelines updated November 10, 2014).	HIGH	EPA MDE DNR P&R	W&S	P&R	DPW, DES, DILP																					
ACTION: Use RiskMAP HAZUS data to identify at-risk properties and target for mitigation actions.	HIGH	Budget	P&Z	DPW, DES, DILP																						

	MANAGEMENT					TIME LINE									
	PRIORITY	FUNDING	LEAD AGENCY	SUPPORT AGENCIES		JULY 2022	DEC 2022	JULY 2023	DEC 2023	JULY 2024	DEC 2024	JULY 2025	DEC 2025	JULY 2026	DEC 2026
ACTION: Ensure critical infrastructure is adequately protected from flood damage.	HIGH	Existing Budgets, FEMA	P&Z	DES, P&Z, DPW											
ACTION: Ensure that new county plans (such as the Green Infrastructure Plan and new Nuisance Flood Plan) and policies reduce vulnerability to flood damage and improve resiliency.	MOD	Grants	FEMA, MDEM, DILP	P&Z, DPW											
GOAL 2: ENSURE EMERGENCY COMMUNICATIONS CAPABILITY FOR ALL PUBLIC SAFETY OFFICIALS, INCLUDING EMERGENCY PUBLIC INFORMATION															
OBJECTIVE 2a: Maintain a state of the art communication system for county-wide emergency response															
Hazards: drought, severe thunderstorms, high winds and tornados, tropical cyclones, riverine flooding, severe winter storms, hurricanes, technological and hazmat, soil movement, earthquakes, wildfires, public health emergencies, extreme temperatures															
ACTION: Collect and maintain data on vulnerable populations who require supplementary services during disasters.	HIGH	FY Budget, REPP	DES	Community Services, Red Cross, P&Z , Office on Aging											
ACTION: Ensure all system updates and mobile/portable radio updates are completed in timely fashion.	HIGH	FY Budget	DES	DPW, ICT, Sheriff, Fire Companies											
GOAL 3: PROTECT INFRASTRUCTURE - WATER AND WASTEWATER SYSTEMS															
OBJECTIVE 3a: Protect water and wastewater systems from terrorist activities															
Hazard: technological															
ACTION: Pursue security upgrades (e.g. secure SCADA, locking system, video surveillance, perimeter controls).	HIGH	Grants, FY Budget	DPW, W&S												
ACTION: Chlorine conversion to alternative disinfectant	MED	Grants, FY Budget	DPW, W&S												
ACTION: Evaluate need for dual booster station for 4th zone as part of comprehensive water model study.	LOW	Grants, FY Budget	DPW, W&S												
OBJECTIVE 3b: Protect water and wastewater systems from flood damages															
Hazards: severe thunderstorms, high winds and tornados, tropical cyclones, riverine flooding, severe winter storms, hurricanes															
ACTION: Flood-proof existing water and sewer utilities which may be in danger of damage from flooding	LOW	FY Budget	DPW, W&S												
ACTION: Identification of vulnerable sanitary sewer mains susceptible to streambank erosion and re-check after major storm events	HIGH	FY Budget	DPW, W&S												

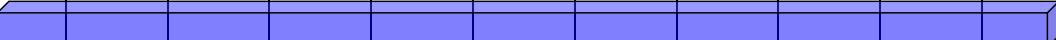
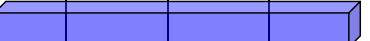
	MANAGEMENT				TIME LINE										
	PRIORITY	FUNDING	LEAD AGENCY	SUPPORT AGENCIES	JULY 2022	DEC 2022	JULY 2023	DEC 2023	JULY 2024	DEC 2024	JULY 2025	DEC 2025	JULY 2026	DEC 2026	JULY 2027
ACTION: Reduce storm-water inflow into sanitary sewers to provide greater capacity and reduce amount of treated wastewater	MOD	FY Budget	DPW, W&S												
OBJECTIVE 3c: Develop a mitigation plan for drought															
Hazards: drought															
ACTION: Adopt a local water conservation plan	MOD	FY Budget	DPW, W&S	Municipalities											
ACTION: Plan for alternative water supplies.	HIGH	FY Budget	DPW, W&S	Municipalities											
ACTION: Participation in Regional Conowingo Task Force (Baltimore/York, PA)	HIGH	State/Local	SRBC	DPW, W&S											
ACTION: Maintain drought coordination with all local water purveyors	HIGH	FY Budget	DPW, W&S	Municipalities											
OBJECTIVE 3d: Protect against technological hazards that could result in accidental release of hazardous chemicals															
Hazard: technological															
ACTION: Review and update W&S input to county emergency plans.	HIGH	FY Budget	DPW, W&S												
GOAL 4: PROTECT TRANSPORTATION SYSTEMS															
OBJECTIVE 4a: Ensure safe passage on major roads during storm events.															
Hazards: wildfires, extreme temperatures, severe thunderstorms, high winds and tornados, tropical cyclones, riverine flooding, severe winter storms, hurricanes															
ACTION: Identify roads, culverts, or bridges in need of significant repair or replacement annually	MOD	FY Budget	DPW	SHA											
ACTION: Continue implementation of road classification system	HIGH	FY Budget	DPW	P&Z											
ACTION: Upgrade, add, and/or replace snow removal equipment to meet changing requirements	MOD	FY Budget, Special appropriations by Council	DPW												
ACTION: Review Harford County Capital Improvement Program annually.	MOD	FY Budget	DPW	DES, P&Z, County Council											
GOAL 5: EDUCATE AND INFORM THE PUBLIC ABOUT NATURAL HAZARDS															

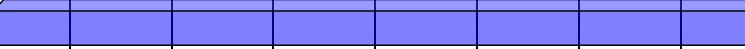
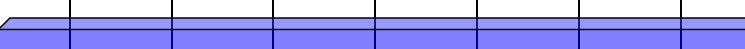
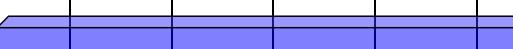
	MANAGEMENT				TIME LINE									
	PRIORITY	FUNDING	LEAD AGENCY	SUPPORT AGENCIES	JULY 2022	DEC 2022	JULY 2023	DEC 2023	JULY 2024	DEC 2024	JULY 2025	DEC 2025	JULY 2026	DEC 2026
OBJECTIVE 5a: Improve public awareness of natural disasters and response activities														
Hazards: drought, wildfires, severe thunderstorms, high winds and tornados, tropical cyclones, riverine flooding, severe winter storms, hurricanes, technological, soil movement, extreme temperatures														
ACTION: Ensure that DES keeps adequate copies of the Harford Emergency Preparedness Guide in stock	MOD	FY Budget	DES											
ACTION: Maintain in all public and private schools and public buildings, NOAA hazard alert radios	MOD	FY Budget, MDEM, NOAA	DES	Board of Education, Private Schools										
ACTION: Participate in all national awareness campaigns (i.e. National Severe Storm Awareness Week, Hurricane Awareness Week, etc.)	HIGH	FY Budget, MDEM, NOAA	DES	PIO										
ACTION: Use RiskMAP tools such as depth grid analysis to communicate depth of flooding, or risk over 30-year periods.	MOD	FY Budget	P&Z											
ACTION: Target owners of non-conforming structures and repetitive loss properties regarding flood-proofing options.	MOD	FY Budget	P&Z	DILP, MDE										
OBJECTIVE 5b: Reduce exposure to drought														
Hazard: drought														
ACTION: Educate the public on water conservation methods before and during periods of drought.	MOD	Budget	DPW	DILP, DES, P&Z, NRCS,										
GOAL 6: INVOLVE LOCAL STAKEHOLDERS IN MITIGATION EFFORTS														
OBJECTIVE 6a: Continue joint planning for all hazard response, recovery, and mitigation projects														
Hazards: drought, severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes, technological and hazmat, extreme temperatures, soil movement, public health emergencies														
ACTION: Coordinate with surrounding jurisdictions (Maryland & Pennsylvania)	HIGH	FY Budget	DES	APG, Bel Air, Aberdeen, Havre de Grace, & neighboring counties*										
ACTION: Meet with executive committees (Environmental Advisory Board [EAB], Planning Advisory Board [PAB], and Local Emergency Planning Committee [LEPC])	MOD	MDEM, FY Budget	P&Z	DES										
ACTION: Maintain and update Memoranda of Agreement and Mutual Aid Agreements with surrounding jurisdictions	MOD	FY Budget	DES	APG, Bel Air, Aberdeen, Havre de Grace, and neighboring counties										

	MANAGEMENT				TIME LINE										
	PRIORITY	FUNDING	LEAD AGENCY	SUPPORT AGENCIES	JULY 2022	DEC 2022	JULY 2023	DEC 2023	JULY 2024	DEC 2024	JULY 2025	DEC 2025	JULY 2026	DEC 2026	JULY 2027
ACTION: Publish and upload County Hazard Mitigation Plan to County Website	MOD	FY Budget	DES	DES and P&Z											
ACTION: Plan for debris management activities and maintain contracts for primary and back-up debris management handling and disposal including grinding and recycling of materials.	HIGH	Grants	DPW, EA Div., DES	P&R											
OBJECTIVE 6b: Streamline debris management and recovery efforts															
ACTION: Maintain the FEMA approved Debris Management Plan	MOD	FY Budget, Grants	DPW	DES											
GOAL 7: IDENTIFY, LOCATE, AND ASSESS HAZARDOUS MATERIALS RISKS WITHIN THE COMMUNITY TO ESTABLISH VULNERABILITIES AND PREVENT ACCIDENTS OR INCIDENTS															
OBJECTIVE 7a: Protect the public from hazardous material incidents															
Hazards: drought, severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes, technological															
ACTION: Support and sponsor Local Emergency Planning Committee (LEPC) meetings and activities	MOD	FY Budget, MDEM	DES	APG, municipalities, local businesses, MDE, FEMA											
TOWN OF BEL AIR															
GOAL 1: REDUCE FLOOD RISKS															
OBJECTIVE 1a: Restrict development in the floodplain															
Hazards: severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes															
ACTION: Maintain CRS activities (2018 HM Plan Action Item was to implement CRS - Revised)	MOD	FY Budget	Planning	DPW											
OBJECTIVE 1b: Reduce vulnerability to flood damages															
Hazards: severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes															
ACTION: Elevate, move, acquire, and/or demolish flood damaged buildings	LOW	GRANTS FEMA MDEM DPW	Planning	DPW, DES											
ACTION: Evaluate flooding problems along Plumtree Run (Completed)	MOD	FY Budget	Bel Air DPW												
ACTION: Upgrade storm water management system: Plumtree Stream Bank Restoration @ S. Atwood. Plumtree Stream Bank Restoration @ W. Mac Phail and Market Place. (Completed 2020)	MOD	FY Budget	Bel Air DPW												

	MANAGEMENT					TIME LINE								
	PRIORITY	FUNDING	LEAD AGENCY	SUPPORT AGENCIES		DEC 2022	JULY 2023	DEC 2023	JULY 2024	DEC 2024	JULY 2025	DEC 2025	JULY 2026	DEC 2026
ACTION: Upgrade storm drain outfalls at: 802 Linwood Avenue, 704 Linwood Avenue, 422 Linwood Avenue, Lee Way and the Pennsylvania Avenue intersection, 21 Linwood Avenue, and 331 Baltimore Pike (Completed)	MOD	FY Budget, MS4 Budget	Bel Air DPW											
ACTION: Conduct a storm water treatment system evaluation (Completed)	MOD	FY Budget, Grants and CIP, MS4	Bel Air DPW	MDE										
ACTION: Identify solution to sewer line exposure along Plumtree interceptor line - Plumtree Run Stream Bank Restoration. (Completed)	HIGH	Grants and CIP	Bel Air DPW											
CITY OF ABERDEEN														
GOAL 1: REDUCE FLOOD RISKS														
OBJECTIVE 1a: Restrict development in the floodplain														
Hazards: severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes														
ACTION: Update Floodplain Management Ordinance (COMPLETED). Aberdeen adopted the FEMA Flood Insurance Rate Maps and updated our Floodplain Management Ordinance No. 16-O-03 on March 28, 2016. The Flood Insurance Rate Maps have an effective date of April 19, 2016.	HIGH	FY Budget	Dept of Planning & Community Dev.	MDE										
GOAL 2: PROTECT INFRASTRUCTURE - Water and Wastewater Systems														
OBJECTIVE 2a: Protect water systems from flood damages														
Hazards: severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes														
ACTION: Develop/review vulnerability assessments and emergency response plan for all water and wastewater infrastructure (COMPLETED). This is reviewed on an annual basis.	HIGH	City of Aberdeen	City of Aberdeen	EPA										
ACTION: Maintain Emergency Response Plan (Risk Management Plan) for the Aberdeen Advanced Wastewater Treatment Plant, updated as of 12/1/2021.	HIGH	City of Aberdeen	City of Aberdeen											
ACTION: Maintenance of SCADA Systems on all water and wastewater facilities - Updates are continuous and Aberdeen Water and Wastewater are all 100% monitored by SCADA Systems.	HIGH	City of Aberdeen	City of Aberdeen											
Action: Review/Revise risk management plans for APG wastewater plant (COMPLETED in 2021). Will be reviewed again in 2022.	HIGH	City of Aberdeen	City of Aberdeen											

	MANAGEMENT					TIME LINE																		
	PRIORITY	FUNDING	LEAD AGENCY	SUPPORT AGENCIES		DEC 2022	JULY 2022	DEC 2023	JULY 2023	DEC 2024	JULY 2024	DEC 2025	JULY 2025	DEC 2026	JULY 2026	JULY 2027								
ACTION: Utilization of Microtox system for toxicity screening of water supply and wastewater influent (discontinued in 2012).	HIGH	City of Aberdeen	City of Aberdeen																					
ACTION: Raise all Critical process equipment and facilities above flood/storm surge elevations at APG. UPDATE: New chemical building is elevated and has secondary containment system. Methanol Storage is raised and secondary containment as well. A lot of the older buildings are at ground level.	HIGH	City of Aberdeen	City of Aberdeen																					
ACTION: Adopt Wellhead Protection Plan and Ordinance (COMPLETED). Wellhead Protection Ordinance No. 656-04 adopted in August 2018. No amendments have been made to the ordinance since this time. All new development is consistent with the mapped wellhead protection areas and the Wellhead Protection Ordinance.	HIGH	City of Aberdeen	City of Aberdeen	MDE																				
ACTION: NOI sent for HMGP for emergency backup power supply for the City's AWWTP in 2021.	HIGH	City of Aberdeen	City of Aberdeen	FEMA																				
GOAL 3: EDUCATE AND INFORM THE PUBLIC ABOUT NATURAL HAZARDS																								
OBJECTIVE 3a: Increase public awareness about flood hazard																								
Hazards: severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes																								
ACTION: Conduct annual mailings to floodplain residents regarding the flood hazard. UPDATE: The City of Aberdeen website contains updated information regarding the new FEMA mapping and the adopted Floodplain Management Ordinance. As part of the public hearing/notice process in 2016, the City of Aberdeen notified all property owners that have property in the Special Flood Hazard Area.	MOD	GRANTS FEMA MDEM DPW	P&Z	DPW																				
ACTION: Drought Task Force Participation	HIGH	FY Budget	DES	City of Aberdeen																				
GOAL 4: REDUCE LOSSES DUE TO DROUGHT																								
OBJECTIVE 4a: Establish supplemental water source																								
Hazard: drought																								

	MANAGEMENT				TIME LINE									
	PRIORITY	FUNDING	LEAD AGENCY	SUPPORT AGENCIES	JULY 2022	DEC 2022	JULY 2023	DEC 2023	JULY 2024	DEC 2024	JULY 2025	DEC 2025	JULY 2026	DEC 2026
ACTION: Review agreement with county for back up water supplies. UPDATE: The City of Aberdeen maintains contracts with Harford County for back-up water sources.	HIGH	Existing budgets	Aberdeen	County W&S										
ACTION: Creation of the Aberdeen-Havre de Grace Water Purchase Agreement for the City of Aberdeen to purchase up to 900,000 gallons of water per day from the City of Havre de Grace.	HIGH	Existing Budgets	Aberdeen	Havre de Grace										
CITY OF HAVRE DE GRACE														
GOAL 1: REDUCE FLOOD RISKS														
OBJECTIVE 1a: Restrict development in the floodplain														
Hazards: severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes														
ACTION: Maintain Floodplain Management Program and CRS	HIGH	FY Budget	Planning	DPW										
ACTION: Update Floodplain Management Ordinance, as needed.	MOD	FY Budget	Planning											
ACTION: Update the Water Resources component of the Comprehensive Plan	MOD	FY Budget	Planning											
OBJECTIVE 1b: Reduce vulnerability to flood damages														
Hazards: severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes														
ACTION: Obtain funding for mitigation projects	MOD	Budget Grants	DPW	City Council, MDE Planning										
ACTION: Continue electronic Citizen communications regarding extreme weather events that may cause flooding or other property damage.	MOD	Budget, Grants	Planning/ Administration	DPW										
ACTION: Expand the City's Living Shoreline projects	MOD	Budget, Grants	DPW											
OBJECTIVE 1c: Reduce Lilly Run flooding														
Hazards: severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes														
ACTION: Construct Phase I Lilly Run flood mitigation project.	MOD	GRANTS FEMA MDEM DPW	DPW	Planning, DES										
ACTION: Develop other possible area projects to lessen flooding along Lilly Run	MOD	GRANTS FEMA MDEM DPW	DPW	Planning, DES										
GOAL 2: PROTECT INFRASTRUCTURE - WATER AND WASTEWATER SYSTEMS														

	MANAGEMENT					TIME LINE																					
	PRIORITY	FUNDING	LEAD AGENCY	SUPPORT AGENCIES		JULY 2022	DEC 2022	JULY 2023	DEC 2023	JULY 2024	DEC 2024	JULY 2025	DEC 2025	JULY 2026	DEC 2026	JULY 2027											
ACTION: Install SCADA Systems in Water Treatment Plant and all wastewater pump stations.	HIGH	FY Budget	DPW	DPW W&S																							
OBJECTIVE 2a: Establish supplemental water source during drought																											
Hazards: drought																											
ACTION: Upgrade Water Treatment Plant to improve efficiency and capacity.	HIGH	FY Budget	DPW																								
ACTION: Design new water intake system.	HIGH	FY Budget	DPW																								
ACTION: Solve problem of high salinity levels in drinking water during drought	HIGH	FY Budget	DPW	DPW W&S																							
ACTION: Continue to put information on water conservation in the City Newsletter, on the City Website, and on Social Media	MOD	FY Budget	Planning/ Administration																								
ACTION: Find alternative uses for greywater	MOD	FY Budget	DPW																								
OBJECTIVE 2b: Secure water systems from terrorism and vandalism																											
Hazards: all																											
ACTION: Implement enhanced security at water treatment, wastewater treatment plants & DPW shop	HIGH	Budget, Capital Projects	DPW	Administration Police																							
OBJECTIVE 2c: Reduce Inflow and Infiltration in waste water treatment plant																											
Hazards: severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes																											
ACTION: Smoke test sewer system to check for illegal connections from sump pumps and downspouts	MOD	FY Budget	DPW																								
ACTION: Mill and recrown roads and upgrade SWM piping	MOD	FY Budget	DPW																								
ACTION: Develop Drainage System Maintenance procedures for debris removal and problem site maintenance	MOD	FY Budget	DPW	Planning																							
GOAL 3: EDUCATE AND INFORM THE PUBLIC ABOUT NATURAL HAZARDS (ONGOING)																											
OBJECTIVE: Increase public awareness about flood hazard																											
Hazards: Drought, severe thunderstorms, high winds and tornados, riverine flooding, severe winter storms, hurricanes																											

	MANAGEMENT					TIME LINE							
	PRIORITY	FUNDING	LEAD AGENCY	SUPPORT AGENCIES		DEC 2022	JULY 2023	DEC 2023	JULY 2024	DEC 2024	JULY 2025	DEC 2025	JULY 2026
ACTION: Plan annual public meetings to promote flood awareness, flood insurance, and property protection solutions	MOD	FY Budget	Planning/Administration										
ACTION: Continue to prepare flooding handouts specific to needs of waterfront communities & rec. facilities regarding flooding.	MOD	Budget Grants	Planning	MDEM Police DPW									
GOAL 4: PROTECT INFRASTRUCTURE													
OBJECTIVE 4a: Protect structures from terrorist activities													
Hazards: Technological													
ACTION: Maintain safety and security measures at City Hall, Police Department, and water treatment plant.	MOD	FY Budget	Police	Admin, DPW									
ACTION: Ensure functionality of panic button system in City Hall.	MOD	FY Budget	Police	Admin, DPW									
ACTION: Continue to provide funding and equipment, and implement training for "active shooter" preparedness	MOD	FY Budget	Police	Admin									

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APPENDIX G
NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEYS

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: HARFORD COUNTY, MD

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	Hard copies of the FIRMs and FIS are located at the Harford County Department of Planning and Zoning. We also have an interactive Floodplain Map service that ties into the FEMA National Flood Hazard Layer on County webpage.
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	YES	April 19, 2016
c. Does the municipality support request for map updates?	If yes, state how.	YES	Floodplain Manager assists property owners in filing Letter of Map Amendments and Letter of Map Revisions (131-9, B 10 a)
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	YES	Information is shared, as required in Floodplain Management Program (131-9, B 9 / 131-12 B 2)
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	Floodplain Manager makes local floodplain determinations based on the official FIRM, or by using more detailed ground elevations as detailed in (131-10) & by Agreement to submit elevation certificate (131-8)
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	Harford County, Department of Planning and Zoning is the designated Floodplain Administrator (131-3 / 131-9 A)

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	YES	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	YES	Harford County, Department of Planning and Zoning is the designated Floodplain Administrator (131-9 A / 131-9 B 6)
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	YES	Harford County, Department of Planning and Zoning (131-10 / 131-12 A 5) County requires data for 5 lots/ 5 acres or more.
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	YES	Harford County, Department of Planning and Zoning Floodplain Management Program (131-9 / 131-17 / 131-18 / 131-19 A)
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	YES	Harford County, Department of Planning and Zoning requires Agreement to submit elevation certificates (at time of building permit application, upon placement of lowest floor, and as-built prior to Certificate of Occupancy permit) (131-8)
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.		We actively monitor compliance through the permitting process, investigations, and stop work orders. (131-9 B 7, 131-9 B 10 b / 131-9 B 11, 131-45, 131-46, 131-47)

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> Participation in the Community Rating System Prohibition of production or storage of chemicals in SFHA Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA Prohibition of certain types of residential housing (manufactured homes) in SFHA Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	YES	<p>Harford County is a Class 7 CRS community. Examples of activities that go beyond the minimum requirements include:</p> <ul style="list-style-type: none"> 2' freeboard for new and substantial improved structures Cumulative substantial improvement tracking (5-year) Subdivision access roads at or above BFE Onsite sewage disposal systems prohibited in SFHA Electric panelboards must be 3' or higher than BFE New man. Homes prohibited from floodways and Coastal A zones Critical facilities not permitted in V zones, Coastal A, or floodways Compensatory storage requirement for fill, if permitted Enforce V zone standards in Coastal A zones (LiMWA)

3. FLOOD INSURANCE			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	YES	Harford County educates our citizens about the availability of flood insurance through the County's Emergency Preparedness Guide, along with Emergency Preparedness messages that include a variety of mitigation best practices, the need for flood insurance and how it will save the homeowner/business owner/renter much in both dollars and time. We also hand out FEMA Flood Insurance brochures at public County events such as Farm Fair, Prepare Because you Care program, and many other Open House events.
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	YES	Yes, the County just recently updated it's FIRMS on April 19, 2016. Prior to that, newspaper advertisement we sent out notifying the public of the proposed changes. Over 3,300 letters / postcards were sent through US Mail, to all properties that had mapped floodplain (most with changes) on them, and

			offered a public Open House meeting to go over changes with any interested property owners.
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	YES	Floodplain Manager provides all necessary information for insurance policies to residents and insurance agents. Manager also provides mapping services to assist with flood insurance questions and clarifications, along with elevation certificate support.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: CITY OF ABERDEEN

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	YES	
c. Does the municipality support request for map updates?	If yes, state how.	YES	We review and provide comments when necessary.
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	YES	If this information is available; we will share the source and data with the Federal Emergency Management Agency.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	We are asked for copies of the FIRM and determinations if a property is located in a mapped special flood hazard area.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	The Department of Planning and Community Development maintains these records.

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	YES	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	YES	The Department of Planning and Community Development and the Department of Public of Works; prior to issuance we must have approval from FEMA and MDE.
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	YES	The Department of Planning and Community Development and the Department of Public Works
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	YES	The Department of Planning and Community Development
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	YES	The Department of Planning and Community Development
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	YES	The Department of Planning and Community Development enforces the Floodplain Management Ordinance adopted 3/28/16 which has provides a notice of violation and stop work order section.

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
<p>c. Has the municipality considered adopting activities that extend beyond the minimum requirements?</p> <p>Examples include:</p> <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	YES	<p>We have considered these items and have elected to adopt the Maryland Model Floodplain Management Ordinance.</p> <p>Additionally, will be completing CRS at the end of 2022.</p>

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	YES	We have the floodplain mapping and ordinance on the City website making it available to all citizens.
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	YES	We send letters to each homeowner or property owner that is impacted.
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	NO	We do provide minimal guidance and copies of the adopted FIRM.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: TOWN OF BEL AIR

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	April 19, 2016
c. Does the municipality support request for map updates?	If yes, state how.	Yes	If we agree the request is warranted.
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Yes	We have done this in the past with engineered studies. We've had the engineering firm work directly with FEMA to supply necessary data.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	In writing and over the phone.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	Planning Department has maintained these records in the past.

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	Yes	Planning and Public Works are both responsible.
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	Planning and Public Works are both responsible.
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	Planning and Public Works are both responsible.
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	Planning and Public Works are both responsible.
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Building permits, Elevation Certificates, inspections.

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
<p>c. Has the municipality considered adopting activities that extend beyond the minimum requirements?</p> <p>Examples include:</p> <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	Yes	CRS, limitations on construction within the SFHA, additional freeboard

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	Yes	Notification to financial and insurance agencies yearly describing flood insurance requirements.
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	When changes to the FIRM are made, property owners are notified in writing.
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Yes	Letters of determination, information on request.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: CITY OF HAVRE DE GRACE

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	Yes, Available at City Hall.
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	YES	April 19, 2016
c. Does the municipality support request for map updates?	If yes, state how.	YES	Encourage Letter of Map Revision.
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	No	None Available.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	Provide technical Assistance with available local survey/topo information.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	The Department of Planning.

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	YES	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	YES	The Department of Planning.
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	YES	The Department of Planning.
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	YES	The Department of Planning.
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	YES	The Department of Planning.
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	YES	Require Elevation Certifications and on-site inspections to ensure compliance.

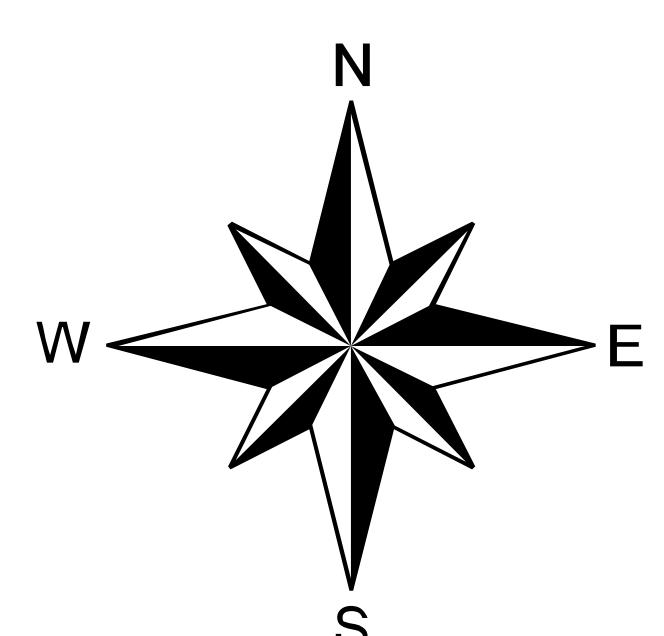
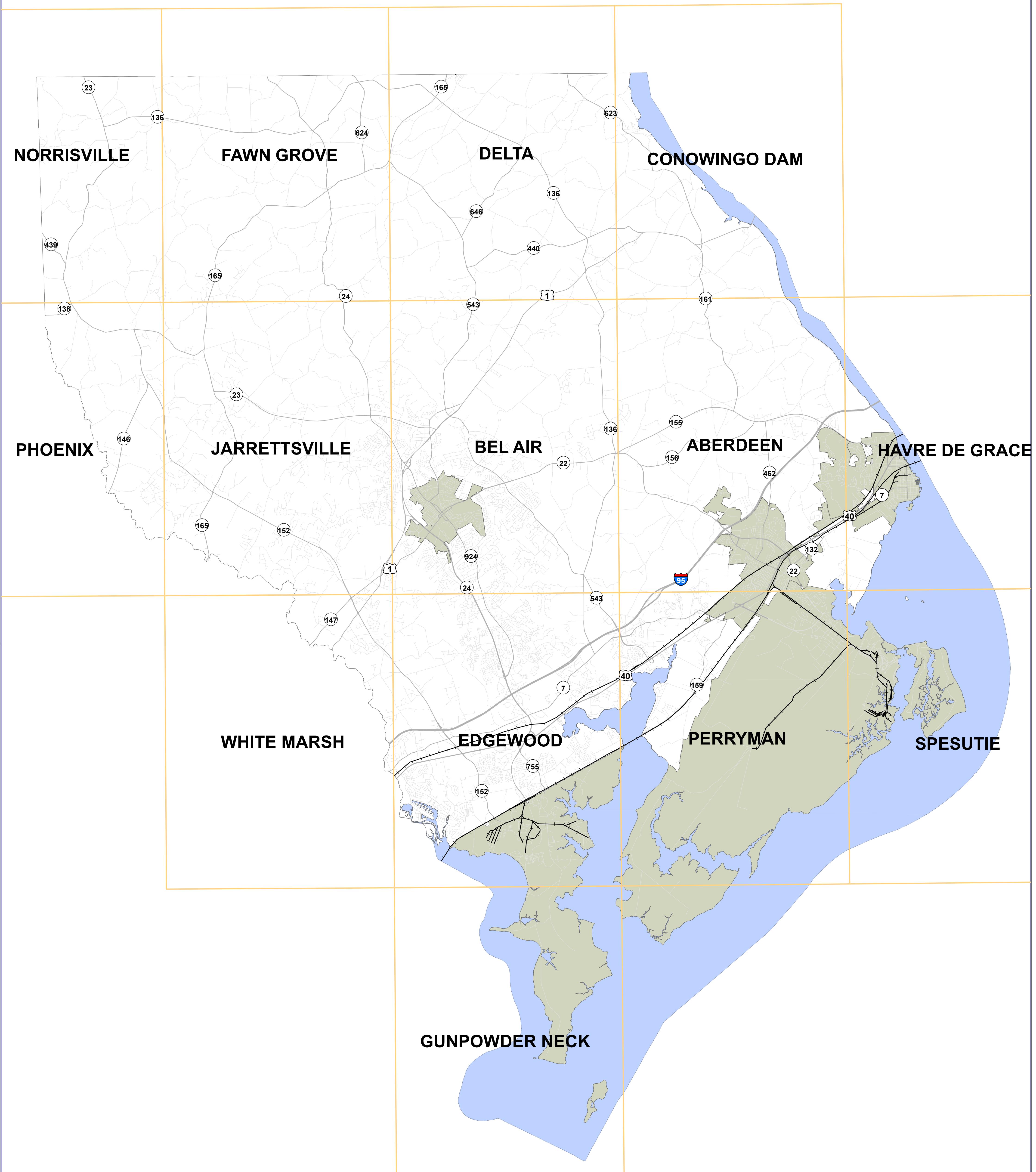
2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
<p>c. Has the municipality considered adopting activities that extend beyond the minimum requirements?</p> <p>Examples include:</p> <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	YES	Member of CRS; No specific prohibitions beyond what is regulated by the State Model Code.

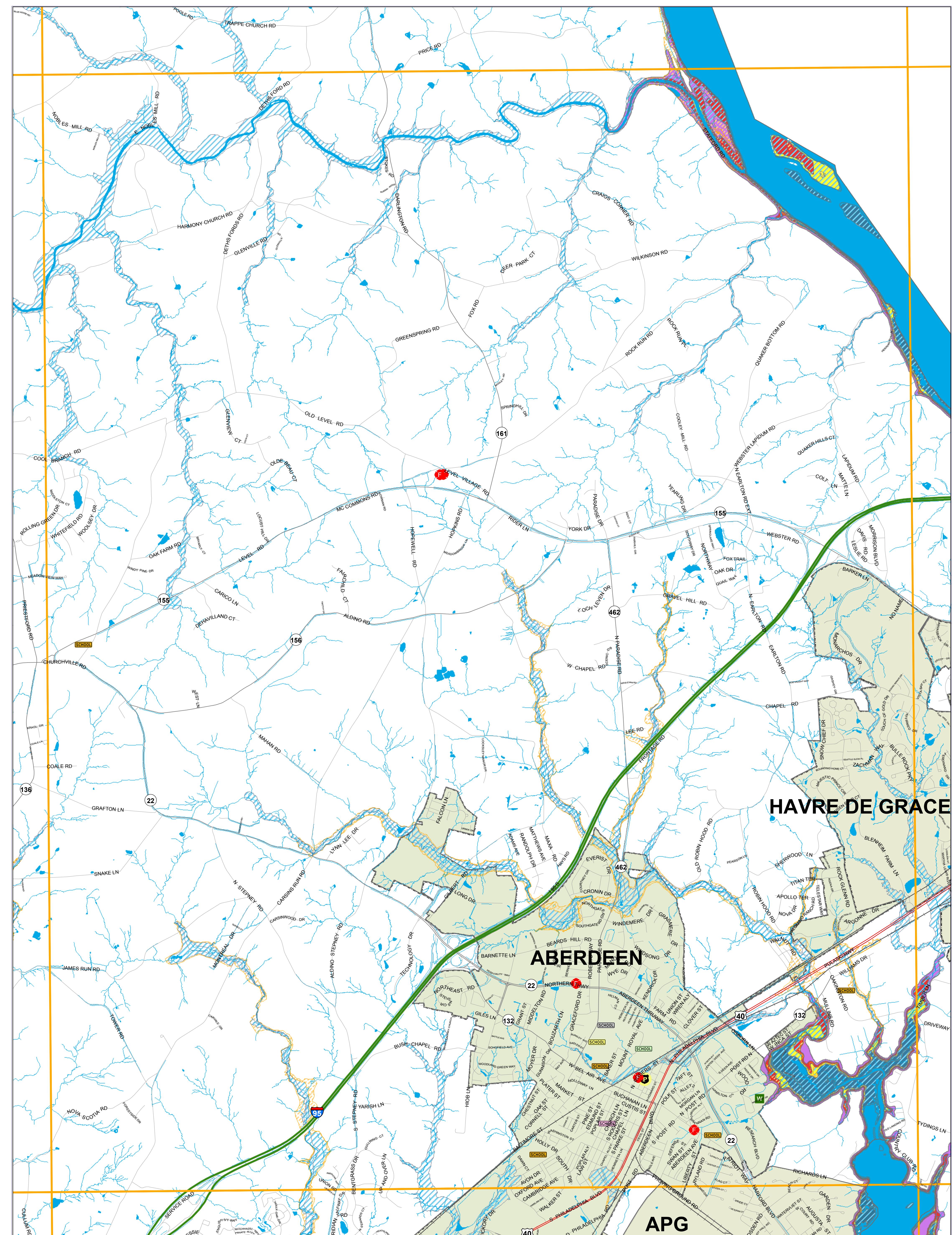
3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	YES	When citizens inquire, within the City's Floodplain Management Webpage, and annual mailings to residents.
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	YES	When citizens inquire. Official map amendments are advertised by newspaper and the City's website.
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	YES	Provide contact information and internet connections.

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APPENDIX H
USGS QUADRANGLE MAPS

INDEX TO USGS QUADRANGLE MAPS





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

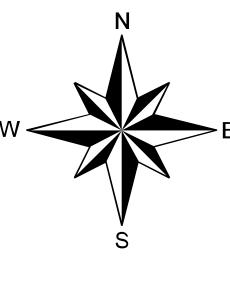
ABERDEEN QUADRANGLE

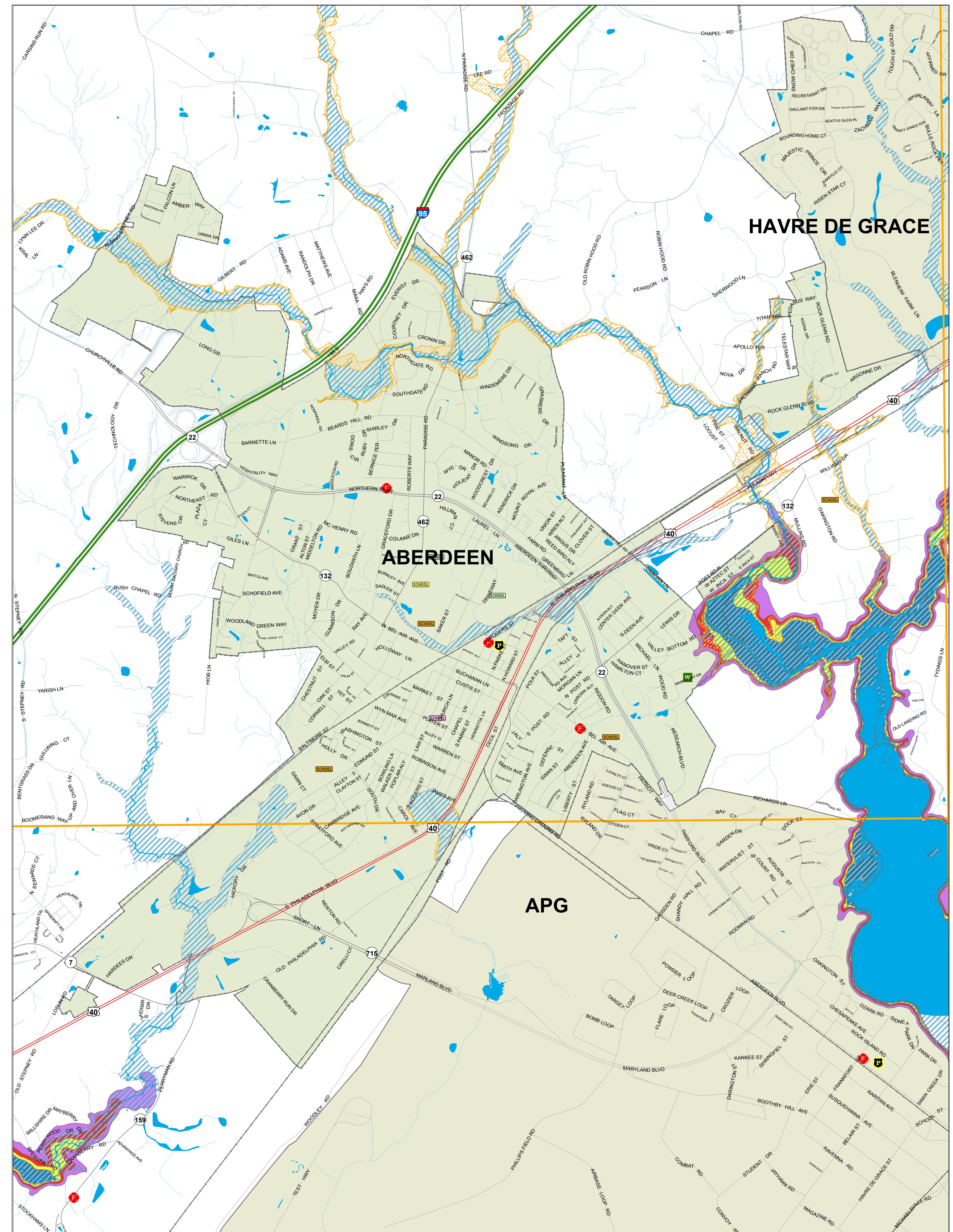
Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid	Streams	Storm Surge Area	Private or Alt Education	F	Fire/Ems Station
ABERDEEN	CANAL/DITCH/LAKE/POND/RESERVOIR	Category 1	SCHOOL	P	Police Depts
BEL AIR	100 Year Floodplain	Category 2	SCHOOL	H	Hospital
HAVRE DE GRACE	500 Year Floodplain	Category 3	SCHOOL	W	Wastewater Treatment Plant
APG		Category 4	SCHOOL	▲	High Hazard Dams
COUNTY					Rail Road
					Miles
				0 0.15 0.3 0.6 0.9 1.2	





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

CITY OF ABERDEEN, MD

**Prepared by Harford County
Depart. of Emergency Services in
cooperation with the Depart. of Planning and Zoning
and US Army Corp of Engineers Data**

April 2022

Legend

Legend:

- Quadrangle Grid
- Streams
- CANAL/DITCH/LAKE/POND/RESERVOIR
- Storm Surge Area
 - Category 1
 - Category 2
 - Category 3
 - Category 4
- Private or Alt Education
 - SCHOOL
 - College
 - Elementary
 - High
 - Middle
 - Elem/Middle
 - Middle High
- Fire/Ems Station
- Police Depts
- Hospital
- Wastewater Treatment Plant
- High Hazard Dams
- Rail Road

FEMA Flood Hazard Data:

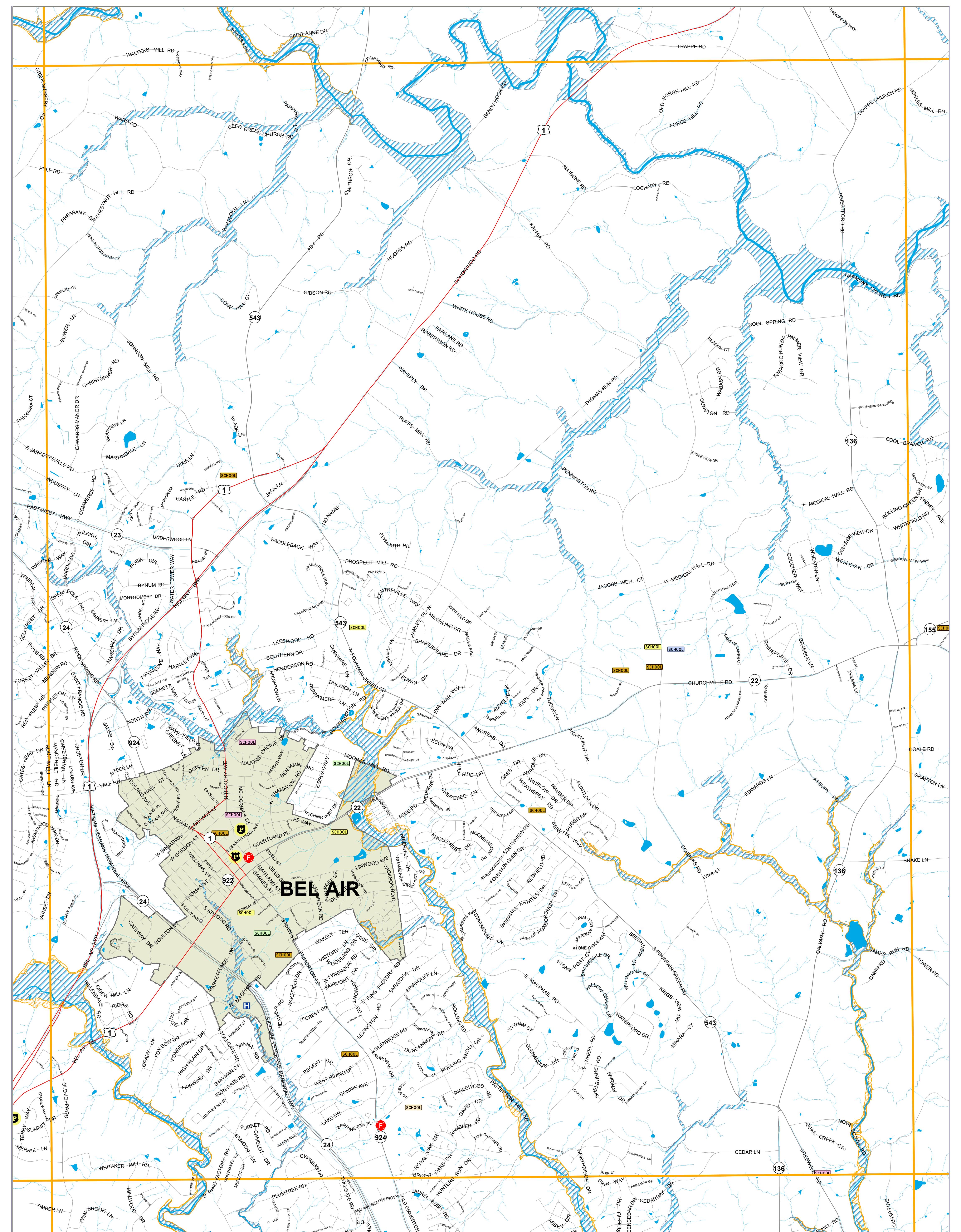
- 100 Year Floodplain
- 500 Year Floodplain

Map Labels:

- ABERDEEN
- BEL AIR
- HAVRE DE GRACE
- APG
- COUNTY

Compass Rose:

Miles Scale: 0 0.1 0.2 0.4 0.6 0.8



FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

BEL AIR QUADRANGLE

Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid

ABERDEEN

BEL AIR

HAVRE DE GRACE

APG

COUNTY

Streams

CANAL/DITCH/LAKE/POND/RESERVOIR

FEMA Flood Hazard Data

100 Year Floodplain

500 Year Floodplain

Storm Surge Area

Category 1

Category 2

Category 3

Category 4

SCHOOL Private or Alt Education

College

Elementary

High

Middle

Elem/Middle

Middle High

F Fire/Ems Station

P Police Deps

H Hospital

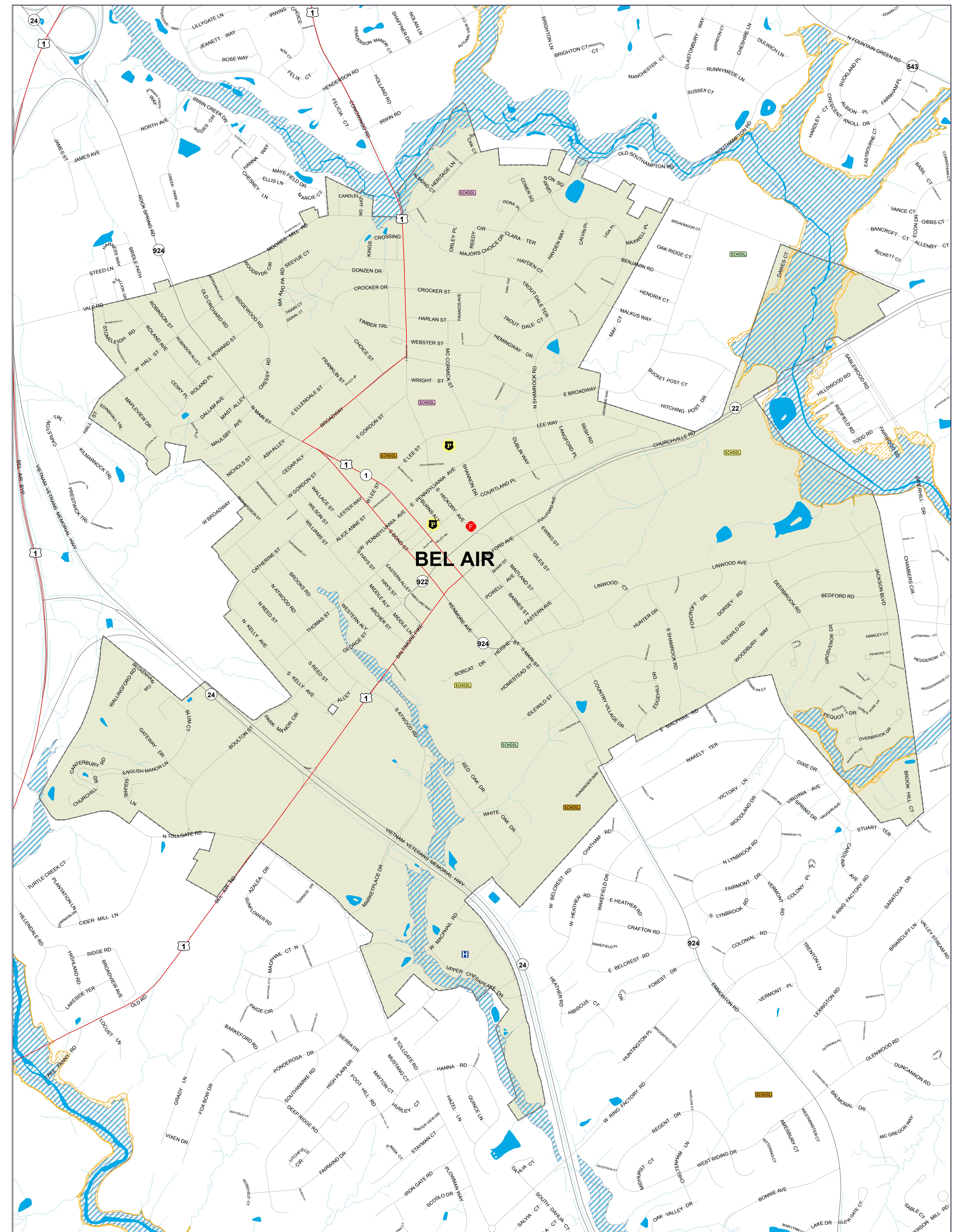
W Wastewater Treatment Plant

▲ High Hazard Dams



Miles

0 0.15 0.3 0.6 0.9 1.2



FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

TOWN OF BEL AIR, MD

Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid

ABERDEEN

BEL AIR

HAVRE DE GRACE

APG

COUNTY

Streams

CANAL/DITCH/LAKE/POND/RESERVOIR

FEMA Flood Hazard Data

100 Year Floodplain

500 Year Floodplain

Storm Surge Area

Category 1

Category 2

Category 3

Category 4

SCHOOL Private or Alt Education

College

Elementary

High

Middle

Elem/Middle

Middle High

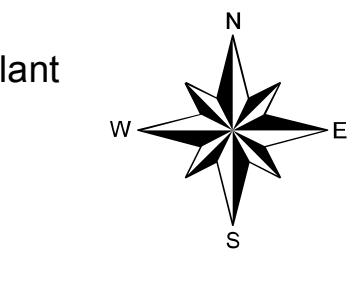
F Fire/Ems Station

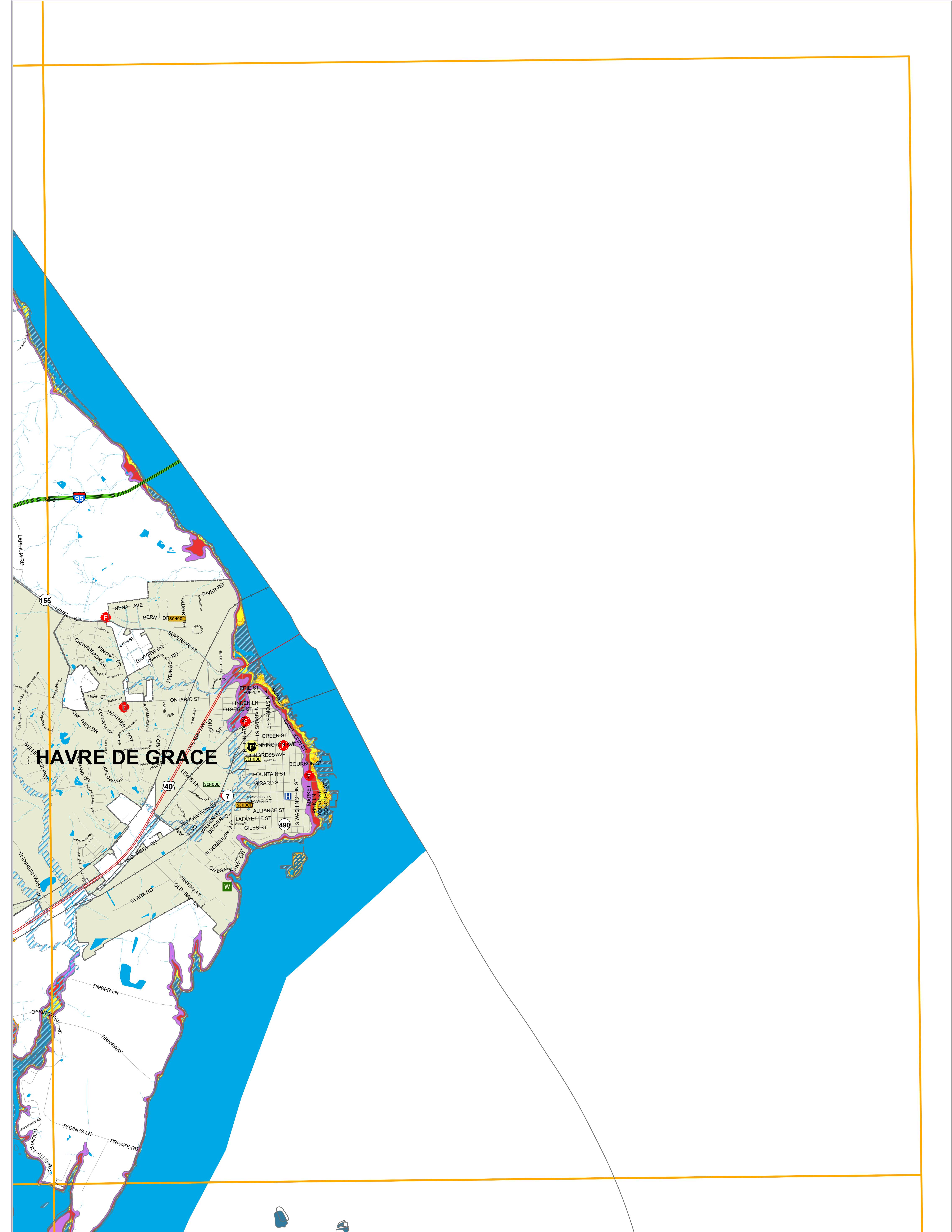
P Police Depts

H Hospital

W Wastewater Treatment Plant

▲ High Hazard Dams





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

HAVRE DE GRACE QUADRANGLE

Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid

ABERDEEN

BEL AIR

HAVRE DE GRACE

APG

COUNTY

Streams

CANAL/DITCH/LAKE/POND/RESERVOIR

FEMA Flood Hazard Data

100 Year Floodplain

500 Year Floodplain

Storm Surge Area

Category 1

Category 2

Category 3

Category 4

SCHOOL Private or Alt Education

SCHOOL College

SCHOOL Elementary

SCHOOL High

SCHOOL Middle

SCHOOL Elem/Middle

SCHOOL Middle High

Fire/Ems Station

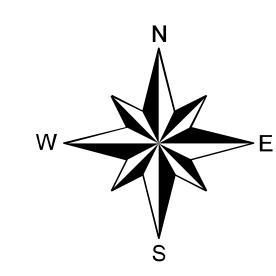
Police Depts

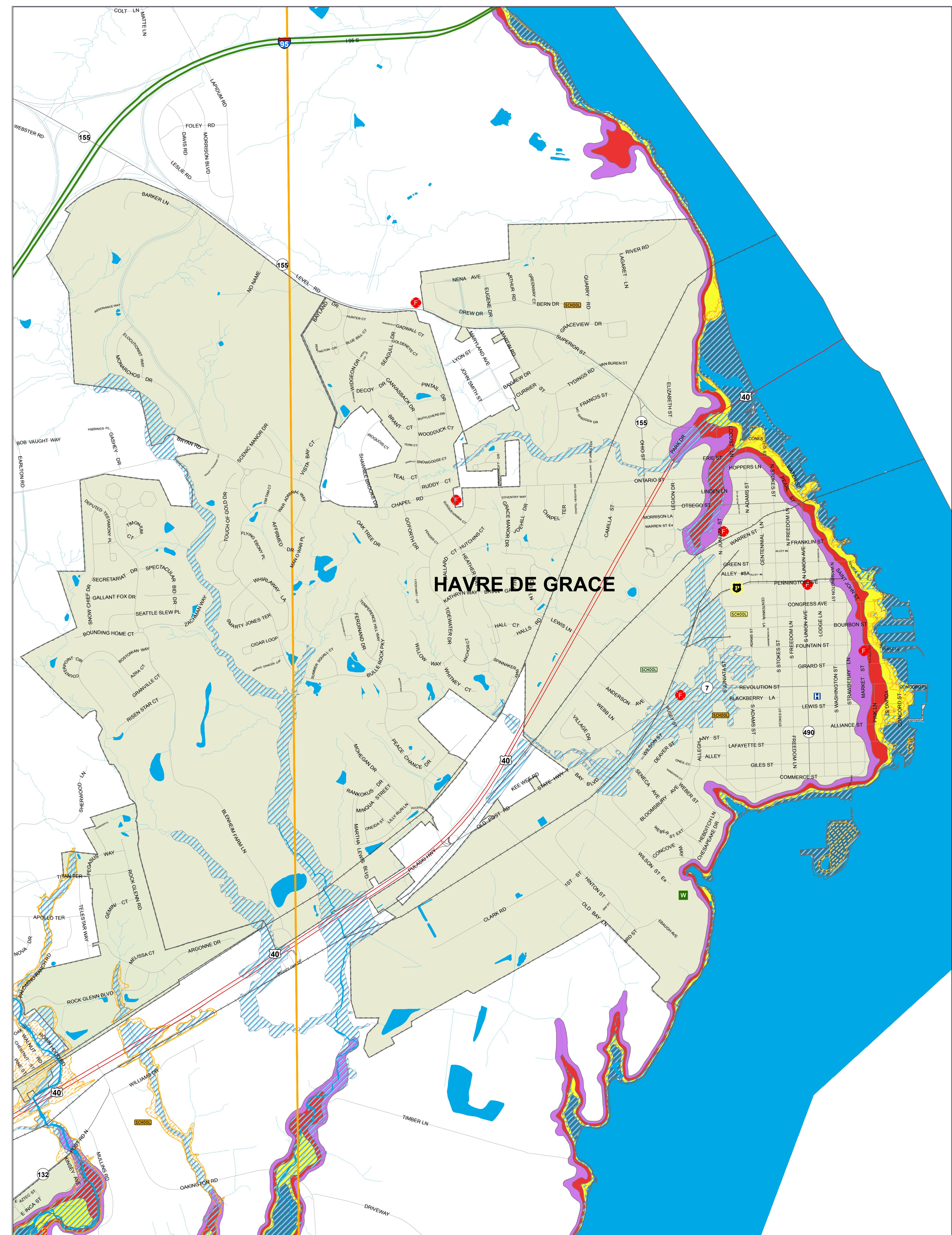
Hospital

Wastewater Treatment Plant

High Hazard Dams

Rail Road





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

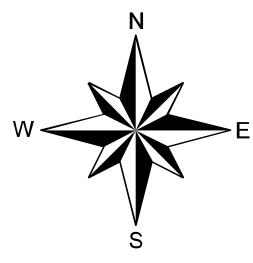
CITY OF HAVRE DE GRACE, MD

Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

	Quadrangle Grid		Streams		Storm Surge Area		Private or Alt Education		Fire/Ems Station
	ABERDEEN		CANAL/DITCH/LAKE/POND/RESERVOIR		Category 1		College		Police Deps
	BEL AIR		100 Year Floodplain		Category 2		Elementary		Hospital
	HAVRE DE GRACE		500 Year Floodplain		Category 3		High		Wastewater Treatment Plant
	APG				Category 4		Middle		High Hazard Dams
	COUNTY				Elem/Middle		Middle High		Rail Road
									0 0.075 0.15 0.3 0.45 0.6 Miles





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

CONOWINGO QUADRANGLE

Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid

ABERDEEN

BEL AIR

HAVRE DE GRACE

APG

COUNTY

Streams

CANAL/DITCH/LAKE/POND/RESERVOIR

FEMA Flood Hazard Data

100 Year Floodplain

500 Year Floodplain

Storm Surge Area

Category 1

Category 2

Category 3

Category 4

SCHOOL Private or Alt Education

SCHOOL College

SCHOOL Elementary

SCHOOL High

SCHOOL Middle

SCHOOL Elem/Middle

SCHOOL Middle High

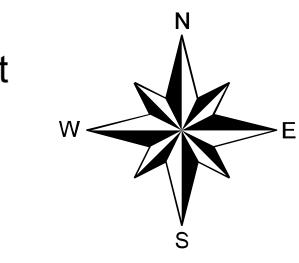
Fire/Ems Station

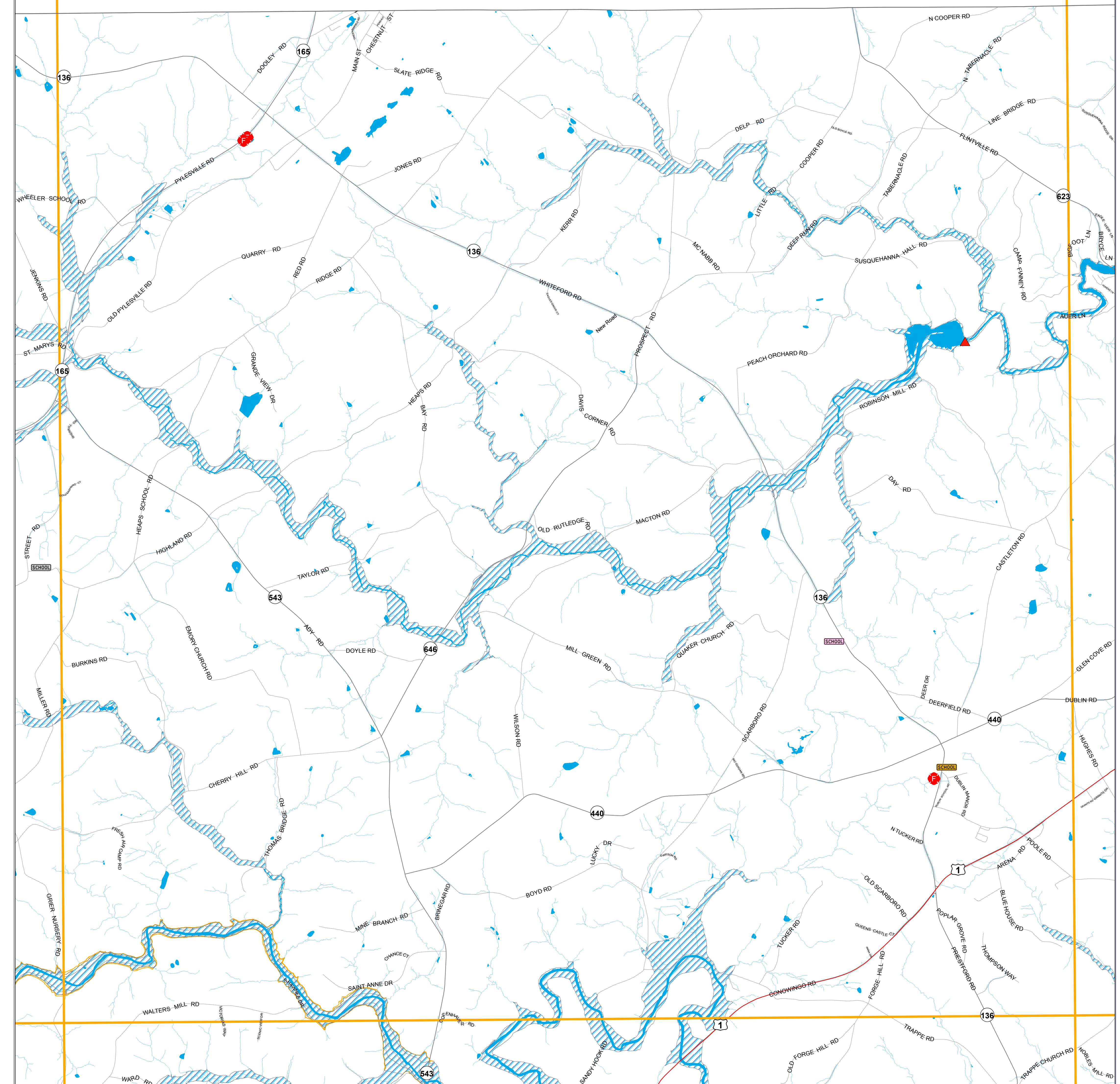
Police Depts

Hospital

Wastewater Treatment Plant

High Hazard Dams





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

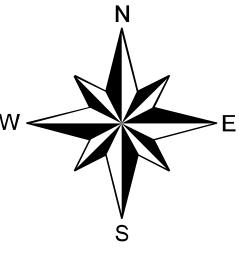
DELTA QUADRANGLE

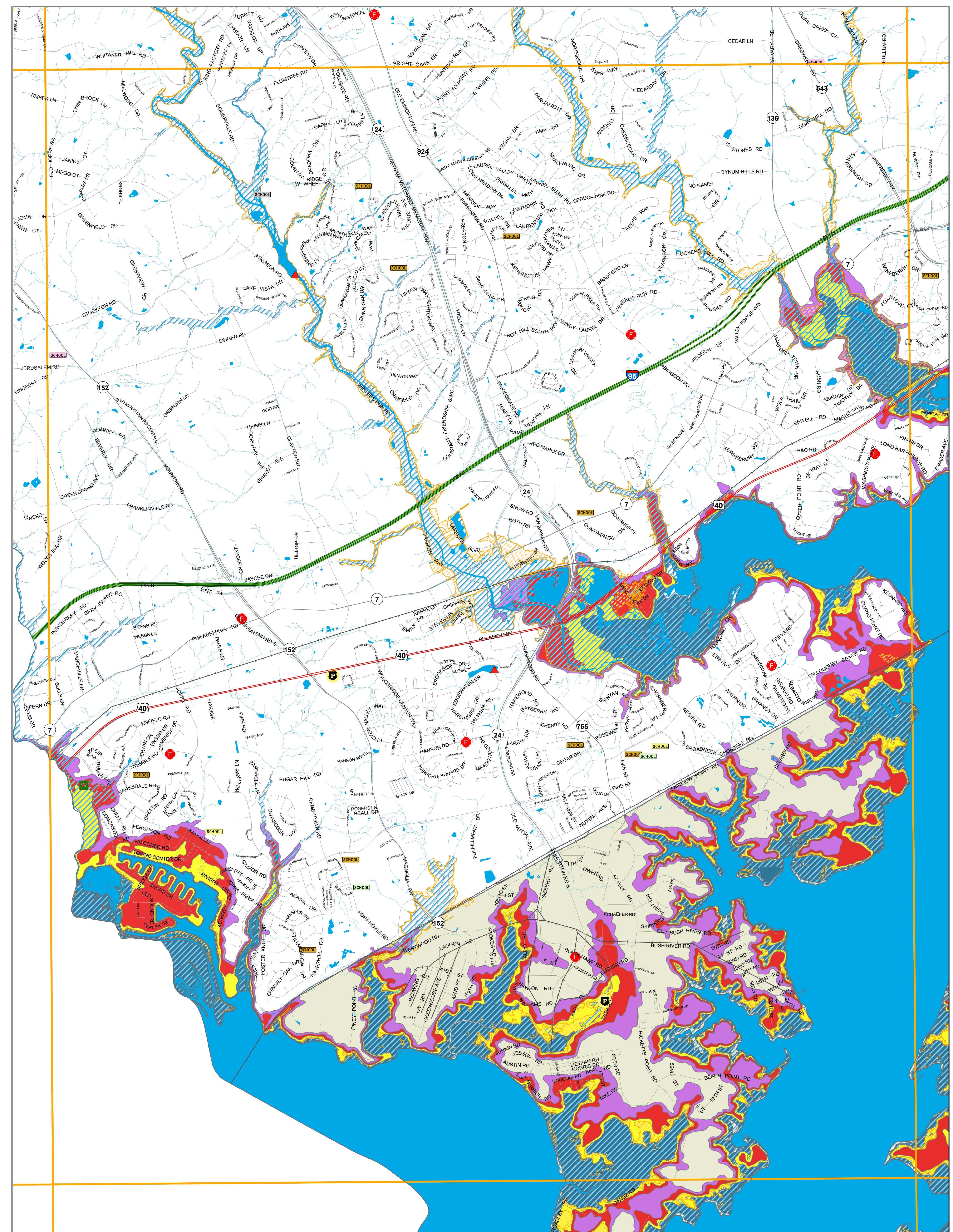
Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid	Streams	Storm Surge Area	Private or Alt Education		Fire/Ems Station	
ABERDEEN	CANAL/DITCH/LAKE/POND/RESERVOIR	Category 1	SCHOOL	College		Police Dep'ts
BEL AIR	100 Year Floodplain	Category 2	SCHOOL	Elementary		Hospital
HAVRE DE GRACE	500 Year Floodplain	Category 3	SCHOOL	High		Wastewater Treatment Plant
APG		Category 4	SCHOOL	Middle		High Hazard Dams
COUNTY			SCHOOL	Elem/Middle		Rail Road
			SCHOOL	Middle High		
					0 0.15 0.3 0.6 0.9 1.2	Miles





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

EDGEWOOD QUADRANGLE

Prepared by Harford County
Dept. of Emergency Services in
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and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid

ABERDEEN

BEL AIR

HAVRE DE GRACE

APG

COUNTY

Streams

CANAL/DITCH/LAKE/POND/RESERVOIR

FEMA Flood Hazard Data

100 Year Floodplain

500 Year Floodplain

Storm Surge Area

Category 1

Category 2

Category 3

Category 4

SCHOOL Private or Alt Education

SCHOOL College

SCHOOL Elementary

SCHOOL High

SCHOOL Middle

SCHOOL Elem/Middle

SCHOOL Middle High

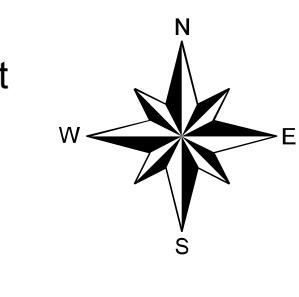
F Fire/Ems Station

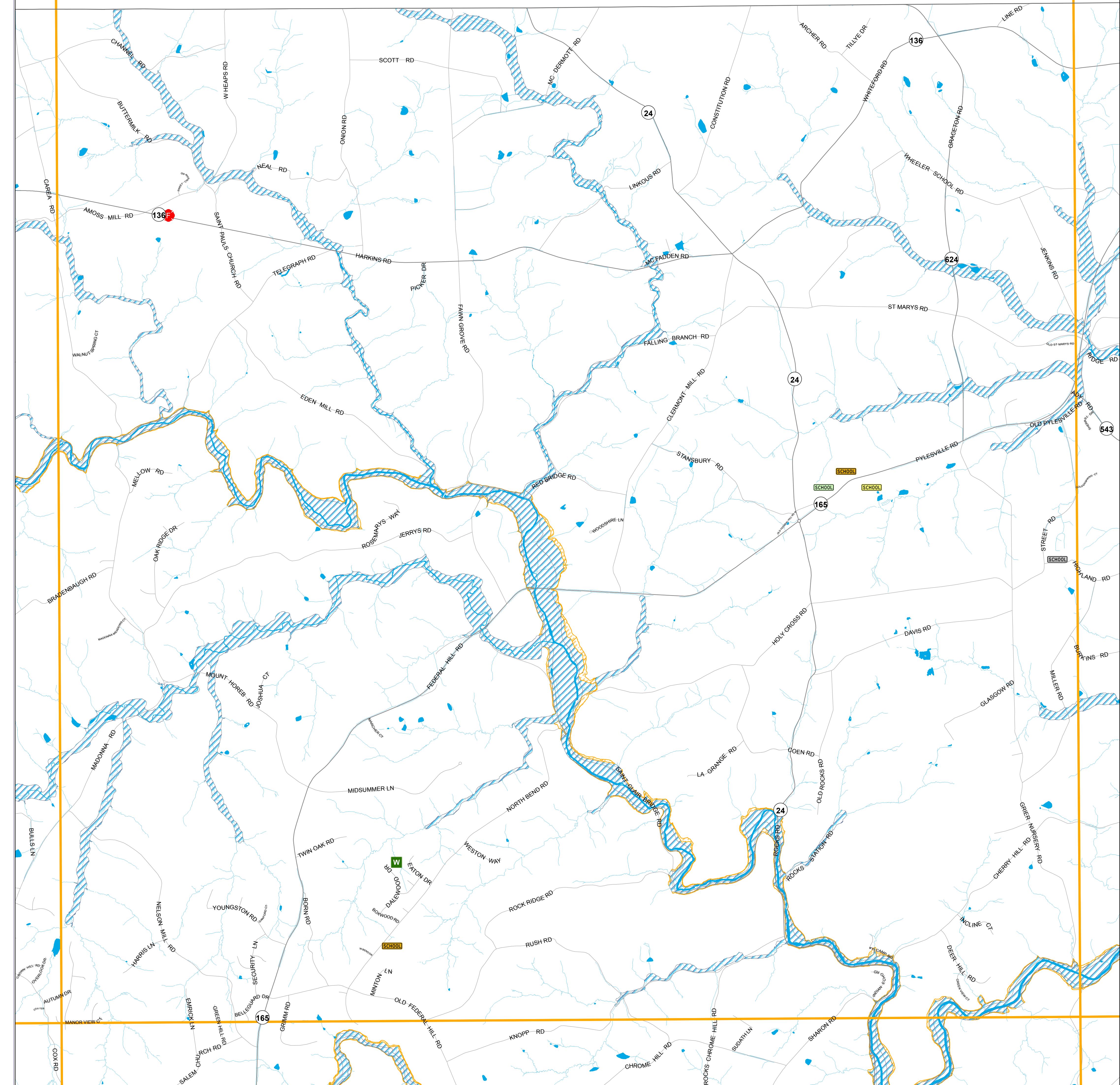
P Police Depts

H Hospital

W Wastewater Treatment Plant

▲ High Hazard Dams





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

FAWN GROVE QUADRANGLE

Prepared by Harford County
Dept. of Emergency Services in
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April 2022

Legend

Quadrangle Grid

ABERDEEN

BEL AIR

HAVRE DE GRACE

APG

COUNTY

Streams

CANAL/DITCH/LAKE/POND/RESERVOIR

FEMA Flood Hazard Data

100 Year Floodplain

500 Year Floodplain

Storm Surge Area

Category 1

Category 2

Category 3

Category 4

SCHOOL Private or Alt Education

SCHOOL College

SCHOOL Elementary

SCHOOL High

SCHOOL Middle

SCHOOL Elem/Middle

SCHOOL Middle High

F Fire/Ems Station

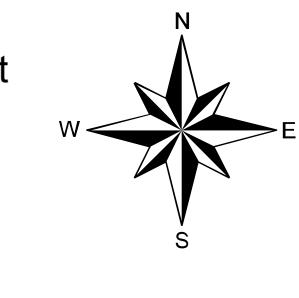
P Police Depts

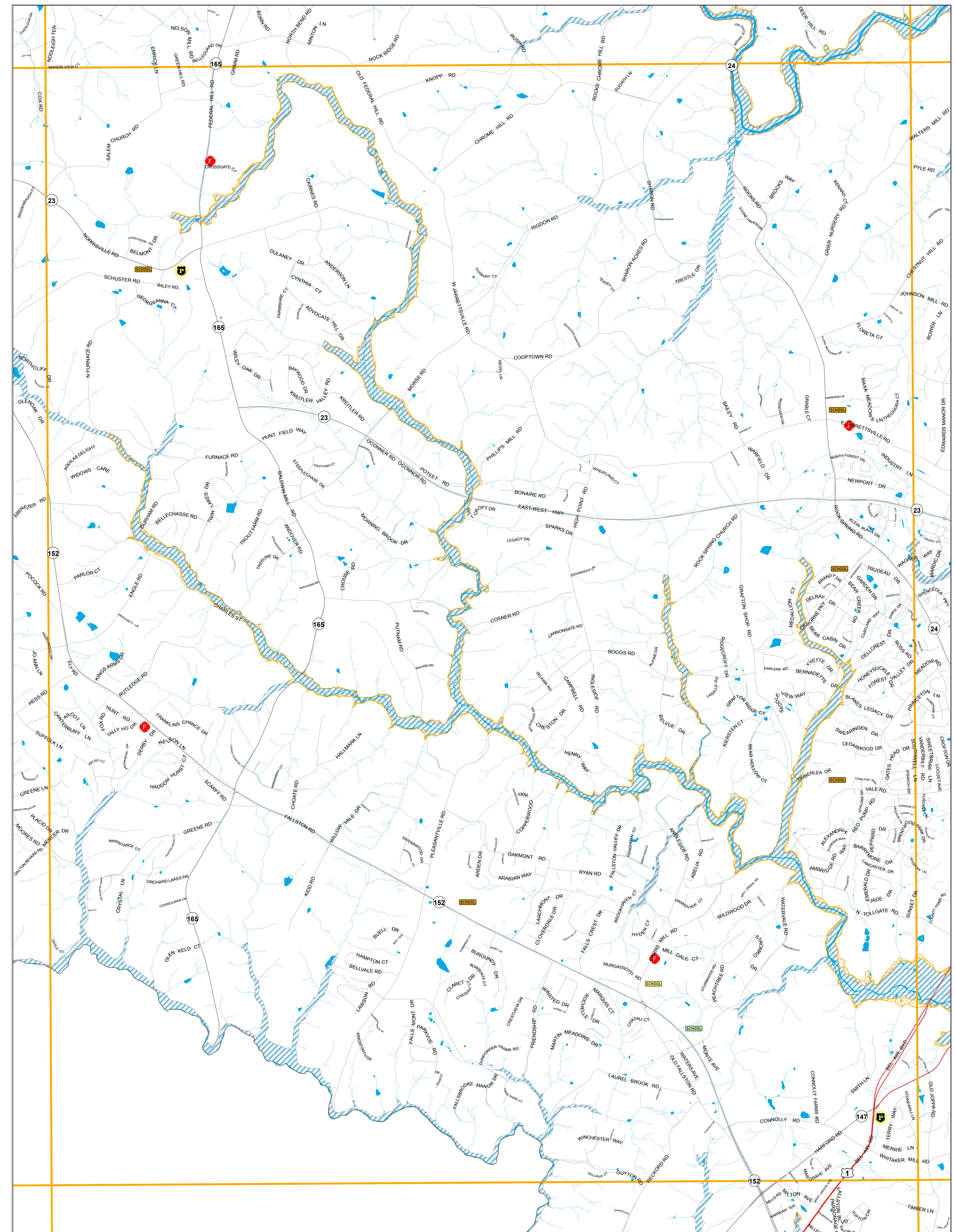
H Hospital

W Wastewater Treatment Plant

▲ High Hazard Dams

— Rail Road





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

JARRETTSVILLE QUADRANGLE

Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid

ABERDEEN

BEL AIR

HAVRE DE GRACE

APG

COUNTY

Streams

CANAL/DITCH/LAKE/POND/RESERVOIR

FEMA Flood Hazard Data

100 Year Floodplain

500 Year Floodplain

Storm Surge Area

Category 1

Category 2

Category 3

Category 4

SCHOOL Private or Alt Education

College

Elementary

High

Middle

Elem/Middle

Middle High

F Fire/Ems Station

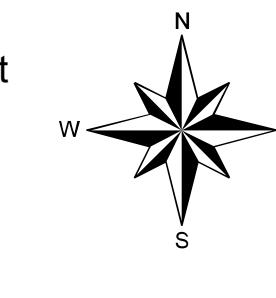
P Police Depts

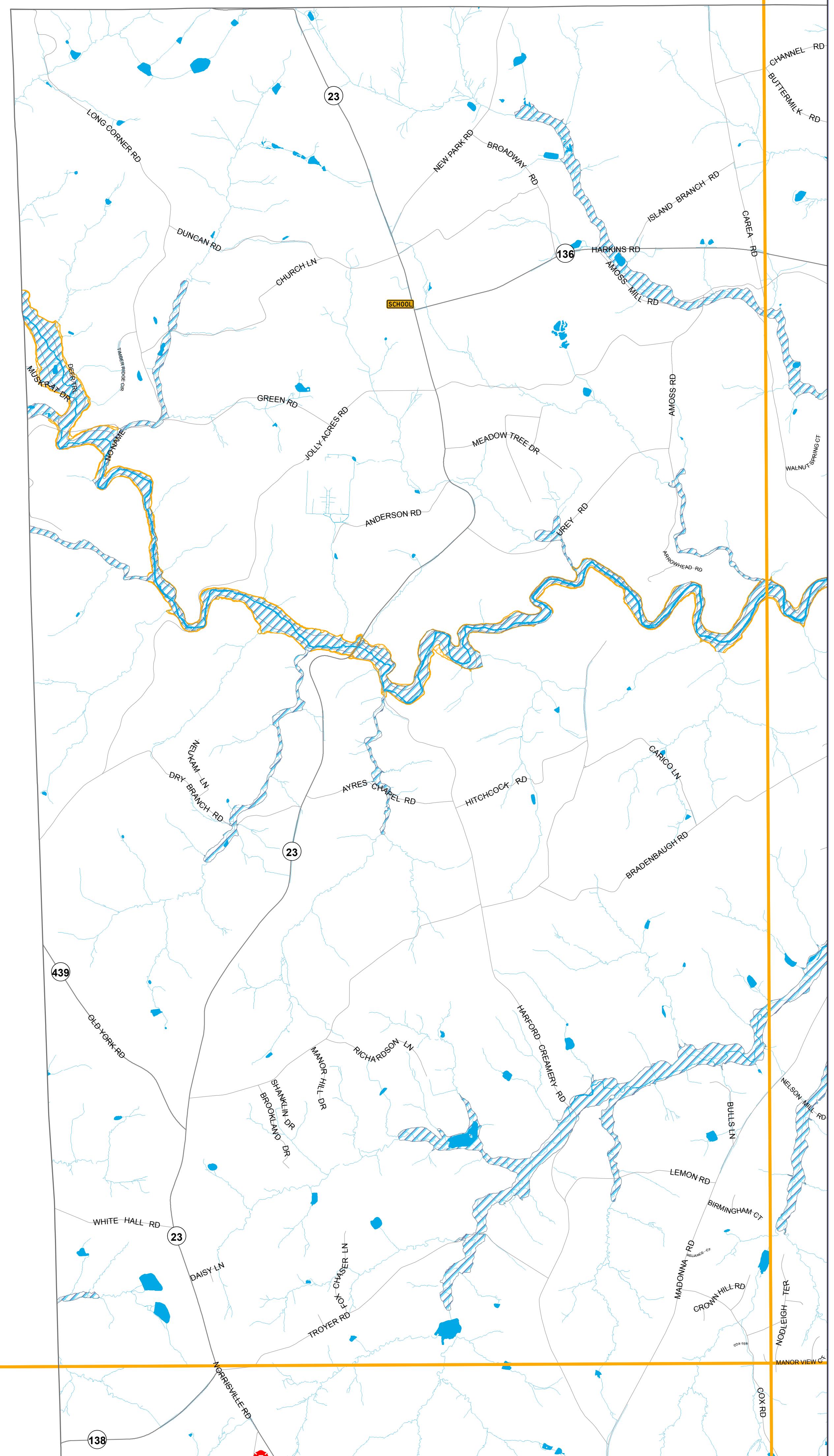
H Hospital

W Wastewater Treatment Plant

▲ High Hazard Dams

— Rail Road





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

NORRISVILLE QUADRANGLE

Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid

ABERDEEN

BEL AIR

HAVRE DE GRACE

APG

COUNTY

Streams

CANAL/DITCH/LAKE/POND/RESERVOIR

FEMA Flood Hazard Data

100 Year Floodplain

500 Year Floodplain

Storm Surge Area

Category 1

Category 2

Category 3

Category 4

SCHOOL Private or Alt Education

College

Elementary

High

Middle

Elem/Middle

Middle High

F Fire/Ems Station

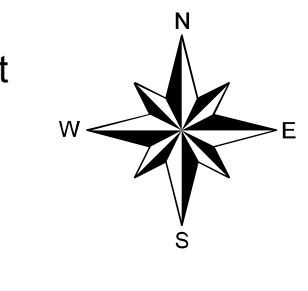
P Police Depts

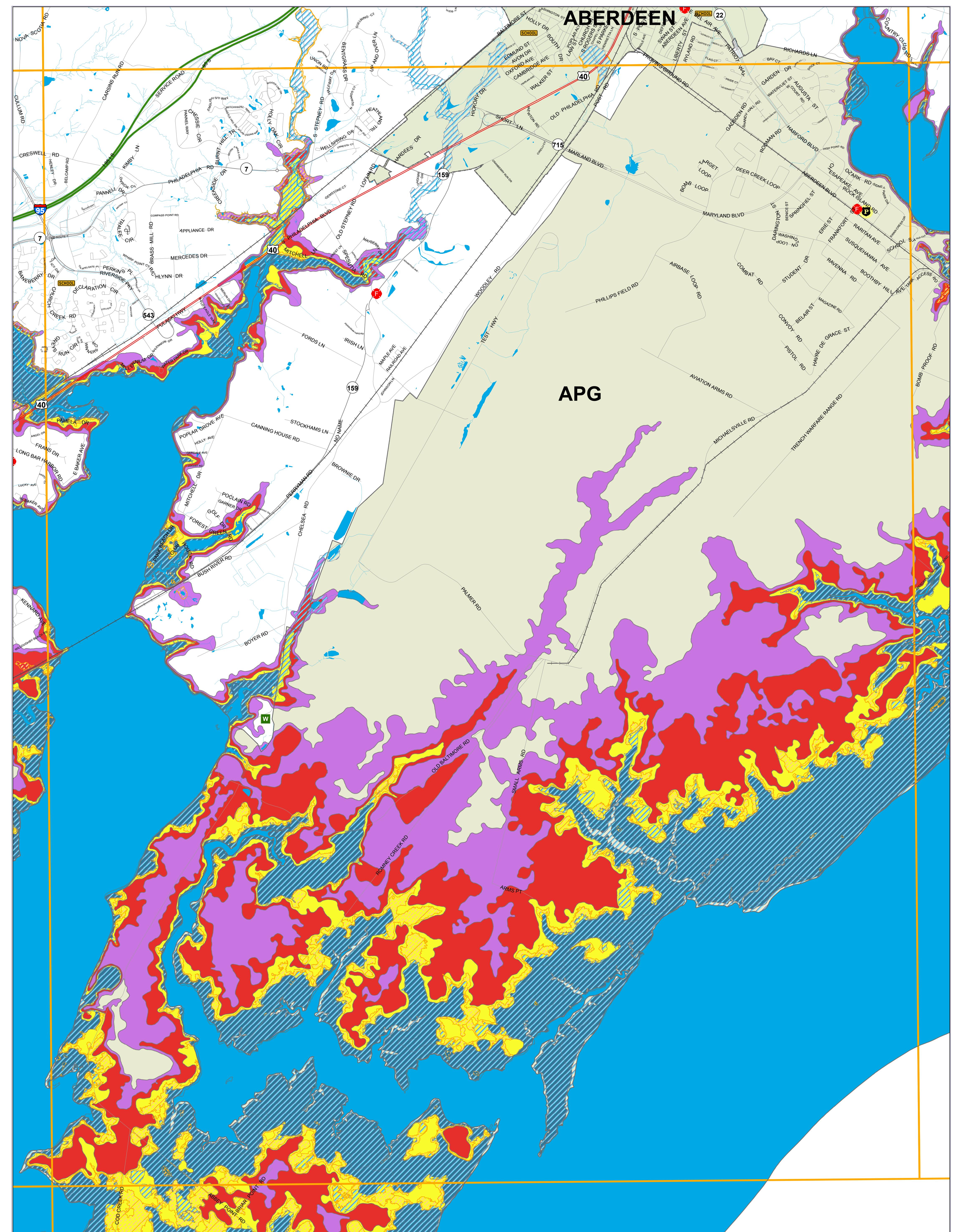
H Hospital

W Wastewater Treatment Plant

▲ High Hazard Dams

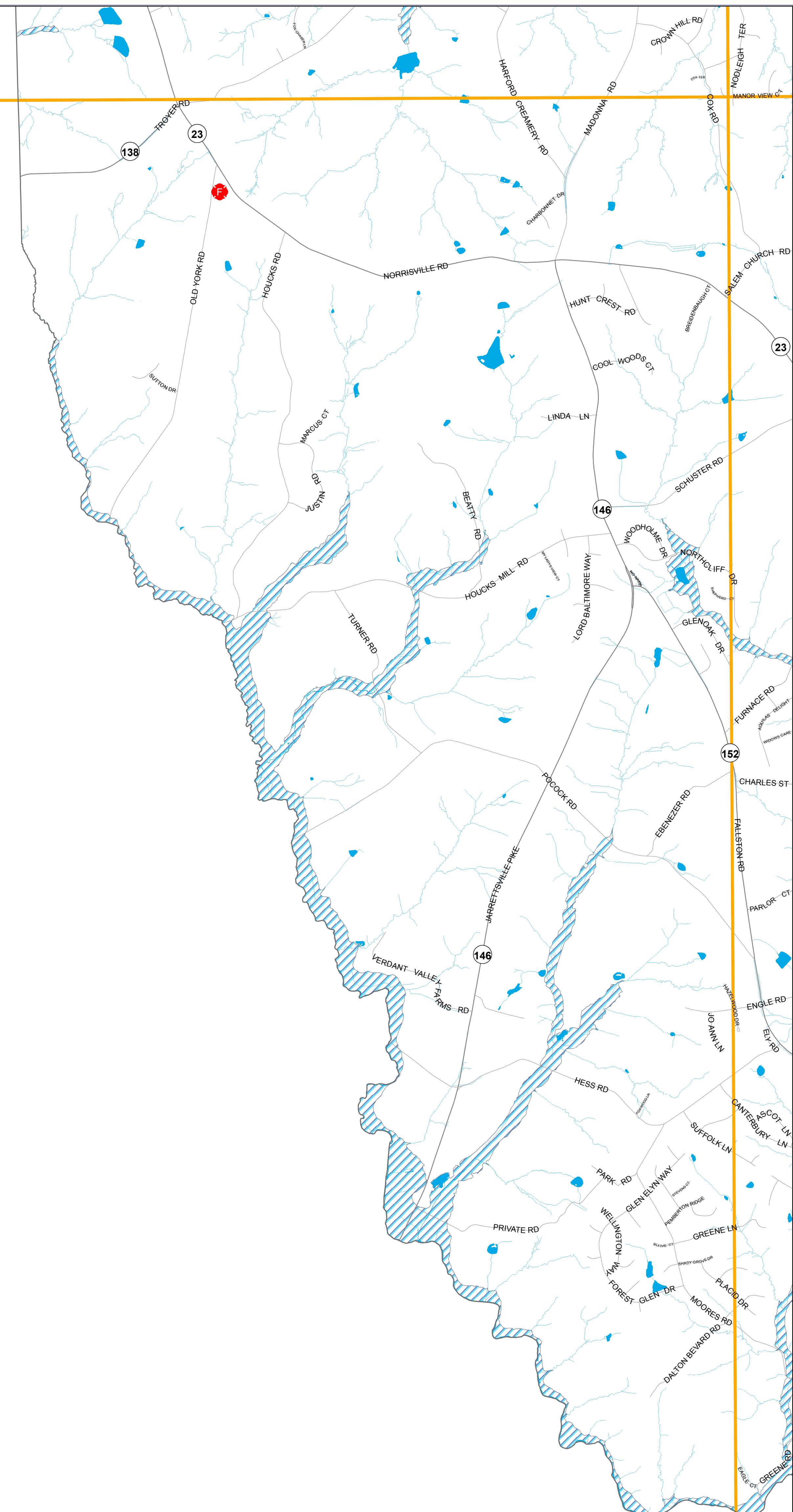
— Rail Road





Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022



FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

PHOENIX QUADRANGLE

Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid

ABERDEEN

BEL AIR

HAVRE DE GRACE

APG

COUNTY

Streams

CANAL/DITCH/LAKE/POND/RESERVOIR

100 Year Floodplain

500 Year Floodplain

Storm Surge Area

Category 1

Category 2

Category 3

Category 4

SCHOOL Private or Alt Education

College

Elementary

High

Middle

Elem/Middle

Middle High

F Fire/Ems Station

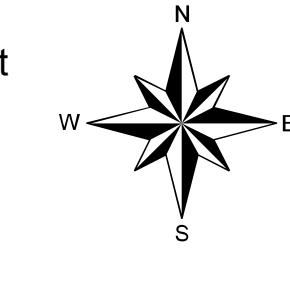
P Police Depts

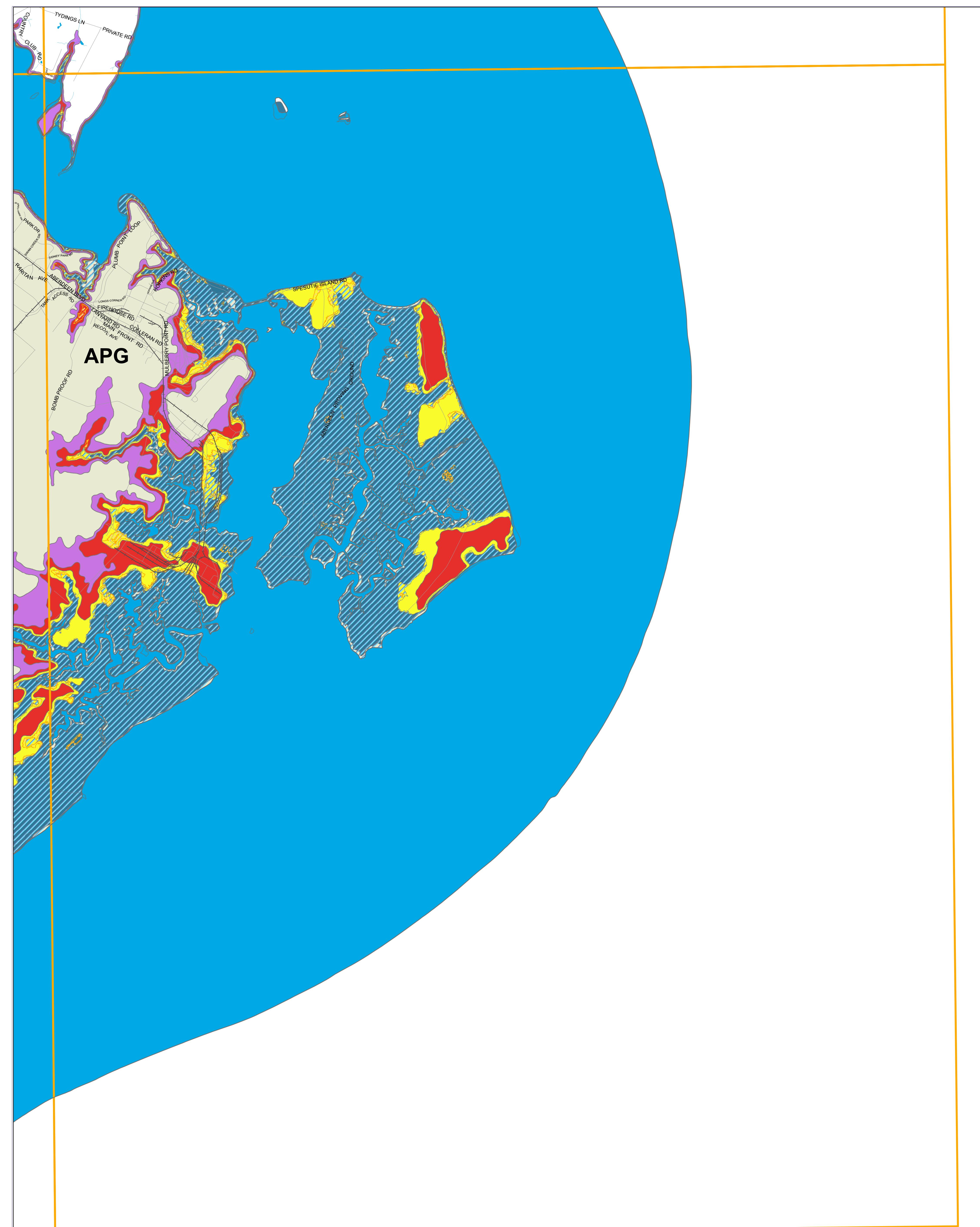
H Hospital

W Wastewater Treatment Plant

High Hazard Dams

Rail Road





FLOOD PRONE AREAS HARFORD COUNTY, MARYLAND

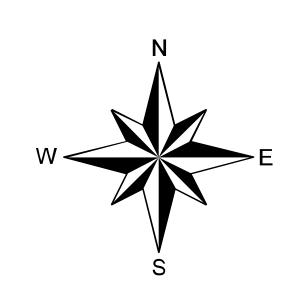
SPESUTIE QUADRANGLE

Prepared by Harford County
Dept. of Emergency Services in
cooperation with the Dept. of Planning and Zoning
and US Army Corp of Engineers Data

April 2022

Legend

Quadrangle Grid	Streams	Storm Surge Area	Private or Alt Education	Fire/Ems Station
ABERDEEN	CANAL/DITCH/LAKE/POND/RESERVOIR	Category 1	SCHOOL	College
BEL AIR	100 Year Floodplain	Category 2	SCHOOL	Elementary
HAVRE DE GRACE	500 Year Floodplain	Category 3	SCHOOL	High
APG		Category 4	SCHOOL	Middle
COUNTY			SCHOOL	Elem/Middle
			SCHOOL	Middle High
				Rail Road
				0 0.15 0.3 0.6 0.9 1.2 Miles



One Independence Mall
615 Chestnut Street, 6th floor
Philadelphia, PA 19106-4404



FEMA

August 4, 2022

Caitlin Whiteleather
State Hazard Mitigation Officer
Maryland Department of Emergency Management
5401 Rue Saint Lo Drive
Reisterstown, Maryland 21136

Dear Caitlin Whiteleather:

FEMA has reviewed the Harford County Hazard Mitigation Plan (HMP), based on the standards in Title 44 of the Code of Federal Regulations, Part 201. The items reviewed address the planning process, hazard identification and risk assessment, mitigation strategies and plan maintenance.

The plan received a “satisfactory” rating on all required criteria. It is now approvable pending adoption. Prior to formal approval, each jurisdiction participating in the Harford County HMP must provide FEMA with a resolution of adoption.

We commend you for your continued commitment to reducing future disaster losses. If you have questions, please contact me at (215) 931-5532.

Sincerely,

A handwritten signature in black ink, appearing to read "Sarah Wolfe".

Sarah Wolfe, Branch Chief
Floodplain Management and Insurance Branch
FEMA Region 3

Enclosure

cc: Caitlin Whiteleather, State Hazard Mitigation Officer, MDEM
Sara Bender, Disaster Risk Reduction Directorate, Director, MDEM
Jesse Delph, Project Support Officer, MDEM
Linda J. Ploener, Manager, Harford County Department of Emergency Services
Matt Kropp, Planner, Long Range Planning, Harford County Department of Emergency Services
Richard Ayers, Deputy Director/Emergency Manager, Harford County Department of Emergency Services
Jenny Jarkowski, Planning & Zoning Director, Harford County Department of Emergency Services

Local Mitigation Plan Review Tool Annex

Recommendations for Improvement



FEMA Region III

Jurisdiction:	Title of Plan:	Date of Plan:
Harford County	Harford County Hazard Mitigation Plan	2022

Element A: Planning Process

	<input type="checkbox"/> Promote open and inclusive public awareness of the Hazard Mitigation Plan and seek public comment by utilizing new (or the most salient) social media and online outreach platforms/opportunities.
	<input type="checkbox"/> Continue to expand the planning team to include a broad range of stakeholders such as watershed organizations, business owners, regional planning councils, dam owners, conservation districts, academia, utility providers, and other partners that can assist with mitigation implementation and community outreach.
	<input type="checkbox"/> Consider enhancing or expanding engagement with local media to help increase public awareness and participation.
	<input type="checkbox"/> Refine the executive summary by adding the HMP goals and a color-coded table or list summarizing the hazards profiled in the HMP (including Harford County's risk prioritization ranking for each hazard). For an example, refer here: 2022-Frederick-County-Hazard-Mitigation-and-Climate-Adaptation-Plan---for-Adoption (frederickcountymd.gov) .
	<input type="checkbox"/> During the next Harford County HMP planning process, develop a list of mitigation action prioritization questions to pose to plan participants throughout the planning process and include documentation demonstrating that the submitted feedback informed the content of the HMP. Refer to Table 7.2 of the 2022 Frederick County Hazard Mitigation and Climate Adaptation Plan for an example of detailed and clearly explained mitigation action prioritization criteria.
	<input type="checkbox"/> Integrate and incorporate the mitigation strategy into existing local planning mechanisms and provide documentation about how this was done. Utilize the document 'Plan Integration: Linking Local Planning Efforts' to step through the process of connecting local planning mechanisms. The mitigation strategy should be incorporated into the local comprehensive Plan in a way that informs land use and future development.

Element B: Hazard Identification and Risk Assessment

<input type="checkbox"/>	Digitize all hard copy maps integrated into the HMP, then add building footprints to the USGS quadrangle maps (which currently include select point locations for critical infrastructure, the 500-year flood zone 100-year flood zone) in order to provide a higher resolution understanding of hazard exposure (potential losses) and jurisdiction specific-vulnerabilities.
--------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Local Mitigation Plan Review Tool Annex

Recommendations for Improvement



FEMA Region III



	<input type="checkbox"/> FEMA's community lifelines concept has not be integrated into the HMP. Consider addressing this through a future plan amendment or during the next HMP update.
	<input type="checkbox"/> In the next Plan update or amendment, base the building stock loss estimates on the latest Census data.
	<input type="checkbox"/> Compare National Flood Insurance Program (NFIP) Insurance Policies in Force with insurable structures in the Special Flood Hazard Area (SFHA) for analysis of flood insurance coverage.
	<input type="checkbox"/> Identify historic properties and/or cultural resources being incorporated into the Plan. Include a list of team members and stakeholders who participated in the planning process; the results of the risk assessment and loss estimation; mitigation goals and objectives aimed at reducing or avoiding the effects of natural and manmade hazards; mitigation actions that will help the Tribe, State, region, or community accomplish the established goals and objectives; and implementation strategies that detail how the mitigation actions will be executed.
	<input type="checkbox"/> Incorporate and document new data obtained and/or developed into the next Plan update. Vulnerable structure data (i.e., lowest floor elevation, value, building materials) and other similar information can be used for mitigation grant applications. Be sure to document differing data sets (i.e. TEIF vs. HAZUS).
	<input type="checkbox"/> Consider using Non-Regulatory Flood Risk products (NRFRP) to establish opportunities for discussion with local officials to attain a greater understanding of specific structure's vulnerabilities within the planning area and potential mitigation opportunities.
	<input type="checkbox"/> Identify gaps or inaccuracies in existing data (i.e., such as natural hazards data, GIS mapping, and research on successful risk reduction methods) and develop mitigation actions to fill those gaps. Public agencies, such as regional planning agencies, geological surveys, forestry divisions, emergency management offices, dam safety agencies, and weather service offices, at the regional, State, and Federal government levels are key resources for data and technical information. Online resources, such as the National Climatic Data Center (part of NOAA), are also useful sources for hazard-related data.
	<input type="checkbox"/> Include more detailed references information throughout the HMP. For instance, page 45 states "Crop losses were estimated at \$6,000,000 for 2001 – 2002 (Farm Service Agency production losses)." Consider including footnotes that provide direct links to sources. Moreover, update figures to include the data source/citation associated with the information displayed. For instance, add a date for the data in Table 1.
	<input type="checkbox"/> Continue to assess the potential impacts of future conditions, such as changes in population, land use, weather, and natural disaster frequency and severity. In the next update include a more detailed discussion and additional maps overlaying projected development against areas of heightened hazard risk (for all hazards profiled within the HMP).

Local Mitigation Plan Review Tool Annex

Recommendations for Improvement



FEMA Region III

<input type="checkbox"/>	Consider profiling additional hazards based on the State Hazard Mitigation Plan or other identified risks.
Element C: Mitigation Strategy	
	<input type="checkbox"/> Include detailed information on how each community manages the NFIP to ensure compliance with the local floodplain ordinance utilizing the Region 3 developed NFIP capability worksheets here . Each floodplain manager should complete the NFIP Survey to identify how their communities are continuing to comply with floodplain requirements and regulations.
	<input type="checkbox"/> Additional narrative analysis (gaps and strengths) for each jurisdiction's capabilities should be included in the next HMP update and/or amendment. For the next HMP update, utilize FEMA Region 3's Hazard Mitigation Plan Guidance: Community Capability Assessment Worksheet (fema.gov) and Checking In On The NFIP (fema.gov) to collect and help analyze jurisdiction specific capabilities information throughout the planning process.
	<input type="checkbox"/> Provide specific information about why mitigation actions could not be completed (funding, staffing, political, etc.) to help document barriers or obstacles to successful implementation.
	<input type="checkbox"/> Include addition information within the HMP describing the mitigation actions listed and prioritized in Appendix F. Additional information should include a scope of work description that addresses key project details (who, what, where, when, and how), project costs that consider sources of non-federal match funds, information conveying which community lifeline(s) would be mitigated by each action, the goals addressed by the respective action (understanding that some actions can address multiple goals), the lead agency, partner agencies, sources of data for the respective action, and any additional project-specific information that provides a clear picture of how risk will be or is being mitigated.
	<p>For examples, refer to the Mitigation Action Portfolio (MAP) and mitigation action profiles included in Chapter 7 of the 2022 Frederick County Hazard Mitigation and Climate Adaptability Plan here: 2022 Frederick County Hazard Mitigation and Climate Adaptation Plan.</p>

Local Mitigation Plan Review Tool Annex

Recommendations for Improvement



FEMA Region III

Element D: Plan Review, Evaluation, and Implementation

	<input type="checkbox"/> Utilize the 5-Year Planning Wheel, which reflects the continuous development, implementation and enhancement of your Hazard Mitigation Plan. <input type="checkbox"/> Submit annual progress reviews and plan discussion to state and FEMA
	<input type="checkbox"/> All Dam Risk: During the next HMP update or amendment, add information to the Plan further describing the potential cascading impacts of seismic events, wildfires, and other hazards profiled within in the Plan that affect the risks and vulnerabilities from at least eligible HHPDs. Consider adding this recommended information to the Dam and Levee Failure Vulnerability Summary narrative in Chapter 5. NOTE: Address all required and recommended HHPD items included in the final FEMA issued Plan Review Tool (PRT).



Local Mitigation Plan Review Tool Annex

Recommendations for Improvement



FEMA Region III

	<p>All Dam Risk: One local dam owner (Harford County) and no Maryland Department of the Environment (MDE) Division of Dam Safety staff participated in the Hazard Mitigation Planning process. Consider inviting them to participate in the planning process. Examples would include adding a mitigation action for a specific dam if they are interested in potentially applying for the HHPD grant program, working with them to understand the downstream risk from dams, or having them comment on the final draft plan.</p>	
	<p><input type="checkbox"/> For the next update (ideally 3 years before the expiration of this HMP once it has been adopted and FEMA approved), submit a Hazard Mitigation Assistance (HMA) subapplication to MDEM to help bolster your hazard mitigation planning outreach and plan development efforts. FEMA Region 3 and MDEM staff can provide technical assistance to help Harford County develop an effective planning grant scope of work and grant subapplication. Keep in mind that the new State and Local Mitigation Planning Policies fully take effect on 4/19/2023 and the support of an experienced plan developer could help ensure that Harford County addresses all applicable HMP requirements while building on the momentum established by this HMP update. For more information regarding the policy updates, refer here: Mitigation Planning Policy Updates FEMA.gov.</p>	

LOCAL MITIGATION PLAN REVIEW TOOL +HHPD

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: HARFORD COUNTY, MARYLAND	Title of Plan: The 2022 Harford County Hazard Mitigation Plan	Date of Plan: April 2022
Local Point of Contact: Linda J. Ploener	Address: Harford County Department of Emergency Services 2220 Ady Road Forest Hill, Maryland 21050	
Title: Manager, Preparedness and Planning Branch		
Agency: Harford County Department of Emergency Services		
Phone Number: 410-638-4029 (office) 410-808-6986 (cell)	E-Mail: ljploener@harfordpublicsafety.org	
FEMA Reviewer: Casey Garnett Joshua Norris	Title: WV FIT, Hazard Mitigation Planner MD FIT, Hazard Mitigation Planner	Date: 3/17/2022 (Courtesy Review) 7/5/2022 (Official Review) 8/4/2022 (Official Review)
Date Received in FEMA Region (insert #)	Submission 1 (Courtesy Review): 2/25/2022 Submission 1 (Official Review): 6/9/2022 Submission 2 (Official Review): 8/1/2022	

Plan Not Approved	
Plan Approvable Pending Adoption	Required revisions addressed.
Plan Approved	

SECTION 1: REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST	Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR § 201.6 Local Mitigation Plans)			
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	III.A., pgs 27-30, III.B., pgs. 30-31, Appendix B	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	I.C., pgs 18-19, Appendix B	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	III.A., pgs 27-30, III.B., pgs 30-31, Appendix B	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	IV.A., pgs 31-35, IV.B., pg 35, IV.C., pgs 36-79	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Executive Summary, pgs 15-16, III.A., pgs 27-30 III.B., pgs 30-31	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating, and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	III.A., pgs 27-30, III.B., pgs 30-31, VII., pgs 108-110	X	

ELEMENT A:**REQUIRED REVISIONS**

A1. Meetings regarding the plan update were held with three standing committees (EAB, PAB, and LEPC). The plan states “additional information on each of these committees, along with copies of meeting notices, agendas, and sign-in sheets, are presented in Appendix B”. This draft did not include this information in Appendix B. In particular, note that we will need to know not just the current membership of these committees, but who actually attended the planning meetings. Keep in mind that for a jurisdiction to be considered participating in a multi-jurisdictional HMP, the plan must include at least 2 documented contributions from the jurisdiction to the planning process (form submission, meeting notes documenting attendance, phone call records, and social media records of plan input are viable options).

*Update: All Meeting Agenda, Minutes, and Attendees have been added to Appendix B. Additionally, each of the 3 municipalities provided revisions/updates specific to their respective community, i.e., the City of Havre de Grace provided all updates/revisions to all documentation that discusses the City of Havre de Grace).

FEMA: Addressed.

A1. For each jurisdiction seeking plan approval, the plan must document how they were involved in the planning process, such as through meetings attended, data provided, or stakeholder and public involvement activities offered. As mentioned above, in order to meet participation requirements, each jurisdiction must have attended at least one meeting and/or filled out at least one form (at least 2 contributions per jurisdiction must be documented in the HMP to demonstrate plan participation). It is not currently listed what meetings each jurisdiction attended and forms they filled out. Recommend adding a table or narrative description to *Section III Mitigation Summary B. Documentation of the Planning Process* detailing how each jurisdiction participated. Jurisdictions that adopt the plan without documenting how they participated in the planning process will not be approved.

*Update: All Documentation has been added to Appendix B.

FEMA: Addressed.

Keep in mind that in order for FEMA Region 3 staff to review a multi-jurisdictional HMP, Harford County will need to fill in (their respective components of) and submit a local Plan Review Tool (PRT) to MDEM as a part of their official HMP submission. Notably, Section 3 “MULTI-JURISDICTION SUMMARY SHEET” must be completed in full (without blank or omitted information).

*Update: This planning tool serves as the Local Plan Review Tool documentation discussed above.

FEMA: Addressed.

A6. Good – hazard mitigation plan is considered a “living” document. The plan states it will be formally reviewed and updated each year.

RECOMMENDED REVISIONS

A1: Refine the executive summary by adding the HMP goals and a color-coded table or list summarizing the hazards profiled in the HMP (including Harford County’s risk prioritization ranking for each hazard). For an example, refer here: [2022-Frederick-County-Hazard-Mitigation-and-Climate-Adaptation-Plan---for-Adoption \(frederickcountymd.gov\)](https://frederickcountymd.gov/2022-Frederick-County-Hazard-Mitigation-and-Climate-Adaptation-Plan---for-Adoption).

*Update: Table of Contents added per recommendation.

FEMA: Addressed.

A1: Recommend adding names to the list of Hazard Mitigation Planning Committee members that is included on pg. 29 or, at a minimum, at least including them in the Multi-Jurisdiction Summary Sheet (see the end of this document) in the submitted Plan Review Tool.

*Update: Committee members titles have been added, as recommended. Additionally, meeting participants (by name), had been added in each set of meeting minutes in Appendix B.

FEMA: Partially addressed.

A1: The jurisdictional representative information was added to the Multi-Jurisdictional Summary Sheet, but representative names were not added to the Hazard Mitigation Planning Committee member list on page 30 (as Casey recommended above). To fully address this recommended revision, add each respective representative's first and last name so that the reader does not need to reference the appendices to discern who represented each participating jurisdiction and additional partners.

****COUNTY UPDATE 7/26/2022:** Names and titles all added to Page 29-30, per above paragraph.

FEMA: Addressed.

A1/A3: The plan has assumed that the public meetings, which according to the current document haven't happened yet, will *not* be successful public outreach – pg. 30 “Efforts to involve other citizens (not involved with the PAB, EAB or LEPC) in the planning process were fruitless.” Recommend trying alternative ways of involving the public if these meetings won't work such as sending the draft plan to be reviewed by specific types of community members (academia, non-profits, representatives of vulnerable populations, business owners, etc), attending an event, or holding meetings at a convenient location and time after work hours in order to allow for more of the public to join.

*Update: Public Meeting Agenda, Minutes have been added to Appendix B. For future revisions/updates, Harford County (and the municipalities) will push messaging via social media with link to the URL for the Mitigation Plan and provide email addresses for residents/business representatives to submit comments/suggestions.

FEMA: Noted. Consider the following.

A1/A3: For the next update (ideally 3 years before the expiration of this HMP once it has been adopted and FEMA approved), submit a Hazard Mitigation Assistance (HMA) subapplication to MDEM to help bolster your hazard mitigation planning outreach and plan development efforts. FEMA Region 3 and MDEM staff can provide technical assistance to help Harford County develop an effective planning grant scope of work and grant subapplication. Keep in mind that the new State and Local Mitigation Planning Policies fully take effect on 4/19/2023 and the support of an experienced plan developer could help ensure that Harford County addresses all applicable HMP requirements while building on the momentum established by this HMP update. For more information regarding the policy updates, refer here: [Mitigation Planning Policy Updates | FEMA.gov](#).

A2: Remember to note all stakeholders that were involved *and* who were given an opportunity to be involved in the planning process. Considering the committees involved, some participants may have been invited to the committee meeting, but were unable to attend. At a minimum, stakeholders must include:

1. Local and regional agencies involved in hazard mitigation activities;
2. Agencies that have the authority to regulate development; and
3. Neighboring communities.

1. REGULATION CHECKLIST	Regulation (44 CFR § 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Not			
			Met	Met		
<p>*Update: Reference Page 29 in the HMP and Appendix B. FEMA: Addressed.</p> <p>A4: Include more detailed references information throughout the HMP. For instance, page 45 states "Crop losses were estimated at \$6,000,000 for 2001 – 2002 (Farm Service Agency production losses)." Consider including footnotes that provide direct links to sources. Moreover, update figures to include the data source/citation associated with the information displayed. For instance, add a date for the data in Table 1.</p>						
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT						
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))		IV.A., B., C., pgs 31-79	X			
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))		IV.A., pgs 31-35 Appendix E	X			
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))		IV.A., pgs 31-35 IV.B., pg 35 IV.C., pgs 36-79	X			
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))		Figure 6, pg 92, Appendix D, and Appendix D- Figure 7	X			

ELEMENT B:**REQUIRED REVISIONS**

B1: The plan must include a description of the natural hazards that can affect the jurisdiction(s) in the planning area or provide the rationale for the omission of any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area. In *Section IV. Natural Hazards A. Identification*, hazards for Harford County from the Maryland State HMP are identified. Additional hazards for Harford County identified in the 2021 State HMP include Extreme Temperatures (Medium), Soil Movement (Medium), and Public Health Emergencies (Medium-High).

*Update: All hazards have been identified in the Plan, per the paragraph above.

FEMA: Partially addressed. See below for details.

B1: Clarify the plan's description of hazard extent by updating the hazard specific descriptions within the Risk Assessment (i.e. the main text of the plan) to include introductory information regarding relevant scientific scales. For instance, under the drought hazard section include a visual depiction and summary of the U.S. Drought Monitor Classification System [Drought Classification | U.S. Drought Monitor \(unl.edu\)](#) and/or [Palmer Drought Severity Index \(PDSI\) | NCAR - Climate Data Guide \(ucar.edu\)](#), for flooding include the FEMA flood zones [Flood Zones | FEMA.gov](#), for Severe Storms/Thunderstorms include the National Weather Service severe thunderstorm outlook categories [SPC_outlook_final_updated.png \(2500x1407\) \(noaa.gov\)](#), for high winds the NWS wind warnings, watches, and advisories categorizations [Wind Warnings, Watches and Advisories \(weather.gov\)](#), for winter storms the National Weather Service [WSSI-factsheet.pdf \(weather.gov\)](#), for Hurricanes include the entire Safire-Simpson scale [Saffir-Simpson Hurricane Wind Scale \(noaa.gov\)](#), for earthquake the full Richter Scale [Earthquake Glossary \(usgs.gov\)](#), for wildfire the National Fire Danger Rating System [Francis Marion and Sumter National Forests - Home \(usda.gov\)](#), for extreme temperatures a visual depiction of the NWS heat index [Heat Forecast Tools \(weather.gov\)](#) and NWS Wind Chill Chart [Wind Chill Chart \(weather.gov\)](#). Some of this information is included in Appendix A, but it should be included in the main text of the HMP to advance the clear communication of hazard risk.

Keep in mind that the 2011 Local Mitigation Plan Review Guide, Element B1 defines extent as the following:

Extent means the strength or magnitude of the hazard. For example, extent could be described in terms of the specific measurement of an occurrence on a scientific scale (for example, Enhanced Fujita Scale, Saffir-Simpson Hurricane Scale, Richter Scale, flood depth grids) and/or other hazard factors, such as duration and speed of onset. Extent is not the same as impacts, which are described in sub-element B3.

**County Update 7/29/2022: Additional information pulled from the above weblinks has been added to each individual hazard and hazard extent as required above. Additional data has been incorporated to enhance each specific area. Refer to Pages 47-79 for revisions.

FEMA: Addressed.

FEMA: Harford County is encouraged to correct formatting irregularities throughout the newly added content on pages 47-79. For instance, align the bulleted text on page 77 with the formatting and indentation of the existing text.

B1: Some natural hazards (severe storms, earthquakes, wildfires) are missing definitions in *Section IV. Natural Hazards D. Hazard Identification and Discussion*.

*Update: Definitions have been added, per comments above.

FEMA: Addressed.

B2: The plan must include the history of previous hazard events for each of the identified hazards. There is a list of events included for most hazards in *IV. Natural Hazards D. Hazard Identification and Discussion* however, there is limited discussion of past occurrences for Flooding, Wildfires, and Severe Thunderstorms.

*Update: Wildfires are a low risk in Harford County. The County has experienced a few small woodland and/or brush fires, and has also experienced a limited number of small field fires (usually due to a burn pile fire spreading during dry conditions), but, again, this is a very low risk with limited impact.

Flooding and Severe T-storm information has been updated, per comments above. Also, Refer to Appendix E for updated stream discharge data.

FEMA: Addressed.

B2: The probability of future events for each identified hazards is described with general descriptors (low, medium, high). When general descriptions are used, they must be defined in the plan. For example, "high" could be defined as equals near 100% chance of occurring each year.

*Update: Please refer to IV.A, pgs 31-35 for descriptors.

FEMA: Addressed.

B3: The plan must provide an overall summary of each jurisdiction's vulnerability to the identified hazards. Some aspects of vulnerability, particularly critical infrastructure vulnerability, is described in the plan. The overall summary of vulnerability should identify structures, systems, populations, or other community assets as defined by the community that are susceptible to damage and loss from hazard events. Try to consider additional elements of vulnerability, in particular vulnerable populations within the hazard areas, as well and identify to which hazard these assets are vulnerable too. FEMA's community lifelines could also be incorporated into this plan update.

*Update: See C. Vulnerability, Page 36.

FEMA: Partially addressed. See below for details.

B3: The "Vulnerability" section of the HMP (pages 35 to 46) provides an overview of hazard vulnerability for select hazards and jurisdictions, but does not clearly present this information for all Harford County jurisdictions and natural hazards. If specific jurisdictions have been determined to not be vulnerable to specific hazards, then explicitly state this and explain how this conclusion was reached. If limitations prevent a complete analysis of hazard vulnerability for each hazard and each jurisdiction, then explicitly state this and include an approach for addressing each identified limitation (ideally by adding a mitigation action to address the respective limitation). To elaborate, the "Vulnerability" section of the HMP includes subsections for "Mapping Vulnerable Areas," "Vulnerability to Storm/Tidal Surge," "Vulnerability to Dam Breaches," "Vulnerability to Critical facilities and Infrastructure," "Vulnerability of Water Systems," "Vulnerability of Law Enforcement facilities and Fire," "Emergency Preparedness," "Vulnerability Assessment Report," and "Potential Losses from Hazards" (which addresses Hurricanes and Flooding, Severe Winter Storms, Drought, and Tornado related losses). However, there are no vulnerability subsections dedicated to the wildfire, soil movement, and extreme temperatures hazards. Additionally, throughout the vulnerability subsections there is occasional mention of select jurisdictions such as Harford County and Havre de Grace for select hazards, but there is no mention of the City of Aberdeen and jurisdiction specific hazard impacts (past and potential) are not included for all natural hazards profiled.

To address this required revision, add content to the plan explicitly describing the hazard vulnerabilities for Harford County, the City of Havre de Grace, the Town of Bel Air, and the City of Aberdeen as they relate to each profiled hazard (at least the natural hazards: Drought, Severe Thunderstorm, Severe Winter Storms, Coastal Hazards, High Winds and Tornadoes, Riverine Flooding/Flooding, Wildfire, Solid Movement, and Extreme Temperatures).

** County Update: 7/29/2022. Refer to table and narrative on page 33-34.

FEMA: Addressed.

FEMA: Notably, FEMA's community lifelines concept has not been integrated into the HMP. Consider addressing this through a future plan amendment or during the next HMP update (refer to the Plan Assessment section of this Plan Review Tool document for additional details).

B4: The plan states that there are only 4 remaining repetitive loss properties as of 2017, and four repetitive loss areas are described. However, in Figure 7 – Repetitive Loss Properties there are 14 repetitive loss properties and five repetitive loss areas. Please correct this discrepancy and describe the type of each repetitive loss property.

*Update: Revised and current as of April 2022 per above paragraph. Refer to Appendix D and Figure 7, Repetitive Loss Properties Map.

FEMA: Not addressed. See below for details.

B4: The main text of the plan still states that there are 4 repetitive loss properties within the county, yet Appendix D states that there are "...six repetitive loss properties in the planning area (2 in Havre de Grace, and 4 in the County)." Appendix D includes repetitive loss information associated with "4 repetitive loss areas," but the rows for the two Havre De Grace repetitive loss properties are not included. Please correct this discrepancy and clearly define (within the HMP) the plan's distinction between repetitive loss properties and repetitive loss areas.

**County Update: 7/29/2022: Please refer to paragraphs on pages 46-47.

FEMA: Addressed.

B4: The plan must "estimate the number of repetitive loss properties located in identified flood areas" (2011 Local Mitigation Plan Review Guide, page 21). Page 45 and 46 of the plan describes the number of buildings in the floodplain by jurisdiction, but it does not specify if/how many of these buildings are repetitive loss properties located in flood hazard areas. To meet this requirement, add the omitted repetitive loss exposure information.

** County Update: 7/29/2022. 38 County-wide repetitive loss properties as described on Page 47.

FEMA: Addressed.

Edits –

Completed Mitigation Actions -> this section is actually about the NFIP

RECOMMENDED REVISIONS

B1: Change "Riverine Flooding" on page 34 to "Flooding" to reflect the broader flood hazard information provided throughout the risk assessment.

1. REGULATION CHECKLIST	Location in Plan (section and/or page number)	Not Met	Met
Regulation (44 CFR § 201.6 Local Mitigation Plans)		Met	Met
**County Update: 7/29/2022. Changed per recommendation reflected on Page 33.			
FEMA: Addressed.			
<p>B1/B2: To improve readability, add subheadings to the hazard-specific risk assessment sections that clearly convey “Extent,” “Probability of Future Occurrence,” and “Location.” Each natural hazard “Type” has been addressed in the plan via the hazard specific “definition[s]” within section D, <i>Hazard Identification and Discussion</i>.</p> <p>B1: To more clearly communicate how the SMP ranks Harford County hazards vs how the County ranked its hazards, convey the information on page 34 in a tabular format with a dedicated column displaying the State’s Harford County natural hazards by risk ranking and a separate column for County’s/Municipalities’ natural hazards by risk ranking.</p> <p>B1/B3: To provide the reader with an explanatory introduction to each profiled hazard before analyzing jurisdictional vulnerability by hazard, move the <i>Hazard Identification and Discussion</i> section (Section “D”) to be before the “Vulnerability” section “C.”</p>			
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	V.A., pg 79	X	
C2. Does the Plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	III.A., pgs 27-30, Appendix D, Appendix G	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	VI.B., C., pgs 96-107, Appendix F	X	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	VI.B., C., pgs 96-107, Appendix F	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Appendix F.	X	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	VI.B., C., pgs 96-107, Appendix F	X	

ELEMENT C:**REQUIRED REVISIONS**

C1: *Section V. County Mitigation Capability (All Hazards)* does not meet this requirement. The plan must describe each jurisdiction's existing authorities, policies, programs, and resources available to accomplish hazard mitigation. This plan includes some policies, programs and resources that can support mitigation (public outreach capabilities, GIS, DPW approach to the construction of new water and sewer facilities, NFIP capabilities), however, this section is primarily focused on response capabilities. The response capabilities can be included in this plan if you want, but in order to address this revision for mitigation capabilities, consider the following:

- The primary types of local capabilities to review in mitigation planning are planning and regulatory, administrative, and financial, technical, and education and outreach.
- The capabilities for each jurisdiction must be described, not just the County's. If the County administers something for a local jurisdiction, note it. Make sure to clearly identify what capabilities are specific to each jurisdiction.
- What capabilities have improved or declined?
- What is working for your community? What are the obstacles?
- How can you expand and improve your existing capabilities?

Examples of potential mitigation capabilities include, but are not limited to: staff involved in local planning activities, public works, and emergency management; funding through taxing authority, awarded mitigation grants, and annual budgets; or regulatory authorities for comprehensive planning, building codes, and ordinances.

*Update: Refer to Section V.A., beginning on page 65 in the HMP regarding details required above.

Examples cited above have been addressed throughout the revised document, per sections listed in table.

FEMA:

Not addressed. See below for details.

C1: The HMP includes summary text that speaks at a high level to response, communication, public information, equipment, infrastructure, and utilities "capabilities," which address the outreach component of education and outreach, but the HMP does not clearly describe each jurisdiction's planning and regulatory, administrative, and technical, and financial capabilities. Notably, the plan does not include a section identifying available local, state, and federal funding streams that can be used to implement the plan's prioritized mitigation actions (for FEMA funding sources at least the following should be addressed in the HMP: [Hazard Mitigation Assistance Grants | FEMA.gov](#), [Mitigate Disaster Damage with FEMA Public Assistance](#), and [Rehabilitation Of High Hazard Potential Dam \(HHPD\) Grant Program | FEMA.gov](#)). When capability-related limitations or areas for improvement are identified, the HMP should include an approach (such as a mitigation action) for resolving the deficiency. Additionally, information from the jurisdiction specific Appendix G NFIP surveys should be integrated into the narrative of the capabilities assessment.

To address this revision, add content to the plan that clearly explains the planning and regulatory, administrative and technical, and financial capabilities of each Harford County jurisdiction. Examples of the types of information that should be included under these respective sections can be found within this resource: [Hazard Mitigation Plan Guidance: Community Capability Assessment Worksheet \(fema.gov\)](#). To improve readability, consider grouping the content of your capability assessment into the subheadings that address the following:

Planning and regulatory capabilities are plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards.

Administrative and technical capabilities include boards, commissions, departments, staff, and consulting services, along with the related skills and tools, that can be used for mitigation planning and the implementation of specific mitigation actions

Financial capabilities include access to or eligibility to use funding resources for hazard mitigation.

Education and outreach capabilities include programs and methods already in place that could be used to support implementation of mitigation actions and communicate hazard-related information.

**County Update: 7/29/2022. Refer to Table on pages 96-97 .

FEMA Addressed.

FEMA: Additional narrative analysis for each jurisdiction's capabilities should be included in the next HMP update and/or amendment.

C2: Good description of how Harford County participates in the CRS.

C5. Prioritized mitigation actions are not included in this draft. The plan states all action items will be ranked as low, moderate, or high priority in Appendix F.

*Update: See Documentation in Appendix F.

FEMA: Addressed.

C5. Section VI. Mitigation Goals and Action Plan C. Future Mitigation Strategy describes the criteria used for prioritizing implementation of the actions. However, in order to completely meet this requirement, the plan must identify the position, office department or agency responsible for implementing and administering the action for each jurisdiction, and identify potential funding sources and expected timeframes for completion. It is recommended the potential cost of the projects (if known) are also included. A table summarizing this information for each action would meet this requirement.

*Update: See Documentation in Appendix F.

FEMA: Addressed.

C6. Recommend clarifying *how* the communities will integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms, such as the Green Infrastructure Plan and county comprehensive master, HarfordNEXT as described in *Section IV. Mitigation Goals and Action Plan C. Future Mitigation Strategy*. The updated must describe how the mitigation strategy, including the goals and hazard mitigation actions, will be incorporated into other planning mechanisms.

*Update: Additional documentation added in IV. C. and other appropriate sections in the Plan.

FEMA: Addressed.

RECOMMENDED REVISIONS

C4. There are four types of mitigation actions: local plans and regulations, structure and infrastructure project, natural systems protection, and education and awareness programs. It is not identified in this plan which actions correspond to which type. However, it appears there are no Natural Systems Protection actions (i.e. nature-based solutions) listed. Consider incorporating this type of action into the plan.

1. REGULATION CHECKLIST	Location in Plan (section and/or page number)	Not Met
Regulation (44 CFR § 201.6 Local Mitigation Plans)	Met	Met
<p>C4. Each jurisdiction participating in the plan must have mitigation actions for that jurisdiction. Recommend editing the City of Aberdeen's actions to reflect that they are current and ongoing – e.g. the objectives could be actions, such as "Action: Restrict development in the mapped floodplain as outlined in the effective DFIRMS from April 19th, 2016", Objective 1b could be "Action: Work with State Highways for repairs to State-owned roadways that experience frequent flooding" or similar.</p> <p>*Update: See V.I., pgs 80-90, and Appendix F.</p> <p>FEMA: Addressed. Consider addressing the recommended revision below.</p> <p>C4: Include addition information within the HMP describing the mitigation actions listed and prioritized in Appendix F. Additional information should include a scope of work description that addresses key project details (who, what, where, when, and how), project costs that consider sources of non-federal match funds, information conveying which community lifeline(s) would be mitigated by each action, the goals addressed by the respective action (understanding that some actions can address multiple goals), the lead agency, partner agencies, sources of data for the respective action, and any additional project-specific information that provides a clear picture of how risk will be or is being mitigated.</p> <p>Please refer to the Mitigation Action Portfolio (MAP) and mitigation action profiles included in Chapter 7 of the 2022 Frederick County Hazard Mitigation and Climate Adaptability Plan here 2022 Frederick County Hazard Mitigation and Climate Adaptation Plan.</p> <p>C6. Are there any relevant plans beyond the County plans? This plan must identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated. Do any of the communities have plans that information for this plan could be taken from, or which information in this plan could inform?</p> <p>Edits – Pg. 85 cost/benefit → benefit-cost analysis Pg. 69 – Bel Air is a CRS Class 6</p> <p>*Update: Edits made per above.</p> <p>FEMA: Addressed.</p>		
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	II.B., pgs 21	X
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Appendix D, Appendix F	X
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	IV.B., pg 97-107, Appendix F	X

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR § 201.6 Local Mitigation Plans)				
<u>ELEMENT D: REQUIRED REVISIONS</u>				
<p>D2. This plan highlights successful mitigation efforts throughout the document. However, there is no updates or specific inclusion of the mitigation actions from the last plan. The plan must describe the status of hazard mitigation actions in the previous plan by identifying those that have been completed or not completed. For actions that have not been completed, the plan must either describe whether the action is no longer relevant or be included as part of the updated action plan.</p>				
<p>*Update: Refer to Appendix D and Appendix F.</p> <p>FEMA: Addressed.</p> <p><i>Recommended Revisions</i></p> <p>D1. Changes in development can also include conditions that could affect the risk and vulnerabilities of the jurisdictions, such as climate variability, declining population, or projected increases in population. Consider adding these additional considerations to the plan. For the population component, 2020 census data is included on pg. 27, and a narrative description of how that compares to the prior plan could be included.</p> <p>FEMA: Not addressed. Please consider addressing this element D1 recommendation.</p> <p>County update: 7/29/2022. Refer to Census Data discussion on pages 26.</p> <p>FEMA: Incorporate the latest census data for each jurisdiction (with its reference or citation) into the plan. Currently, it is unclear what year the population statics in Table 1 are associated with.</p>				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))		Yes, In Draft. Upon FEMA Approval, Docs will be signed, and County Resolution will be Added.		
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))		Yes. See above comment.		
<u>ELEMENT E: REQUIRED REVISIONS</u>				
<p>This plan has not been adopted yet. There is space for adoption resolution letters at the front of the plan. Prior Executive Promulgations are included. They will need to be updated or removed (for now) until the current plan is adopted.</p> <p>*Update: All promulgation letters and County Council Resolution will be completed once we receive FEMA "Approval pending formal adoption". Unsigned promulgation letters have been added to the front of the Plan pending formal signature.</p> <p>FEMA: Noted.</p>				
ALL DAM RISKS - ELIGIBLE HIGH HAZARD POTENTIAL DAMS				

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR § 201.6 Local Mitigation Plans)				
HHPD1. Did Element A4 (planning process) describe the incorporation of existing plans, studies, reports, and technical information for eligible high hazard potential dams?	Table 2, pg 40, Figure 4, pg 41	X		
HHPD2. Did Element B3 (risk assessment) address eligible high hazard potential dams in the risk assessment?	Pg. 41, bottom of table		X	
HHPD3. Did Element C3 (mitigation goals) include mitigation goals to reduce long-term vulnerabilities from eligible high hazard potential dams that pose an unacceptable risk to the public?	VI.B. pgs 96-107, Appendix F	X		
HHPD4. Did Elements C4-C5 (mitigation actions) prioritize mitigation actions to reduce vulnerabilities from eligible high hazard potential dams?	*Will review and revise in future as noted at bottom of Table 2., pg 40		X	

REQUIRED REVISIONS (for FY22 Rehabilitation of High Hazard Potential Dam Grant Eligibility):

HHPD1: Describe how the local government coordinated with local dam owners and/or the state dam safety agency how the jurisdiction state dam safety agency coordinated with the jurisdiction and/or local dam owners. When dam safety coordination is limited, explain the limitations within the plan.

Note: The language of this required revision (for HHPD grant eligibility) has been slightly adjusted to align with the 2022 Local Mitigation Planning Policy Guide which contains HHPD requirements that took effect on 5/16/2022 for the FY22 HHPD grant.

FEMA: Addressed. However, going forward include more detailed information concerning how dam owners were engaged throughout the planning process.

HHPD1: Good information on who/what will be impacted by dam failure in Table 2 – Harford County High and Significant Hazard Dams. Clarify language – “sunny-day failure” and any different impacts expected due to a storm.

*Update: Refer to Table 2., pg 39 and Figure 4, pg 40 for revised/updated HH dam identification and mapping.

FEMA: Noted.

HHPD2: The plan does not adequately address All Dam Risk. To meet this requirement, add information to the HMP describing the risks and vulnerabilities to and from eligible HHPDs including:

- Potential cascading impacts of storms, seismic events, landslides, wildfires, etc. on dams that might affect up and downstream flooding potential in terms of breach, non-breach, and residual risk.
FEMA: Not addressed.
- Potential significant economic, environmental, or social impacts as well as multijurisdictional impacts from a dam incident.
FEMA: Not addressed.
- Location and size of populations at risk from eligible HHPDs as well as potential impacts to institutions and critical infrastructure/facilities/lifelines.
FEMA: Population at risk from HHPDs not addressed.
FEMA: Addressed potential impacts to institutions and critical infrastructure/facilities in table 2.
- Methodology and/or assumptions for risk data and inundation modeling.
FEMA: Not addressed.
- Documentation of limitations and the approach to address deficiencies.
FEMA: Not addressed.

Note: The language of this required revision (for HHPD grant eligibility) has been slightly adjusted to align with the 2022 Local Mitigation Planning Policy Guide, which contains HHPD requirements that took effect on 5/16/2022 for the FY22 HHPD grant.

*Update: see comment highlighted above.

FEMA: Not addressed. See above for details.

**County Update: 7/29/2022. Refer to comments 39- 41 and 97. We understand that at this time, this Plan is not eligible for HHPD Grant funding. As we further develop HHPD sections, based on this very new requirement, we will submit revisions thru MDEM to FEMA.

FEMA: Noted.

HHPD4: Prioritized mitigation actions are not included in this draft. The plan states all action items will be ranked as low, moderate, or high priority in Appendix F.

To meet this requirement, the HMP must address the following:

- Describe a range of specific actions such as:
 - Rehabilitating and/or removing dams.
 - Adopting and enforcing land use ordinances in identified flood zones.
 - Acquiring and/or elevating structures, and/or acquiring easements within identified flood zones.
 - Implementing flood protection measures such as berms, floodwalls or floodproofing within identified flood zones.
- Describe the criteria used for prioritizing actions related to HHPDs.
- Identify the position, office, department, or agency responsible for implementing and administering actions related to mitigating hazards for eligible HHPDs.

*Update: Refer to Table 2, pg 39, Figure 4, pg 40, and Appendix F which has been revised and updated, per requirement.

FEMA: Addressed.

RECOMMENDED REVISIONS (for FY22 Rehabilitation of High Hazard Potential Dam Grant Eligibility):

HHPD1: The plan states “The dam inundation area maps have been prepared for each high and significant hazard dam”. Consider including these maps in the HMP.

FEMA: Not addressed.

HHPD1: One local dam owner ([Harford County](#)) and no Maryland Department of the Environment (MDE) Division of Dam Safety staff participated in the Hazard Mitigation Planning process. Consider inviting them to participate in the planning process. Examples would include adding a mitigation action for a specific dam if they are interested in potentially applying for the HHPD grant program, working with them to understand the downstream risk from dams, or having them comment on the final draft plan.

FEMA: Not addressed.

HHPD2: The plan does not provide a summary description of all dam risk, which consists of incremental, non-breach, and residual risk. To address this recommended revision, add narrative describing non-breach, incremental, and residual risk with respect to at least Harford County ~~eligible~~ high hazard potential dams. If insufficient information is available, please add language explaining this limitation and include the definition of the three all dam risk component concepts. Relevant definitions are included below.

Definitions:

Incremental Risk: The risk (likelihood and consequences) to the pool area and downstream floodplain occupants that can be attributed to the presence of the dam should the dam breach prior or subsequent to overtopping, or undergo component malfunction or misoperation, where the consequences considered are over and above those that would occur without dam breach. The consequences typically are due to downstream inundation, but loss of the pool can result in

significant consequences in the pool area upstream of the dam.

Non-Breach Risk: The risk in the reservoir pool area and affected downstream floodplain due to 'normal' dam operation of the dam (e.g., large spillway flows within the design capacity that exceed channel capacity) or 'overtopping of the dam without breaching' scenarios.

Residual Risk: The risk that remains after all mitigation actions and risk reduction actions have been completed. With respect to dams, FEMA defines residual risk as "risk remaining at any time" (FEMA, 2015, p A-2). It is the risk that remains after decisions related to a specific dam safety issue are made and prudent actions have been taken to address the risk. It is the remote risk associated with a condition that was judged to not be a credible dam safety issue.

Source: "Rehabilitation of High Hazard Potential Dams Grant Program Guidance," June 2020

Note: This required revision has become a recommended revision as of 5/16/2022, due to the release of the FY22 HHPD Notice of Funding Opportunity (NOFO) which shifted the HPPD HMP elaborated requirements source from the 2020 HHPD Program Guidance to the 2022 State and Local Mitigation Planning Policy Guides.

*Update: Refer to Table 2., pg 39 and Figure 4, pg 40 for revised/updated HH dam identification and mapping.

FEMA: Not addressed.

HHPD3: This requirement is met by Goal 1: Reduce Flood Risks, however clarifying additional information could be provided to clearly link reducing long-term vulnerabilities from HHPDs to (at least 2) HMP goals.

FEMA: Not addressed. Clarifying information clearly linking the reduction of long-term vulnerability from HHPDs to the HMP goals was not added.

HHPD4: Consider amending or updating the plan to include mitigation action designed to rehabilitate and/or remove specific high hazard potential dams that pose a risk to Harford County lives and property.

To help inform the development and refinement of HHPD mitigation actions, eligible activities from the FEMA FY22 HHPD grant funding opportunity are included below. Consider incorporating mitigation actions with language from the eligible activities below for specific HHPDs within Harford County.

Eligible Rehabilitation of HHPD Grant Program Activities

- Construction activities such as:
 - Repair or rehabilitation of the dam
 - Dam removal
 - Construction monitoring
 - Installation of early warning systems associated with the eligible dam project
- Planning activities such as:
 - Activities and studies that determine risks associated with eligible dams
 - Environmental studies for NEPA compliance
 - Development of operation and maintenance plans
 - Public education and awareness of flood risks associated with the eligible dam project
 - Dam risk and consequence assessments Feasibility studies
 - Preliminary engineering studies Alternatives analysis

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Not Met
Regulation (44 CFR § 201.6 Local Mitigation Plans)		Met	Not Met
	<ul style="list-style-type: none"> ○ Mapping, engineering survey, and inundation modeling ○ Development of evacuation plans, plans for flood fighting, or community response plans to include in the floodplain management plan ○ Coordination of EAP and EOPs for different release conditions ● Design activities such as: <ul style="list-style-type: none"> ○ Engineering design ○ Development of specifications 		
Source: Fiscal Year (FY) 2022 Rehabilitation of High Hazard Potential Dams (HHPD) Notice of Funding Opportunity (NOFO)			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
<u>ELEMENT F: REQUIRED REVISIONS</u>			

SECTION 2: PLAN ASSESSMENT

Plan Strengths

- Element A: The plan introduces the topic of hazard mitigation planning by providing its historical context on page 28.
- Element A: The plan includes illustrative images of relevant community assets such as dams (as featured on page 40).
- Element B (Best Practice): The plan includes detailed USGS quadrangle maps depicting jurisdictional boundaries, key infrastructure (such as roads police departments, fire/EMS stations, hospitals, wastewater treatment plants, colleges, elementary schools, high schools, private or alternate education locations), and hazard areas (the 100- and 500-year floodplains) in detail.
- Element B: Figure 5 identifies the location of vulnerable populations with access and functional needs. Consider adding hazard risk areas to this map to better understand which vulnerable populations are uniquely subject to specific hazards and/or multiple hazards. The figure identifies the location of hospitals, ambulance corps, EMS, special education schools, and mobile home parks within Harford County.
- Element C: In addition to providing clear goals, the HMP includes more precise and actionable objectives followed by clarifying text that speaks to how Harford County is or will work to advance each priority.
- Element C (Best Practice): Appendix F clearly provides the timeframe, lead agency, and supporting agencies associated with each prioritized mitigation action within the Hazard Mitigation Plan.
- All Dam Risk: Within the dam failure hazard section, Table 2, *Harford County High and Significant Hazard Dams* clearly identifies infrastructure that will be impacted by sunny-day dam failure.

Opportunities for Improvement

For the next update or plan amendment...

- Element B: Add building footprints to the USGS quadrangle maps (which currently include select point locations for critical infrastructure, the 500-year flood zone 100-year flood zone), in order to provide a higher resolution understanding of hazard risk exposure (potential losses) to inform the HMP's risk assessment and mitigation strategy.
- Element B: Integrate community lifelines into the Hazard Mitigation Plan. For instance, explain how community lifeline assets are impacted by specific hazards as a component of vulnerability assessments, or specify which and how specific lifelines are impacted by specific mitigation actions. Keep in mind that the new [Local Mitigation Planning Policy Guide](#) fully takes effect on 4/19/2023 and requires community lifelines to be addressed during the planning process and within the HMP.

- Element C: During the next Harford County HMP planning process, develop a list of mitigation action prioritization questions to pose to plan participants throughout the planning process and include documentation demonstrating that the submitted feedback informed the content of the HMP. Refer to Table 7.2 of the [2022 Frederick County Hazard Mitigation and Climate Adaptation Plan](#) for an example of detailed and clearly explained mitigation action prioritization criteria.
- Element C: For the next HMP update, utilize FEMA Region 3’s Hazard Mitigation Plan Guidance: [Community Capability Assessment Worksheet \(fema.gov\)](#) and [Checking In On The NFIP \(fema.gov\)](#) to collect and help analyze jurisdiction specific capabilities information throughout the planning process.

Resources

- FEMA: [Local Mitigation Planning Policy Guide \(April 19, 2022\)](#)
- FEMA/Resilient Nation Partnership Network/NASA: [Building Alliances for Climate Action](#)
- FEMA/Resilient Nation Partnership Network/NOAA: [Building Alliances for Equitable Resilience](#)
- FEMA: [National Risk Index \(NRI\) for Natural Hazards](#)
- FEMA: [Resilience Analysis and Planning Tool \(RAPT\)](#)
- FEMA: [Mitigation Action Portfolio](#)
- FEMA: [Community Lifelines](#)
- FEMA: [Region 3 HM Planning Resources](#)
- FEMA: [Region 3 Conducting Annual Hazard Mitigation Plan Reviews Resource](#)
- FEMA: [Region 3 High Hazard Potential Dams State and Local Mitigation Planning Tips Resource](#)
 - **Note:** The latest version will be shared before or following the plan review discussion/technical assistance call.
- FEMA: [Region 3 Checking In On The NFIP Resource](#)
- FEMA: [Guides to Expanding Mitigation](#)
- FEMA: [Protect Your Home from Flooding, Low-Cost Project You Can Do Yourself Resource](#)
 - **Note:** This resource will be shared before or following the plan review discussion/technical assistance call.

FEMA: [Protect Your Home from Flooding, Low-Cost Project You Can Do Yourself Resource](#)

SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

#	Jurisdiction Name	Jurisdiction Type (city/borough/township/village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N) *=HHPD					
							A. Planning Process*	B. Hazard Identification & Risk Assessment*	C. Mitigation Strategy*	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
1	Harford County Government	County	Linda Ploener Matt Kropp	2220 Ady Road, Forest Hill, Maryland 21050 Department of Planning and Zoning 220 South Main Street, Bel Air, Maryland 21014	lploener@harfordpublicsafety.org mtkropp@harfordcountymd.gov	410-808-6986 410-638-3103 X1364	Met	Met	Met	Met	(pending FEMA Approval)	Met

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/township/village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N) *=HHPD					
							A. Planning Process*	B. Hazard Identification & Risk Assessment*	C. Mitigation Strategy*	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
2	City of Aberdeen	City	Robert Hartscock	60 North Parke Street, Aberdeen, Maryland 21001	rhardtsock@aberdeenmd.gov	410-272-1600	Met	Met	Met	Met	(Pending FEMA Approval)	Met
3	Town of Bel Air	Town	Stephen Kline	705 E. Churchville Road, Bel Air, Maryland 21014	skline@belairmd.org	410-638-4536	Met	Met	Met	Met	(Pending FEMA Approval)	Met
4	City of Havre de Grace	City	Marisa Willis	711 Pennington Avenue, Havre de Grace, Maryland 21078	marisaw@havredegraceemd.com	410-939-1800	Met	Met	Met	Met	(Pending FEMA Approval)	Met
5												
6												
7												
8												
9												
10												

#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N) *=HHPD					
							A. Planning Process*	B. Hazard Identification & Risk Assessment*	C. Mitigation Strategy*	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
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