TOWN COUNCIL INFORMATIONAL
WORK SESSION AGENDA
July 11, 2023
Starting at 6:00 PM

I. Call to Order and Roll Call

II. Pledge of Allegiance

III. Informational discussion on the following:

1. Rachel Larsen Weaver – Candidate for the Planning and Zoning Commission
2. Amy Everett – Candidate for the Board of Appeals
3. Town of Chesapeake Beach Coastal Resiliency Plan
4. Chesapeake Beach Water Reclamation Treatment Plant (CBWRTP) generator access platform
5. Calvert Library Foundation Request for Funding
6. Food Insecurity Request for Funding
7. Zoning Text Amendment, RV-1 commercial uses at Horizons on the Bay
8. Request for Proposal (RFP) Pocket Parks
9. Chesapeake Beach Water Park

IV. Council Lightning Round

V. Adjournment

To: The Honorable Mayor and Town Council From: Holly Wahl, Town Administrator

Subject: Coastal Resiliency Plan
Date: July 10, 2023

I. BACKGROUND:

The Town of Chesapeake Beach Coastal Resiliency Task Force and Coastal Resiliency Steering Committee coordinated to provide a draft coastal resiliency plan for the Town. The draft coastal resiliency plan provides strategies and recommendations that are intended to guide the Town as it adapts to sea level rise and an increased incidence and severity of flooding.

The plan is prepared by the Town of Chesapeake Beach using federal funds from the Office for Coastal Management at the National Oceanographic and Atmospheric Administration (NOAA). The organizational and technical approach to the project was developed jointly with the Town of North Beach in coordination with the Maryland Department of Natural Resources, Chesapeake, and Coastal Services. The jurisdictions also coordinated in the simultaneous production of mapping used in this report which documents the projected impacts of future seal level rise. While this Plan's strategies and recommendations were developed through a planning process specific to Chesapeake Beach, they reflect an understanding of the effects of sea level rise on North Beach and compliment North Beach's own efforts to adapt to sea level rise.

II. COASTAL RESILIENCY PLAN:

Please see Exhibit A for the Town of Chesapeake Beach Draft Coastal Resiliency Plan. The plan has been submitted to the State to comply with the guidelines of the grant; however, it is still pending Steering committee approval. This item is on the Town Council work session to hear feedback from the Town Council on the plan prior to final review / approval by the Steering Committee.

III. FISCAL IMPACT:

Projects to address Coastal Resiliency will need to be addressed through short- and long-range planning activities of the Town.

Coastal Resiliency Plan

Town of Chesapeake Beach

A Flood and Sea Level Rise Action Plan

Financial assistance in the preparation of this document was provided by the federal Coastal Zone Management Act of 1972 as amended as administered by the Office for Coastal Management, National Oceanic and Atmospheric Administration, with local grant administration by the Maryland Department of Natural Resources, Chesapeake and Coastal Service.

Acknowledgments

Chesapeake Beach Mayor and Town Council

Pat "Irish" Mahoney, Mayor
Larry Jaworski, Council Vice President
Valerie Beaudin
Greg Morris
Keith Pardieck
L. Charles Fink
Margaret Peggy Hartman

Steering Committee on Coastal Resiliency

Jeff Foltz, P.E. Chairman
Larry Jaworski, P.E., CC-P, Town Councilman
Keith Pardieck, Town Councilman
Wesley Donovan
Robert Munro
Phil Pfanschmidt
Grant Soderstrom
Dave Kimelblatt

Technical Advisory Committee on Coastal Resiliency

Larry Jaworski, P.E., CC-P, Town Councilman
Jay Barry, Chief, Public Works Administrator
Christopher N. Jakubiak, AICP, Town Planning and Zoning Administrator
Wayne Newtown, P.E., Town Engineer
John Stinnett, Superintendent, Chesapeake Beach Water Reclamation Plant (CBWRTP)
Holly Wahl, MBA, Town Administrator

Special thanks to Sasha Land, Coastal Resilience Program Director, Maryland Department of Natural Resources, Chesapeake and Coastal Services, and Laurent McDermott, GISP and Mary Buffington, GI with the Eastern Shore Regional GIS Cooperative, Salisbury University.

Table of Contents

Chapter 1 Introduction

Introduction

This plan is about coastal resiliency in Chesapeake Beach. Its strategies and recommendations are intended to guide the Town as it adapts to sea level rise and an increased incidence and severity of flooding.

It was prepared by the Town of Chesapeake Beach using federal funds from the Office for Coastal Management at the National Oceanographic and Atmospheric Administration (NOAA). The organizational and technical approach to the project was developed jointly by the neighboring towns of Chesapeake Beach North Beach in coordination with the Maryland Department of Natural Resources, Chesapeake and Coastal Services. The jurisdictions also coordinated in the simultaneous production of mapping used in this report which documents the projected impacts of future seal level rise. While this Plan's strategies and recommendations were developed through a planning process specific to Chesapeake Beach, they reflect an understanding of the effects of sea level rise on North Beach and compliment North Beach's own efforts to adapt to sea level rise.

General Context and Purpose

Chesapeake Beach is vulnerable to very severe flooding associated with hurricanes, tropical storms, and nor'easters; the latest such major event was Isabel in 2003[1]. It made landfall in North Carolina's Outer Banks and followed a path northwestward through western Maryland. While far removed from the Chesapeake Bay, its winds drove a 4 to 5 foot storm surge against the western shore that swamped coastal communities including the Twin Beaches (Chesapeake Beach and North Beach). Buildings were destroyed, beaches were washed away, bullheads, piers, and revetments were damaged, and MD Route 261, including along its frontage with the North Beach Volunteer Fire Company, was inundated and impassible[2].

Figure 1: 2003 Photo Following Hurricane Isabel. MD Route 261 (Bayside Road) at the entrance to the Volunteer Fire Company, looking north).

[1] Hurricane Isabel was just one of 39 recognized flooding events between 1996 and 2016 reported by the National Climate Data Center and one of 56 tropical storm events impacting Maryland between 1980 and 2015. (Calvert County All-Hazard Mitigation Plan, 2017).

[2] Photos like the one on this page showing the aftermath of Hurricane Isabel in Chesapeake Beach are available at: https://forums.somd.com/media/albums/2003-hurricane-isabel-chesapeake-beach-north-beach.246/page-2

The Town is also vulnerable to nuisance flooding. Such flooding is not necessarily associated with named storms and sometimes results simply from the mechanisms of the tides. As recently as October 2002 a high tide breached shoreline revetments and flooded residential lots close to the Bay. It entered the Fishing Creek Marina area via the Town's public boat landing. It overloaded local storm drainage systems and flooded public streets including MD Route 261. These severe events disrupt daily activities, impede travel, and add to the standing pools of water at lower elevations along roads, in parking lots, and at Kellam's Field.

Global sea level rise is related to the release of carbon dioxide emissions into the atmosphere, the resulting warming of the oceans, and melting of glaciers and polar ice sheets[3]. It is an ongoing phenomenon and is projected to continue well beyond 2100. The combination of global sea level rise and land subsidence in coastal Maryland has raised mean high tide in the Chesapeake Bay. Historic tracking at the tide gauge at Solomon's Island records an increase of about 0.15 inches per year, or 1 foot of rise, between 1937 and 2019. Sea level rise is accelerating, and current projections indicate the Town should plan for the Bay to rise another 2.4 feet by 2050[4]--that is, the Bay at Chesapeake Beach would be 2.4 feet, or 28.8 inches, higher than it was in 2000.

Over the very long term, the rise of the Bay is projected to largely reclaim much of Town's low lying areas built on and around tidal wetlands. In so doing the remaining marshes that so define the Town's natural setting are projected to increasingly become open water at their lower elevations, and at higher elevations, to continue to migrate into developed places. With the passage of time more and more of the Town will become vulnerable to flooding. With higher water levels in the Bay, future storm surges will arrive at the Town's shoreline feet above their predecessors and logically bring more water and hazard potential. A rising Bay will place a larger area of Chesapeake Beach at risk, including existing neighborhoods, housing complexes, cultural and recreational assets, and essential infrastructure.

The purpose of this Plan is to provide a coordinated and long term approach to becoming more resilient to the effects of rising water levels and the flooding associated with it.

To be clear, this is not a master plan or an engineering design plan, intended to direct specific resources toward specific or known design challenges in the short term. Sea level rise is not that kind of problem, and the environmental and cultural setting of Chesapeake Beach is not well suited to one design solution. There will be a time for project based plans and designs.

Rising sea level presents an ongoing community development and conservation challenge; one whose challenges and opportunities will evolve and thus cannot be fully understood here and now in 2023. The resources of current and multiple future generations will be called upon to address sea level rise and

[3] In the Chesapeake Bay region sea level rise is also a function of ongoing Ice Age related land subsidence as the earth's plate, like a seesaw, falls in the east and rises in the northwest still feeling the effects of the glacier retreat.
[4] Sea Level Raise, 2018 Projections, Maryland Commission on Climate Change.

learning memory will be achieved. Therefore, this Plan is also meant to provide a forum of sorts –- an organizational and policy framework -- where solutions to what will be an evolving challenge can be refined, implemented, extended, or even corrected as needed, as residents, businesses, and property owners interact with the Town and its partners like the Town of North Beach, the Maryland Department of Natural Resources, and NOAA.

Coastal Resiliency

This Plan is about building coastal resiliency. By coastal resiliency, we mean the ability of the Chesapeake Beach community to adapt to the risks posed by sea level rise. At its heart, this is a plan for the physical adaptation of the Town to the threat of sea level rise.

Resiliency, as a term used in hazard planning generally, is more comprehensive than this plan aims for. For context, the United Nations Office of Disaster Risk Reduction refers to resiliency as the ability of a community exposed to hazards to resist, absorb, accommodate to, and recover in a timely and efficient manner including by preserving and restoring essential structures and function. This and other definitions of "resiliency" embrace notions of hazard preparedness, emergency management, rescue, and rebuilding. While this Plan touches on these elements, its focus is on physical adaptation to the risk of living along the Chesapeake Bay in areas projected to become inundated. This is less about emergency response and recovery and more about long range community planning, civil engineering, and landscape and building design.

In the future as projects are implemented there will be ongoing opportunities to further incorporate the multifaceted themes of resiliency. For example: An engineering design for a sea-wall might incorporate flexibility to readily allow strengthening at such time that live loads increase; or a storm drain upgrade might be re-routed to convey water away from its previous discharge point or be designed with much larger inlets for holding water, as a means for avoiding the mechanical pumps necessary to discharge into the Bay against projected higher tides. Resiliency must permeate all plans and designs that flow from this Plan.

Related Plans and Studies

There are three local plans particularly relevant to coastal resiliency in Chesapeake Beach that have influenced this Plan. These are described below[5].

Calvert County, Maryland All-Hazard Mitigation Plan

In 2017 Calvert County adopted the All-Hazard Mitigation Plan, which includes useful information on past flood events and flood risk assessments including in Chesapeake Beach and North Beach. While the County Plan does not evaluate in a detailed way sea level rise and future local vulnerabilities, its research and findings have informed this Plan.

The Plan sets goals for mitigating flood hazards with special mention of concerns that towns share with the County, namely protecting critical infrastructure and facilities that residents rely on and protecting and sustaining natural resources such as tidal wetlands that function naturally to mitigate flooding damage. With respect to flood hazard mitigation planning, the County Plan incorporates input provided by the Town of Chesapeake Beach and recommends the following specific mitigation actions for the Towns of Chesapeake Beach and North Beach:

- Identify natural resources that provide mitigation such as wetlands, (riparian) buffers, etc. and make them a priority for preservation.
- Continue to ensure compliance with stormwater management regulations.
- Give high priority to undeveloped floodplain areas for preservation.
- Maintain zoning ordinance provisions for protection of all hazard areas.
- Continue a community-based stormwater management program consisting in routine inspections and debris removal.

Chesapeake Beach Nuisance Flood Plan: 2000-2025

In 2020, the Town adopted a Nuisance Flood Plan per Maryland statues which require jurisdictions that experience nuisance flooding to adopt, publish, and update a plan once every five years[6]. As defined in State law, "nuisance flooding" is high tide flooding that causes public inconvenience. Such flooding is not a product of major storm events and typically lasts only for several hours before abating.

The plan is a short-term plan intended primarily to build awareness at the local level of certain recurring flood areas, to improve the capacity of local governments to notify and warn the public about flood hazards, and to consider steps to mitigate potential hazards. The Town's Nuisance Flood Plan also provides guidance on how to document nuisance flood occurrences and sets four priorities:

[5] Also relevant is the Calvert County, Maryland All-Hazard Mitigation Plan, adopted by the County in 2017, which also covers the Towns of Chesapeake Beach and North Beach.

[6] See Maryland Senate Bill 1006 from the 2018 Session of the Maryland General Assembly which amended parts of the Transportation and Natural Resources Articles of the Annotated Code of Maryland and included revision to the Coast Smart laws related to the siting and design of infrastructure in areas vulnerable to sea level rise inundation.

- Ensure existing structures are resistant to flood-related damage, where possible.
- Create awareness of floodplain hazards and protective measures.
- Protect critical facilities.
- Prepare and update stormwater management plans.

The Town's Plan identifies three primary locations for nuisance flooding: (1) the lowest lying parts of the Kellam's recreational area and Fishing Creek Marina, (2) the northern edge of the wetland complex west of MD Route 261 and south of First Street (North Beach), and (3) Town-owned property along the tidal wetlands south of Harbor Road, running parallel to and west of DeForest Drive. These same areas are among the first projected to be inundated in the decades due to sea level rise.

Chesapeake Beach Comprehensive Plan

In April 2022, the Town adopted a new Comprehensive Plan that extensively addressed sea level rise through land use and natural resource recommendations. The Plan used mapping to establish the extent of existing and projected flooding, and designated parts of the Town that are especially vulnerable. It also made specific land use and zoning recommendations to eliminate or minimize development potential in areas projected to be inundated with a 2.1 foot sea level rise as well as remaining forests and forested steep slopes. The Town Council codified these latter recommendations into law through amendments to the Zoning Ordinance and official Zoning Map in 2022. Lastly the Comprehensive Plan recommended that this Coastal Resiliency Plan be prepared, and it adopted overall principles to guide local planning for sea level rise over the long term, as follows:

- The low-lying land, where Fishing Creek meets the Chesapeake Bay, is the very heart of Chesapeake Beach, encompassing the recreational assets and natural resources that have shaped the Town's heritage. Continued use of this area and even redevelopment is not necessarily incompatible with projections of increased flooding.

- The Town's natural environment itself can be a guide to how to manage rising water levels in Chesapeake Beach. The Town's marshes absorb storm surges and hold back floodwaters. The Town's remaining woodlands soak up rainwater reducing the severity of flooding. The Town's topography shows that the heart of Chesapeake Beach was built on and around the natural estuary of Fishing Creek.

- A long-term response to a rising Chesapeake Bay can be positive and aligned with a vision of harmonizing land with water. In a coastal town, built as a tourist destination, rising water levels can be an asset and an opportunity to build upon the Town's heritage.

- Lands that were "made" through the filling in wetlands, are the most quickly threatened by sea level rise. Allowing space for water to reclaim parts of these areas and for wetlands to migrate within them can help recreate nature's role in holding back flood waters and buffering storm surges.

- Unplanned and uncoordinated efforts to raise the elevation of the land or build structural flood defenses including seawalls, raised bulkheads, shoreline revetments, etc. are counterproductive to ongoing efforts to coordinate an effective strategy to address sea level rise. Such measures must only be undertaken in a coordinated way consistent with an adopted plan.

- Rising water levels expand the area that is vulnerable to flooding. As the Bay rises, some areas that do not flood today are predicted to flood in the future and some areas that do in fact flood today are predicted to experience more frequent and severe flooding events.

There are other important parts of the Chesapeake Beach Comprehensive Plan that have shaped this Plan and speak to coastal resiliency including the conversion of Kellam's recreational complex into a blue-green recreational and flood management area, the introduction of small parks, the preservation of resource lands, promoting walkability and public accessibility especially to the waterfront, and eliminating new residential development potential from vulnerable areas.

Community Engagement

As part of this project the Town created the Steering Committee on Coastal Resiliency. The Steering Commission conducted four public work sessions, and three public informational events. All the events were live-streamed and recorded. Once the analysis and findings were assembled but before recommendations were developed, the Committee held a round of neighborhood based work sessions: one at the Volunteer Fire Company and the other at the Town Hall. Notices and invitations to each event were mailed to all residents located within the localized flood hazard areas. The Town also created a webpage for the project where documents, maps, and notice were published.

Chapter 2 Existing Conditions

South Creek and Fishing Creek, Chesapeake Bay Inlets

South Creek and Fishing Creek are tributaries to the Chesapeake Bay. The watersheds they drain extend far beyond the Town's borders. Their natural estuaries are among the features of Town most vulnerable to sea level rise. South Creek drains the coastal plain north of MD Route 260 including North Beach and forested lands west of the Twin Beaches. It discharges to the Bay through a tidal estuary shown in the photo below. The Chesapeake Beach Water Reclamation Plant, North Beach Volunteer Fire Company, and the Seagate residential communities are located in this estuary. MD Route 261 crosses through it.

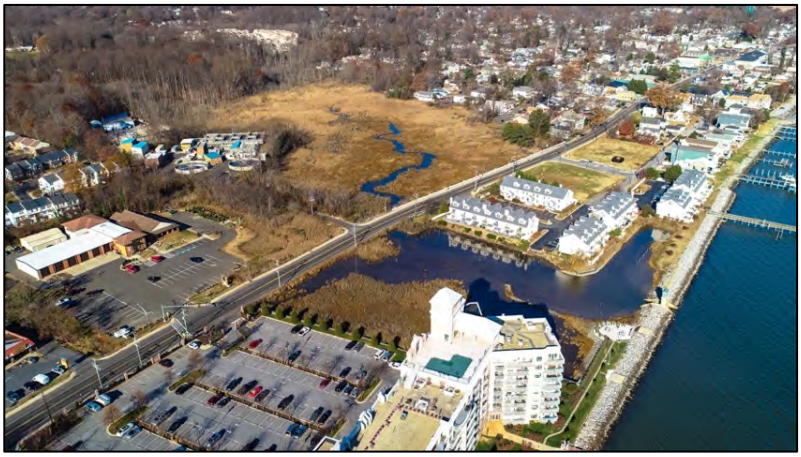

Figure 2. Birdseye view of the South Creek estuary.

Fishing Creek drains a mostly forested and rural landscape and meets the Bay in the traditional maritime center of Chesapeake Beach. At one time, the Creek's natural estuary covered what is today the Courtyards at Fishing Creek Apartments and Townhouses, Chesapeake Beach Waterpark, Northeast Community Center, Fishing Creek Marina, and all of Kellam's Recreation Complex.

Figure 3: Birdseye view of the Fishing Creek estuary.

To better understand the complexity of the Fishing Creek estuary, note the marshland grass symbols in Figure 4 . They are indicating the historic extent of tidal wetlands on the west side of MD 261 north and south side of Gordon Stinnett Avenue. Most of this has been replaced by parkland, parking lots, building sites, and streets.

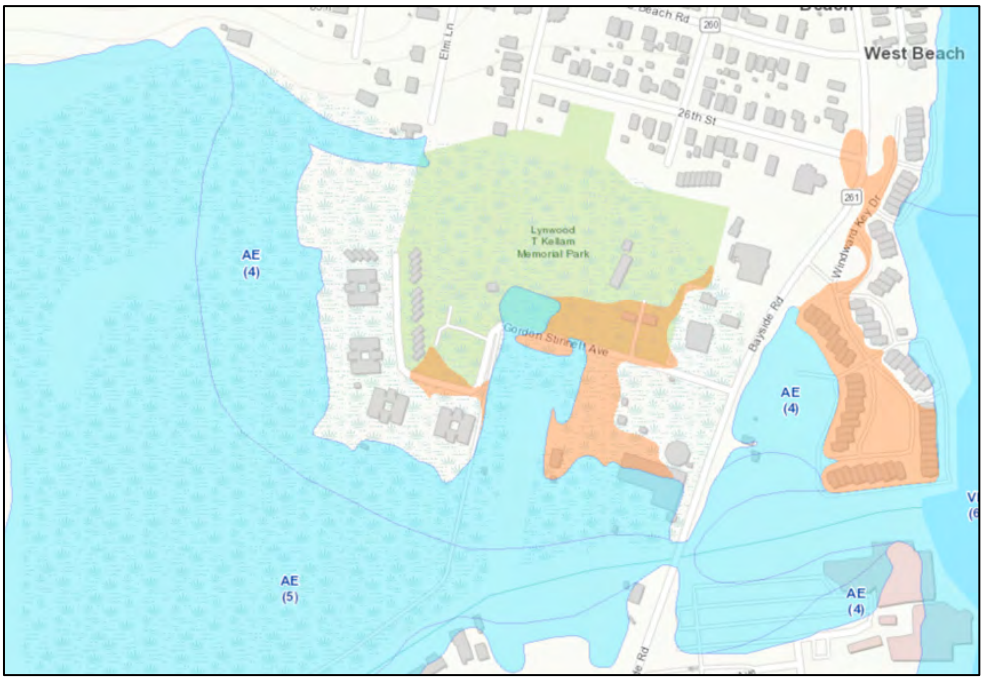

Figure 4: Historic FEMA floodplain mapping showing the extent of the marsh associated with Fishing Creek.

Floodplains

The Federal Emergency Management Agency (FEMA) regularly maps floodplains having a 1% chance of flooding in any given year (i.e., the 100-year floodplain). These are shown in Figure 5 below for most of coastal Chesapeake Beach and the North Beach area. In these floodplains, within Town boundaries, Chesapeake Beach regulates building and land development activities through its Floodplain Management Ordinance (Chapter 149 of Town Code).

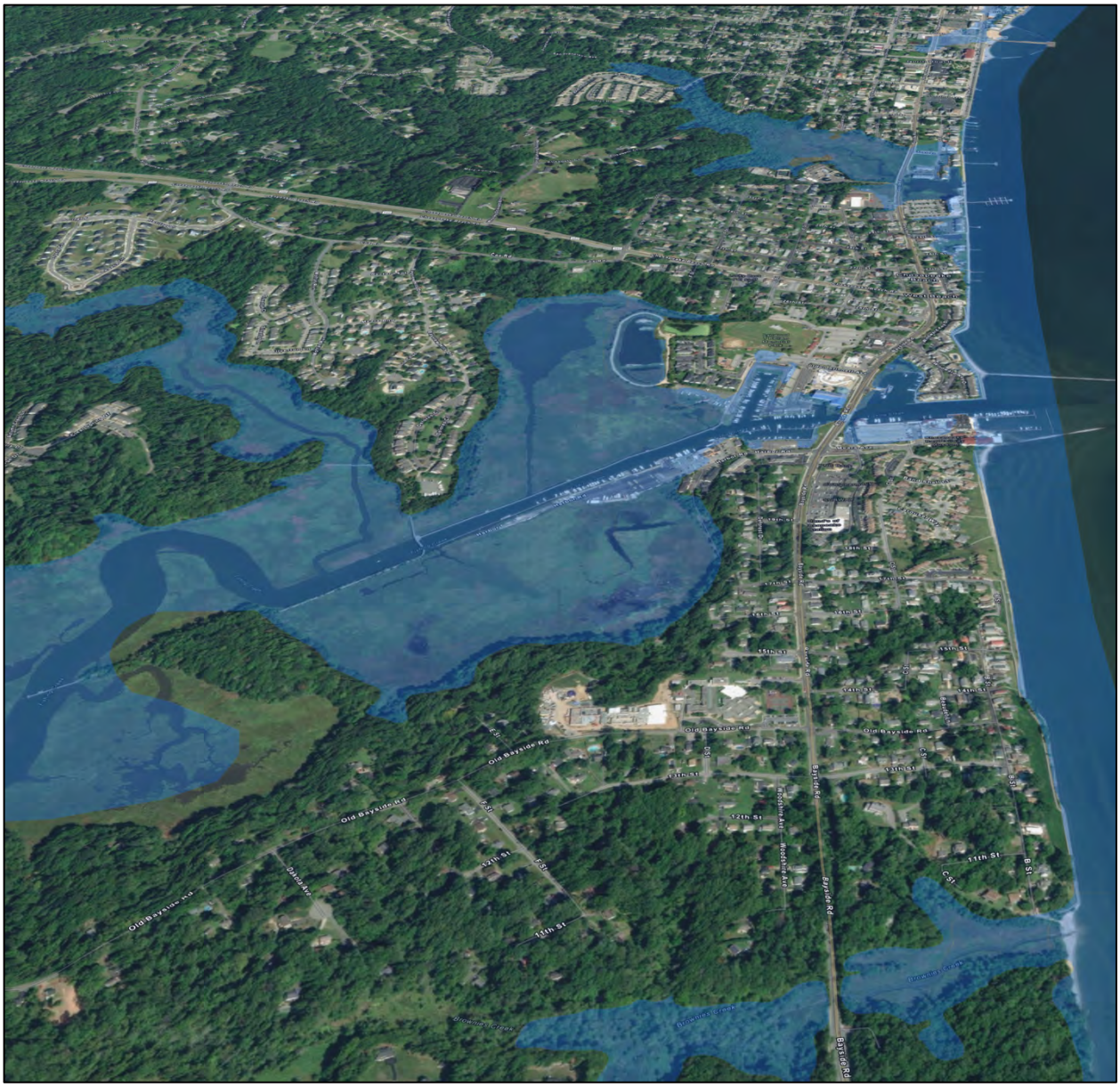

Figure 5: Mapped FEMA Floodplain, 1% Annual Chance Flood Area.

Figure 6 below maps the existing 1% Annual Chance floodplain from MD Route 260 north to North Beach. It provides a more detailed view of the northern part of Town and the floodplain associated with South Creek.

Figure 6: FEMA 1% Annual Chance Floodplain.

The figures below highlight separate flood zones within this above geographic area and show the base flood elevation (BFE). BFE is FEMA's estimate of the elevation of surface water resulting from the "base flood". The base flood is the flood with a 1% chance of being equaled or exceed in any given year. BFE can be thought as the minimum elevation above which a homebuilder must set the first floor to prevent water entering the home during a flood with a 1% annual chance of occurring. Figure 7 shows that the flood zone associated with South Creek has a BFE of 4 feet. Figure 8 shows floodplain that is mapped without a BFE. Figure 9 shows the flood zones along the shoreline from First Street in North Beach to 27th Street is subject to high velocity wave action and has a BFE of 8 feet.

Figure 9: FEMA Flood Zone AO. Base flood elevation is 4 feet.

Figure 8: FEMA Flood Zone AO. The base flood elevation may be less than 4 feet but is not mapped by FEMA.

Figure 7: FEMA Flood Zone VE, Special Flood Hazard Area. This area is subject to high velocity wave action. Base flood elevation is 8 feet.

Wetlands

Most of the Town's floodplain is tidal estuarine wetlands (marsh). These wetlands attenuate flooding, prevent shoreline erosion, improve the water quality of the Bay, and provide habitat for native plants, fish, and wildlife. They protect the existing settlement pattern in the historic center of Chesapeake Beach. Figure shows the wetlands in Chesapeake Beach.

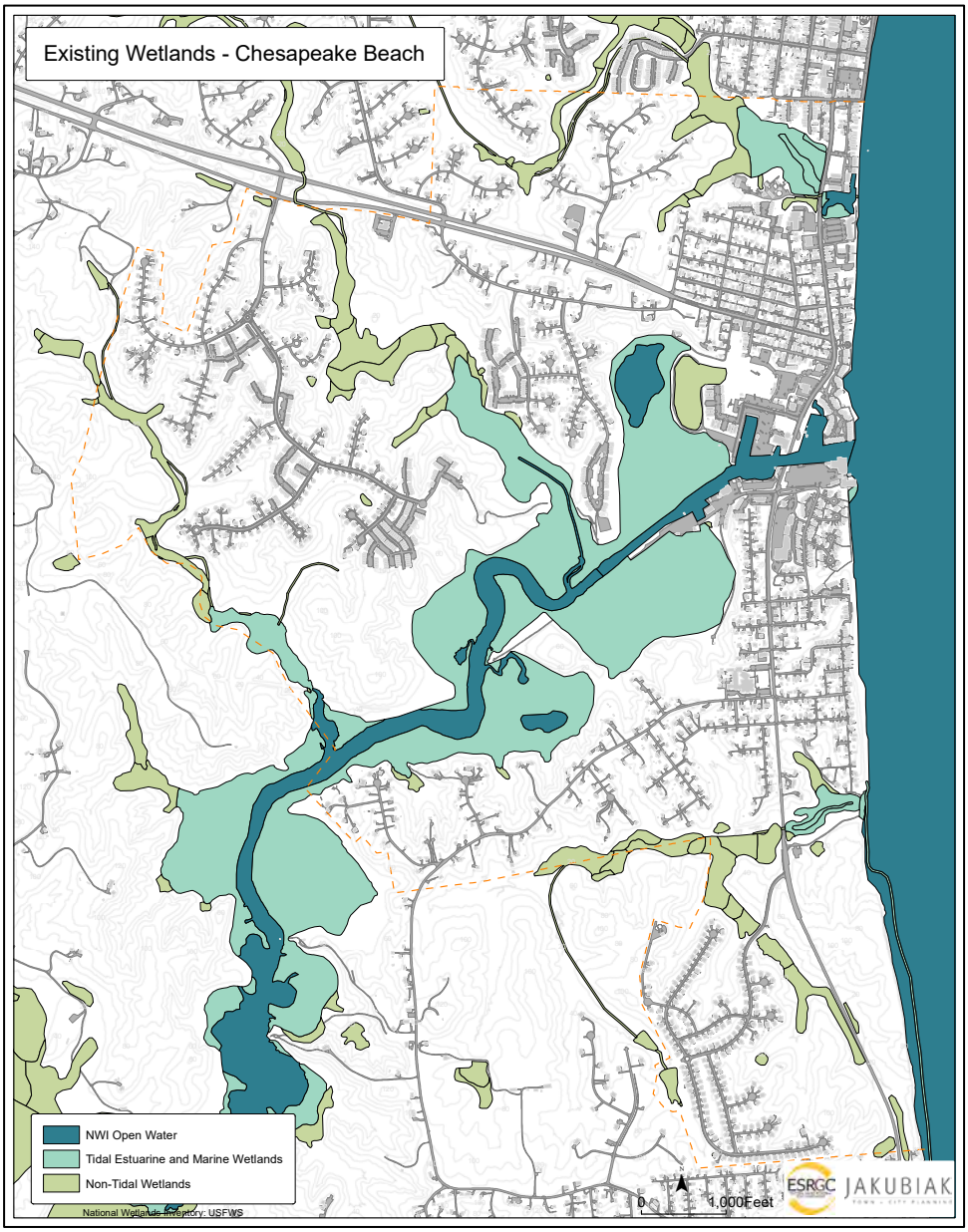

Figure 10: Mapped Wetlands in Chesapeake Beach.

The dominant wetland in and around Chesapeake Beach is the 92-acre Estuarine and Marine Wetland associated with Fishing Creek. Shown on Figure 10, it's the central green area on either side of Fishing Creek. This defining landscape feature consists of deep-water tidal habitats and marshes in which the bottom is both flooded and exposed by tidal action. It is also among the most scenic type of all natural resources in coastal Maryland.

The similar but smaller (12.5-acre) wetland complex of the same type on the north end of Town extends into North Beach and is associated with South Creek (See Figure 2.) Though it is mainly on the western side of MD Route 261, it is associated with the tidal action which is restricted to some extent by the seawall and a flood gate located between the Seagate and Horizons on the Bay housing communities.

Figure 10 also shows that non-tidal wetlands are located near both major tidal marshes. These are generally forested and extend into slightly higher elevations at greater distance from tidal action. The Town's non-tidal wetlands, whether populated by trees or just herbaceous plants, provide vital basins for retaining and filtering rainwater that flows from upland locations. The largest non-tidal wetland in Town is seven acres in size and is actually the Town's dredge disposal site. It separates Kellam's Field and the Courtyards at Fishing Creek from the Town's central tidal marsh. Even more extensive however, are the non-tidal wetland associated with South Creek (which extends northwesterly into North Beach) and along various tributary streams within the Town. These wetlands are mostly forested, and their preservation is an essential element of local flood management.

As sea levels rise, the Town's marshlands are expected to gradually transform into open water and simultaneously grow in response to both higher surface and ground water levels. Which is to say, the wetlands and marshes are dynamic; as they fill with water, they will also migrate and establish themselves where conditions are right for their growth.

Chesapeake Bay Shoreline

Two-thirds of the Town's 2.4-mile Bay shoreline, from North Beach south to 17th Street, is safeguarded by revetments. A revetment is a permeable wall of stones set at an angle away from the water to absorb the energy of waves and protect against erosion. Only a small section of the Bay's shoreline, at the Rod 'N' Reel Resort, is protected by bulkheading. Except for this small run of bulkhead and developed shoreline, the shoreline is gently sloping and mostly planted in lawn. There are two small private beach areas, one at Chesapeake Station and the other at the Rod 'N' Reel Resort. There are no naturalized or vegetated (living) shorelines or buffer zones in Town except at Brownies Beach and the Randle Cliff Natural Heritage Area.

From 17th Street southward, the shoreline becomes very steep with slopes exceeding 50%. Cliffs are a special type of steep slope, where the face of the slope rises at least 10 feet at a grade of 50% or more[7]. The cliffs extend to Brownies Beach, where the shoreline flattens out again allowing Brownies Creek to flow into the Bay. After leveling out at the Brownies Creek inlet, the shoreline rises steeply again, this time in a naturalized condition and unprotected by revetment. Here the shoreline becomes the Randle Cliffs, which is a dynamic natural landform, continually eroding by force of waves, ground and surface water, and wind.

The Maryland Department of Natural Resources has designated the Randle Cliffs and its associated upland forest a Natural Heritage Area. Its combined geological, hydrological, and biological features are considered among the best in Maryland. Habitats for three threatened / endangered species are found there[8]. The Town has protected the area with its Resource Conservation zoning.

Figure 11: Bay Shoreline in southern Chesapeake Beach.

[7] The tops of these shoreline slopes were subdivided and sold as building lots long before the advent of zoning. Houses and other structures now stand above the Bay, most notably along B Street. Heavy rains in recent years have caused noticeable sloughing and evoked concerns about the natural processes at work shaping the shoreline. Considering this, the Town adopted a Steep Slope Ordinance in 2018 requiring independently reviewed geo-technical studies and special stormwater management planning as conditions for future building activities.

[8] Puritan Tiger Beetle found in the intertidal zone, beach, cliff face and upland forest along Bay shoreline. Red Turtlehead (plant) found in the floodplain and non-tidal wetland areas to the west of MD Route 261. Glade Fern found in the northeast facing ravines and contiguous uplands between and above the ravines in the southwestern part of the area.

Drainage

Drainage in low lying areas has increasingly become a challenge and the Chesapeake Beach Nuisance Flood Plan: 2000-2025 documented locations throughout the Town where residual standing water follows coastal flooding and/or precipitation events. Figures 12 and 13 show two of those locations.

Figure 12: Standing Water at the Tot Lot at Kellam's.

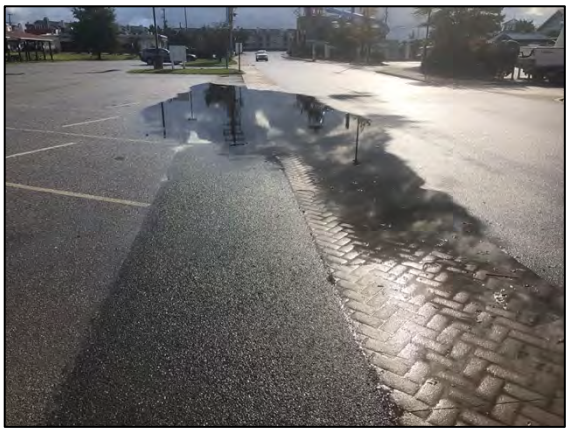

Figure 13: Standing water on Gordon Stinnett Ave.

There are two areas of Town, however, where major drainage systems are not operating effectively as described below and the effects are more extensive. Both would require updated engineering and significant investment. The solutions to both are integrally tied to this Plan's approach to coastal resiliency.

Floodgate

The South Creek estuary is partially controlled by a flood gate located between Seagate (on the north) and Horizon's on the Bay (on the south). Between these communities is the eastern section of the estuary's tidal wetland which is separated from the Chesapeake Bay by a floodgate with a revetment and causeway. These features are visible in the photo below, which was taken from the northbound lane of MD Route 261. The open floodgate is in the distant center of the photo. Over time, this wetland has been converting to open water.

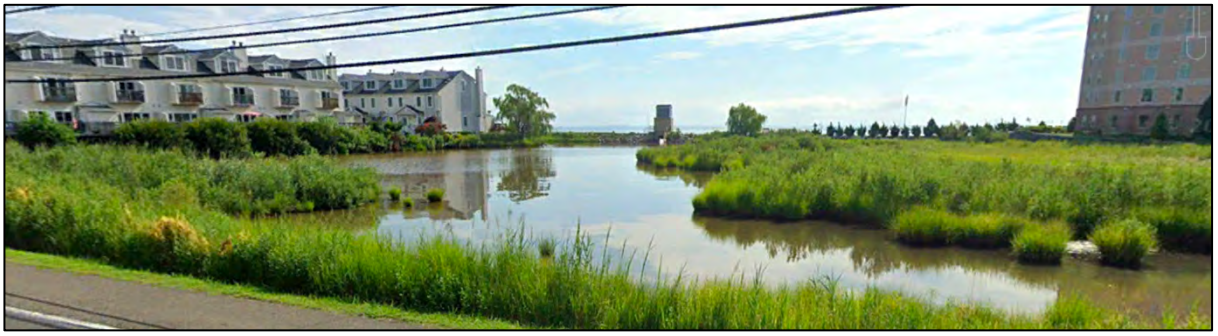

Figure 14: Photo showing the floodgate.

The floodgate, with its revetment and causeway, were intended to prevent storm surge from entering the wetland and flooding the northern part of Town, including Seagate and MD Route 261[9]. However, the floodgate is in a permanently open position, so it does not operate to prevent tidal flooding. Figure 15 shows that MD Route 261 was inundated by the October 2022 unnamed tidal event that occurred without precipitation.

During times of precipitation and upland flooding, the open floodgate is intended to allow water to flow out to the Bay thus preventing the back up of water. When there is a major coastal flooding event (like October 2022) or coastal event in combination with a rain storm—a common occurrence--the floodgate system also cannot work which among other things overwhelms the drainage system near the Seagate townhouse community.

Figure 15: View from Sea Gate community along MD 261 frontage looking west toward the sidewalk railing on MD Route 261 which is underwater following the un-named high tide event on October 12, 2022.

Seagate, which lies on the north bank of the wetland, contains a pumped stormwater system near the intersection of C and 31st Streets. This pump drains a sump area and discharges its water through a storm drain which outfalls about 460 feet to the south into the wetland. Presumably, the water is meant to be held in the wetland where its sediments are allowed to drop out. But, in times of coastal flooding, the water in the wetland is pushed westward over MD Route 261 (or through a culvert) whereupon it eventually moves eastward returning to the sump area to be pumped again into the wetland. This creates a continuous circular pumping scenario.

[9] That is, in the rare occurrence where there is coastal high flooding event without significant precipitation.

To avoid this, the drainage infrastructure would need to be re-constructed to pump directly to the Bay. The ultimate design solution for MD Route 261, however depends in large part of how this drainage system is reconfigured.

29th Street & Veterans Park

The Bayfront properties between 29th Street and Veterans Memorial Park have traditionally drained into the Bay through a series of storm drain pipes or wall openings in a bulkhead. The storm drain design for this area, which was implemented, is shown below. It is no longer effective. Note that it extends well west of MD Route 261 into the Middle Subdivision. Some years ago, the Army Corps of Engineers (USACOE) built the current stone revetment structure to protect those properties from eroding effects of wave action. In doing so, the USACOE raised the level of the structure relative to the homes and yards behind the revetment and did not modify drainage infrastructure.

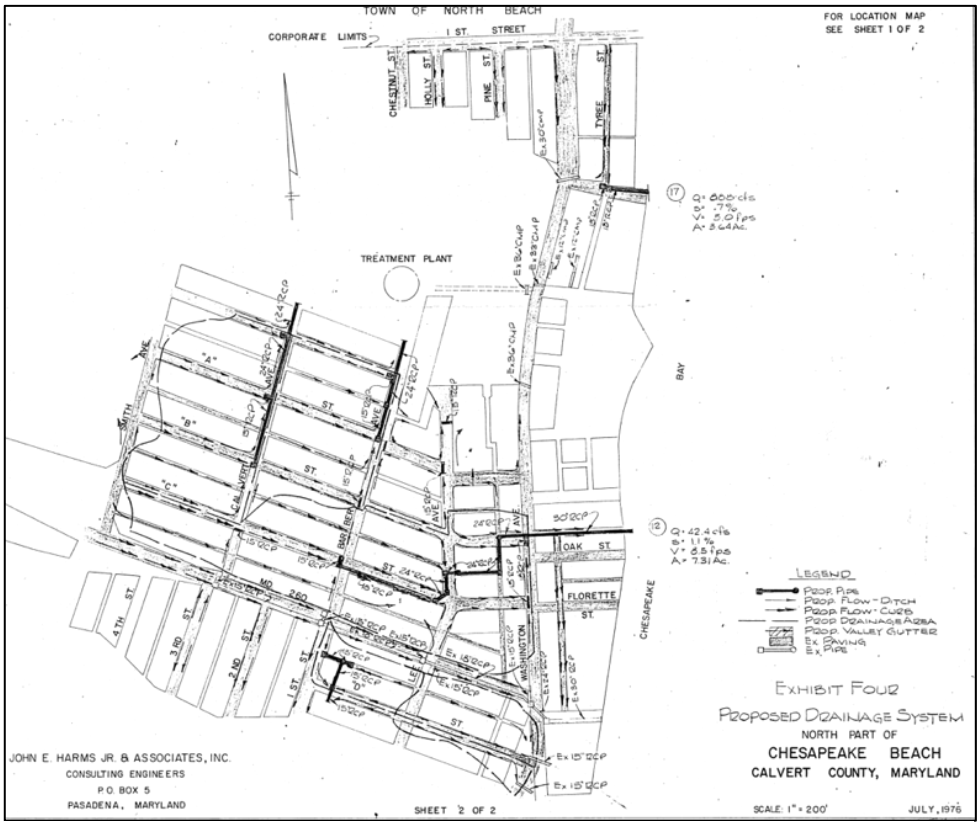

Figure 16: Storm Drain Plan, 1976.

Over time due to sea level rise and the raised revetment wall, both of which have prevented the discharge of water to the Bay, private property owners and the Town have found it necessary to implement incremental drainage solutions. Storm drains have been re-routed to find low areas to convey water and pipes have been elevated where possible. Also, the storm drain outlet at 28th Street and the Bay was completely plugged to prevent ponding on private property during high tide events. A comprehensive and areawide drainage assessment needs to be undertaken including videotaping the existing drainage system. Detailed mapping is required to determine an optimal method of modernizing the drainage system in light of the sea level rise projected in this Plan.

Chapter 3 Vulnerable Areas and Assets

Background

Local sea level is measured at tide gauges in the Chesapeake Bay. The baseline for the sea level projections used in this report is the level recorded in 2000 at the Solomon's Island, Maryland tide gauge. When this report refers to sea level rise, it is referring to the change above the levels recorded at Solomon's Island in 2000. The projections of sea level rise are from the Maryland Commission on Climate Change, Sea-Level Rise Expert Group via the University of Maryland Center for Environmental Science (UMCES). The Commission's publication titled Sea-Level Rise: Projections for Maryland 2018, is the source for the projections[10]. Pursuant to State law, these projections are to be updated every five years.

Tolerance for Flood Risk

The UMCES projects sea levels at various "tolerances for risk" and advises how these projections should be used when planning or and designing improvements. Figure 17 shows the projections for three levels of risk tolerance by decade through the year 2150.

Tide Gauge: Solomons Island, MD
Emissions Pathway beyond 2050: Stabilized (RCP 4.5)

Year	High tolerance for flood risk	Medium tolerance for flood risk	Low tolerance for flood risk
2030	0.9 ft	1.1 ft	1.3 ft
2040	1.2 ft	1.5 ft	1.8 ft
2050	1.7 ft	2.0 ft	2.4 ft
2060	2.0 ft	2.4 ft	2.9 ft
2070	2.4 ft	2.9 ft	3.5 ft
2080	2.7 ft	3.3 ft	4.3 ft
2090	3.1 ft	3.8 ft	5.0 ft
2100	3.5 ft	4.4 ft	5.8 ft
2110	3.9 ft	5.0 ft	6.8 ft
2120	4.3 ft	5.5 ft	7.8 ft
2130	4.8 ft	6.1 ft	8.8 ft
2140	5.2 ft	6.7 ft	9.7 ft
2150	5.6 ft	7.3 ft	10.9 ft

Figure 17: Projections of Sea Level Rise, University of Maryland Center for Environmental Science, 2018.

This Plan uses maps for projected sea levels in the years 2030, 2050, and 2100 at a "low tolerance for flood risk". Figure 17 shows, for example, that in 2050 sea level is projected to be plus 2.4 feet at the low risk tolerance projection. For comparison, at the medium risk tolerance, the projection is plus 2.0 feet. At the high risk tolerance, the projection is plus 1.7 feet. The risk tolerances correspond to the flowing percent probabilities that sea level will meet or exceed the stated value in a given year:

- High tolerance for flood risk: 17% probability
- Medium tolerance for risk: 1 in 20 chance, or 5% probability
- Low tolerance for flood risk: 1 in 100, chance, or 1% probability

[10] Boesch, D.F., W.C. Boicourt, R.I. Cullather, T. Ezer, G.E. Galloway, Jr., Z.P. Johnson, K.H. Kilbourne, M.L. Kirwan, R.E. Kopp, S. Land, M. Li, W. Nardin, C.K. Sommerfield, W.V. Sweet. 2018. Sea-level Rise: Projections for Maryland 2018, 27 pp. University of Maryland Center for Environmental Science, Cambridge, MD. https://www.umces.edu/sites/default/files/Sea-Level%20Rise%20Projections%20for%20Maryland%202018_0.pdf

For coastal planning purposes, University of Maryland Center for Environmental Science and Maryland Department of Natural Resources advise using projections associated with the low risk tolerance for flooding[11]. Using a low risk tolerance effectively means planning for avoidance, resistance, and the relocation of assets when adapting to flooding over time. In using a low risk tolerance, this Plan assumes that sea level rise values given for each year are unlikely to be exceeded in that year. In this way, conservative planning can be done so potentially severe consequences of flooding can be avoided, such as loss of life, public safety hazard, property destruction, and costly repair of infrastructure and buildings.

The low risk tolerance projection is used in this Plan can be explained in this way: there is 1% chance that sea level will be 2.4 feet or higher than the level recorded in 2000. It can also be explained by saying: there is a 99% chance sea level rise will be lower than 2.4 feet. Likewise, for the year 2100, the low risk tolerance projection used in this Plan means that there is 1% chance that sea level will be 5.8 feet or higher than the 2000 level and thus a 99% chance it will be lower than 5.6 feet.

If the Town were in the position now to design a new residential community, a town hall, a new water reclamation plan, or a fire company, it would adopt a low tolerance for risk for these assets. Each is vitally important and one of the design goals would be to ensure the long term viability and safety of the asset or of public safety generally. For that reason, the Town would insist on locating and designing such assets to strictly minimize the threat of hazard. The fact that each asset type is already present in Chesapeake Beach, and located within a flood hazard area, only reinforces the need for conservative planning. In applying a low tolerance for risk, this Plan is aiming to guide adaptation of the town and such assets with the greatest concern for public safety and asset preservation.

By contrast, if the Town were now to design a new park, it would likely use a higher tolerance for risk because a park, in contrast to a fire company, can generally flood without causing major damage. In the future, as the Town and State of Maryland implement the ideas recommended in this Plan, engineers will make specific determinations about relative tolerances for risk. An evacuation route (such as MD Route 261) could be conservatively designed with a low risk tolerance and would ideally be elevated well above base flooding conditions, while a parking lot at the Kellam's Recreational Complex could be designed with a much higher tolerance for risk allowing for routine flooding without impact to public safety.

A Word About Storm Surge

The mapping used in this Plan shows the projected extent of future "still" water—that is, open water on a typical day in the future (2030, 2050 and 2100). The mapping does not incorporate the storm surge associated with hurricanes or nor'easters. Storm surge is the level of windblown water that arrives at the shoreline above the normal tide levels. In Hurricane Isabel (2003), the local storm surge was estimated to be 4 to 5 feet -- that is, the water was 4 to 5 feet above the normal tide level on that day in 2003. When one considers the mapping of open "still" water in this report, it's helpful to layer storm surge on top of that higher sea level to appreciate the extent of future risk. If, for instance, the sea level in 2050 is about 2.4 feet higher than it was during Hurricane Isabel (as projected), a comparable storm surge will arrive at roughly 6.4 to 7.4 feet above the 2003 tide level, rather than at 4 to 5 feet. This gives greater credence to this Plan's decision to use the low risk tolerance for coastal resiliency planning.

[11] Guidance for Using Maryland's 2018 Sea Level Rise Projections, Kate McClure University of Maryland Sea Grant Extension and Allison Breitenother and Sasha Land, Maryland Department of Natural Resources, March 2022.

Mapping

The Eastern Shore Regional GIS Cooperative (ESRGC) assisted the Towns of Chesapeake and North Beach with flood analyses and prepared the maps shown in this Plan. An ESRGC prepared document summarizing its methodology is provided in the Appendix. The ESRGC used the most current (2017) LiDAR topographic mapping data to establish land elevations, meaning that any topographic changes following 2017 were not captured on the maps presented in this report. To address this, the Town of Chesapeake Beach surveyed lands in 2022 known to have been raised since 2017 and updated the mapping as needed. The updated maps are not incorporated into this report but were considered in this study, presented at public work sessions, and remain available on the webpage the Town created for public review.

The sea level maps are used throughout this report to explain existing or projected conditions, but they are also provided at a higher resolution for more detailed examination in the Appendix to this report. For the year 2100 two series of maps were produced. The first series is based on the 2100 projection for sea level rise (RCP 4.5) which assumes global society is able to stabilize carbon emissions following 2050. The second series (RCP 8.5) assumes global carbon emissions continue to grow beyond 2050[12]. This second scenario shows a greater extent of inundation and flooding than the stabilized emission scenario. Both series of maps were considered in formulating the recommendations of this Plan, but only the stabilized emissions scenario is presented in the body of this document. The maps contain content that is particularly useful to understanding the Town's vulnerability to flooding due to sea level rise. Figure 18 provides guidance for reading the maps.

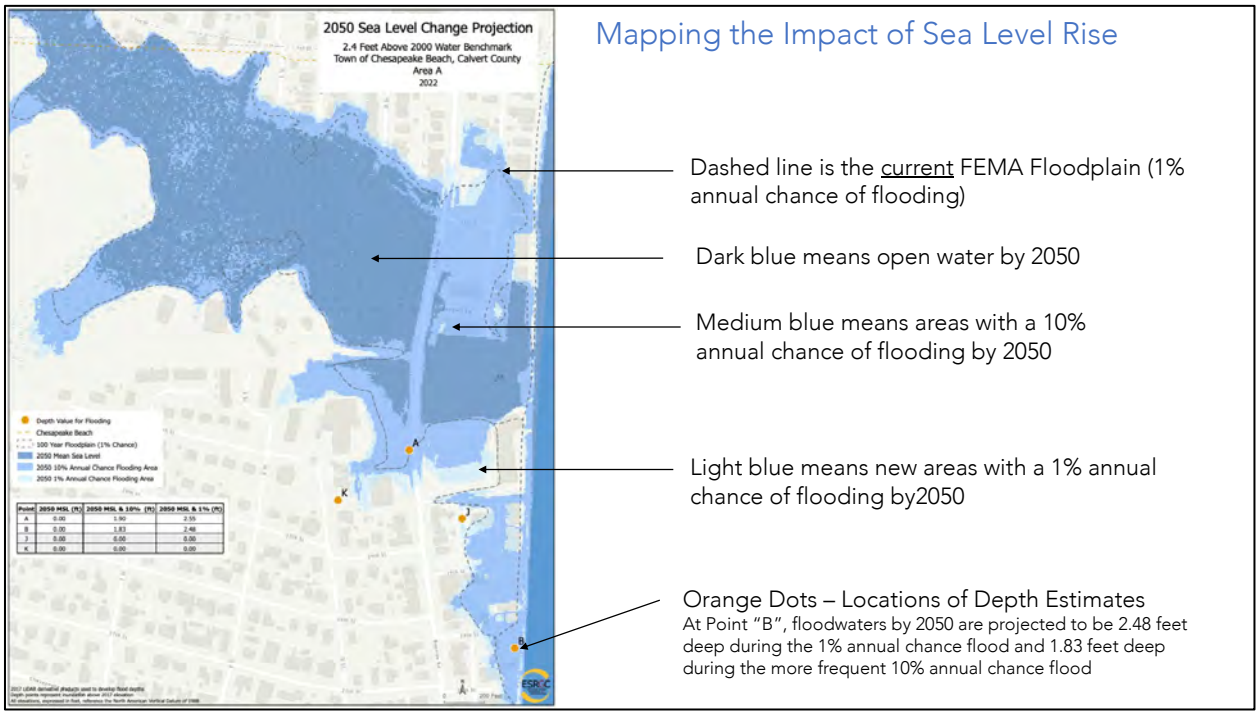

Figure 18: A Guide to the Content on the Sea Level Rise Maps.

[12] See the aforementioned report, Sea Level Rise, Projection for Maryland, 2018.

Vulnerability Areas

To allow for detailed examination of the effects of projected sea level rise on neighborhoods, infrastructure, and community assets, this Plan focuses on three subareas within the Town (See Figure 19). The maps that follow document the extent of future inundation, flooding, and vulnerable community assets within each of these areas. Later in Chapter 4, this Plan's recommendations are also organized by area.

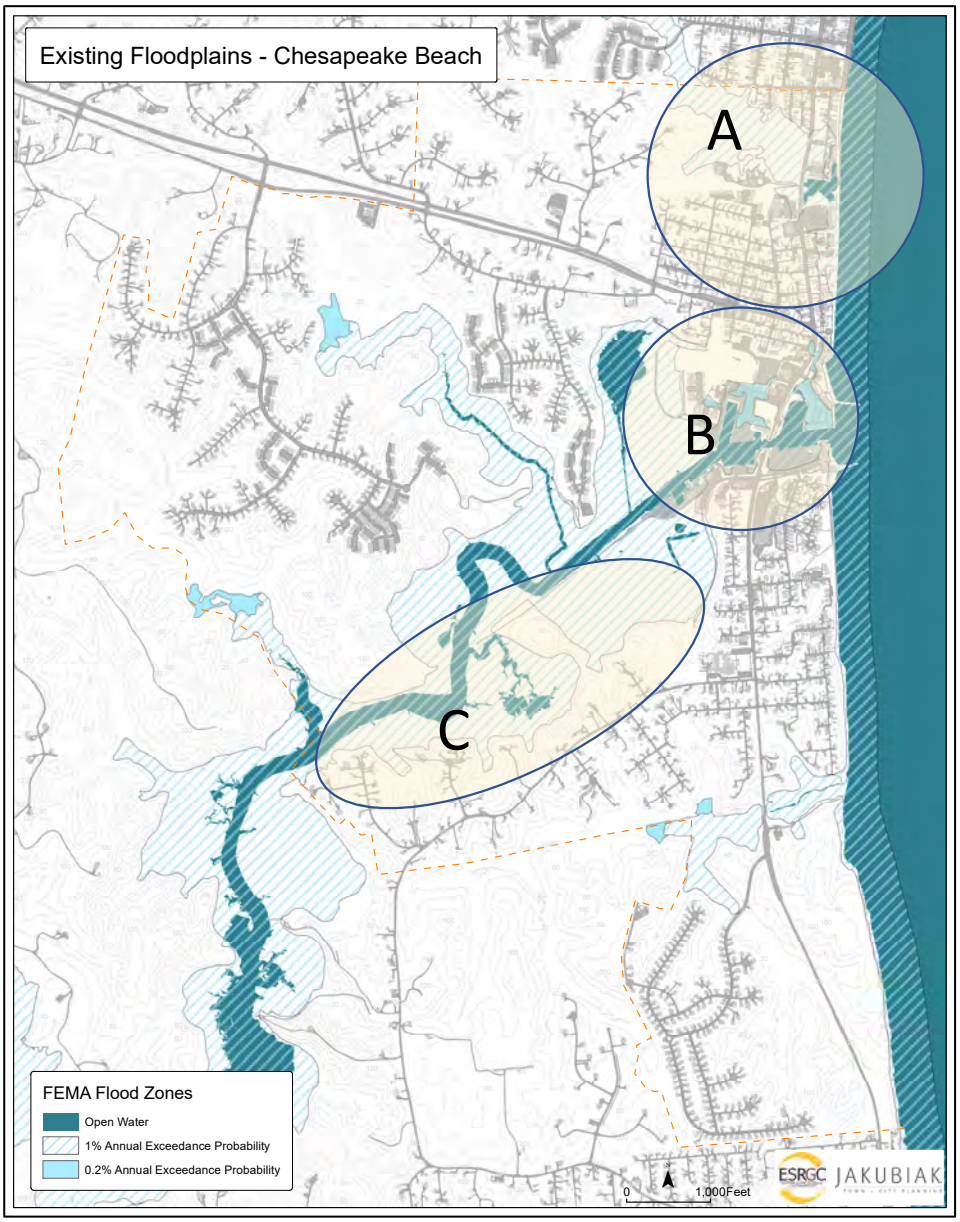

Figure 19: Three Vulnerability Areas.

Area A

Area A extends from about 27th Street north to First Street. It encompasses the South Creek estuary or inlet to the Bay. Shown here is the area in 2030 (with a sea level rise of 1.3 feet), in 2050 (with a sea level rise of 2.4 feet), and 2100 (with a sea level rise of 5.8 feet. The most dramatic change projected between 2030 and 2050 is the near complete conversion of the marsh to open water. Over time the floodplain would extend both north and south encompassing residential and commercial properties that today are not within the FEMA floodplain.

The community assets shown in the maps are the Chesapeake Beach Water Reclamation Plant (WRP) and the North Beach Volunteer Fire Company (NBVFC). The Sea Gate residential community, consisting of 30 townhouses, is projected to be increasingly vulnerable to flooding in the decades ahead. By 2100 the are South Creek estuary is projected to be fully engulf in water covering the grounds of Sea Gate and nearby properties.

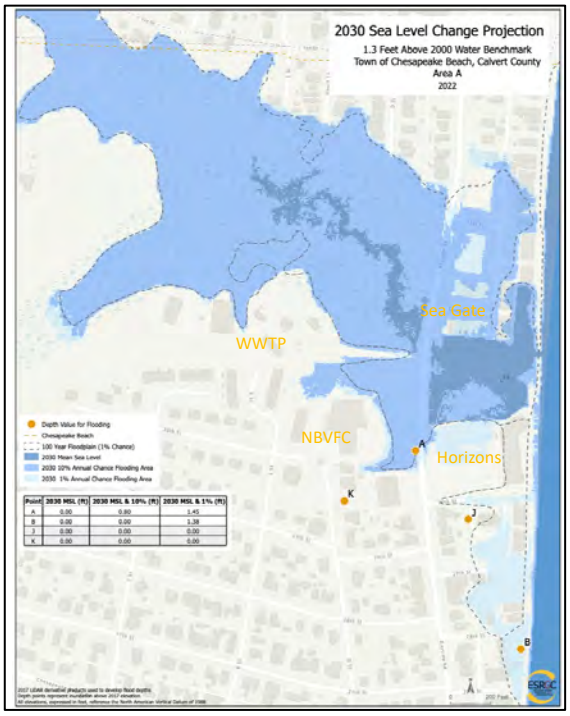

Figure 20: 2030 Sea Level Rise Projection, Area A.

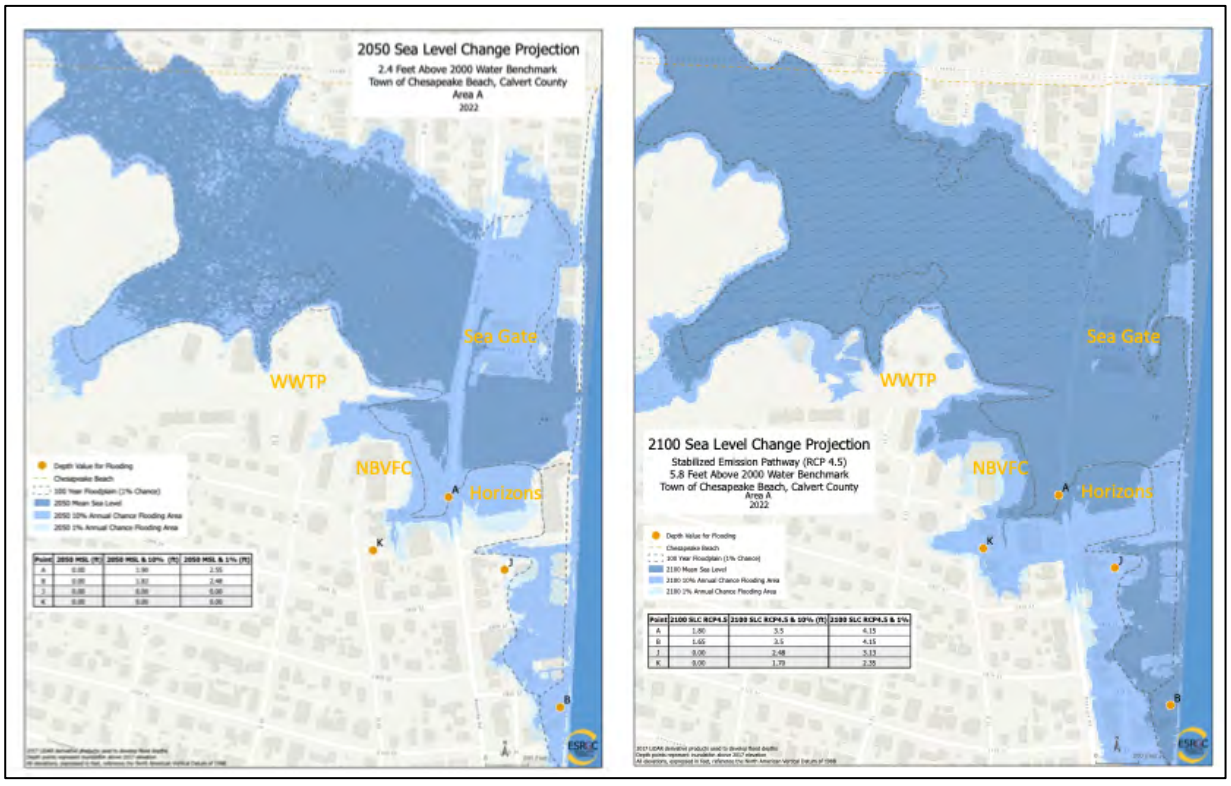

Figure 21: 2050 & 2100 Sea Level Rise Projections, Area A.

Area B

Area B encompasses the historic center of Chesapeake Beach and the Fishing Creek inlet to the Bay. Shown here is the area in 2030 (with a sea level rise of 1.3 feet), in 2050 (with a sea level rise of 2.4 feet), and 2100 (with a sea level rise of 5.8 feet.

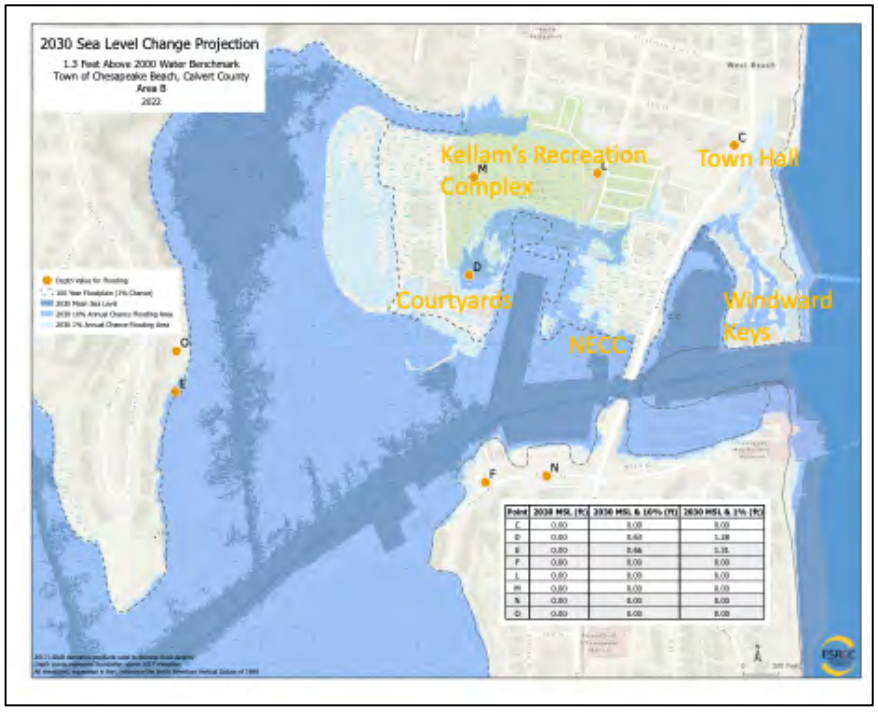

Figure 22: 2030 Sea Level Rise Projection, Area B.

The community assets shown in the maps of Area A are the Chesapeake Beach Town Hall, the Kellam's Recreation Complex, the North East Community Center (NRCC). The Chesapeake Beach Waterpark and Public Boat Landing are also located here. The Courtyards at Fishing Creek Townhouses and Apartments (Courtyards) and Windward Key are also located in this area of Town. Both are projected to be increasingly vulnerable to flooding in the decades ahead, the Courtyards especially.

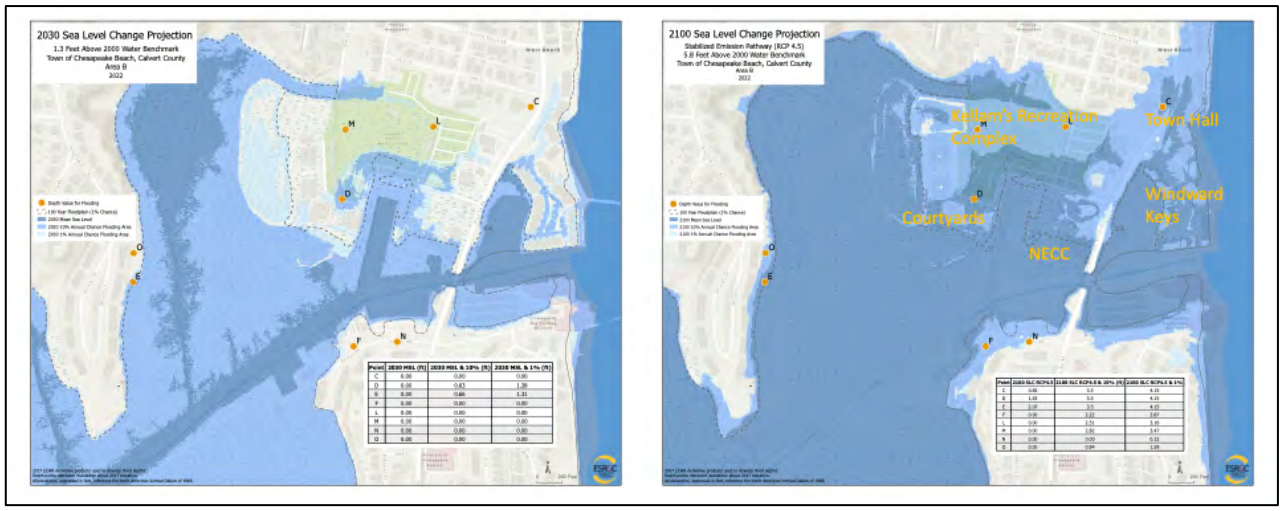

Figure 23: 2050 & 2100 Sea Level Rise Projections, Area B.

Area C

Area C encompasses the southern section of the Fishing Creek marsh. Shown here is the area in 2030 (with a sea level rise of 1.3 feet), in 2050 (with a sea level rise of 2.4 feet), and 2100 (with a sea level rise of 5.8 feet.

Sea level rise in Area C is almost entirely contained within the current FEMA floodplain, through some expansion of the flood plain in lower lying areas is projected over time. This area of Chesapeake Beach is largely wooded and sparsely developed. It is zoned for low density residential development and falls within the Limited Development Area (LDA) of the Critical Area. There are no community assets here and no public streets or utilities are anticipated to be impacted by sea level rise.

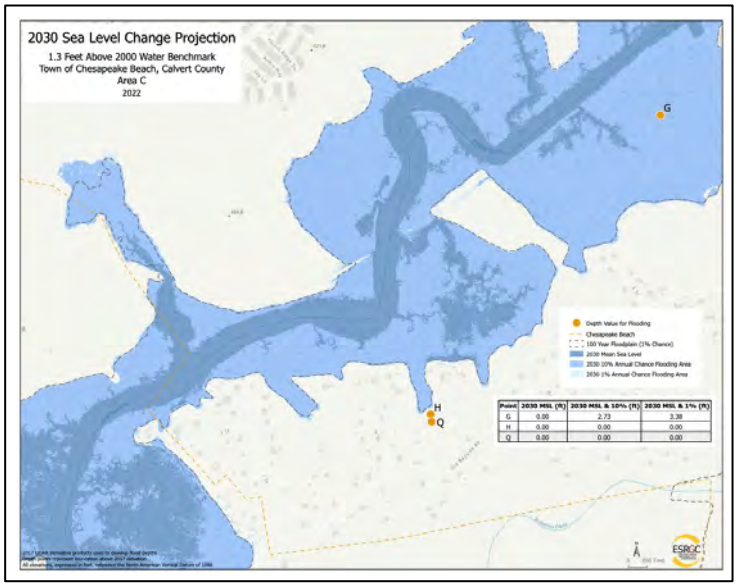

Figure 24: 2030 Sea Level Rise Projection, Area C.

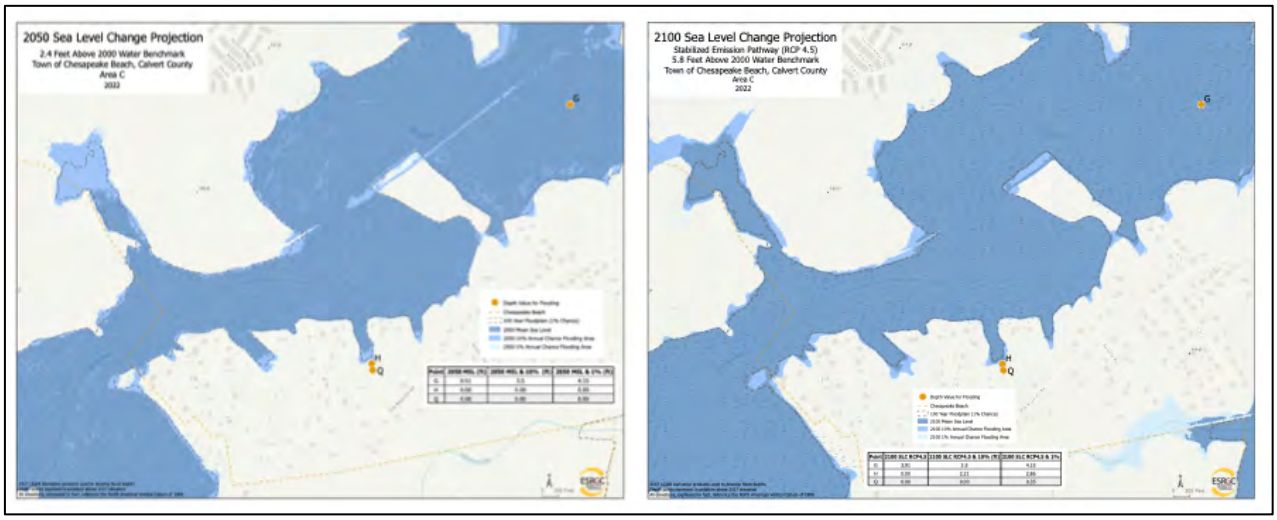

Figure 25: 2050 and 2100 Sea Level Rise Projection, Area C.

Summary of Impacts

Housing developments have been built within areas and at elevations which present significant future flood hazard. Circulation within Chesapeake Beach is also vulnerable to multiple day disruptions during both tidal events and major storms. Over the long term, beyond 2050, some streets are also at risk of being permanently inundated as sea level fills low lying areas. This includes MD Route 261 between 27th Street and First Street, several Town owned streets including parts of 31 Street, C Street, D Street, E Street, David Street, and Gordon Stinnett Avenue. A major section of this road is elevated only 2.5 to 3.0 feet above the current sea level and is routinely flooded during 1% annual storm events.

Gordon Stinnett Avenue is the only access route between the Courtyard at Fishing Creek housing community and the Town street system. The Courtyards was established in 1989 under the federal Low Income Housing Tax Credit program (LIHTC) and was constructed on filled wetlands. It provides 76 units for Town households earning below the median housing income. Multiple private community streets are at risk including those at the Courtyard at Fishing Creek, Windward Key, and Sea Gate.

Further, essential community facilities are at risk, including the North Beach Volunteer Fire Department, the entrance road to the Chesapeake Beach Water Reclamation Plant, the grounds of the Town Hall, and the Northeast Community Center (which is actually a designated hazard resource center). The entire Kellam's Recreation Complex was constructed on filled wetlands and a large portion sits at, or under, five feet above sea level. The Chesapeake Water Park is a site of significant subsidence as mentioned elsewhere in this report and its ability to function over the longer term is at risk due to flooding. The extent of these and other risks by area is explored further in Chapter 4, Action Plan Strategies and Recommendations.

Chapter 4 Plan Strategies, Recommendations

Overall Approach

The purpose of this Plan is to provide a coordinated and long term approach to making Chesapeake Beach more resilient to the effects of rising water levels and the flooding associated with it.

This Plan aims to be holistic in its approach. It considers the natural resource systems and the Town's settlement pattern. As documents in this report, the Town developed in a way that placed current and future populations increasingly at risk, mostly within and adjoining the tidal estuaries associated with South and Fishing Creeks. So, this Plan for resiliency is largely about retrofitting those patterns.

Solutions must be comprehensive, flexible, sensible and consensus driven. This plan for coastal resiliency is a plan about embracing the reality of the landscape and its limitations and making Chesapeake Beach safer and more environmentally sustainable, walkable, beautiful, and enjoyable. The solutions that address flood risk most optimally therefore will be solutions that provide other community benefits too.

The overall approach can be broken into two main strategic frameworks. The first is about strategic flood management and sustainable drainage. These recommendations are universally applicable within the Town's coastal areas most notably within lower lying areas at risk of flooding or permanent inundation. The recommendations include changes to the regulations that govern development activities and land use in the floodplain. The second strategic framework is about tactical retrofitting. These recommendations are location-specific and include both policy and project-based proposals. Recommendations are provided for each of the three subareas described elsewhere in this report: Areas A, B, and C.

Strategic Flood Management and Sustainable Drainage

In order to operationalize the recommendations in this section, the Town must periodically track projected changes in sea level and map the effects of these changes on the landscape. In other words, it must update the maps presented in Chapter 3. The Maryland Commission on Climate Change Commission updates the projections every five years so the Town could periodically select and adopt a sea level rise projections, based on the Commission's published projection. With the new projections in hand, the Town could then revise its geo-spatial mapping and take account of any local topographic changes. The updated mapping would then provide the base for drawing flood hazard zones wherein certain types of regulations would apply.

Tying regulations to consensus projections of sea level rise means the regulations can be reasonably applied in the short term and adjusted over the longer term as changing conditions or improved information warrants. For now, the recommendations that follow reflect this Plan's adoption of the 2.4 foot increase (projected to occur by 2050), and the mapping which derives from that projection, and the 5.6-foot increase (projected to occur by 2100) and the mapping which derives from that.

For guidance to the recommendations that follow, note that when the recommendations refer to the "2050 Maps" or "2100 Maps" they are referring to the maps in Chapter 3 of this report. The 2050 Maps show areas of open water, areas with a 10% annual chace of flooding and areas with a 1% annual chance flooding under the assumption that relative sea level is 2.4 feet over the year 2000 baseline. The 2100 Maps show the same geographic areas and the same categories but assume relative sea level is 5.6 feet over the baseline established in the year 2000. Please refer to the maps in the Appendix.

1. Amend the Floodplain Management Ordinance (Chapter 149 of Town Code) to apply flood management regulations to all properties mapped on the 2100 Maps as a Flood Area. The regulations would include among other things applying a required minimum flood protection elevation (FPE or "freeboard"), and requiring flood resistance materials, the elevation of electrical building components, and anchoring of accessory structures. This effectively means broadening the geographic area and expanding the number of properties subject floodplain regulations.

2. Amend the Floodplain Management Ordinance to incorporate a higher flood protection elevation (FPE, or freeboard). For all areas mapped in the higher risk 10% Annual Chance Flood Area on the 2100 Maps, the Town should require that development or redevelopment projects incorporate a FPE of at least 4.5 feet. This is 2.5 feet higher than the current 2-foot flood protection elevation required in the Town's Floodplain Management Ordinance. The extra clearance is intended to account for the projected 2.4 feet of sea level rise through 2050. This Plan assumes over time FEMA will continually update its base flood elevation and while the 2 -foot FPE should continue to be adequate generally, all properties mapped as 10% Annual Chance Flood Area, will need to adhere to this new higher standard for freeboard: 2-foot FPE plus at least 2.5 feet.

3. Amend the Zoning Ordinance (Chapter 290 of Town Code) to require that all site plans for any development or redevelopment on properties mapped on the 2100 Maps as Flood Area include certification by a Professional Engineer that all principal buildings have a demonstrated capability to withstand the storm surge associated with the Town's projected sea level rise. Specifically, for the next decade, the certification will need to demonstrate that flood tolerant construction methods would be used appropriate to the projected storm surge assumed with the 2.4 foot rise. This is the "Isabel plus 2.4-foot test". It takes the Town's experience with the last recorded Hurricane and assumes it arrives on a tide level 2.4 feet higher.

4. Amend the Zoning Ordinance (including Critical Area regulations) to require that all required stormwater management practices and techniques for development or redevelopment projects in areas on the 2100 Maps as Flood Area be proven effective with the 2.4 foot rise in sea level assumed as a base condition. This includes stormwater management evaluations required for development activities within the Critical Area. The Town will need to coordinate with Calvert County Department of Public Works to incorporate this standard, or a comparable standard, into the Department's administration of Maryland stormwater management regulations.

5. Amend the Zoning Ordinance to prohibit from areas mapped as 2100 Flood Area, all group homes, convalescent centers, nursing homes, medical clinics, and hospitals. These uses would be especially vulnerable to coastal hazards and would present difficulties for emergency evacuation.

6. Thoughtfully evaluate the Zoning Ordinance to determine what regulatory obstacles may impede property owners from raising buildings and improving their properties in ways that would protect public health and safety and advance the resiliency goal of this Plan.

Tactical Retrofitting

This section is organized into three parts. The first describes the spatial tactics and the techniques which may be applicable within the Town generally. The second and third part describe the tactics and techniques specially recommended as applicable to Area A, B, and C respectively. Recall areas A, B, and C are described and mapped in Chapter 3.

The tactics and techniques are summarized in the framework set forth in Figure 26 below. Some of the tactics can work in coordination with each other and in fact may be codependent. All of them can be used to ensure the most effective and comprehensive approach.

Spatial Tactic	Techniques	Description
Attenuate	General open space protection. Forest preservation and tree planting. Steep slope -- preservation in wooded condition. Shoreline, rip rap or naturalizing shoreline.	Reduce the velocity of flood waters and increase the time water takes to move along a pathway
Alleviate	Allowing marsh migration. Re-establishing wetlands. Spill-overs and retention zones. Building new landforms to contain water. Sustainable drainage. Best Management Practices.	Increase the capacity to withstand floods, provide safe areas that can be flooded to limit vulnerability elsewhere, manage stormwater in all forms of development, retro-fit existing neighborhoods. Absorb.
Restrict	Building, rebuilding revetments and bulkheads. Building, rebuilding floodgates and seawalls. Building new landforms to block water.	Restrict the entry of water. Hold the line against flooding.
Realign	Elevating streets, sidewalks, parking lots. Redeveloping neighborhoods. Elevating individual buildings. Managed retreat, relocating buildings and community assets. Bringing about land use changes.	Reposition and thus reduce exposure by moving infrastructure and buildings, either vertically or horizontally.

Figure 26 Spatial Tactics and Techniques

Attenuate. Attenuation is the foundation for the Town's coastal resilient approach. While sea level rise is a coastal phenomenon, good land use and stormwater management further inland, (in the drainage basins of South and Fishing Creeks) can reduce the Town's vulnerability to flooding. Healthy forests, especially on steeply sloped terrain and along streams, and healthy wetlands work to reduce the velocity of floodwater and increase the time it takes to flow into the lower lying areas of coastal Chesapeake Beach.

Alleviate. Alleviation is also foundational to coastal resiliency in Chesapeake Beach. The local context described in Chapter 2 of this report indicates the potential latent in the Town's natural resources to help cushion sea level rise and withstand floods. This tactic is in part about allowing natural or nature-like processes, like the migration of wetlands and sustainable drainage, to absorb floodwater so that overall vulnerabilities are lowered.

Restrict. Restricting the entry of water into critical zones through floodgates, sea walls, bulkheads, and other structures is a must in certain locations but it's viability within the unique environmental context of Chesapeake Beach is limited. Because the Town has been built on and among two estuaries, flood waters comes from the Bay while stormwater flows to the shoreline. The structures that would be required to hold back the water along the shorelines of the Bay and Fishing Creek would displace much of the Town and the drainage pipes and pumps necessary to convey floodwaters over and through those structures back to the Bay would be monumental.

Realign. Realignment is about moving things like roads, houses, business, and community assets so they can withstand flooding or avoid it altogether. Some buildings, and infrastructure can be raised so water passes under or around and some can be relocated to safer locations. The Realign and Alleviate tactics can be especially complementary. For example, allowing tidal marshes to expand (alleviate) may depend on relocating buildings and infrastructure (realign).

Area A

Overview

As described elsewhere in this report, Area A is dominated by the confluence of South Creek and the Bay and home to essential community assets and residential communities. The prominent scenic and environmental feature in Area A is the South Creek tidal marsh which now extends along the west side of MD Route 261 roughly from the entrance to the Volunteer Fire Company north to 31st Street. On the east side of the roadway, the marsh is hemmed in by Seagate to the north and Horizon's on the Bay to the south. The blue lines on Figure 27 show the approximate limits of land projected to become mostly open water through this century. This is an area of heightened concern.

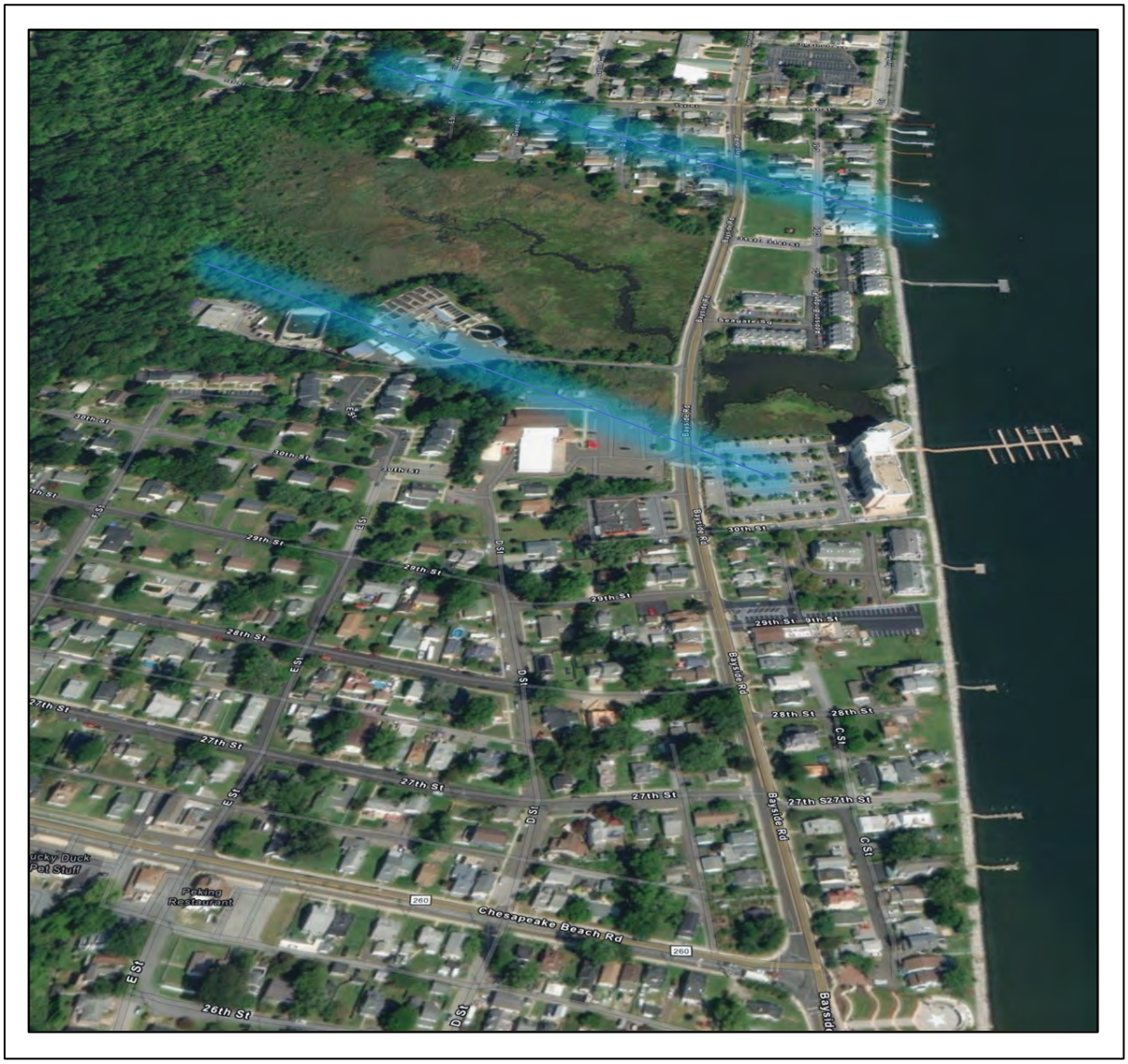

Figure 27: Defining the limits of the South Creek Estuary for planning.

The sea level rise mapping in Chapter 3 shows that relative sea level rise is projected to render much of the area between the blue lines in the figure above permanently inundated in still water conditions. Even by 2050, the marsh that exists today is projected to be open water and the edges of that marsh are likely to have migrated further north and south in response to expanding high water tables. Future storm surges (on par with the hurricanes of the past) would be far more devasting to any structures not substantially elevated or capable of floating. For context, Hurricane Isabel is reported to have soaked the insulated undersides of the elevated first floors in the Seagate community when its storm surge passed under the townhouses in 2003.

The optimal long term approach to coastal resiliency in this area is to allow, to the greatest extent possible, the natural functions of the estuary to be re-established and to prevent the introduction of any residential population. How that might optimally be achieved over the decades ahead will depend on considerable consultation with all parties including residents, property owners, and the Maryland Department of Transportation, State Highway Administration. Holding back the water in this area with structures along the Bay or along the marsh is not practical and maintaining essential community services and infrastructure to the limited population over the long term could prove exceedingly challenging. As this area continues to flood and transform, the potential for property damage and risk will rise. Whether the existing development (especially residential uses) within this subarea of Area A can be sustained, and in what form, will require much study and consultation with property owners in the decades ahead. Some of the potential responses that flow from the realization that this estuary may become open water are:

- The North Beach Volunteer Fire Company would need to be relocated, and the service areas reimagined such that emergency service to both towns would not depend on this section of highway. The fire company property would then be converted to open space.

- MD Route 261 would need to be reconstructed as a bridge over the marsh/open water, allowing for safe travel over the marsh and the freer movement of waters to and from the Bay. The question of costs and feasibility would need to be studied.

- The access route to the Water Reclamation Plant would need to be elevated significantly in combination with MD Route 261, or if that is not practical, a new access route would need to be developed likely to the south side of the facility from a point north of 30th Street. The ground of the treatment plant itself, while at increased risk of flooding, is elevated above projected inundated levels even in 2100.

- Many of the residences on C Street would be surrounded by water on both their Bay and street sides and subjected to hazardous conditions. At minimum, C and 31st Street and the infrastructure and utilities within their rights-of-way would need to be reconstructed and raised to considerably higher elevations, which would affect driveway access to adjoin properties. Alternatively, such houses would need to be removed, raised or reconstrued.

- The residences along the north side of the marsh would be flooded and a wide band of homes extending from the marsh would be subjected to hazardous conditions. The southern ends of E Street, David Street, and D Street are projected to be inundated making vehicular access to the houses closest to the marsh impractical. The ends of these streets collect the drainage flowing southward from First Street and they encounter the northern overflow from the marsh. The houses near the marsh would need to be removed or they, along with the street and utilities, would need to be elevated significantly.

- The townhouses in the Sea Gate community are projected to be surrounded by water with the private streets and grounds fully inundated. The community's current private street intersection at MD Route 261 is projected to be open water. The October 2022 tidal events foreshadows this condition (see Figure 15 in Chapter 2 under the heading Drainage). The townhouse blocks would need to be removed or completely and comprehensively elevated and/or redeveloped at a significantly higher elevation along with all streets, utilities, and infrastructure. It is quite possible the land itself would need to be raised and contained within bulkheads or seawalls, thus presenting a significant challenge for access, circulation, and public water and sewer.

- The parking lot and access road into Horizons on the Bay is projected to be inundated and would need to be elevated.

- Development of any open lands and intensification of any existing development would need to be strictly avoided.

Recommendations for Area A

The following recommendations are intended for the next 10 years.

Attenuate Recommendations

Land preservation in the South Creek watershed is essential. The adopted 2040 Comprehensive Plan designated most of the remaining stands of forest within Town boundaries for resource conservation. Following the adoption of the Comprehensive Plan in 2022, the Town Council adopted zoning ordinance amendments and a new map which largely removed development potential from these areas and rezoned them "Resource Conservation".

Moving forward, the Town should seek to minimize any further forest removal through adjustment to its zoning regulations, implement recommendation for an urban forest program to increase forest cover within the watershed, and coordinate with Calvert County and North Beach to ensure continued preservation and appropriate land use strategies in the parts of the watershed that extend beyond town limits.

Alleviate Recommendations

1. Through 2050, facilitate outward migration of the South Creek tidal marsh. To the north, allow the growth toward E, David, and D Streets. This can be optimally accomplished by coordinating with the most impacted property owners to buy out impacted owners and convert the land to open space. On the south side of the marsh, wetlands are migrating into the Volunteer Fire Company and its parking areas. This is addressed below under "Realign" where this Plan recommends relocating the company. In the meantime, the strict application of State and federal regulations preventing the disturbance of tidal wetlands and wetland buffers must be enforced along the edges of the marsh. Development activities in these area are further restricted by the Town's Critical Area regulations.

2. Assert rightful public ownership and maintenance of the 20-foot wide historic trolley right-of-way that runs along the east side of MD Route 261. The section from First Street in North Beach to 31st Street is shown in the Figure 15 . This area may be used for flood management as conditions and opportunities warrant and/or to provide space needed by the State Highway Administration to elevate MD Route 261. Prevent the encroachment of any further private development activities within this area and coordinate with adjoining property owners to eliminate the several private structures (sheds, fences, and similar structures) that have been constructed on this public land.

3. Incentivize or require the retrofitting of parking lots in Area A and to the extent possible convert un-needed parking area to open space for flood management. Figure 28 shows an example.

Figure 28: Image of parking lot providing stormwater management.

4. Address the drainage issue at Seagate and the storm drainage pump at 31st and C Streets, which is described in Chapter 2 of this report. The design should align with the long term objective of allowing natural processes to work in this area and be designed in combination with other sustainable methods to absorb stormwater while protecting public safety. Any option that makes public health and safety dependent on a mechanical solution must also have built-in redundant systems which are preferably nature based and include substantial physical space for the alleviation of flood risk.

Restrict Recommendations

1. Elevating the revetment along the bayfront in Area A over the next decade is recommended between 30th Street and 27th Street (see Figure 29). This area is presently subject to coastal flooding, is projected to have a 10% annual chance of flooding by 2050, and to be largely open water by 2100 absent a solution.

   The area of Town is not directly connected hydrologically to the South Creek tidal marsh which is just north so a higher revetement along the Bay stands as a viable option. In other words, a physical barrier at this location will not impede the discharge of water from South Creek to the Bay.

   However, any elevation of the revetment in this area must only proceed after a plan is accomplished and adopted for elevating the land, structures, and infrastructure. The master plan must specify the necessary elevation of the land, the minimum elevation of structures, the location and vertical alignment of drainage facilities, standards for sustainable development and building construction, the assignment of private and public costs, the allotment of land for public and private open spaces, and broad public access to and along the Bay front. Elevating the revetment without a plan for raising the land and/or structures, creating open spaces, and enhancing public access to the water is not an option this Plan supports. However, this Plan does anticipate that the revetment could be raised, especially in the short term to dissipate projected wave energy, prior to the implementation of the aforementioned plan.

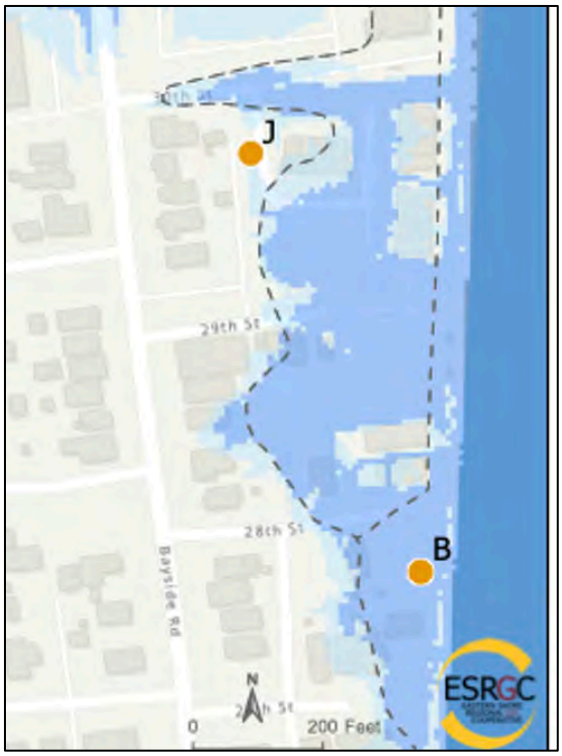

Figure 29: Flood Zone from 30th Street to 27th Street.

2. Conduct an engineering study in coordination with the State of Maryland to determine how much longer the floodgate in its current configuration can remain viable and investigate the optimal solutions for the flood conditions in the area. This Plan foresees the gradual transformation of this area into open water and marsh and that a combination of natural and manmade solutions will be necessary.

Realign Recommendations

1. Relocate the Volunteer Fire Company to a safer location.

2. Reconstruct MD 261 through Area A. The optimal design for reconstruction would emerge after significant engineering studies but this Plan recommends that the roadway be reconstructed as a bridge with elevated pedestrian and bikeways, acknowledging that this vital transportation link has a low tolerance for flood risk. The optimal design will incorporate elevated pedestrian and bicycle facilities.

3. Use voluntary purchase and removal plan to remove houses located along the north side of the marsh and return the land to open space use allowing the marsh to expand.

   Figure 30 shows the "managed retreat lines" signifying roughly the properties that would be eligible for a purchase and relocation option over time. The Town should consider making the first purchase offers to those properties between the marsh and the 2050 Managed Retreat line shown.

Figure 30: Managed Retreat Lines

4. Adopt amendments to the Town's Zoning Map and Zoning Ordinance as necessary to prevent or significantly limit the introduction of new residential development on the open parcels in Area A, especially within the subarea between the two blue lines in Figure 27.

   Options to consider include changing the zoning district to Resource Conservation, which would eliminate development potential or requiring the transfer of "development rights" out of the flood prone areas for use on other properties in the Town. Under a scenario in which the "development rights" would be transferred, the land would become deed restricted open space and then could potentially be available for flood management.

   Alternatively, or in combination with the above zoning options, the Town and/or State could acquire the land for parkland and flood management. In the meantime, the Town should adopt the recommendations in the prior section of this Chapter under the heading Strategic Flood Management and Sustainable Drainage and strictly minimize the risk to future residents and the impact to local flooding conditions in light of the sea level rise projected in this Plan.

5. Conduct a study to determine the practical and financial feasibility of either elevating the Sea Gate community and the neighboring residences or working towards their removing and the relocation of the housing units in Town in practical. As recommended in the Chesapeake Comprehensive Plan, the Town should also be open to modern construction techniques that allow housing to be flexibly designed to adapt to floodwaters. For example, modern flood adapted houses can be anchored to the land but made capable of rising and falling with the tides and flood waters. Flood resilient houses, as diagrammed below, are already constructed throughout the world and may be viable in this location.

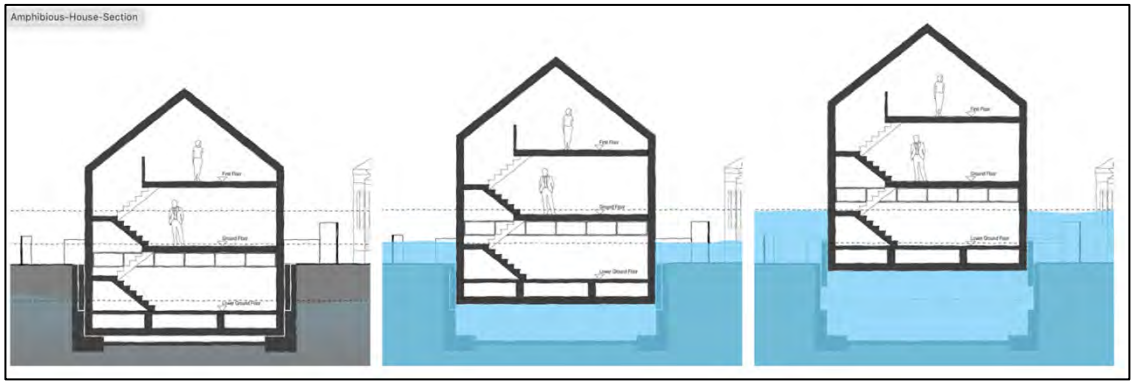

Figure 31: Source of illustration is Bacca Architects London, Amphibious House.

Area B

Overview

As described elsewhere in this report, Area B is where Fishing Creek meets the Bay, the mixed-use town center. It is home to assets including the Town Hall and the North East Community Center, emergency command and control and evacuation centers, respectively. The following recreational assets are located here too: Chesapeake Beach Waterpark, Kellam's Recreational Complex, the Public Boat Landing, and the Chesapeake Beach Railway Trail. The area is also home to maritime, other commercial activities including a hotel and restaurants, two large residential communities, and a standalone apartment building at the end of Harbor Road.

Fishing Creek has been channelized and much of the once extensive marsh was filled and is now the Kellam's' Recreational Complex, Fishing Creek Marina, and Courtyards at Fishing Creek Apartments and Townhouses. The Fishing Creek channel is routinely dredged, and the spoils are deposited at the dredge disposal site located in the marsh along the western edge of the Courtyards at Fishing Creek complex. The Town has documented surface subsidence of up to 16 inches over 15 years at Kellam's, the North East Community Center, and along the right-of-way of Gordon Stinnett Avenue.

The optimal long term approach to coastal resiliency in Area B is to allow the natural functions of the estuary become re-established, where appropriate, while sustaining the maritime mixed use center. Through zoning changes adopted by the Town Council in 2022, the development of new residential uses is no longer permitted in Area B. The existing residential communities are at risk and considerable consultation with all parties will be needed in the decades ahead to address the effects of flooding.

In Area B Fishing Creek has been channelized and the land along its edge has been developed intensively. In these locations, property owners have found it necessary in recent years to raise bulkheads and elevate land. For this reason, even with a 2.4 foot sea level rise, open water is projected to mostly be contained within the channelized Fishing Creek, the boat inlets, and the boundaries of the marsh. As shown on Figure 32 below, the marsh itself is projected to be almost entirely open water by 2050.

While the extent of open water coverage would be limited through 2050, the areal extent of recurring flooding is projected to be substantial by 2050. All the aforementioned community assets, Gordon Stinnett Avenue, and the private streets and grounds of the Courtyards at Fishing Creek and Windward Key, are projected to have a 10% annual chance of flooding. Through 2050, The Kellam's Recreational Complex is projected to flood from both the north and the south leaving a 250-foot wide strip of slightly higher elevated ground just above the floodplain. The 2100 Maps in Chapter 3 show that open water would extend quite far into the Recreational Complex with the projected 5.6 foot rise. The depth of the 10% annual chance flood on the remaining land area at Kellam's would exceed 2.5 feet in 2100.

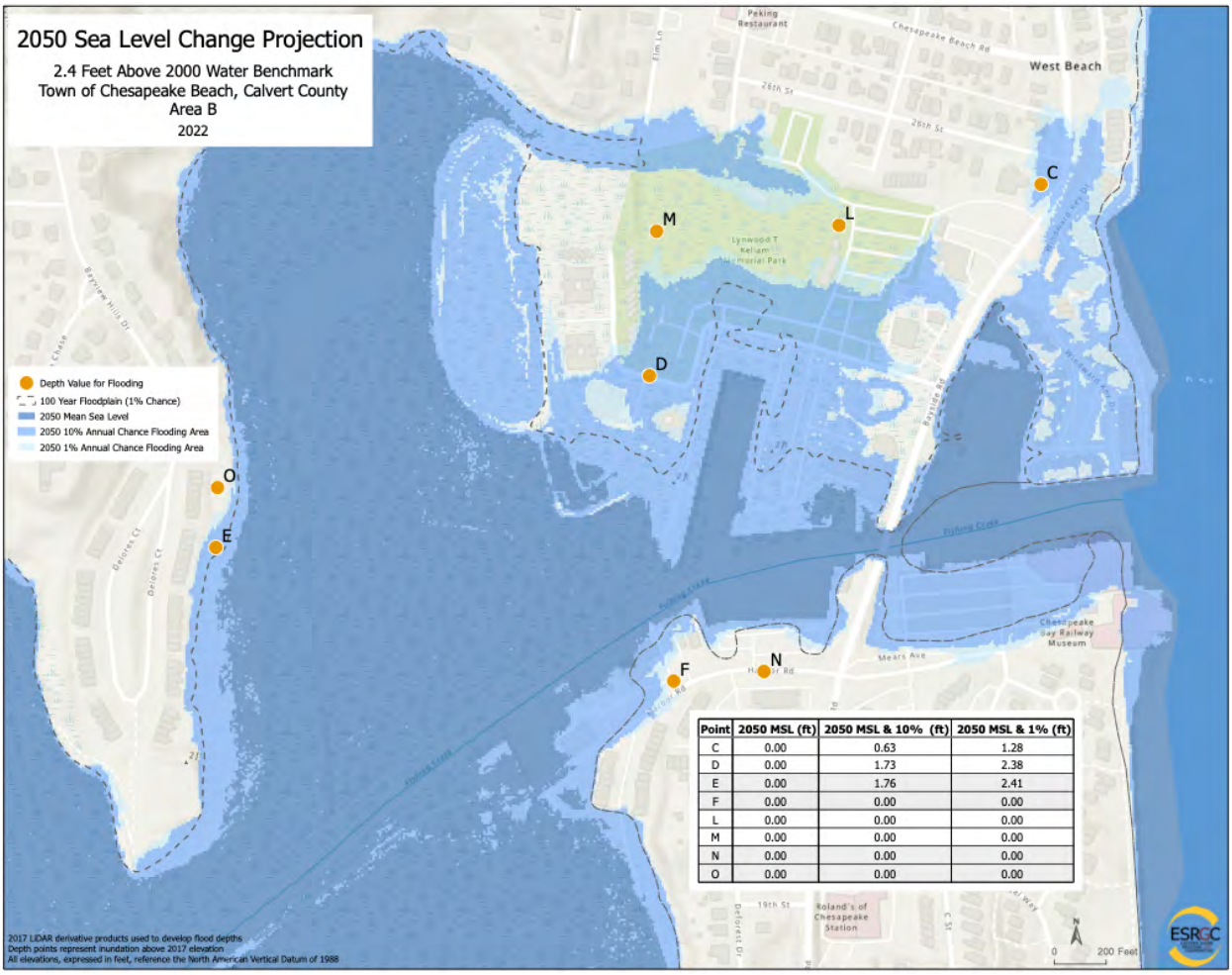

Figure 32

The entire shoreline of Fishing Creek and its boat inlets is structurally supported until the shoreline merges with the natural marsh west of Fishing Creek Marina. All of it is owned privately except for the Public Boat Landing which is owned by the Town of Chesapeake Beach. The boat landing is a break in what is otherwise a solid structure currently containing the water. The October 2022 tidal events demonstrated how far water can enter through the boat landing and it foreshadows permeant conditions if no changes are made.

The private structures along the north side of Fishing Creek and the Fishing Creek Marina, help protect the Kellam's Complex. There are no structures along the western edge of the marsh and flood protection afforded to the Courtyards housing project is partly a function of the elevated dredge spoils site. Elevating the existing structures and building new structures and/or land forms would be needed to secure Courtyards at Fishing Creek and the Kellam's Complex against projected sea level rise.

As this area continues to flood and to transform, the potential for property damage and risk will rise. Whether the existing residential development within this Area B can be sustained, and in what form, will require much study and consultation with property owners in the decades ahead.

Recommendations for Area B

The following recommendations are intended for the next 10 years.

Figure 33: View of Area B.

Attenuate Recommendations

Land preservation in the Fishing Creek watershed is essential. The adopted 2040 Comprehensive Plan designated most of the remaining stands of forest within Town boundaries for resource conservation. Following the adoption of the Comprehensive Plan in 2022, the Town Council adopted zoning ordinance amendments and a new map which largely removed development potential from these areas and rezoned them "Resource Conservation".

Moving forward, the Town should seek to minimize any further forest removal through adjustment to its zoning regulations, implement recommendation for an urban forest program to increase forest cover within the watershed, and coordinate with Calvert County to ensure continued preservation and appropriate land use strategies in the part of the watershed that extends beyond town limits.

Alleviate Recommendations

Beginning now and carrying through 2050, use landscape design and civil engineering to gradually adapt to rising water and flooding conditions in and around the Kellam's Recreational Complex. Wetlands would be allowed to migrate and gradually evolve from newly planned spillover areas (flood retention zones) to open water, contained by berms and other land forms.

Figure 34: An imagined blue-green park excerpted from the Comprehensive Plan.

The goal would be to merge both flood management and recreation into what would be a large blue – green park as generally imagined in the image in Figure 34. This Plan recommends beginning a master plan process within the next couple of years to establish the feasibility and engineering parameters and then to begin phasing the work by the end of this decade.

The basic idea is conceptually rendered for Kellam's in Figure 35. Areas shaded blue are projected to be open water in the decades ahead which would be contained by berms and other landforms (the green lines)[13]. The dredge spoil site has potential to be incorporated into this design approach. The new landforms (along with drainage solutions) could then sustain an open area for ballfields and other activities, which itself could safely accommodate periodic flooding.

Figure 35: Blue - Green Approach at Kellam's Recreational Complex.

[13] As drawn, this approach might possibly help sustain the Courtyards at Fishing Creek Apartments and Townhouses, which would also require the elevation of Gordon Stinnett Avenue and supporting infrastructure. However, the low lying conditions and the fact that the property was developed on wetlands raises questions about the viability of this property as a residential community over the long term. A recommendation for considering relocating the housing to a safer location in Town is discussed later.

The created landforms could become part of the park experience. Figure 36 below shows a recreational cycle track which could become an integral element of a blue - green park and the adjoining Chesapeake Beach Railway Trail.

Figure 36: Source, American Ramp Company. A potential recreational use for the landforms that would be established to help protect Kellam's Recreational Complex.

Restrict Recommendations

1. This Plan assumes private property owners will continue to maintain and as needed elevate the bulkheads which line Fishing Creek and secure their marinas and commercial properties. The Plan supports these efforts, but as noted in Chapter 5, this Plan endorses the Town's Comprehensive Plan recommendation that the Town Council re-establish the Chesapeake Beach Board of Port Wardens to provide oversight to these projects (See Chapter 290 of the Town Code, Article IX).

2. This Plan also assumes that the Windward Key Home Owners Association will secure its property against coastal flooding which may be expected in future decades to come over and through its current revetment and bulkheads. Since the property is not directly threatened by upland flooding, overflow of the marsh (at least for the foreseeable future), or wetland soils, these efforts should secure the neighborhood against major flood hazard. These efforts could also have the ancillary benefit of protecting the Town Hall (at MD Route 261 and 26th Street), which receives coastal inundation in large tidal events that passes through the Windward Key property. The HOA should initiate and plan for these upgrades.

Realign Recommendations

1. Relocate the North East Community Center to a location out of the flood hazard area. In the near term, consider whether the emergency shelter functions assigned to the Center are viable and if so, for how long. This area and the access drive and parking flooded during the October 2022 tidal event. Evaluate the Waterpark similarly.

2. Study the feasibility of elevating Gordon Stinnett Avenue. The full length of this road is the only means of vehicular access to the western side of the Fishing Creek Marina and Courtyards at Fishing Creek Apartments and Townhouses. Maintaining public street access to these two properties will require substantial costs for reconstruction and maintenance. The Town needs to decide the feasibility of elevating the road and its infrastructure and how such a project might be incorporated into a long term approach to flood management.

3. Consider relocating the Courtyards at Fishing Creek Apartments and Townhouses. This housing development was established in 1989 under the federal Low Income Housing Tax Credit program (LIHTC). The 76 units in the development are set aside for households making less than 60% of the area median household income and rents are generally capped at 30% of a household's income. The development thus meets an important housing need in Town, but it was constructed on filled marsh and at an elevation that puts the residents at risk over the long term. Significant consultation with the property owner and the residents is needed to investigate solutions and retain the housing units within the Town, whether at this site or somewhere else.

4. Redesign the Public Boat Landing. The net effect of subsidence and sea level rise is already compromising the functionality of the landing. During high tides and storms, the Landing allows water to enter the southeast side of the Fishing Creek Marina and flood the parking lot and access drive.

Area C

As shown in Chapter 3, Area C includes the southwestern extent of the Fishing Creek marsh within the Town. The area of concern encompasses the residential properties north of Old Bayside Road at the ends of E, H, I, and J Street.

Figure 37 shows that the open water is projected to be contained largely within the exiting FEMA 1% Annual Chance Floodplain with the projected 2.4 foot rise. However, the encroachment of ground water and periodic flooding may potentially degrade the on-site septic systems in the rear yards of these properties. The Town's long term plan is to connect these residences to the public wastewater collection system. Sea level rise may hasten this. This Plan recommends that the Town and the Calvert County Department of Health coordinate with property owner through the next decade to track conditions.

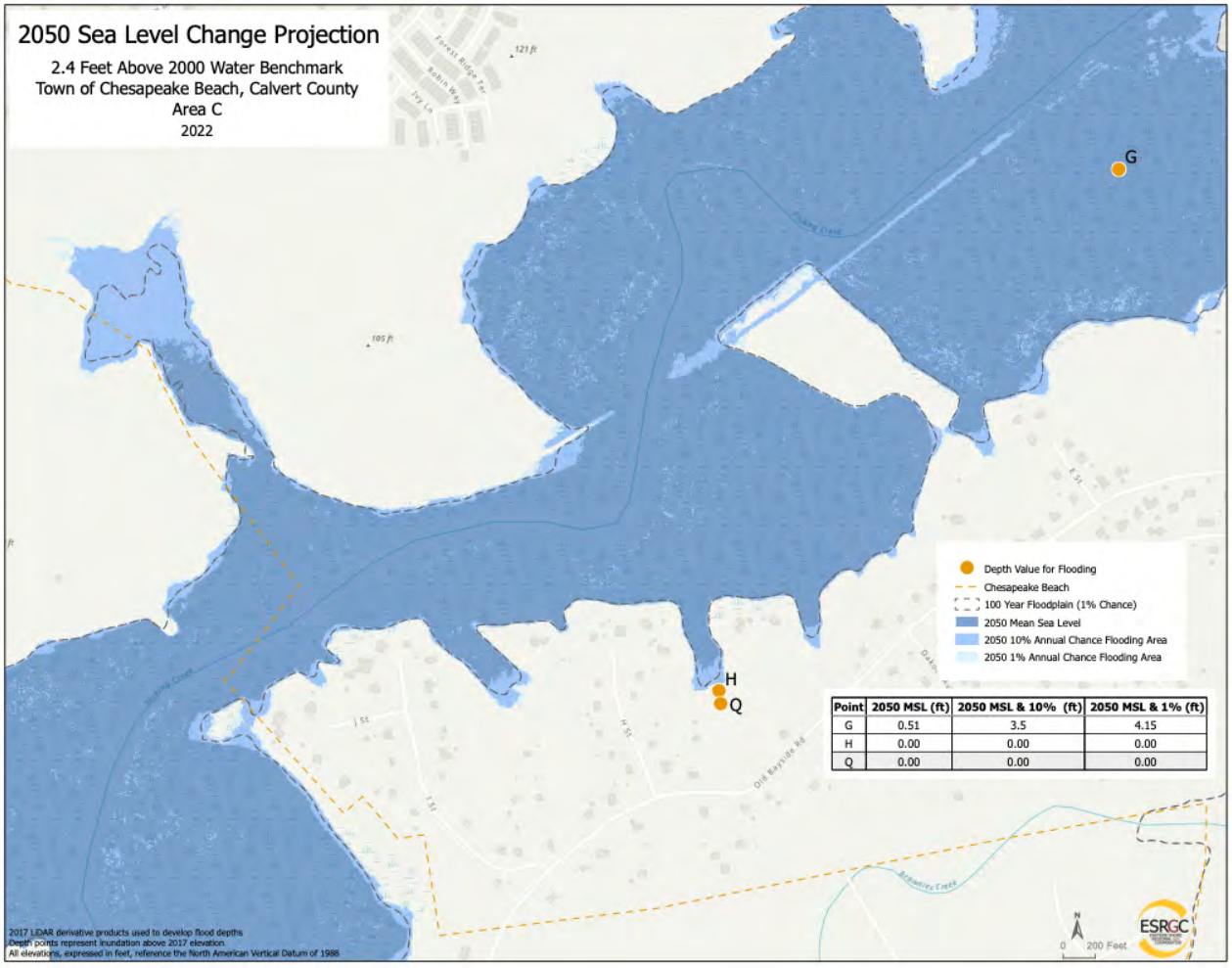

Figure 37

Chapter 5 Implementation and Conclusion

The previous chapter of this Plan described the most important recommendations over the next 10 years. Here are the critical steps necessary to facilitate the implementation of those recommendations.

1. Formally adopt this Plan by resolution of the Mayor and Town Council and transmit copies to the Town of North Beach and Calvert County. Transmit a copy to the Maryland Department of Natural Resources, Chesapeake and Coastal Service.

2. Formalize the Coastal Resiliency Steering Committee into a standing committee or commission within Town government with the main task being to guide the implementation of this Plan and to regularly advise the Mayor and Council. A standing committee or commission, with funding to support its work, would allow development of the specialized local knowledge, institutional capacity, and community trust necessary to deal with the challenges this Plan has highlighted. The commission or committee should be staffed by town employees and/or consulting engineers and planners. As an alternative, the Town may wish to organize the Steering Committee into the Town of Chesapeake Beach Board of Port Wardens or, preferably, to place the Board's portfolio of responsibilities with this new body. This Plan and the Town's adopted Comprehensive Plan both recommended reconstituting the Board of Port Wardens.

3. Update this Plan every five years. Report on progress and refine and detail the recommendations as conditions warrant. Establish a process for tracking progress and providing updates to interested parties including the key Departments in State government. Further develop the Town's webpage devoted to the topic into a community outreach tool to residents and property owners.

4. Continue the work begun under this Plan to document in detail the condition and ownership of the drainage systems in Town and as part of that effect undertake a town-wide coastal survey to refine and detail the elevations of the land, streets, open drainage ways, buildings, revetments, and bulkheads. Much of this today is available but needs to be assembled and updated into a quickly deployable data set that can be used both in planning, preliminary engineering, and disaster recovery and/or rebuilding.

5. Coordinate with Calvert County and North Beach is the periodic update of the Calvert County All-Hazard Mitigation Plan and incorporate the findings and recommendations of this Plan.

6. Funding. First, assemble a package of federal and state grant and loan programs that the Town can be used to undertake the detailed engineering studies recommended in this report. Some sources will require a local match and over the next several years the Town will need to strategize about how to fund this work and the infrastructure upgrades and modernization that will flow from these studies. Examples include the federal Building Resilient Infrastructure and Communities (BRIC) program and the federal Flood Mitigation Assistance program.

7. Funding. Second assemble a package of federal and state and loan programs that the Town can use to assist property owners in making property more resilient to the effects of flooding and to facilitate the relocation of those buildings which lie within the hazard areas designated in this Plan and future studies for "managed retreat". The aforementioned BRIC program is also available for this purpose.

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Appendix

Flood Analysis and Mapping:
Technical Support Methodology
Town of Chesapeake Beach, Calvert County

June 27, 2022

Introduction

The Eastern Shore Regional GIS Cooperative (ESRGC) assisted the Town of Chesapeake Beach with flood analysis, processing, and mapping of data to predict sea level change for Chesapeake Beach, Calvert County. While much of Calvert County's natural and built environment is expected to be impacted by sea level change, the coastal community of Chesapeake Beach will be among the first to experience the effects. The data developed by the ESRGC will be used by the Town of Chesapeake Beach to assess the vulnerability of specific geographic areas in their community; recommend mitigation and adaptation options to address flooding impacts including sea level change; and prepare implementation strategies

The most recently available aerial topographic LiDAR derivatives, current sea level projections for Maryland 2030, 2050, and 2100 (R. Kopp, Rutgers University), and 1% annual-chance flood elevations (FEMA Flood Insurance Study: #24009CV000B; Effective: November 19, 2014) were used in this study to represent sea level rise and periodic flooding for Chesapeake Beach. For this study the ESRGC developed flood grids representing mean sea level for 2030 and 2050, 1% annual chance flood events for 2030 and 2050, and mean sea level for 2100 with a growing emissions pathway and mean sea level for 2100 with a growing emissions pathway and 1% annual chance flood event.

This methodology document is a high-level review of the ESRGC's technical support for the flood analysis and mapping for the Town of Chesapeake Beach. Please see the metadata for analysis details.

Definition of Study Area

The Town of Chesapeake Beach is located in northern Calvert County and experiences flooding from the Chesapeake Bay. Wetland areas to the north and south also flood from the Chesapeake Bay. The study area for this project extends beyond the town boundary to include the Chesapeake Bay and both wetland areas.

Sea Level Change: Depth Grid Development

The ESRGC worked with the Town of Chesapeake Beach to select the most appropriate methodology and flood scenarios. Professor Robert Kopp, Rutgers University, a leading climate scientist whose emphasis on sea level change was determined to be the most appropriate source for regional sea level change projections.

Chesapeake Beach selected the years 2030, 2050, and 2100 (RCP8.5 'growing' emissions pathway) for forecasted depth grid development. The Town also selected a low tolerance for the study area. A low tolerance for flood risk suggests buildings and infrastructure are unable to tolerate flooding.

The following table identifies the sea level change estimates over the 2000 benchmark at the Solomon's Island Tidal Gauge:

Year	Low Tolerance for Flood Risk: 1% meet/exceed
2030	1.3 feet
2050	2.4 feet
2100	7.0 feet

Table 1: Solomon's Island Tidal Gauge SLC Estimates over 2000 Benchmark

The Town also chose to include a 1% annual chance storm event for 2030, 2050, and 2100. Table 2 identifies the flood sources and corresponding still water elevations used in modeling the 1% annual chance storm:

Flooding Source	1% Annual Chance Storm Event
Chesapeake Bay at Northern County Boundary	4.30 feet
Chesapeake Bay at Town of North Beach	4.30 feet
Chesapeake Bay at Town of Chesapeake Beach	4.15 feet
Chesapeake Bay at Randle Cliff Beach	4.10 feet

Table 2: Elevations for 1% Annual Chance Storm Events

Tidal Calibration

The ESRGC prepared the digital elevation model (DEM) for analysis. Sea level change for Chesapeake Beach was localized to the nearest National Oceanic and Atmospheric Administration (NOAA) tidal reference station at Solomon's Island (Station ID: 8577330). Observations were transformed from tidal datum to North American Vertical Datum of 1988 (NAVD 1988). A final correction was applied to account for observed sea level change between the sea level benchmark (2000) and land elevation capture (2017), using the observed relative sea level change at the NOAA Solomon's Island station (3.93 mm/year).

The following table identifies the sea level change estimates adjusted for NAVD 1988 and for use with the land elevation (LiDAR) collected in 2017:

Year	Low Tolerance for Flood Risk: 1% meet/exceed
2030	0.9908071 feet
2050	2.090807 feet
2100	6.6908071 feet

Table 3: Sea Level Change Adjustments

Digital Elevation Model Analysis

The Calvert County DEM, along with the adjacent county DEMs, and an 'open water' GRID of 0.0 values were upsampled to 2-meters and mosaicked to meet the flood study's required extent. The 2-meter upsample maintains horizontal integrity while improving raster processing. Adjacent county LiDAR collections include Anne Arundel, Charles, Prince George's, and St Mary's Counties.

For annual chance depth grid output, the DEM is processed using HAZUS-MH software (v4.2 SP3).

For sea level change depth grid output, the sea level change estimate is subtracted from elevations.

Review of Preliminary Depth Grids

A review of the preliminary sea level change depth grid data is a critical step in the data analysis process.

Traditionally, the ESRGC uses the National Hydrography Dataset (NHD) flowlines to represent water drainage in a study area. However, the scale of the NHD does not lend itself to the scale and geomorphology of the study area and these data were rejected. Lacking a hydro-enforced DEM and data for the location of culverts, the ESRGC used raster analysis to develop a drainage flow line analysis. This analysis allowed the ESRGC to determine where false pooling would likely occur, limiting the true extent of potential flooding.

Local knowledge and investigation from Chesapeake Beach regarding the location of suspected culverts on public roads further supported the flowline analysis and ultimately, the resulting areas of inundation.

Depth Grid "Clean Up"

The preliminary depth grids must be reviewed for local minima, or "noise" in the data. The ESRGC implemented the following rules for the inclusion of cells in the depth grid:

1. Cells must intersect a flow line(s). Cells not intersecting flow line(s) are considered free from sea level change's direct influence and are excluded.
2. Intersected cells must represent a flood source (Chesapeake Bay) or be directly influenced by the flood source where direct influence is defined as:
    a. Contiguous cell representing a flood source,
    b. Adjacent to (2a) (may share corner vertex only),
    c. Adjacent to (2b) (may share corner vertex only),
    d. Not (2a), (2b), or (2c) because of the DEMs hydrologic limitations (i.e., visual inspection on ground or via aerial imagery confirms the presence of culvert(s) that would otherwise allow for continuous feature).

    This validates the data as a sea level change study and not a bathtub model.

Data Development

The ESRGC updated the existing building footprints for six locations using 2019 aerial imagery. The building footprint data assists in the development of first floor flooding. The ESRGC also used the DEM to develop drainage flow lines for the study area.

Depth Points

The Town of Chesapeake Beach provided 17 locations for the ESRGC to create water depth points. The points report the depth of water predicted for each projected year and annual chance periodic flood event. The points and depths are shown on the provided maps in a table and in the delivery geodatabase.

Final Products

The following products were developed for the Town of Chesapeake Beach:

Mean Sea Level, 2030 Depth Grid

- sweldepth0 - represents projected still water depths in 2030 (feet) during a period free from periodic flooding
- sweldepth10 - represents projected still water depths in 2030 (feet) during a 10% annual chance periodic flood
- sweldepth100 - represents projected still water depths in 2030 (feet) during a 1% annual chance periodic flood

Mean Sea Level, 2050 Depth Grid

- sweldepth0 - represents projected still water depths in 2050 (feet) during a period free from periodic flooding
- sweldepth10 - represents projected still water depths in 2050 (feet) during a 10% annual chance periodic flood
- sweldepth100 - represents projected still water depths in 2050 (feet) during a 1% annual chance periodic flood

Mean Sea Level with Stabilizing Emissions Pathway (RCP 4.5), 2100 Depth Grid

- sweldepth0 - represents projected still water depths in 2100 (feet) with a Stabilizing Emissions Pathway during a period free from periodic flooding
- sweldepth10 - represents projected still water depths in 2100 (feet) with a Stabilizing Emissions Pathway during a 10% annual chance periodic flood
- sweldepth100 - represents projected still water depths in 2100 (feet) with a Stabilizing Emissions Pathway during a 1% annual chance periodic flood

Mean Sea Level with Growing Emissions Pathway (RCP 8.5), 2100 Depth Grid

- sweldepth0 - represents projected still water depths in 2100 (feet) with a Growing Emissions Pathway during a period free from periodic flooding
- sweldepth10 - represents projected still water depths in 2100 (feet) with a Growing Emissions Pathway during 10% annual chance periodic flood

- sweldepth100 - represents projected still water depths in 2100 (feet) with a Growing Emissions Pathway during a 1% annual chance periodic flood

Maps

The Town of Chesapeake Beach chose to map the full overview and three additional areas of interest (Area A, Area B, and Area C) selected by the Town. The ESRGC provided the following maps as deliverables:

1. CB2030.pdf
2. CB2030_AreaA.pdf
3. CB2030_AreaB.pdf
4. CB2030_AreaC.pdf
5. CB2030_1_10.pdf
6. CB2030_1_10_AreaA.pdf
7. CB2030_1_10_AreaB.pdf
8. CB2030_1_10_AreaC.pdf
9. CB2050.pdf
10. CB2050_AreaA.pdf
11. CB2050_AreaB.pdf
12. CB2050_AreaC.pdf
13. CB2050_1_10.pdf
14. CB2050_1_10_AreaA.pdf
15. CB2050_1_10_AreaB.pdf
16. CB2050_1_10_AreaC.pdf
17. CB2100_Growing.pdf
18. CB2100_Growing_AreaA.pdf
19. CB2100_Growing_AreaB.pdf
20. CB2100_Growing_AreaC.pdf
21. CB2100_Growing_1_10.pdf
22. CB2100_Growing_1_10_AreaA.pdf
23. CB2100_Growing_1_10_AreaB.pdf
24. CB2100_Growing_1_10_AreaC.pdf
25. CB2100_Stabilized.pdf
26. CB2100_ Stabilized _AreaA.pdf
27. CB2100_ Stabilized _AreaB.pdf
28. CB2100_ Stabilized _AreaC.pdf
29. CB2100_ Stabilized _1_10.pdf
30. CB2100_ Stabilized _1_10_AreaA.pdf
31. CB2100_ Stabilized _1_10_AreaB.pdf
32. CB2100_ Stabilized _1_10_AreaC.pdf

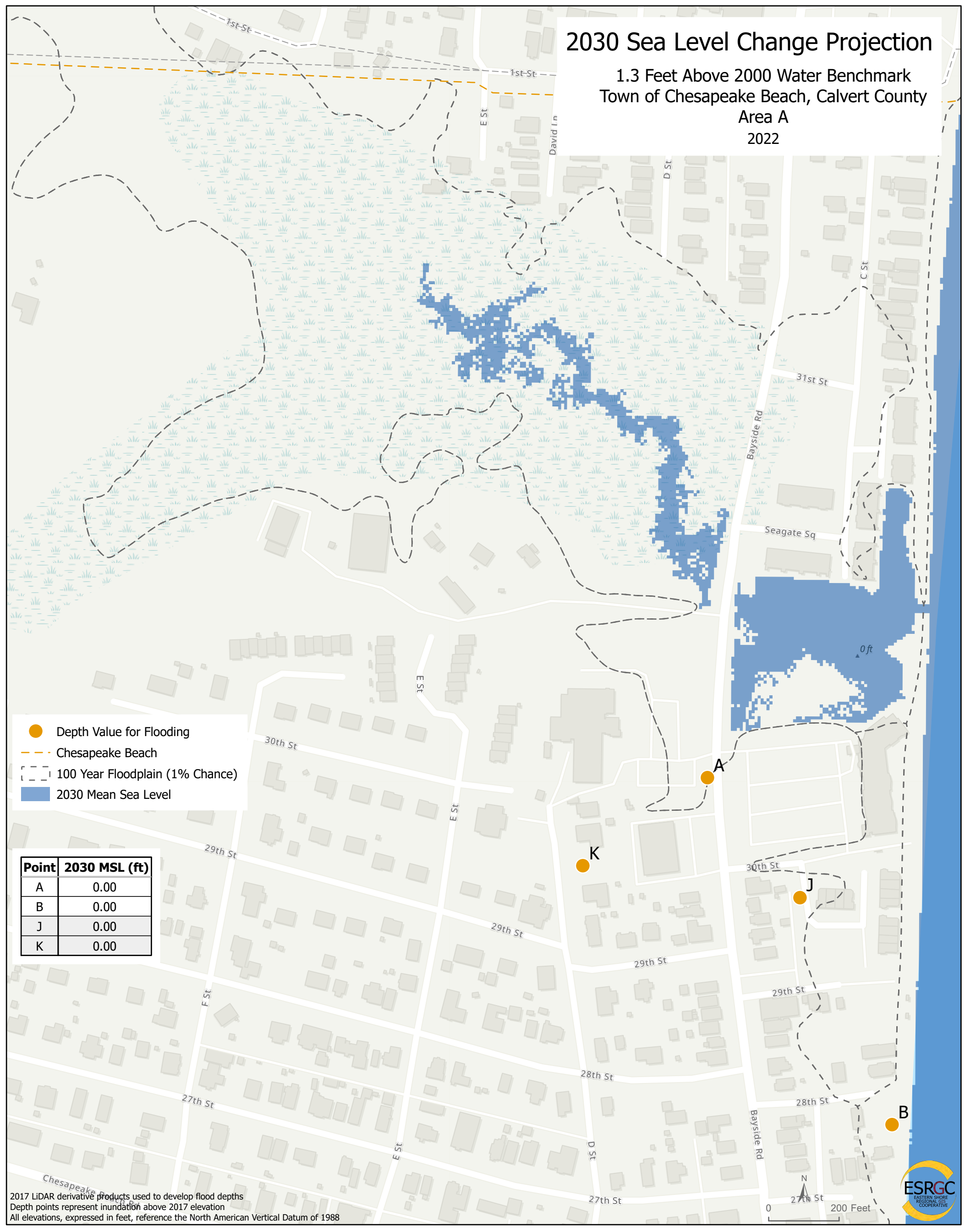
Intended Use and Limitations

The datasets represent projected still water depths (ft) in a forecast sea level change scenario. The layers are an aid for researchers seeking to identify potential vulnerabilities along Chesapeake Beach's shoreline. The data supports Chesapeake Beach's leadership and planners as they endeavor to mitigate or prevent the impacts of sea level change resulting from land surface subsidence and rising sea levels. The product uses sea-level projections to forecasts areas of inundation for a given scenario.

The data may be used and redistributed for free but is not intended for legal use, since it likely contains inaccuracies. The User assumes the entire risk associated with its use of these data and bears all responsibility in determining whether these data are fit for the User's intended use. The information contained in these data is dynamic and will change over time. The data are not better than the original sources from which they were derived, and both scale and accuracy may vary across the data set. These data may not have the accuracy, resolution, completeness, timeliness, or other characteristics appropriate for applications that potential users of the data may contemplate. The User is encouraged to carefully consider the content of the metadata file associated with these data. These data are neither legal documents nor land surveys, and must not be used as such. Eastern Shore Regional GIS Cooperative should be cited as the data source in any products derived from these data. Any Users wishing to modify the data should describe the types of modifications they have performed. The User should not misrepresent the data, nor imply that changes made were approved or endorsed by the Eastern Shore Regional GIS Cooperative. The Eastern Shore Regional GIS Cooperative, nor any of its employees or contractors, makes any warranty, express or implied, including warranties of merchantability and fitness for a particular purpose, or assumes any legal liability for the accuracy, completeness, or usefulness, of this information.

2030 Sea Level Change Projection

1.3 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area A
2022



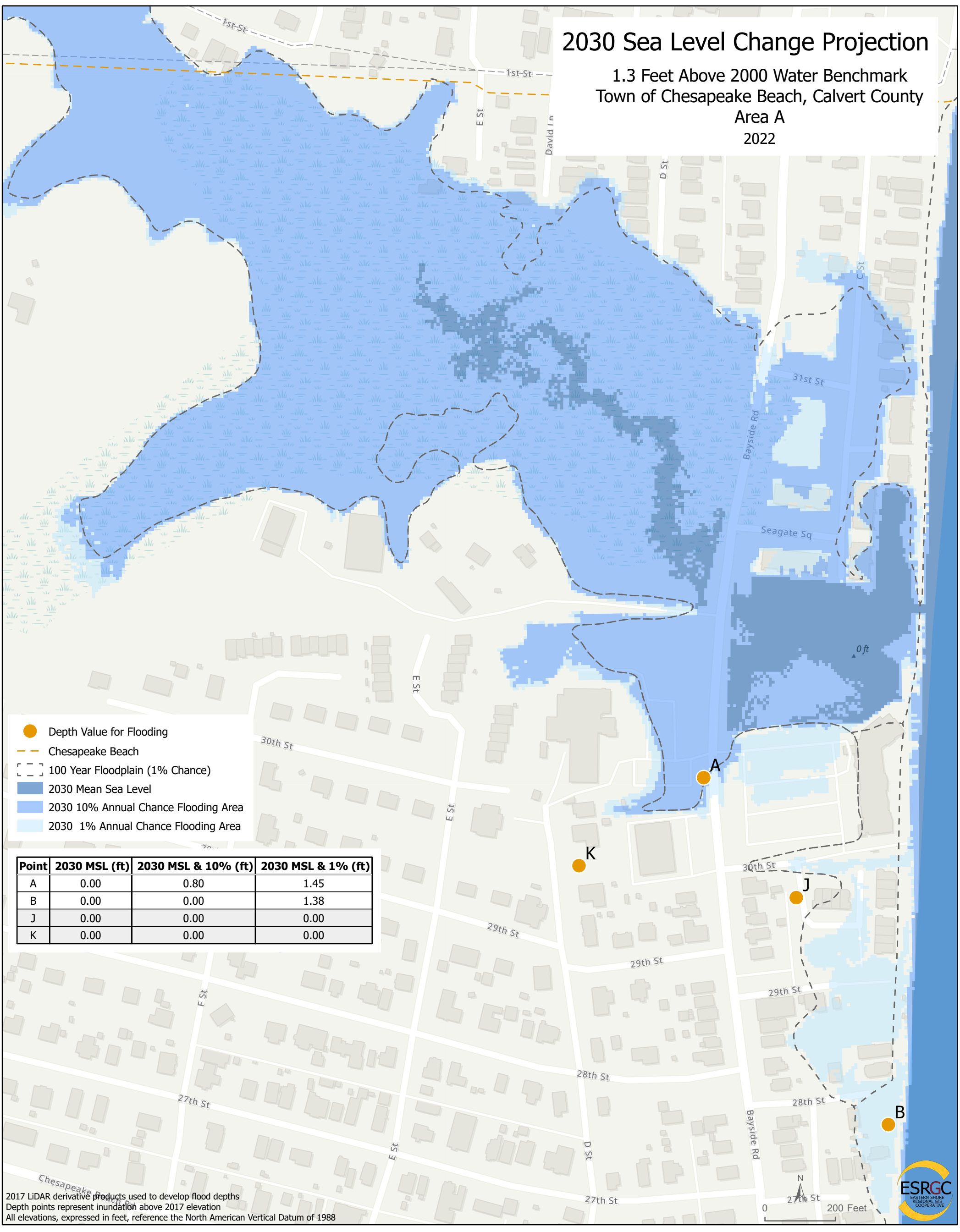
Point	2030 MSL (ft)
A	0.00
B	0.00
J	0.00
K	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2030 Sea Level Change Projection

1.3 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area A
2022



Point	2030 MSL (ft)	2030 MSL & 10% (ft)	2030 MSL & 1% (ft)
A	0.00	0.80	1.45
B	0.00	0.00	1.38
J	0.00	0.00	0.00
K	0.00	0.00	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2050 Sea Level Change Projection

2.4 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area A
2022

Depth Value for Flooding
Chesapeake Beach
100 Year Floodplain (1% Chance)
2050 Mean Sea Level

Point	2050 MSL (ft)
A	0.00
B	0.00
J	0.00
K	0.00

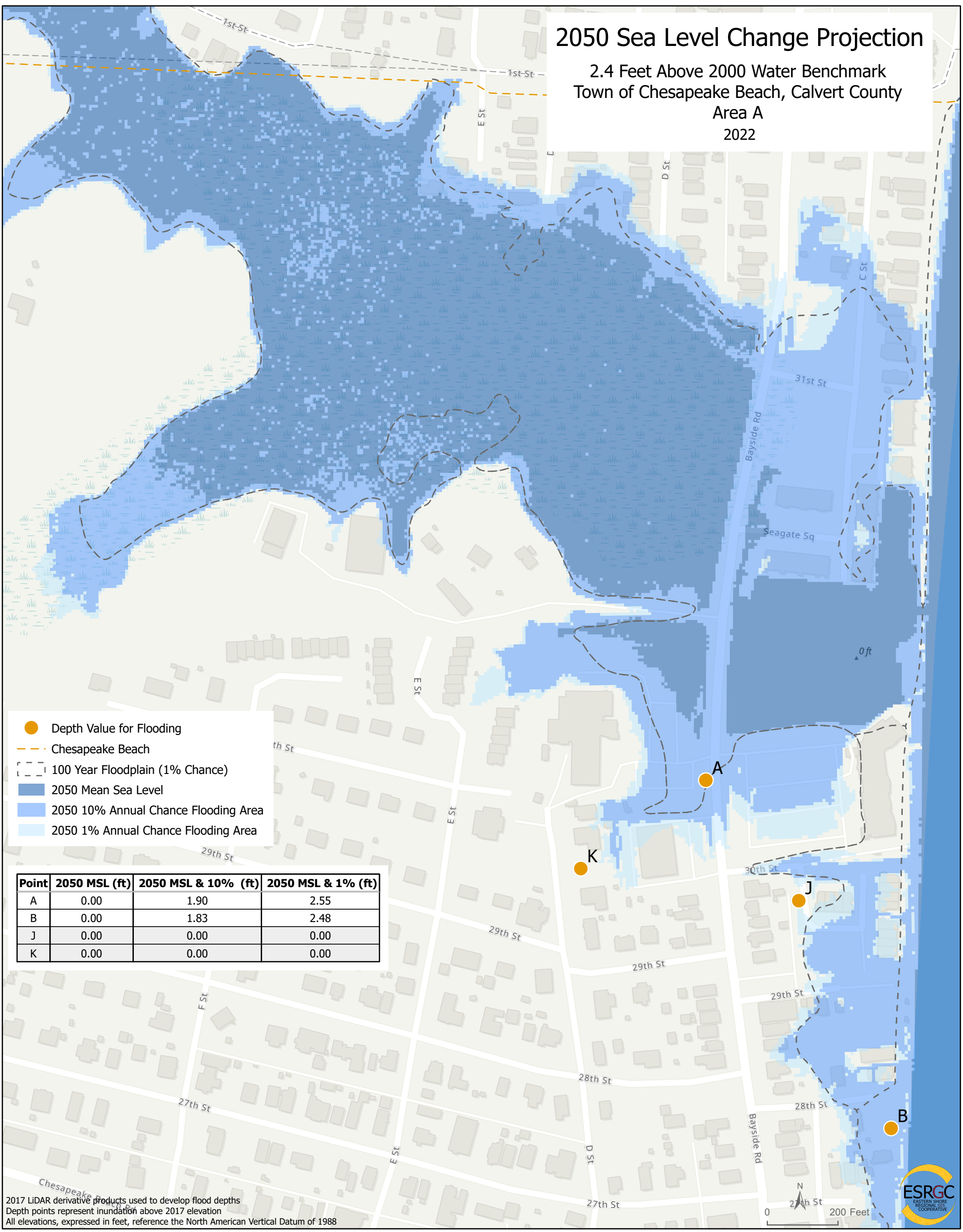
2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

N
0 200 Feet

ESRGC EASTERN SHORE REGIONAL GIS COOPERATIVE

2050 Sea Level Change Projection

2.4 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area A
2022

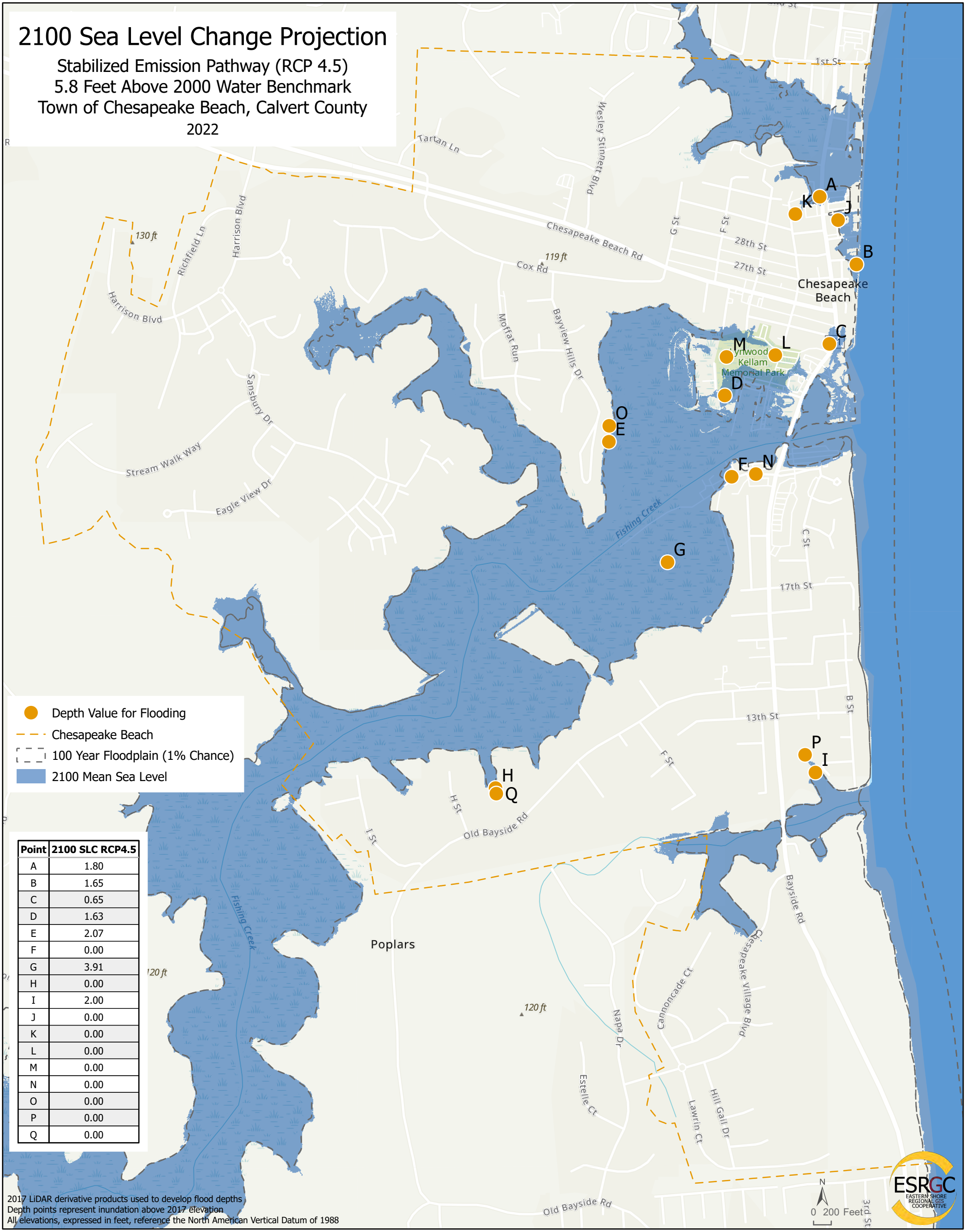


Point	2050 MSL (ft)	2050 MSL & 10% (ft)	2050 MSL & 1% (ft)
A	0.00	1.90	2.55
B	0.00	1.83	2.48
J	0.00	0.00	0.00
K	0.00	0.00	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

2100 Sea Level Change Projection

Stabilized Emission Pathway (RCP 4.5)
5.8 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
2022



Depth Value for Flooding
Chesapeake Beach
100 Year Floodplain (1% Chance)
2100 Mean Sea Level

Point	2100 SLC RCP4.5
A	1.80
B	1.65
C	0.65
D	1.63
E	2.07
F	0.00
G	3.91
H	0.00
I	2.00
J	0.00
K	0.00
L	0.00
M	0.00
N	0.00
O	0.00
P	0.00
Q	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

N
0 200 Feet

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2100 Sea Level Change Projection

Stabilized Emission Pathway (RCP 4.5)
5.8 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area A
2022

Depth Value for Flooding
Chesapeake Beach
100 Year Floodplain (1% Chance)
2100 Mean Sea Level
2100 10% Annual Chance Flooding Area
2100 1% Annual Chance Flooding Area

Point	2100 SLC RCP4.5	2100 SLC RCP4.5 & 10% (ft)	2100 SLC RCP4.5 & 1%
A	1.80	3.5	4.15
B	1.65	3.5	4.15
J	0.00	2.48	3.13
K	0.00	1.70	2.35

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

0 200 Feet

ESRGC EASTERN SHORE REGIONAL GIS COOPERATIVE

2100 Sea Level Change Projection

Growing Emission Pathway (RCP 8.5)

7.0 Feet Above 2000 Water Benchmark

Town of Chesapeake Beach, Calvert County

Area A

2022

Depth Value for Flooding

Chesapeake Beach

100 Year Floodplain (1% Chance)

2100 Mean Sea Level

Point	2100 SLC RCP8.5
A	3.00
B	2.85
J	0.56
K	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

0 200 Feet

N

ESRGC EASTERN SHORE REGIONAL GIS COOPERATIVE

2100 Sea Level Change Projection

Growing Emission Pathway (RCP 8.5)

7.0 Feet Above 2000 Water Benchmark

Town of Chesapeake Beach, Calvert County

Area A

2022

Depth Value for Flooding
Chesapeake Beach
100 Year Floodplain (1% Chance)
2100 Mean Sea Level
2100 10% Annual Chance Flooding Area
2100 1% Annual Chance Flooding Area

Point	2100 SLC RCP8.5	2100 SLC RCP8.5 & 10% (ft)	2100 SLC RCP8.5 & 1%
A	3.00	3.50	4.15
B	2.85	3.50	4.15
J	0.56	3.50	4.15
K	0.00	2.90	3.55

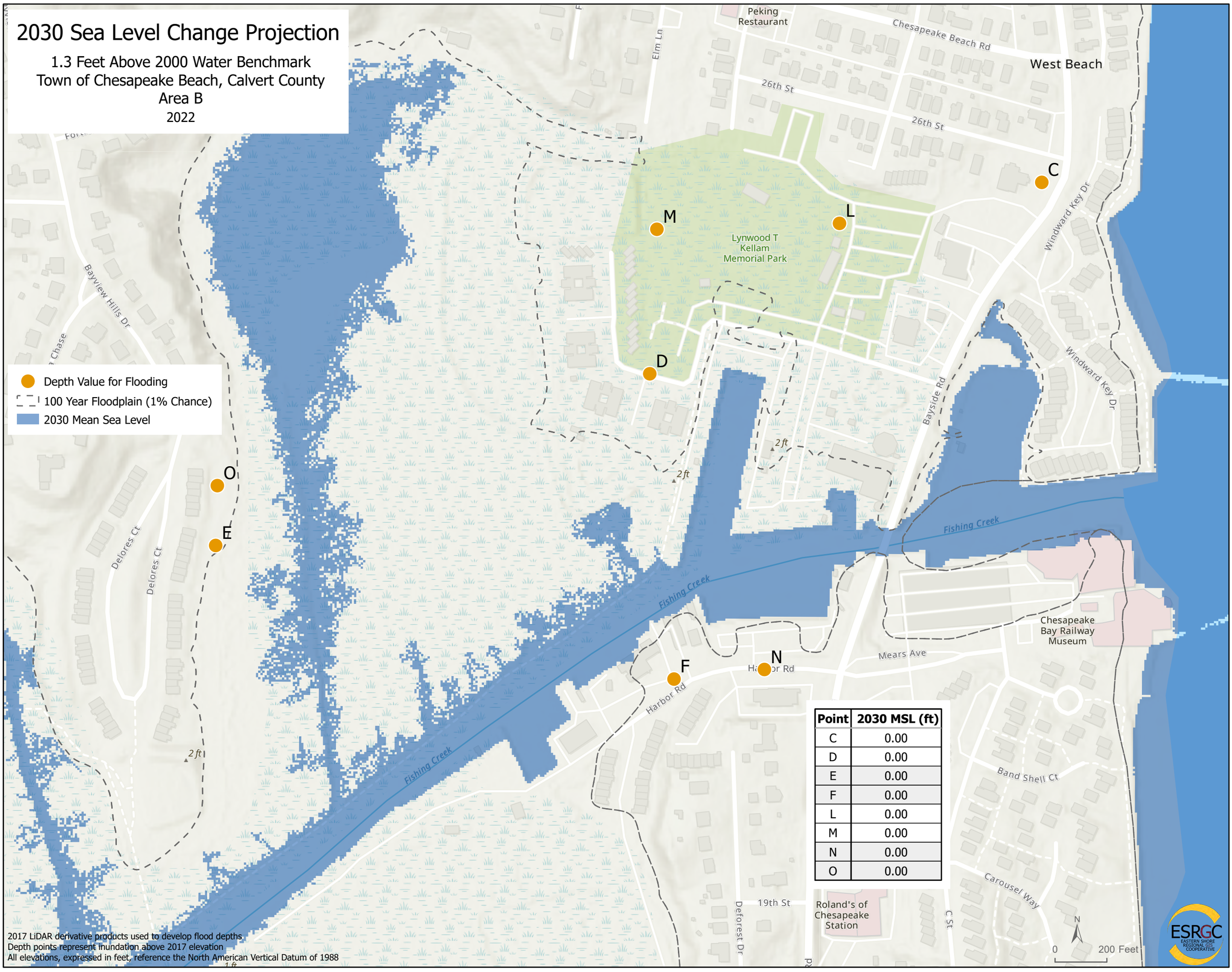
2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

N
0 200 Feet

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2030 Sea Level Change Projection

1.3 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area B
2022



Point	2030 MSL (ft)
C	0.00
D	0.00
E	0.00
F	0.00
L	0.00
M	0.00
N	0.00
O	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2030 Sea Level Change Projection

1.3 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area B
2022

Depth Value for Flooding
100 Year Floodplain (1% Chance)
2030 Mean Sea Level
2030 10% Annual Chance Flooding Area
2030 1% Annual Chance Flooding Area

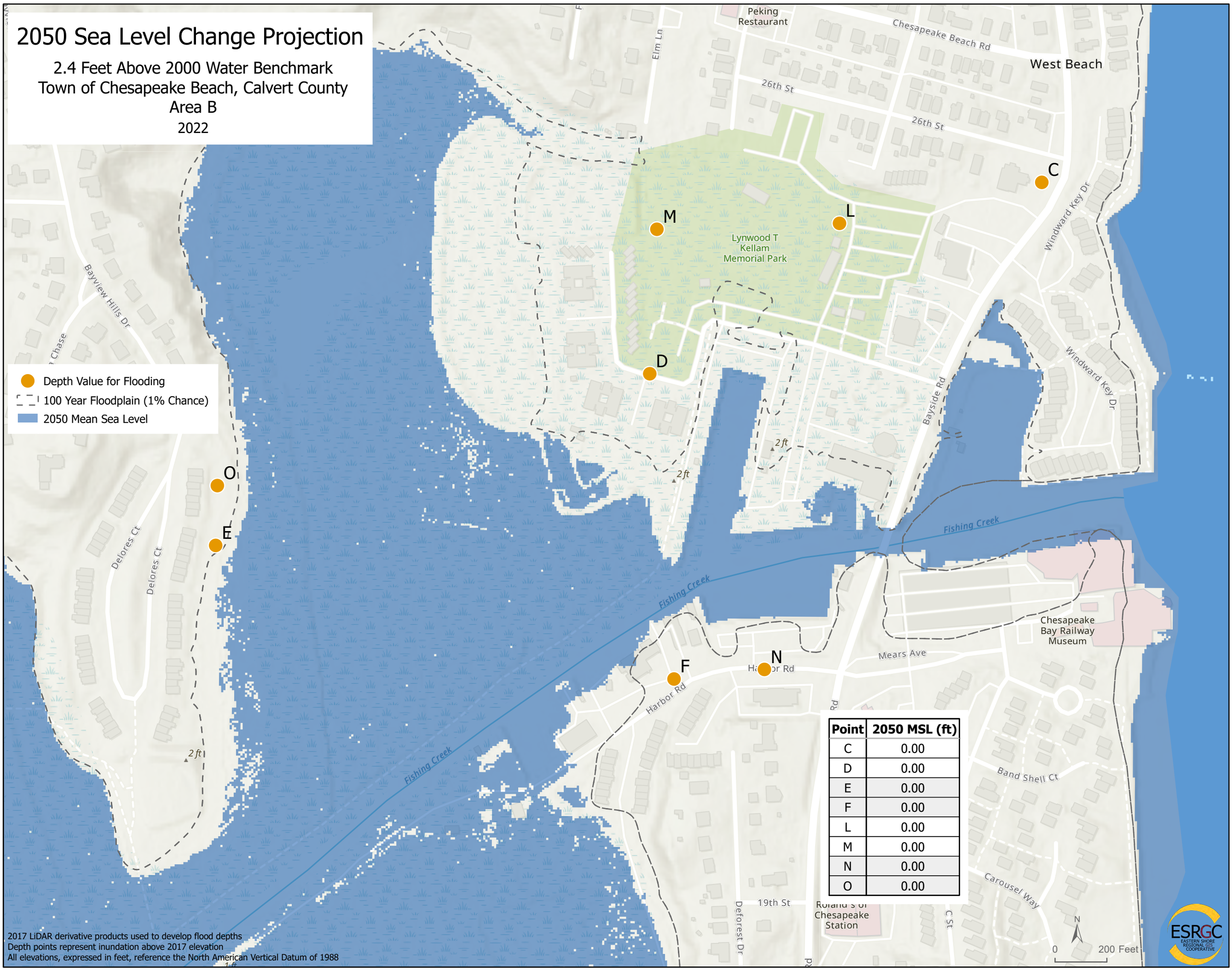
Point	2030 MSL (ft)	2030 MSL & 10% (ft)	2030 MSL & 1% (ft)
C	0.00	0.00	0.00
D	0.00	0.63	1.28
E	0.00	0.66	1.31
F	0.00	0.00	0.00
L	0.00	0.00	0.00
M	0.00	0.00	0.00
N	0.00	0.00	0.00
O	0.00	0.00	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

0 200 Feet

2050 Sea Level Change Projection

2.4 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area B
2022



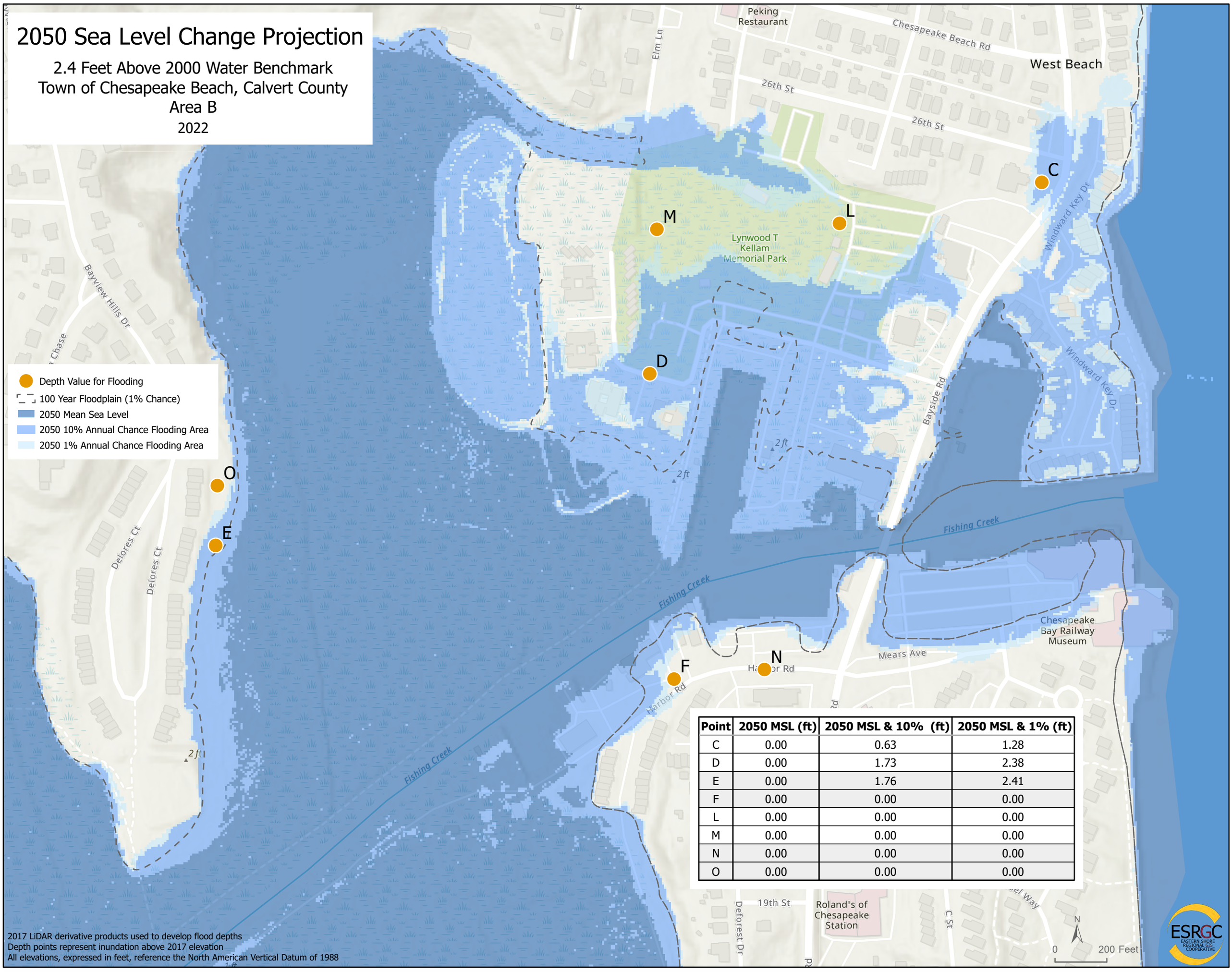
Point	2050 MSL (ft)
C	0.00
D	0.00
E	0.00
F	0.00
L	0.00
M	0.00
N	0.00
O	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2050 Sea Level Change Projection

2.4 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area B
2022



Point	2050 MSL (ft)	2050 MSL & 10% (ft)	2050 MSL & 1% (ft)
C	0.00	0.63	1.28
D	0.00	1.73	2.38
E	0.00	1.76	2.41
F	0.00	0.00	0.00
L	0.00	0.00	0.00
M	0.00	0.00	0.00
N	0.00	0.00	0.00
O	0.00	0.00	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2100 Sea Level Change Projection

Stabilized Emission Pathway (RCP 4.5)
5.8 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area B
2022

Depth Value for Flooding
100 Year Floodplain (1% Chance)
2100 Mean Sea Level

Point	2100 SLC RCP4.5
C	0.65
D	1.63
E	2.07
F	0.00
L	0.00
M	0.00
N	0.00
O	0.00

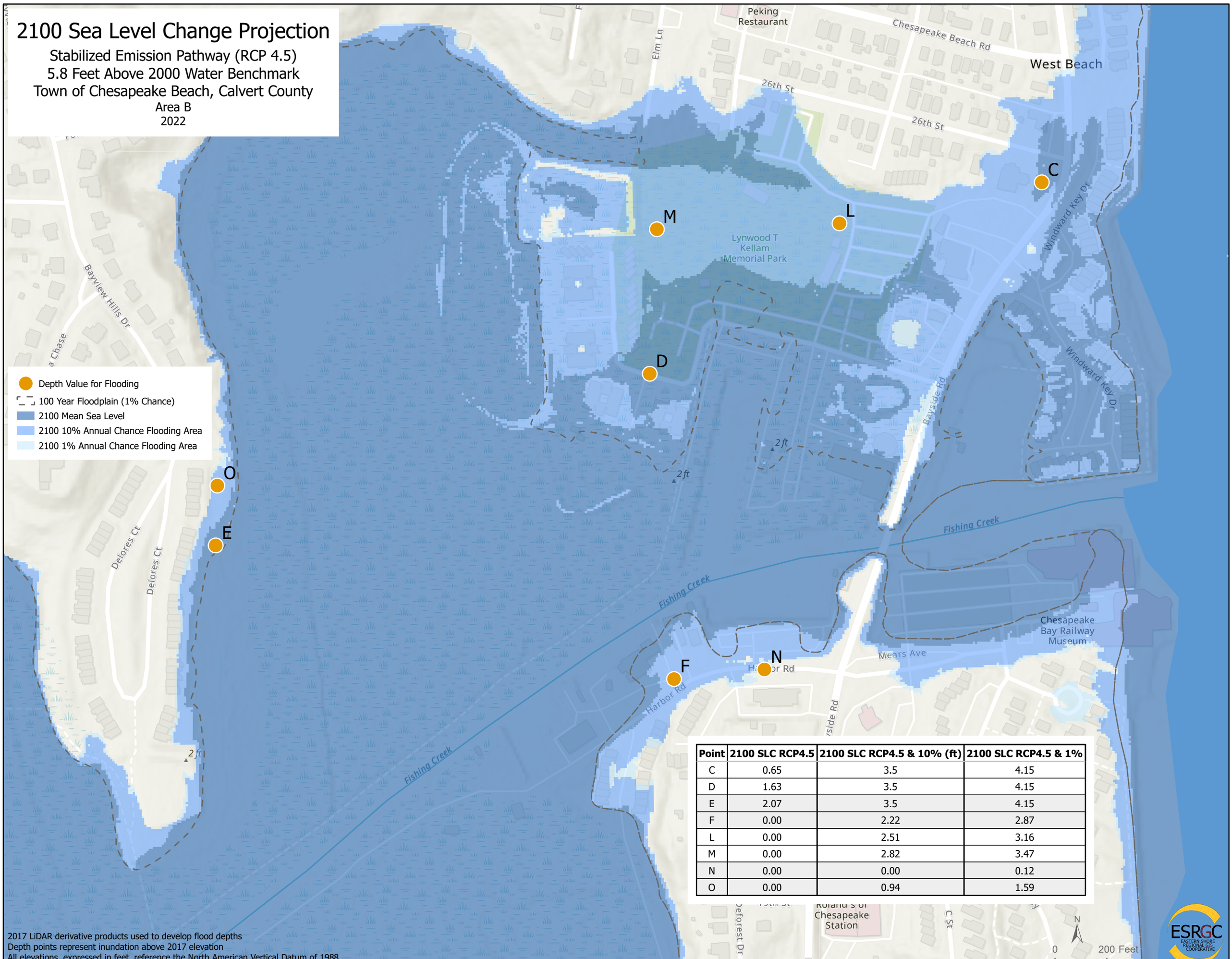
2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

0 200 Feet

ESRGC EASTERN SHORE REGIONAL GIS COOPERATIVE

2100 Sea Level Change Projection

Stabilized Emission Pathway (RCP 4.5)
5.8 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area B
2022



Point	2100 SLC RCP4.5	2100 SLC RCP4.5 & 10% (ft)	2100 SLC RCP4.5 & 1%
C	0.65	3.5	4.15
D	1.63	3.5	4.15
E	2.07	3.5	4.15
F	0.00	2.22	2.87
L	0.00	2.51	3.16
M	0.00	2.82	3.47
N	0.00	0.00	0.12
O	0.00	0.94	1.59

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2100 Sea Level Change Projection

Growing Emission Pathway (RCP 8.5)
7.0 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area B
2022

Depth Value for Flooding
100 Year Floodplain (1% Chance)
2100 Mean Sea Level

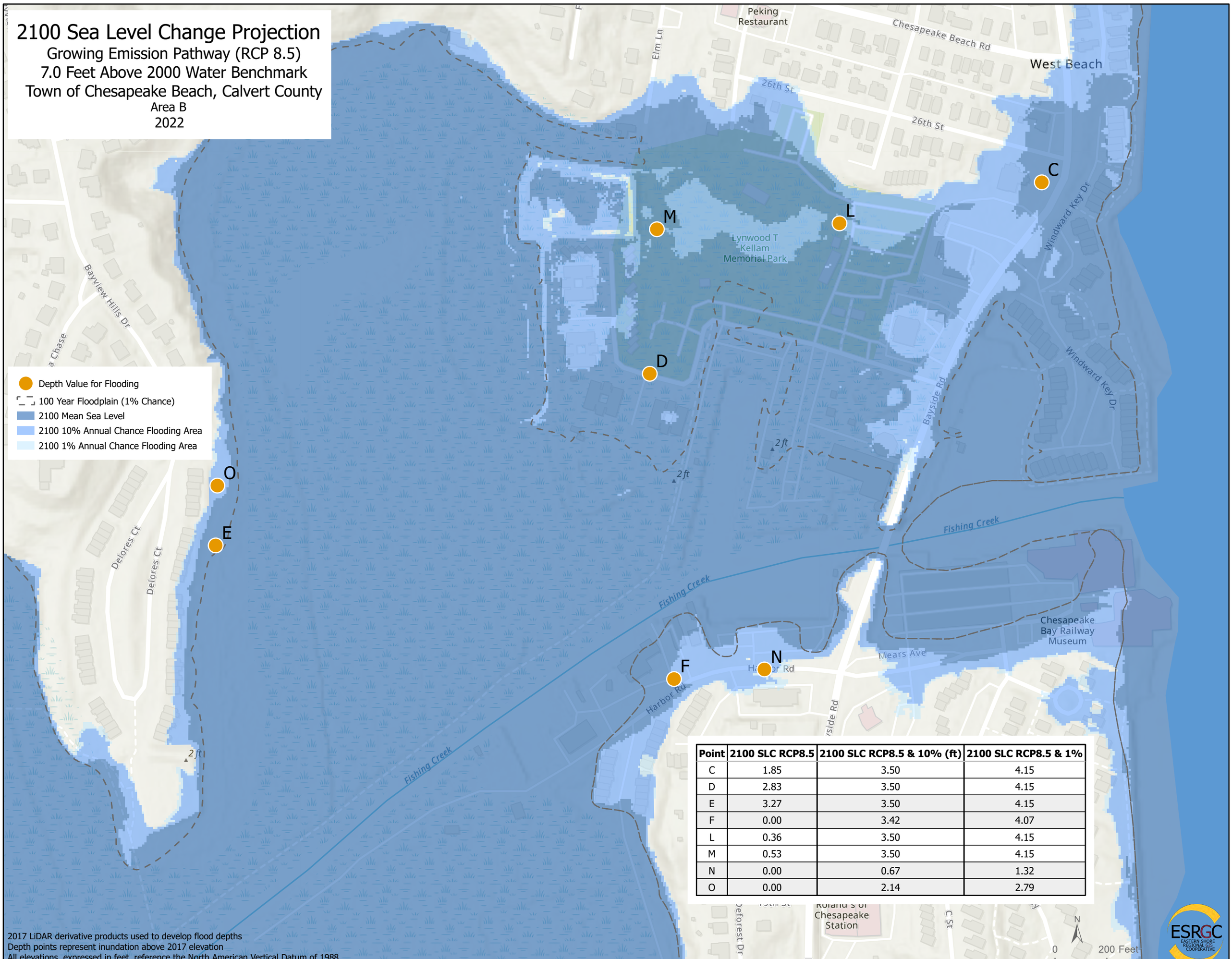
Point	2100 SLC RCP8.5
C	1.85
D	2.83
E	3.27
F	0.00
L	0.36
M	0.53
N	0.00
O	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

0 200 Feet

2100 Sea Level Change Projection

Growing Emission Pathway (RCP 8.5)
7.0 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area B
2022



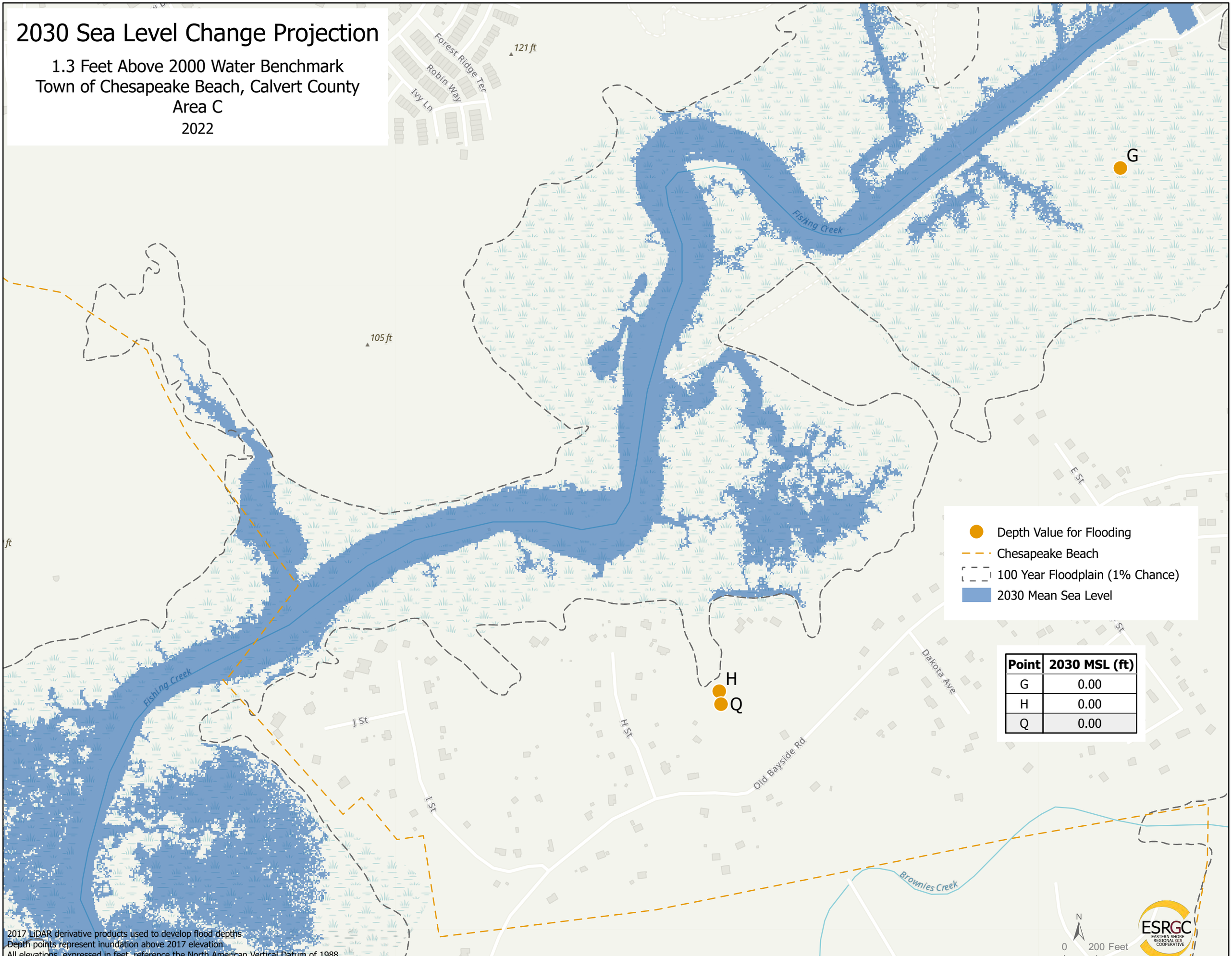
Point	2100 SLC RCP8.5	2100 SLC RCP8.5 & 10% (ft)	2100 SLC RCP8.5 & 1%
C	1.85	3.50	4.15
D	2.83	3.50	4.15
E	3.27	3.50	4.15
F	0.00	3.42	4.07
L	0.36	3.50	4.15
M	0.53	3.50	4.15
N	0.00	0.67	1.32
O	0.00	2.14	2.79

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2030 Sea Level Change Projection

1.3 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area C
2022



Point	2030 MSL (ft)
G	0.00
H	0.00
Q	0.00

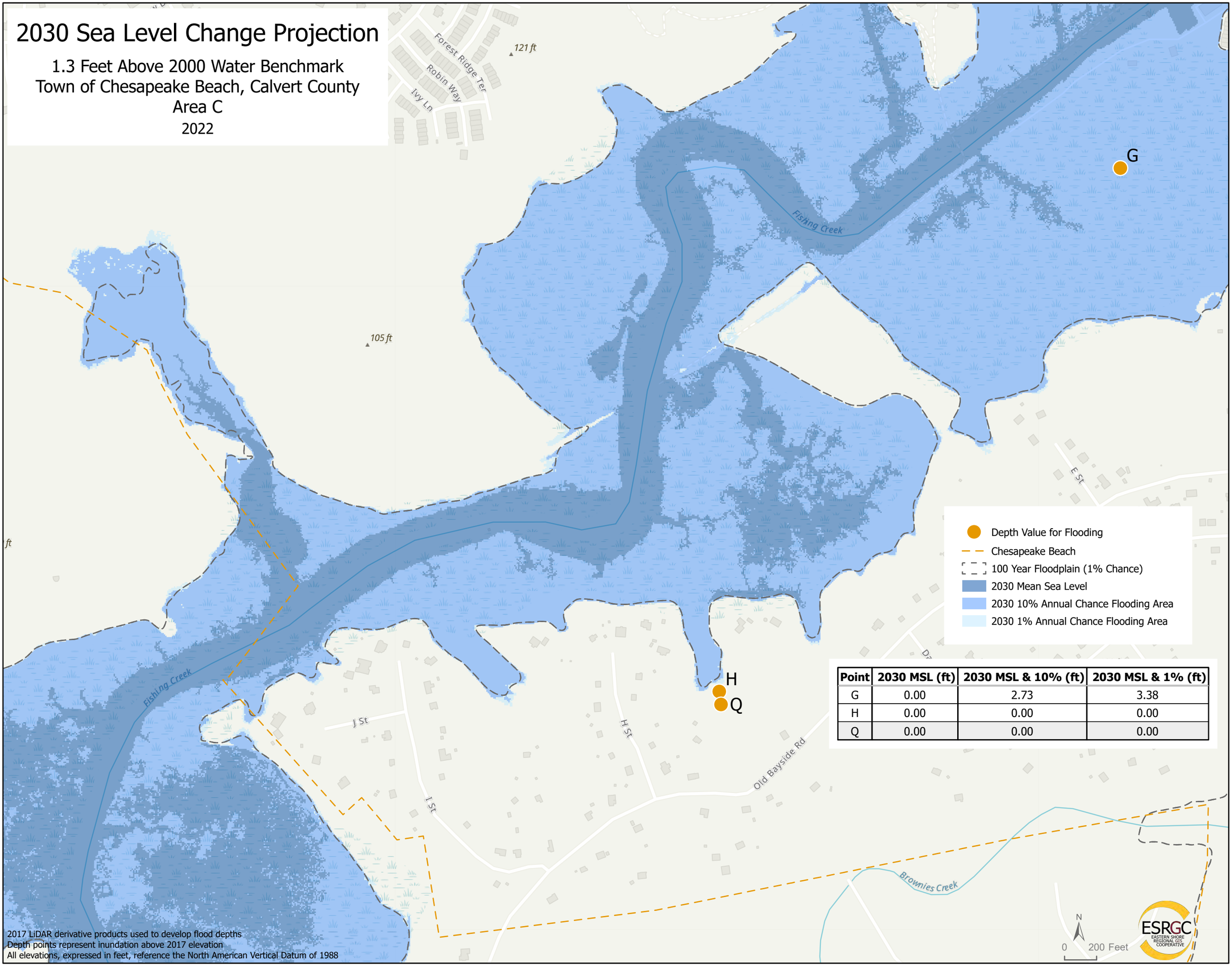
2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

N
0 200 Feet

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2030 Sea Level Change Projection

1.3 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area C
2022



Depth Value for Flooding
Chesapeake Beach
100 Year Floodplain (1% Chance)
2030 Mean Sea Level
2030 10% Annual Chance Flooding Area
2030 1% Annual Chance Flooding Area

Point	2030 MSL (ft)	2030 MSL & 10% (ft)	2030 MSL & 1% (ft)
G	0.00	2.73	3.38
H	0.00	0.00	0.00
Q	0.00	0.00	0.00

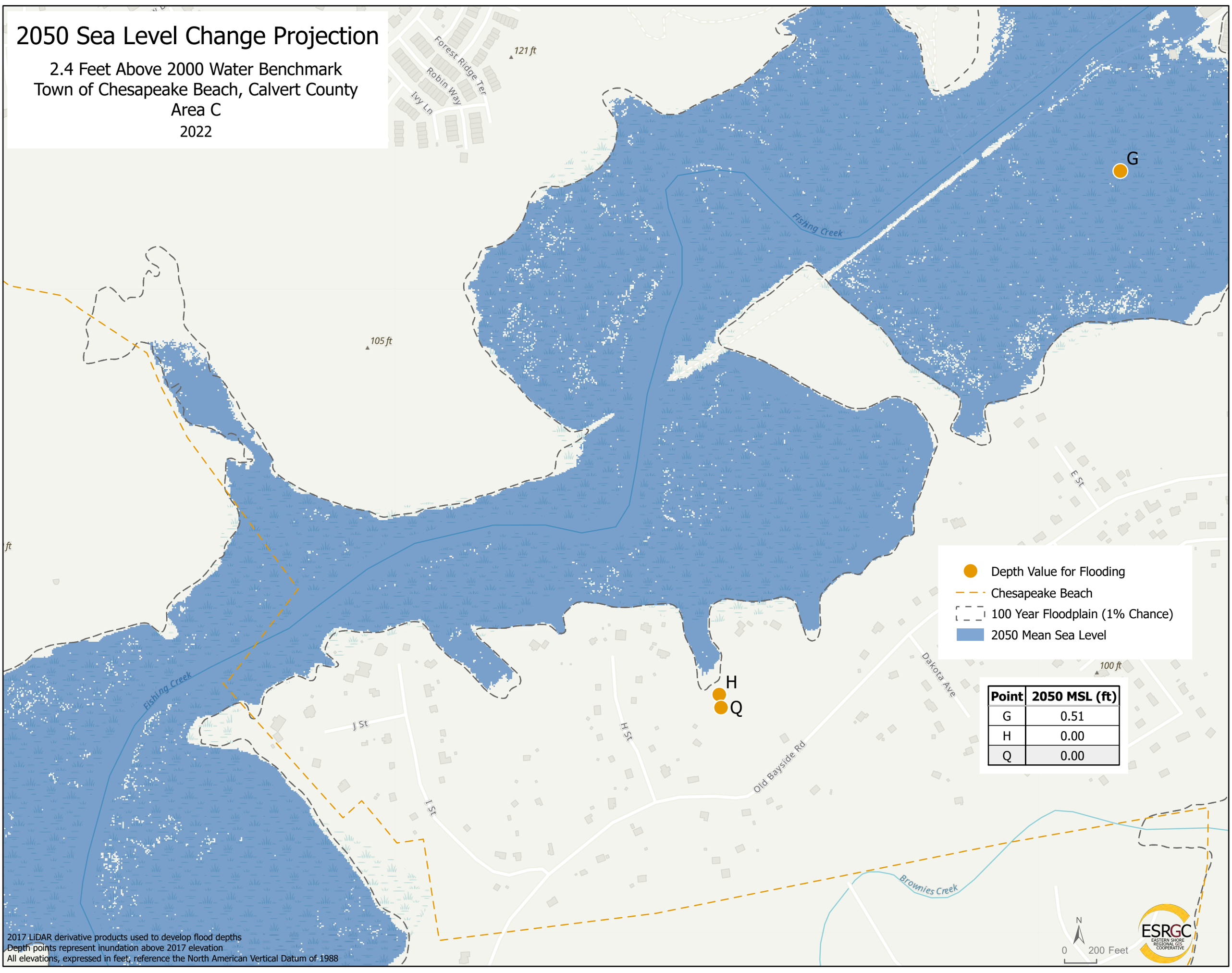
2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

N
0 200 Feet

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2050 Sea Level Change Projection

2.4 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area C
2022

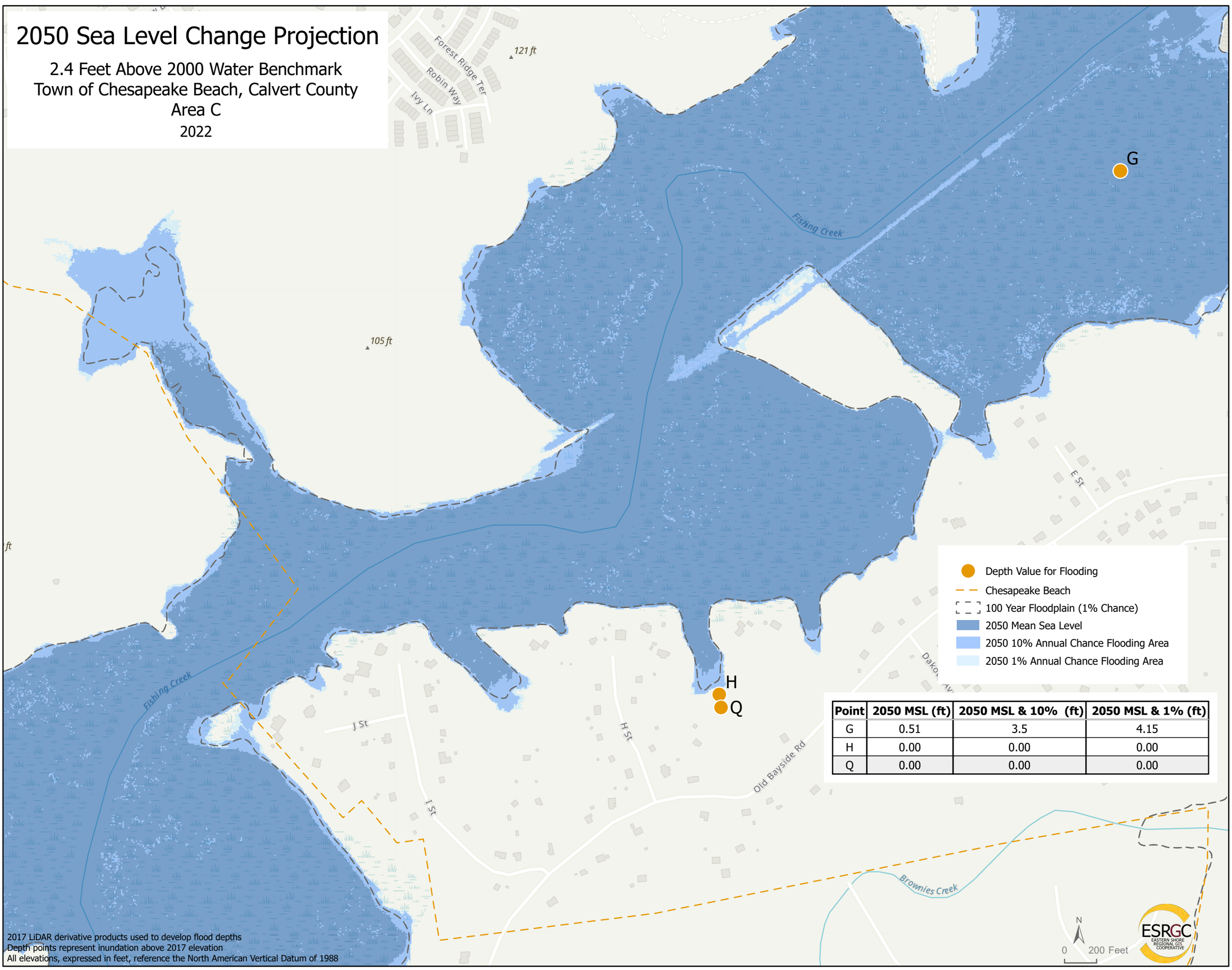


Point	2050 MSL (ft)
G	0.51
H	0.00
Q	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

2050 Sea Level Change Projection

2.4 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area C
2022

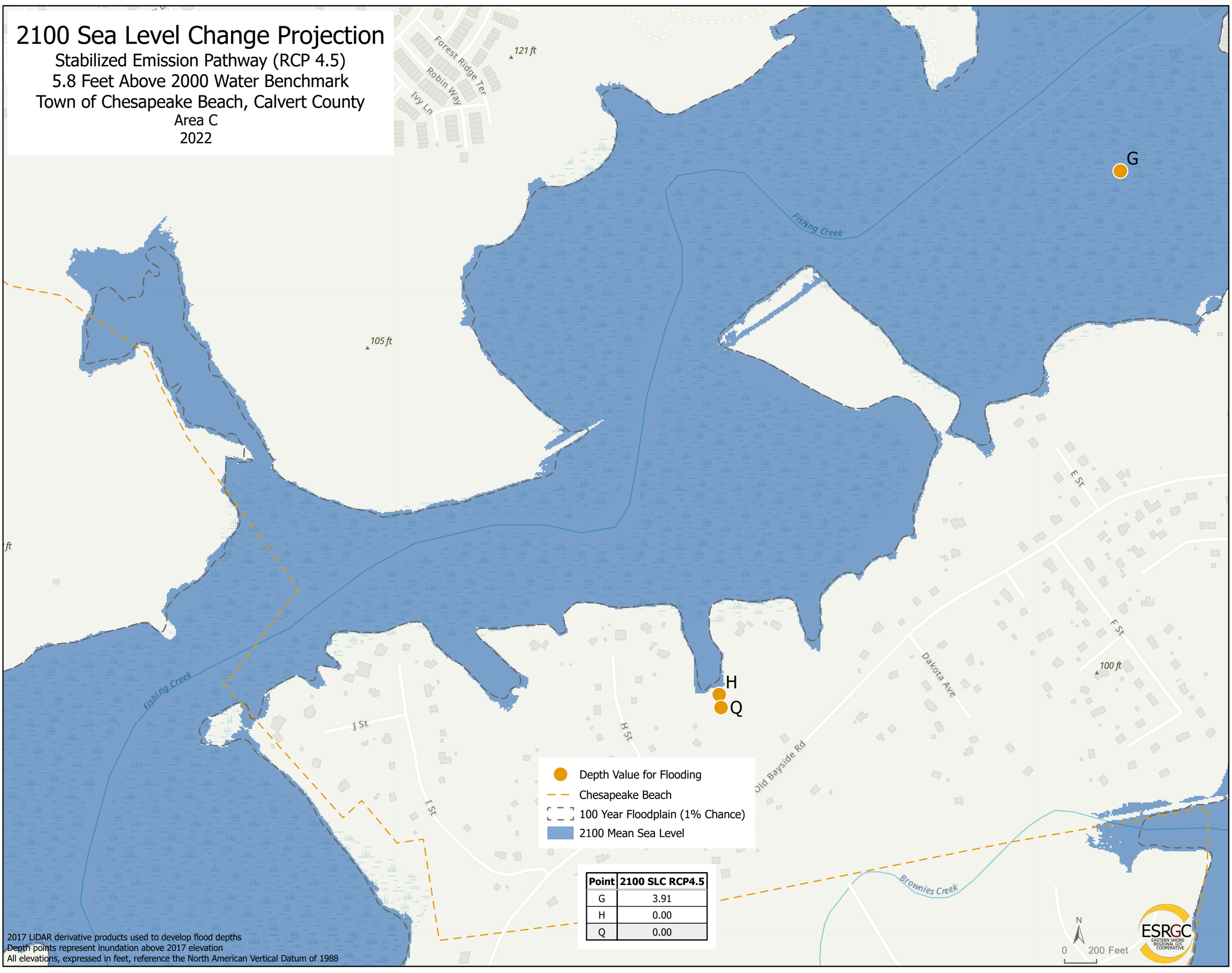


Point	2050 MSL (ft)	2050 MSL & 10% (ft)	2050 MSL & 1% (ft)
G	0.51	3.5	4.15
H	0.00	0.00	0.00
Q	0.00	0.00	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

2100 Sea Level Change Projection

Stabilized Emission Pathway (RCP 4.5)
5.8 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area C
2022

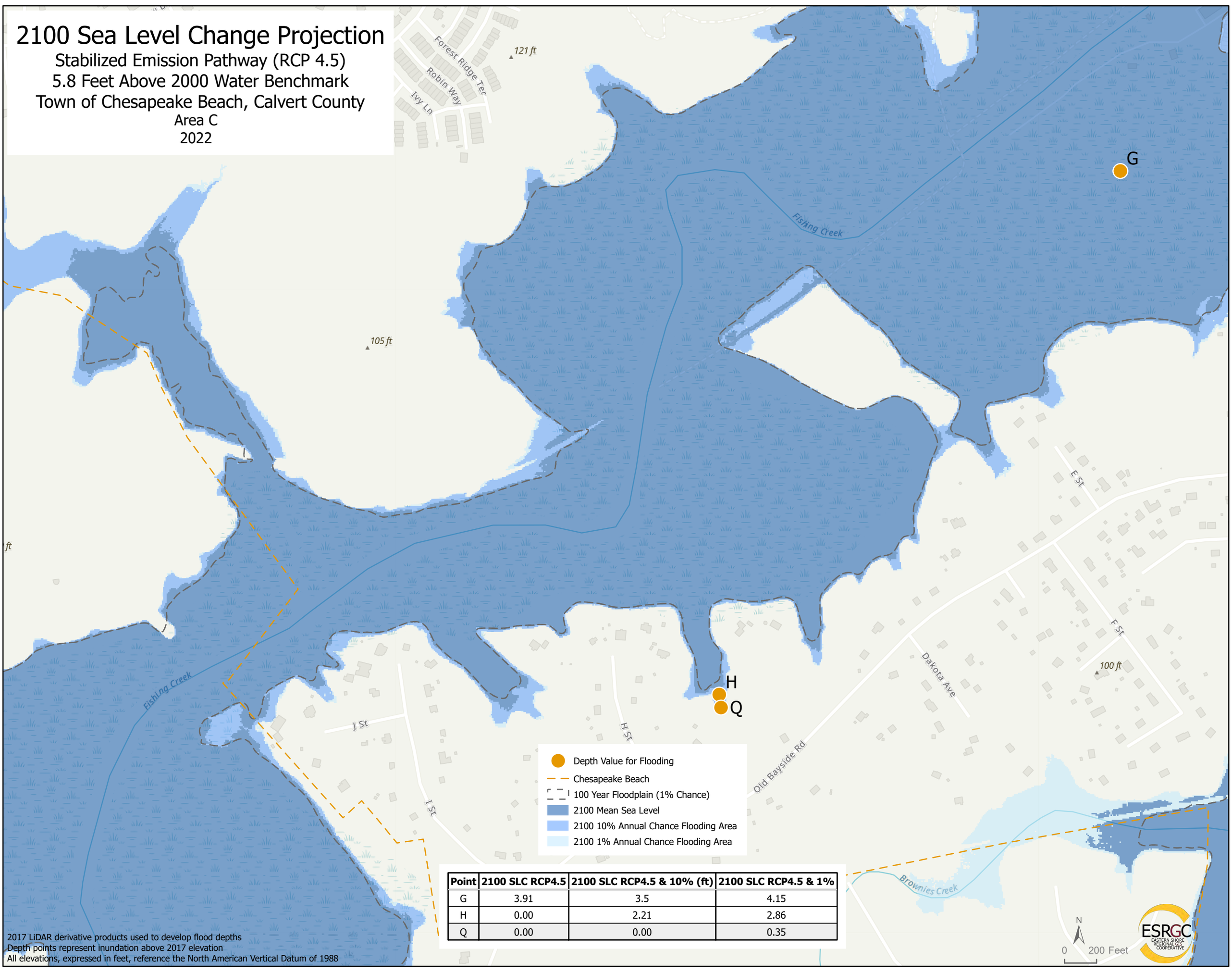


Point	2100 SLC RCP4.5
G	3.91
H	0.00
Q	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

2100 Sea Level Change Projection

Stabilized Emission Pathway (RCP 4.5)
5.8 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area C
2022

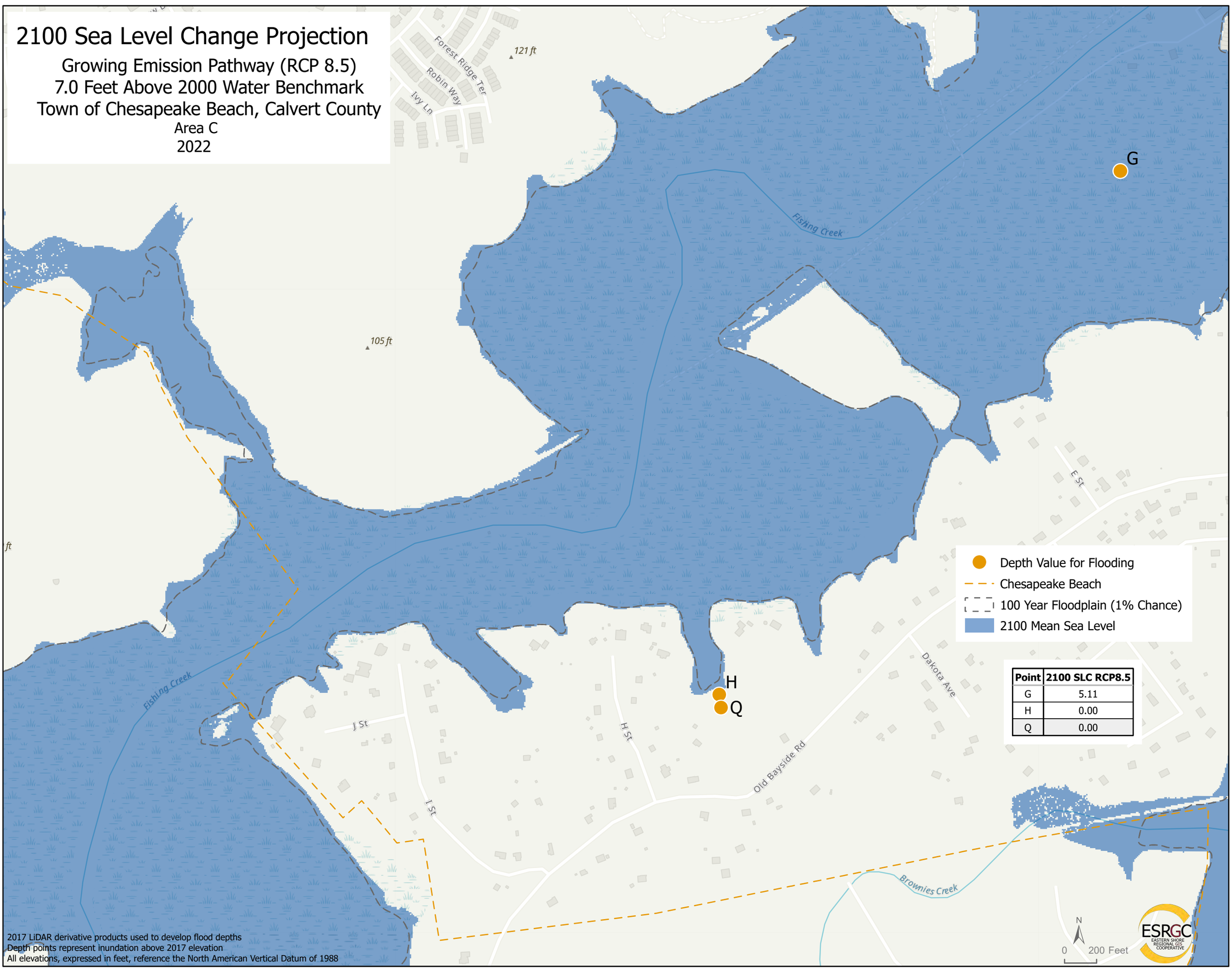


Point	2100 SLC RCP4.5	2100 SLC RCP4.5 & 10% (ft)	2100 SLC RCP4.5 & 1%
G	3.91	3.5	4.15
H	0.00	2.21	2.86
Q	0.00	0.00	0.35

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

2100 Sea Level Change Projection

Growing Emission Pathway (RCP 8.5)
7.0 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area C
2022

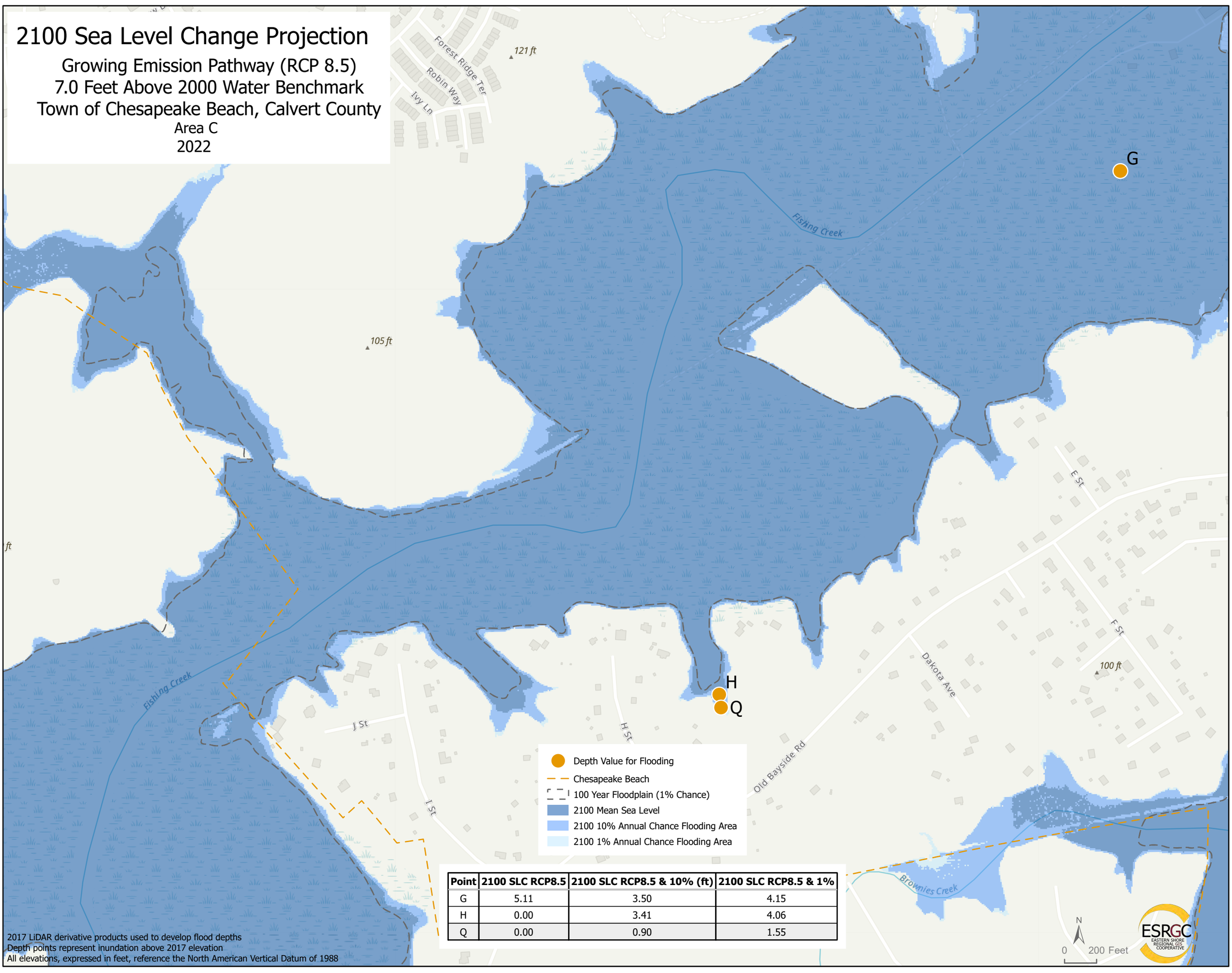


Point	2100 SLC RCP8.5
G	5.11
H	0.00
Q	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

2100 Sea Level Change Projection

Growing Emission Pathway (RCP 8.5)
7.0 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
Area C
2022

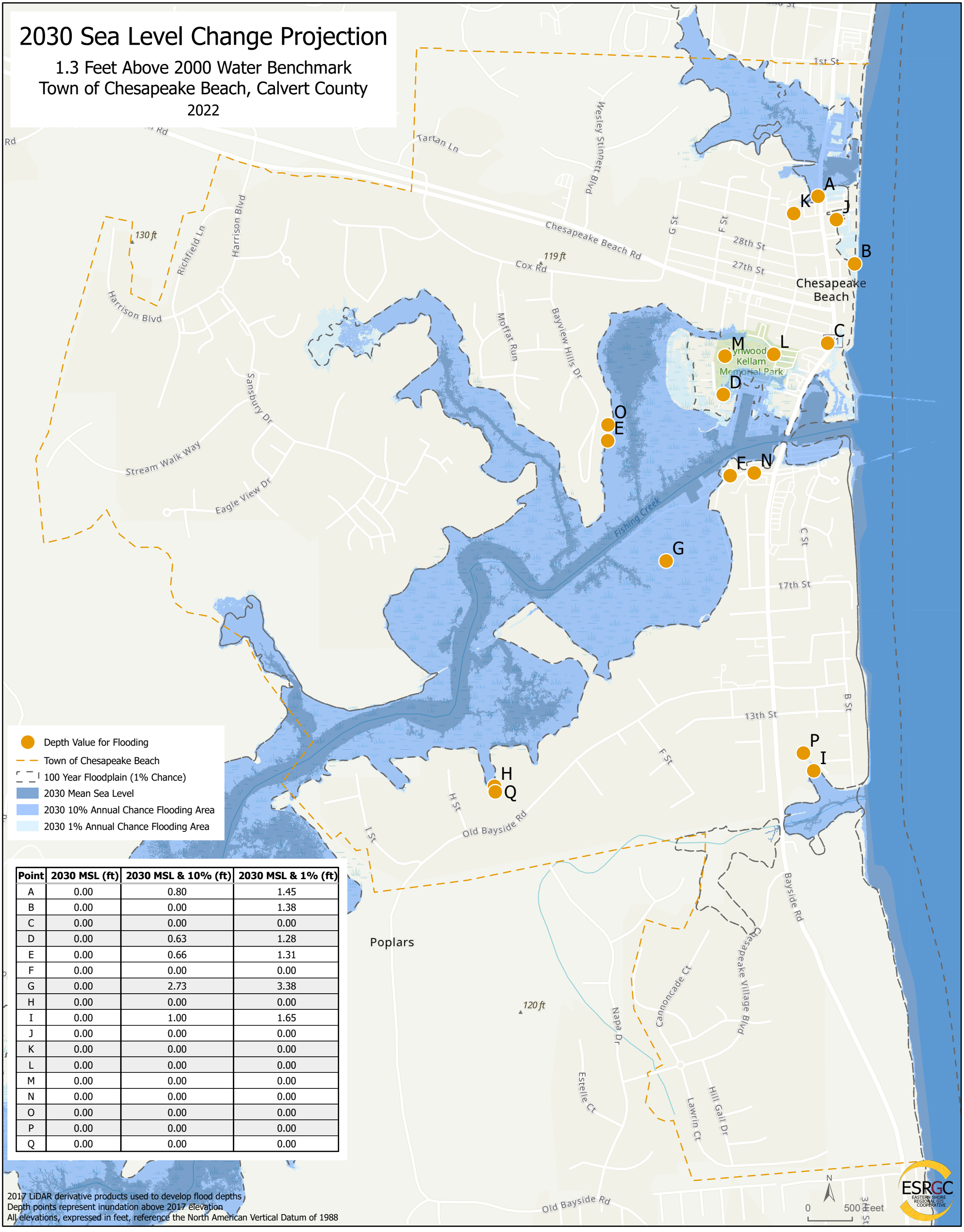


Point	2100 SLC RCP8.5	2100 SLC RCP8.5 & 10% (ft)	2100 SLC RCP8.5 & 1%
G	5.11	3.50	4.15
H	0.00	3.41	4.06
Q	0.00	0.90	1.55

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

2030 Sea Level Change Projection

1.3 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
2022

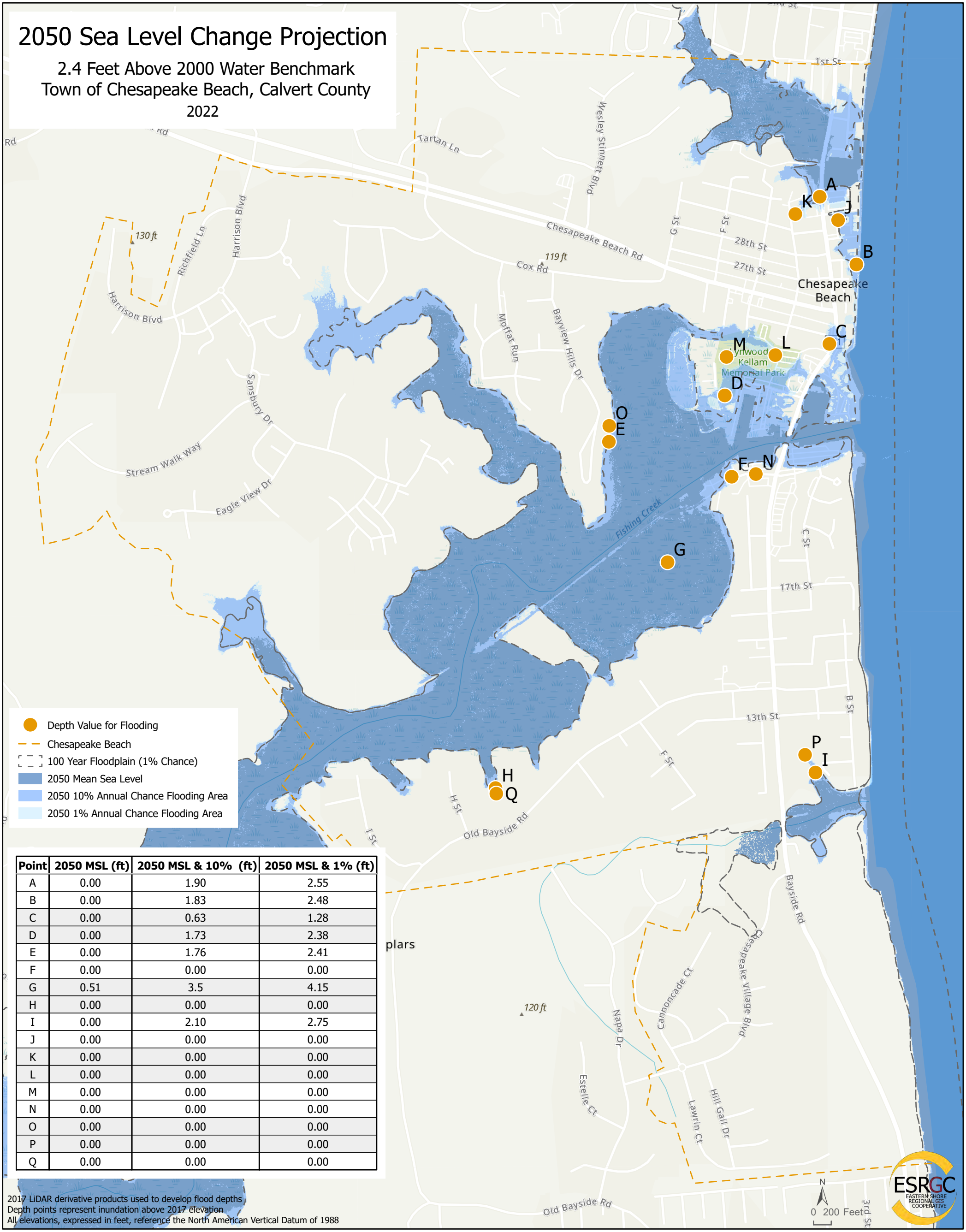


Point	2030 MSL (ft)	2030 MSL & 10% (ft)	2030 MSL & 1% (ft)
A	0.00	0.80	1.45
B	0.00	0.00	1.38
C	0.00	0.00	0.00
D	0.00	0.63	1.28
E	0.00	0.66	1.31
F	0.00	0.00	0.00
G	0.00	2.73	3.38
H	0.00	0.00	0.00
I	0.00	1.00	1.65
J	0.00	0.00	0.00
K	0.00	0.00	0.00
L	0.00	0.00	0.00
M	0.00	0.00	0.00
N	0.00	0.00	0.00
O	0.00	0.00	0.00
P	0.00	0.00	0.00
Q	0.00	0.00	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

2050 Sea Level Change Projection

2.4 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
2022

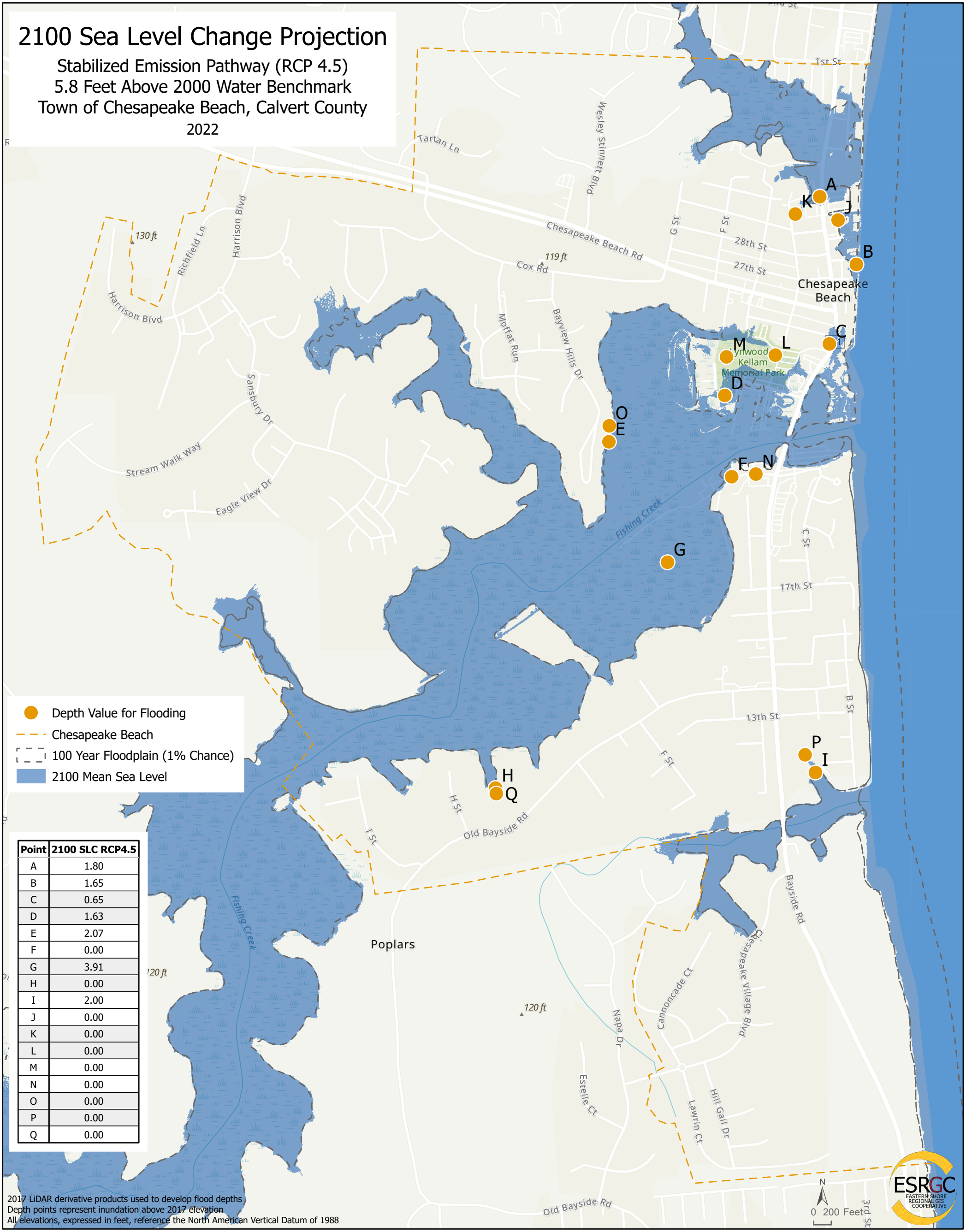


Point	2050 MSL (ft)	2050 MSL & 10% (ft)	2050 MSL & 1% (ft)
A	0.00	1.90	2.55
B	0.00	1.83	2.48
C	0.00	0.63	1.28
D	0.00	1.73	2.38
E	0.00	1.76	2.41
F	0.00	0.00	0.00
G	0.51	3.5	4.15
H	0.00	0.00	0.00
I	0.00	2.10	2.75
J	0.00	0.00	0.00
K	0.00	0.00	0.00
L	0.00	0.00	0.00
M	0.00	0.00	0.00
N	0.00	0.00	0.00
O	0.00	0.00	0.00
P	0.00	0.00	0.00
Q	0.00	0.00	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

2100 Sea Level Change Projection

Stabilized Emission Pathway (RCP 4.5)
5.8 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
2022



Depth Value for Flooding
Chesapeake Beach
100 Year Floodplain (1% Chance)
2100 Mean Sea Level

Point	2100 SLC RCP4.5
A	1.80
B	1.65
C	0.65
D	1.63
E	2.07
F	0.00
G	3.91
H	0.00
I	2.00
J	0.00
K	0.00
L	0.00
M	0.00
N	0.00
O	0.00
P	0.00
Q	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

N
0 200 Feet

ESRGC
EASTERN SHORE REGIONAL GIS COOPERATIVE

2100 Sea Level Change Projection

Growing Emission Pathway (RCP 8.5)
7.0 Feet Above 2000 Water Benchmark
Town of Chesapeake Beach, Calvert County
2022

Depth Value for Flooding
Chesapeake Beach
100 Year Floodplain (1% Chance)
2100 Mean Sea Level

Point	2100 SLC RCP8.5
A	3.00
B	2.85
C	1.85
D	2.83
E	3.27
F	0.00
G	5.11
H	0.00
I	3.20
J	0.56
K	0.00
L	0.36
M	0.53
N	0.00
O	0.00
P	0.00
Q	0.00

2017 LiDAR derivative products used to develop flood depths
Depth points represent inundation above 2017 elevation
All elevations, expressed in feet, reference the North American Vertical Datum of 1988

0 200 Feet

ESRGC EASTERN SHORE REGIONAL GIS COOPERATIVE

To: The Honorable Mayor and Town Council From: Holly Wahl, Town Administrator
Subject: Chesapeake Beach Water Reclamation Treatment Plant (CBWRTP) Generator Access Platform
Date: July 6, 2023

I. BACKGROUND:

OSHA 1910 standards require an access platform for the access doors on both sides of the generator. The specific standards that require the access platform 1910.28(b)(1)(i) regarding a need for fall protection and 1910.25(b)(7) regarding standards for stairways.

Not having an additional access platform on the generator could pose a safety issue if someone opens one of the access doors without a platform to get more light in the enclosure or ventilation. If this were to occur, it could possibly put someone at risk of falling out of the enclosure.

II. GOAL:

Install an additional platform to provide additional access and safety to personnel.

III. SCOPE OF WORK:

Install a second platform on the other side of the generator.

IV. FISCAL IMPACT:

The expected material cost for the platform is $ 22,051.00. If approved by the Town Council these costs would be incurred in the FY24 Capital Improvement line item of the CBWRTP. See Exhibit A.

Exhibit A

REV. NOTE - **
QUOTE #: M13868JBIR

PAGE 1

Original Quote Run
DATE: 1/23/2023

** STOR-DECK MEZZANINES **

20 Technology Way
West Greenwich, RI 02817
PHONE: (800)421-0314 ***FAX:*** (401)421-5679

www.FSIndustries.com

CUSTOMER: Chesapeake Beach Sewerage Plant
8550 Bayside Road
Chesapeake Beach, MD 20732
ATTN: Josh Stinnett

PROJECT: Chesapeake Beach, MD 20732

SPECIFIED USE OF MEZZANINE: Storage
SPECIFIED METHOD OF MATERIAL HANDLING: Hand Carry
SPECIFIED WHEEL LOAD: 0
*****SEISMIC DESIGN*****

STOR-DECK MEZZANINE PHYSICAL DESCRIPTION:
DECK SURFACE: 1 in. Aluminum 19SG1-4 I-Bar Swage-Locked Bar Grating with 3/16 Bearing Bars on 1 3/16 Centers

SECTION I

SIZE IN ft: 16.00 X 4.25

COL CTR ft: 15.33 X 3.58

DECK HT in: 53.00

CLR HT in: 42.00

LEVELS : 1

STOR - DECK

LOAD CAP : 150 PSF

MAXCOLLOAD: 50 PSI

COL SIZE : 4 in sq X 0.19

BASEPLATES: 8 in sq X 0.50

DK SUP CTR: 21.5 in

DECK BEAMS: 10"

MAIN BEAMS: 10"

FRAME COLOR: Mill Finish Aluminum

CONTINUED ON PAGE 2

** STOR-DECK MEZZANINES **
20 Technology Way
West Greenwich, RI 02817
PHONE: (800)421-0314 FAX: (401)421-5679
www.FSIndustries.com

Handrail & Kickplate: 22 Linear Feet Provided
2 Rail OSHA Type - Mill Finish Aluminum

VERTICAL LADDER QTY: 0
TOTAL # OF STAIRS PROVIDED: 1 AS DEFINED BELOW

QTY	NAME	DESCRIPTION
1	str-1	TYPE: OSHA-17 DRAWING: AL773-A-017 HEIGHT: 53 WIDTH: 36 WEIGHT: 347 HORIZONTAL RUN: 48 1/16 DEGREES: 42.92 TREAD: (#82) I Bar Aluminum 9 13/16 in X 1 1/2 in X 1/4 Bars #19-SGI-4 Swage FINISH: Mill Finish Aluminum

PRICING TOTALS

MATERIAL COST (LESS OPTIONS) F.O.B. WEST GREENWICH RI $ 20,699.00
ESTIMATED FREIGHT COST - (M0) Chesapeake Beach, MD 20732 - Flatbed Del.
$ 1,352.00
***Please be aware that freight rates are extremely volatile and large swings may occur from time of quote to time of shipment.
TOTAL SHIPPING WEIGHT - 1565
INSTALLATION NOT QUOTED - ESTIMATED MAN HOURS TO INSTALL - 16
TOTAL DELIVERED $ 22,051.00
**SUBJECT TO THE CONDITIONS LISTED ON PAGE 3

Sales tax is applicable for shipments to the following states:
AL, CA, CT, FL, GA, IA, ID, IL, IN, KS, KY, MA, MD, ME, MI, MN, MO, MS, NC, NJ, NM, NY, OH, PA, RI, SC, TN, TX, UT, VA, WA and WI

QUOTE SUBMITTED BY: Justin Boisclair EMail: jboisclair@fsindustries.com
NO OPTIONAL EQUIPMENT SPECIFIED

PAYMENT TERMS & DELIVERY

TERMS: Net 30 Days
PRESENT LEAD TIME ON APPROVAL DRAWINGS IS 2 WEEKS ARO.
PRESENT LEAD TIME (SHIP DATE) ON THIS MEZZANINE IS APPROXIMATELY 8 WEEKS AFTER RETURN OF SIGNED APPROVAL DRAWINGS.

PRICING VALID FOR 30 DAYS

CONTINUED ON PAGE 3

REV. NOTE - **
Original Quote Run
QUOTE #: M13868JBIR
DATE: 1/23/2023

** STOR-DECK MEZZANINES **

20 Technology Way
West Greenwich, RI 02817
PHONE: (800)421-0314 ***FAX:*** (401)421-5679

www.FSIndustries.com

INSTALLATION PRICING CONDITIONS:

1) UNLOADING MATERIAL AND TRANSPORTING TO ERECTION SITE BY Customer/Others
2) FORKLIFT (IF NECESSARY) TO BE SUPPLIED BY Customer/Others
3) ERECTION SITE AREA - Clear and Level

1) MEZZANINE SHALL BE A STOR-DECK MEZZANINE DESIGNED AND MANUFACTURED BY FS INDUSTRIES 20 TECHNOLOGY WAY WEST GREENWICH RI 02817.
2) MEZZANINE SHALL BE DESIGNED AND MANUFACTURED TO CONFORM TO OR EXCEED THE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (**OSHA**).
3) MEZZANINE SHALL BE FREE STANDING WITH WALL TIES AND/OR SWAY BRACES PROVIDED TO PRECLUDE LATERAL SWAY.
4) APPROVAL DRAWINGS OF FRAMING PLAN AND DECK PLAN SHALL BE SUBMITTED TO THE OWNER OR TO OWNER'S REPRESENTATIVE PRIOR TO FABRICATION.
5) INSTALLATION DRAWINGS AND COMPONENT DESCRIPTIONS SHALLBE PROVIDED AND INCLUDED WITH SHIPMENT.
   1 in. Aluminum 19SG1-4 I-Bar Swage-Locked Bar Grating with 3/16 Bearing Bars on 1 3/16 Centers WITH
   NO TOP LAYER TOP LAYER
6) STAIRS SHALL BE MANUFACTURED TO CONFORM TO THE SPECIFICATIONS LISTED ON PAGE 2. WELDED HANDRAILS SHALL BE 1 1/2 IN. X 11 GA. SQUARE TUBING.
7) FINISH: ALL ALUMINUM STRUCTURAL MEMBERS SHALL BE MILL FINISHED.

CC:House

To: The Honorable Mayor and Town Council From: Holly Wahl, Town Administrator

Subject: Calvert Library – Twin Beaches Branch
Date: July 10, 2023

I. BACKGROUND:

The Twin Beaches Library is underway with its relocation to the Town of North Beach through a capital improvement project to make substantial improvements to program space offered to the community. The Town of Chesapeake Beach has been a longstanding supporter and partner of the Twin Beaches branch through an annual grant that covers a portion of the rental expense for the library. The Town of Chesapeake Beach is a party to the lease agreement along with the Board of County Commissioners. The annual grant totals approximately $45,000 of Town of Chesapeake Beach taxpayer funds a year to support the library at its current location. The lease agreement is expected to be terminated by the Town and County when the Twin Beaches Library relocates to the new building as the library space will no longer be needed for program offerings.

The Calvert Library is requesting that the Town Council consider a capital contribution of $100,000.

II. CAPITAL CONTRIBUTION:

The funds requested from the Town are detailed as covering expenses for community access such as:

- Create an interactive play area for children to develop crucial early learning skills.
- Purchase a sound booth for recording and podcasting.
- Create a Memory lab with digitization equipment.
- Acquire a mobile teaching kitchen.
- Purchase numerous tech and creative tools for Makerspace.
- Purchase technology equipment for a 100-person meeting room

III. FISCAL IMPACT:

The requested contribution is not currently accounted for specially in the FY24 Town of Chesapeake Beach budget; however, the Town has an American Rescue Plan budget line item that can provide the basis of funding needed. The current allocation of ARPA funds are as follows:

Reconciliation of Funds Allocated from ARPA	
5,943,338	Total funds awarded
(200,000)	Food insecurities & food pantry services - GF
(82,813)	Storm Drain Replacement* - GF
(750,000)	Saddle Replacements - UF
(500,000)	Meter Replacement - UF
(350,000)	Fishing Creek Wet Well - UF
4,060,525	***Remaining Funds***

** costs do not include all projects discussed with Town Council only the allocated projects*

Help us write our next chapter...

Calvert LIBRARY Foundation

Porch and terrace with gorgeous views of the Chesapeake Bay! Calvert Library is excited about how this new space will positively impact our community by bringing everyone together! We are building a wonderful, technology rich library of which our community will be able to take full advantage.

Calvert LIBRARY Foundation

Community Impact

18,000 sq-ft of space - -
4x the size of the current branch

Expected to have over
60,000 visitors annually

Easily accessible to pedestrian traffic with over 5,000 residents living within one mile

Calvert LIBRARY Foundation

New Features of the Twin Beaches Branch

Technology-equipped meeting room for 100 people

Community gathering and exhibit spaces

Makerspace with tech and creative tools for community use such as a 3D printer, laser printer, sewing machine, microscopes, robotics equipment

Multi-use podcasting booth that can be utilized for sound recordings, virtual job interviews and remote work

Tutoring and study rooms

25+ Public Computers and Laptops, Wi-Fi access and Loanable Hotspots and Chromebooks

Calvert LIBRARY Foundation

Your Gift's Impact - Makerspace

Purchase tech and creative tools for community use.

- Sound booth for Recording/Podcasting/Job Interviews
- Laser Cutter/Printer
- Sewing Machines
- CNC Router
- Spheros – Coding and Robots
- 3D Printer
- Large Format Printer/Scanner
- Cricut Machine

Calvert LIBRARY Foundation

Your Gift's Impact

Create a large interactive play area for children to develop crucial early learning skills.

Acquire a hands-on, mobile teaching kitchen

Calvert LIBRARY Foundation

Lead Donors will be prominently recognized in the Twin Beaches Library.

Calvert LIBRARY Foundation

Campaign Fundraising goal $500,000

Calvert LIBRARY Foundation

Thank you for considering being a donor for the Calvert Library Campaign

Calvert LIBRARY Foundation

To: The Honorable Mayor and Town Council From: Holly Wahl, Town Administrator

Subject: Food Insecurities
Date: July 10, 2023

I. BACKGROUND:

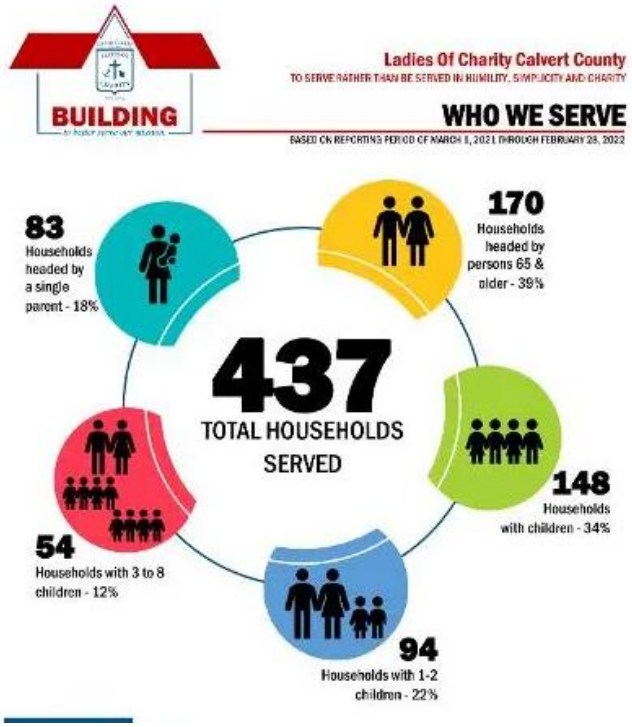
The Town of Chesapeake Beach received $5,943,337 in American Rescue Plan Act funds. The Town Council has prioritized several areas to utilize ARPA funding. The Town's ARPA fundings has reimbursed the Town for expenses incurred for the Twin Beach Deputies and support provided for the North Beach Volunteer Fire Department. This reimbursement has provided for the availability of funds for projects as determined by the Town Council.

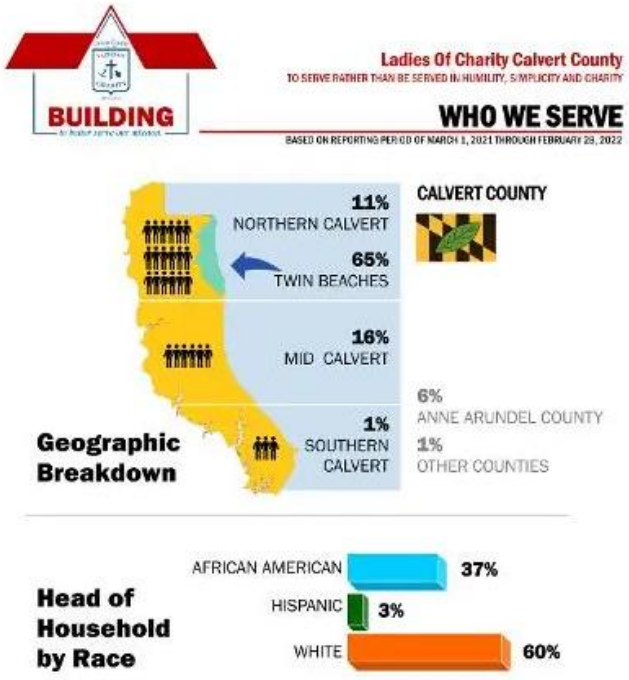
In the December 2022 Town Council meeting the Town Council approved the allocation of $200,000 in funds made available through ARPA to be allocated to food insecurity and food pantry services projects that directly serve the citizens of the Town of Chesapeake Beach.

II. FOOD INSECURITY PROJECTS:

a) **Ladies of Charity**: The Ladies of Charity are operating without a proper building as their 80-year-old building has structural issues. A new building is required to continue to provide services to the community, of which 65% of services are provided to the Twin Beach area.

Services include food insecurity, serving the elderly, serving the youth.





In 2021:

- **443 families visited the Pantry 3,832 times**
- **171 backpacks of school supplies were given to children**
- **665 holiday meals were provided**
- **630 HeartFELT meals were provided to food insecure children**
- **More than 200,000 lbs. of food were distributed, representing 166,667 meals.**

b. Bayside Baptist Church:

The Bayside Food Pantry is open every Saturday from 9:30 to 11:00 AM. In addition, the church is open daily to assist those who need food on a case-by-case basis and is available as a local shelter in case of natural disasters, etc. The number of local families that come through the food pantry varies from season to season, and week to week. However, on average the church assists somewhere between 40-70 families weekly. The church projects this number to increase as the economy and inflation still affects those in the community. The church has seasonal dinners/lunch including an annual Thanksgiving dinner which averages 150 people.

In addition to canned goods, toiletries, etc., the pantry distributes meat, eggs, and milk. The church partners with local farms for fresh vegetables when they are in season. There is a big need for storage and refrigeration of these items as the church has been working from home based/donated refrigerators. There is a current need for a commercial ice maker and freezer for the church to help with storing items as they come in.

Capital costs to operate the food pantry in service of Town residents include:

Food, etc.:	$2,000 month ($24,000 yearly)
Commercial Ice Maker:	$6,000 (One-time expense)
Commercial Fridge/Freezer:	$6,500 (One-time expense)
	$36,500

Bayside Baptist constructed an outreach center totaling $1,200,000 in improvements and have approximately $600,000 in debt repayment for the outreach building. These costs were required in order to provide the food service needed of the Church.

III. FISCAL IMPACT:

It is recommended that the Town Council consider allocating $100,000 in one-time capital improvement funds to the Ladies of Charity organization to provide the infrastructure necessary to service Town residents in need through their capital campaign to build a new building. It is also recommended that the Town Council consider making a one-time capital contribution to Bayside Baptist in the amount of $100,000 to cover current capital expenses and to offset the current debt repayment on their outreach facility. These costs directly impact food insecurities within the Town of Chesapeake Beach and Twin Beaches.

To: The Honorable Mayor and Town Council From Holly Wahl, Town Administrator
Subject: Pocket Park RFP
Date: June 7, 2023

I. BACKGROUND:

The Town of Chesapeake Beach received grant funding from the State of Maryland in the amount of $150,000 for the installation of three (3) pocket parks. The pocket parks are identified in coordination with the Town of Chesapeake Beach Walkable Community Advisory Group. The Town Administration conducted public outreach related to the pocket parks to determine the features that the Town residents desire at the three (3) locations. Public feedback was obtained through surveys and in person outreach sessions at the Chesapeake Beach Town Hall where residents residing near the pocket parks participated by providing valuable feedback related to the features that would be offered within the spaces.

The Town of Chesapeake Beach posted an RFP on eMaryland Marketplace Advantage (eMMA) **Sourcing Project: BPM038247.** The Town held a pre-bid meeting on June 21, 2023, at 9:00 AM at the Chesapeake Beach Town Hall. Three bidders were present at the meeting.

Due to the number of clarifications requested from bidders, the sealed proposal deadline was extended to July 13, 2023.

II. GOALS:

To construct three (3) pocket parks. The B Street overlook will utilize the foundation of a prior home to convert the space into a lookout with ADA access. The 29th street pocket park will provide an accessible platform and park like setting along the waterfront. The northern Kellam's field access point will provide ease of access for pedestrians to the center of the Kellam's complex.

III. PLANS:

Please see exhibit A for the plans for the three pocket parks.

OFFICE OF THE PLANNING COMMISSION

Memorandum

To: Mayor and Town Council
From: Christopher Jakubiak, Planning and Zoning Administrator
Via: Holly Wahl, Town Administrator
Date: July 7, 2023
RE: Zoning Text Amendment, RV-1 commercial uses at Horizons on the Bay

---

On July 5, 2023, the Planning Commission reviewed and deliberated on the attached text amendment. Recall the Council transmitted this to the Commission with a request for its evaluation and a recommendation. The Planning Commission voted unanimously on two motions:

First, it voted to advise the Town Council that the Zoning Administrator should approve the application for the commercial use of a waxing salon in the Horizon Building.

The intent here is to expedite the permitting of the salon use because it would fit compatibly at the Horizons site and the Commission would not want to see the Applicant unduly burdened with further delay. (Note: Notwithstanding this recommendation, as Zoning Administer, I find that the Zoning Ordinance does not allow me to issue the permit, until a text amended is accomplished).

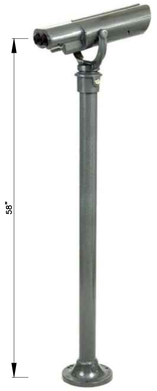
Second, the Commission voted to recommend the text amendment as drafted with the addition that the "condition" in case should be revised so that it reads:

"the use shall be an integral part of an existing and otherwise permitted mixed use commercial and multi-family development that was permitted, platted, and recorded prior to January 20, 2005."

The Commission further wishes to advise the Town Council that its recommendation to allow these four designated commercial type uses in the Horizon's on the Bay mixed use project is not an endorsement of mixed commercial/residential projects generally in the RV-1 district, or multifamily housing developments generally within the RV-1 district. The Commission finds that such uses in the RV-1 are not consistent with the Comprehensive Plan or the intent of the Zoning Ordinance as now adopted. The Commission supports the recommended text amendment only in that it restores the uses that were previously permitted at this particular site, when it was developed in the early 2000's when the property was zoned Commercial High Density Residential. With this observation in mind, the Commission transmits the two above recommendations.

Exhibit A

7429 B STREET

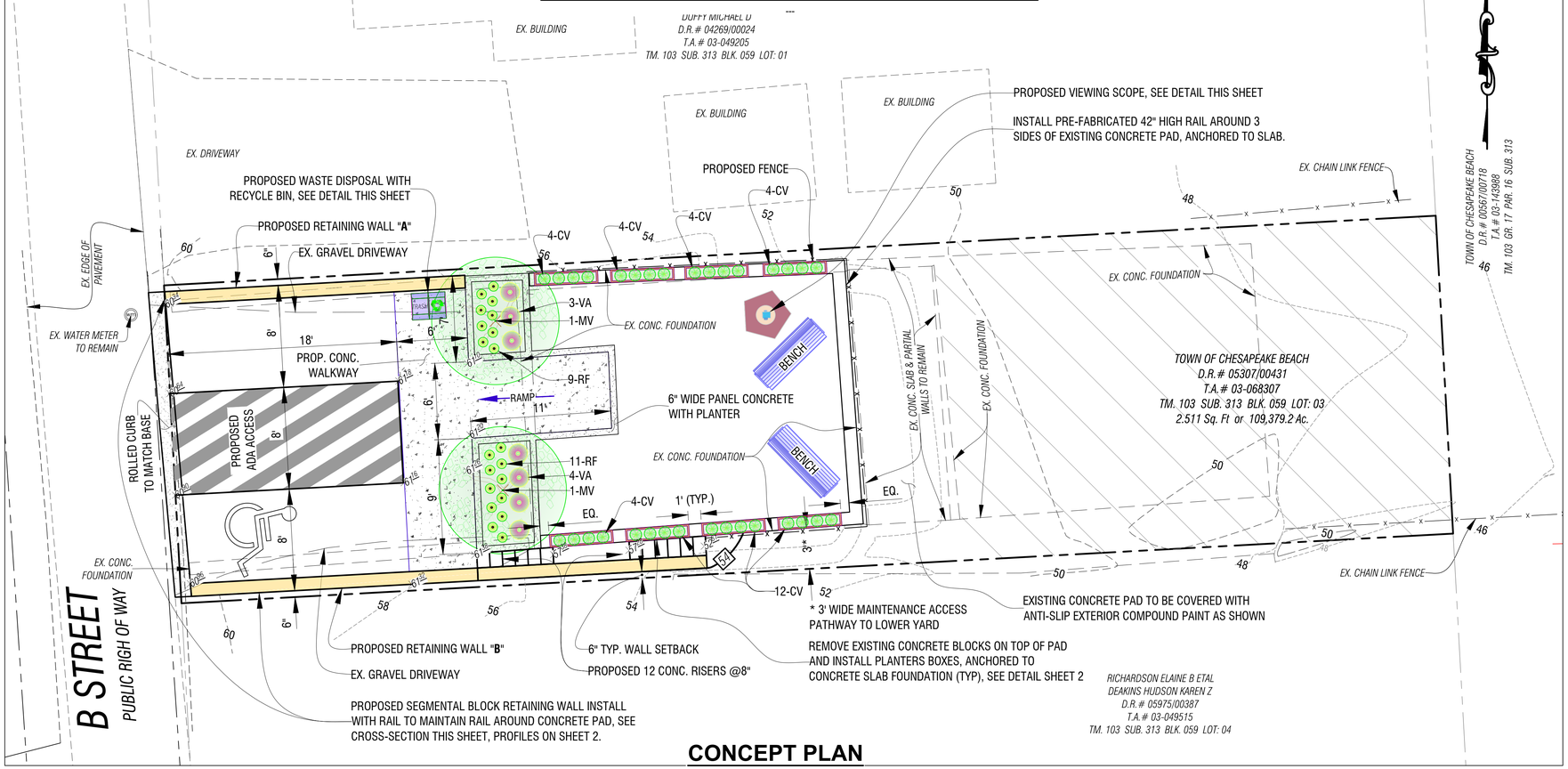


SCOPE DETAIL

NOT TO SCALE

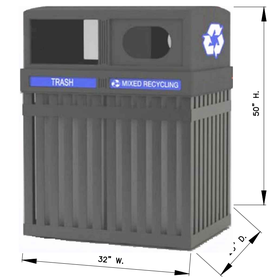
VIEWING SCOPE

MANUFACTURE: ***HDC INTERNATIONAL***
MODEL # ***HDC SC MK2 BINOCULARS*** OR EQUIVALENT
SPECIFICATIONS:
- AUTOMATIC FOCUS: FOCUSES ON OBJECTS 50' TO INFINITY.
- POWER: 10X40. MAGNIFIES BY 10X.
- FIELD OF VIEW: 367' AT 1000 YDS
- EXIT PUPIL: .157"
- RELATIVE BRIGHTNESS: 24
- TWILIGHT FACTOR: 20
- EYE HEIGHT: STANDARD 58"
- ACCESSIBILITY: ADA / DDA COMPLIANT HANDICAP BASE 45"
- WEIGHT: 32LBS
- BINOCULAR WIDTH: 12"
- BINOCULAR LENGTH: 18"
- HOUSING MOVEMENT: 360º ROTATION; ELEVATION: 45º UP/DOWN.
- CONSTRUCTION: CAST 356 ALUMINUM ALLOY, 2½" ALUMINUM PIPE.



CONCEPT PLAN

SCALE: 1" = 5'

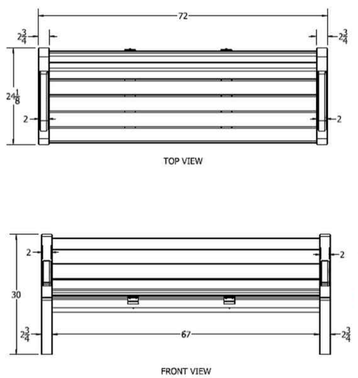


RECYCLE BIN DETAIL

NOT TO SCALE

RECYCLE/TRASH BIN

MANUFACTURE: ***ARCHTEC PARKVIEW***
MODEL# ***108-1209*** OR EQUIVALENT
SPECIFICATIONS:
-SQUARE POWDER COATED STEEL SLAT TRASH RECEPTACLE - DOUBLE
-CONTRACTOR TO INSTALL AND ANCHOR TRASH BIN

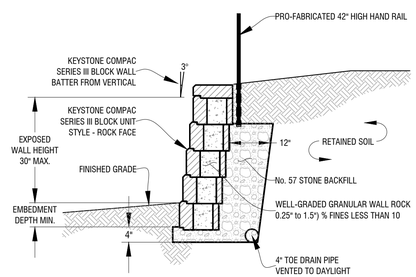


BENCH

MANUFACTURE: ***FROG FURNISHING***
MODEL #*PB 6CEDGFHER*** OR EQUIVALENT
-HERITAGE RECYCLED PLASTIC BENCH WITH BACK (6')
-COLOR: BLACK FRAME / GRAY SLAT
-INCLUDE WEDGE ANCHOR
-CONTRACTOR TO INSTALL CONCRETE MOUNT, INCLUDING BENCH

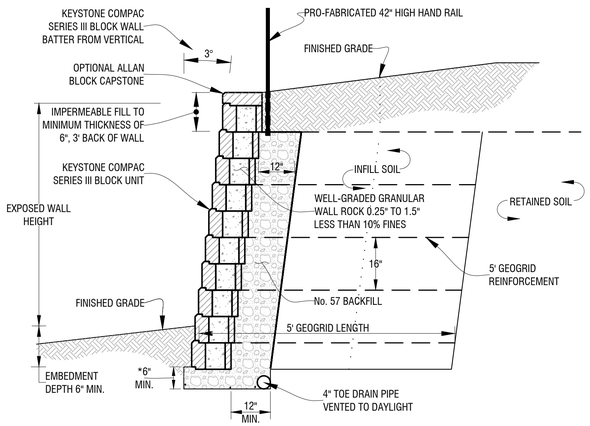
BENCH DETAIL

NOT TO SCALE



GRAVITY WALL TYPICAL

NOT TO SCALE



GEOGRID WALL TYPICAL

NOT TO SCALE

REVISION DESCRIPTION	BY	DATE

MESSICK & ASSOCIATES
CONSULTING ENGINEERS, PLANNERS AND SURVEYORS
7 OLD SOLOMONS ISLAND ROAD, SUITE 202
ANNAPOLIS, MARYLAND 21401
(410) 266-3212 * FAX (410) 266-3502
email: engr@messickandassociates.com
* MESSICK GROUP INC. T/A MESSICK AND ASSOCIATES

STATE OF MARYLAND — WAYNE ALAN MESSICK — No. 21591 — REGISTERED PROFESSIONAL ENGINEER — 4/14/23

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21591, EXPIRATION DATE: MAY 14, 2023.

OWNER/DEVELOPER

TOWN OF CHESAPEAKE BEACH
P.O. BOX 400
CHESAPEAKE BEACH, MD. 20732

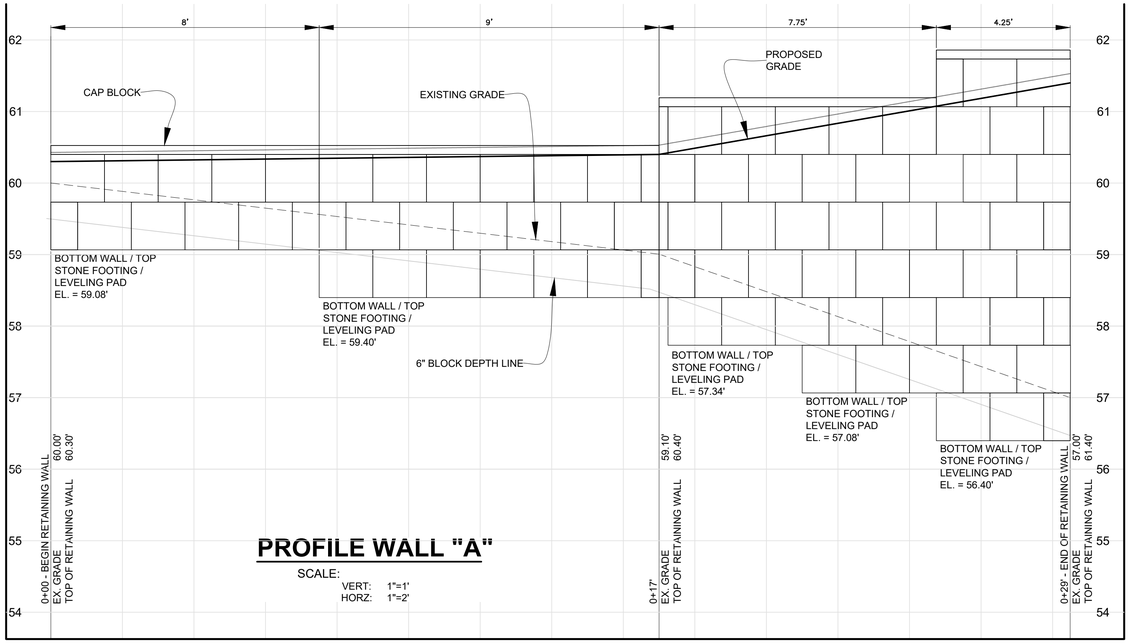
CONCEPT PLAN

B STREET LOT

7429 B STREET
CHESAPEAKE BEACH, MD.

TAX MAP: 0103 GRID: 0000 PARCEL: 0000 LOT:0003
TAX ACCOUNT: 03-068307
THIRD ELECTION DISTRICT CALVERT COUNTY, MARYLAND 20732
SCALE: AS SHOWN DATE: JULY 2022 SHEET 1 OF 2

April 2023 FILE: G:\The Town of Chesapeake Beach\Pocket-Parks\DWGS_A_Bay-Side-Street_Pocket_Parks_Concept_ 11-16-20222.dwg



PROFILE WALL "A"

SCALE:
VERT: 1"=1'
HORZ: 1"=2'

PROPOSED PLANT SCHEDULE

QTY.	ABBREVIATION	SIZE	SCIENTIFIC NAME	COMMON NAME		
32	CV	12" HT.	CHYSOGONUM VIRGIANAUM	GREEN AND GOLD	AS SHOWN	CONT.
2	MV	1.5" CAL.	MAGNOLIA VIRGINIANA	SWEET BAY MAGNOLIA	AS SHOWN	B&B
20	RF	12" HT.	RUDBECKIA FULGIDA	BLACK EYED SUSAN	12" O.C.	CONT.
7	VA	2.5' HT.	VIBURNUM ACERIFOLIUM	MAPLE LEAF VIBURNUM	18" O.C.	CONT.

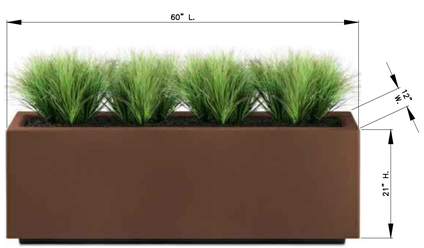
TABLE #4 - MANAGEMENT AND INSPECTION FOR INVASIVES WITHIN SELECTED CLEARING AREAS

RECOMMEND PRACTICES FOR REMOVAL OF INVASIVES

- STEP 1- DURING THE PLANTS DORMANT SEASON AND BEFORE THE GROWING SEASON BEGINS (APPROX. DEC. - FEB.) INDIVIDUAL PLANTS ARE TO BE PULLED/CUT AND REMOVED FROM THE SITE. AN INITIAL TREATMENT OF TRICLOPYR GARLON 4 MIXED AT 2% WITH WATER SHOULD BE SPRAYED DIRECTLY ON THE CUT STUMP IMMEDIATELY AFTER CUTTING TO ENSURE ROOTKILL. A DYE SHOULD BE MIXED IN TO THE HERBICIDE SO AS TO MARK STUMPS HERBICIDE WAS APPLIED.
- STEP 2 - REPEAT STEP 1 IN JILY-AUGUST BEFORE FRUIT MATURE. CAREFULLY REMOVE DEBRIS WITHOUT ENDANGERING NATIVE VEGETATION.
- STEP 3 - IN SEPTEMBER, THIS AREA SHOULD BE MONITORED TO VERIFY THAT MINIMUM DENSITIES ARE BEING MAINTAINED AND THAT SEEDLINGS HAVEN'T BEEN DAMAGED. REMAINING INVASIVE PLANTS THAT HAVEN'T RESPONDED TO THE HERBICIDES SHOULD BE FLAGGED AT THIS TIME.
- STEP 4 - IN MID TO LATE OCTOBER THOSE PLANTS FLAGGED SHOULD BE TREATED WITH TRICLOPYR. THIS WILL HELP TO FURTHER REDUCED THE POPULATION.
- STEP 5 - EVEN WITH THE COMPLETE REMOVAL AND ROOTKILL OF INVASIVES, SUBSTANTIAL SEEDING REGENERATION OCCURS, DUE TO A PERSISTENT SOIL SEED BANK. REINFESTATION IS A CONTINUAL POSSIBILITY TO COMBAT THIS IS NECESSARY TO REPEAT STEP 2-4 FOR A TOTAL OF TWO YEARS.
- STEP 6 - REFOREST CLEARED AREAS WITH SPECIFIED REFORESTATION PLANINGS (REFER TO REFORSTATION SCHEDULES - THIS SHEET)

MDE TOXIC MATERIAL PERMIT NOTE:

THE CONTRACTOR IS RESPONSIBLE FOR ACQUIRING AN MDE TOXIC MATERIAL PERMIT PRIOR TO APPLYING HERBICIDES WITHIN REGULATED WATER RESOURCES. REFER TO ENVIRONMENT ARTICLE, TITLE 9, SUBTITLE 3; COMAR 26.08.03.02

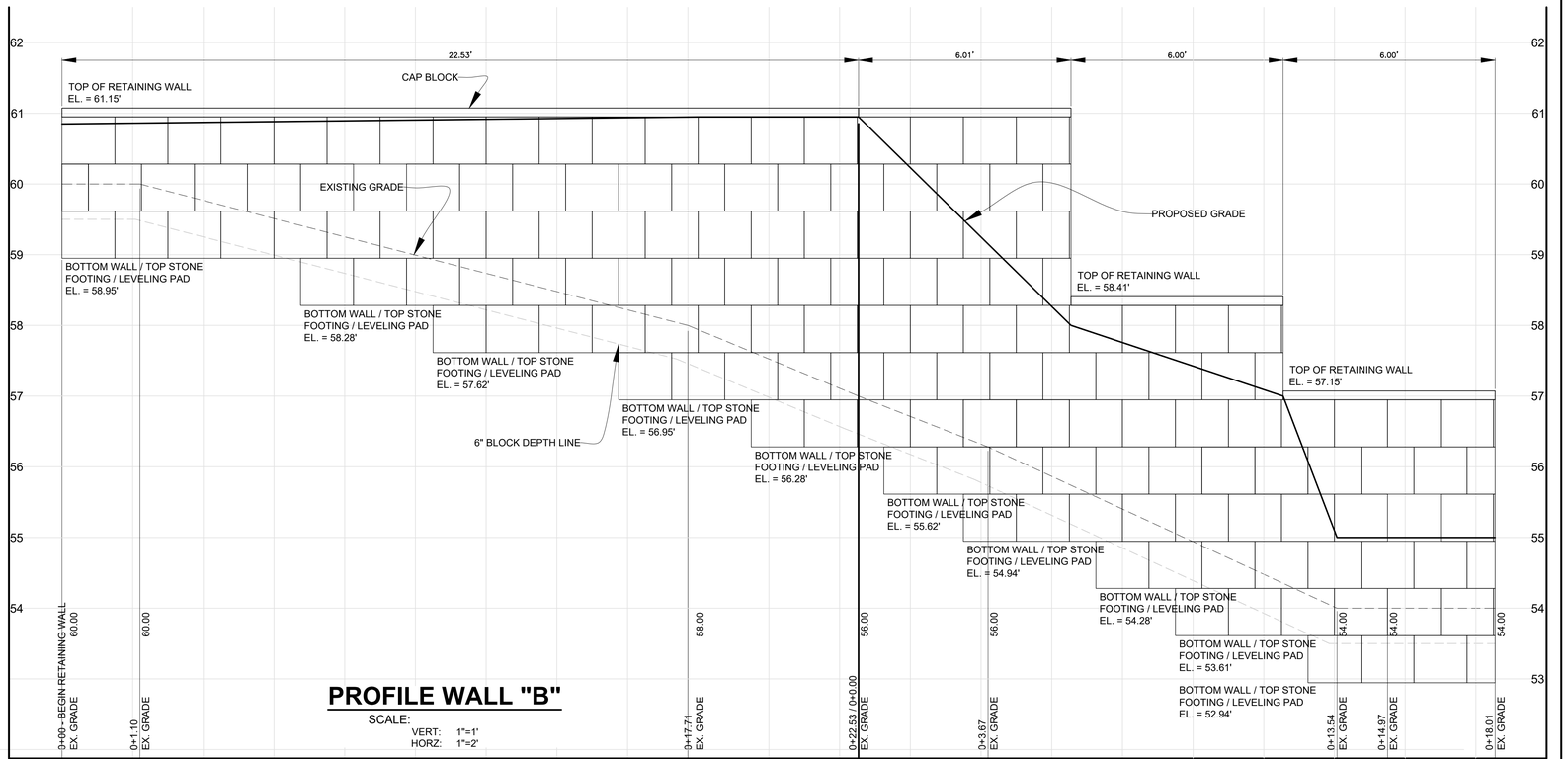


FOR LOCATIONS, SEE SHEET 1

PLANTER DETAIL

NOT TO SCALE

PLANTER
MANUFACTURE: VICTOR STANLEY
MODEL: *URBAN LONG*
DESCRIPTION:
RECTANGULAR FIBERGLASS PLANTERS FEATURE A SIMPLE GEOMETRIC SILHOUETTE AND BLACK RECESSED BASE. DRAIN HOLES.
DIMENSIONS:
-WIDTH: 12"
-LENGTH: 60"
-HEIGHT: 24"



PROFILE WALL "B"

SCALE:
VERT: 1"=1'
HORZ: 1"=2'

REVISION DESCRIPTION	BY	DATE

MESSICK & ASSOCIATES
CONSULTING ENGINEERS,
PLANNERS AND SURVEYORS
7 OLD SOLOMONS ISLAND ROAD, SUITE 202
ANNAPOLIS, MARYLAND 21401
(410) 266-3212 * FAX (410) 266-3502
email: engr@messickandassociates.com
* MESSICK GROUP INC. T/A MESSICK AND ASSOCIATES

STATE OF MARYLAND — WAYNE ALAN WESTON — 21591 — REGISTERED PROFESSIONAL ENGINEER — 4/14/23

"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21591, EXPIRATION DATE: MAY 14, 2023."

OWNER/DEVELOPER

TOWN OF CHESAPEAKE BEACH
P.O. BOX 400
CHESAPEAKE BEACH, MD. 20732

LANDSCAPING / RETAINING WALL PROFILE

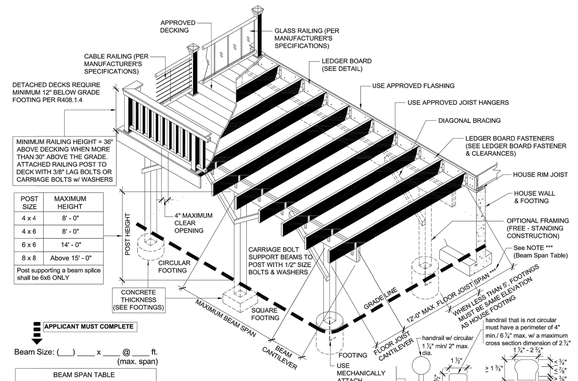
B STREET LOT

7429 B STREET
CHESAPEAKE BEACH, MD.

TAX MAP: 0103 GRID: 0000 PARCEL: 0000 LOT:0003
TAX ACCOUNT: 03-068307
THIRD ELECTION DISTRICT CALVERT COUNTY, MARYLAND 20732
SCALE: AS SHOWN DATE: JULY 2022 SHEET 2 OF 2

April 2023 FILE: G:\The Town of Chesapeake Beach\Pocket-Parks\DWGS_&_Bay-Side-Street_Pocket_Parks_Concept_-_11-16-2022.dwg

DECK CONSTRUCTION DETAIL



POST SIZE	MAXIMUM HEIGHT
4 x 4	8' - 0"
4 x 6	8' - 0"
6 x 6	14' - 0"
8 x 8	Above 15' - 0"

Post supporting a beam splice shall be 6x6 ONLY

APPLICANT MUST COMPLETE

Beam Size: (___) ____ x ____@ ____ ft. (max. span)

BEAM SPAN TABLE	
BEAM SIZE	MAXIMUM BEAM SPAN
2 (2 x 6)	5' - 0"
2 (2 x 8)	6' - 0"
2 (2 x 10)	7' - 6"
2 (2 x 12)	8' - 6"

NOTE ***
Beam floor loads at mid-span in excess of 6'-0" will require beam upgrade or intermediate beams. Provide layout drawings to scale showing footing & beam location. Southern Pine #2 (pressure treated)

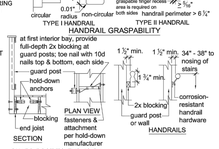
APPLICANT MUST COMPLETE

Floor Joist: ____x_____@ _____" o.c.
Floor Joist Cantilever: _____feet

FLOOR JOIST SPAN TABLE				
Floor Joist Size	FLOOR JOIST SPACING			Maximum Cantilever
	12"	16"	24"	
(2 x 6)	9' - 11"	9' - 0"	7' - 7"	NOT ALLOWED
(2 x 8)	13' - 1"	11' - 10"	9' - 8"	2 feet
(2 x 10)	16' - 2"	14' - 0"	11' - 5"	3 feet
(2 x 12)	19' - 1"	16' - 6"	13' - 6"	4 feet

NOTE:
Lumber species & grade = Southern Pine #2 (pressure treated)

STAIRWAY DETAIL



GUARD POST-TO-END JOIST

NOTCHED POST

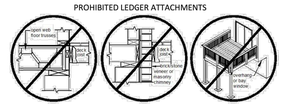
POST-TO-BEAM CONNECTION

HANDRAIL GRASPABILITY

HANDRAILS

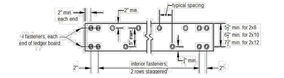
NOTES:
1. All footings must rest on undisturbed soil.
2. Minimum footing size: 16" square or 18" Sonotube (See Table 4).
3. DO NOT attach deck ledger to overhanging bay system or a 2nd beam is required.
4. Corrosion resistant fasteners required for all connections.
5. Decks are NOT APPROVED for future hot tubs.
6. Maintain min. 30 feet separation from well.
7. DO NOT support framing loads on existing chimney.
8. Guardrails shall be designed for lateral load of 200 lbs. applied at any point along top rail.
9. Basement door headroom clearance = 6'-8" min.
10. Basement egress window path = 36" min.

PROHIBITED LEDGER ATTACHMENTS



LEDGER BOARD FASTENER SPACING & CLEARANCES

1 Additional interior fasteners are required at chimney or bay window



LEDGER BOARD FASTENER SPACING, ON CENTER

Fastener	Band Board	Joist Span less than or equal to: 6'	8'	10'	12'	14'	16'	18'
Lag Screws	EWP[1]	24"	18"	14"	12"	10"	9"	8"
	2x lumber	30"	23"	18"	15"	13"	11"	10"
Through Bolts	EWP[1]	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	26"	34"	29"	24"	21"	19"
Wood Screws[2]	1" EWP[1]	18"	13"	11"	9"	8"	7"	6"
	2x lumber	19"	14"	11"	9"	8"	7"	6"
Expansion Anchors	—	36"	26"	34"	29"	24"	21"	19"
Adhesive Anchors	—	32"	32"	32"	24"	24"	16"	16"

1 EWP = 1 inch minimum manufactured engineered wood product.
2 Wood screws shall be permitted to be spaced in accordance with its corresponding evaluation report if less than the values in TABLE above

Through-bolts. Through-bolts shall have a minimum ½-inch diameter. Pilot holes for through-bolts shall be $^{17}/_{32}$ to $^{9}/_{16}$ inches in diameter. Through-bolts must be equipped with washers at the bolt-head and nut. Bolts should be tightened six to 12 months after construction due to drying and wood shrinkage.

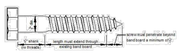
Expansion anchors. Expansion anchors shall be used only when attaching a ledger board to a concrete or solid masonry wall. The bolt or threaded rod of expansion anchors shall have a ½-inch diameter minimum; in some cases, this may require a $^{5}/_{8}$-inch anchor size. Expansion anchors must be installed per manufacturer's instructions and shall be equipped with washers.

Adhesive anchors. The adhesive anchors with a minimum ½-inch diameter threaded rod shall be used when attaching to hollow masonry. Adhesive anchors are also permitted with concrete or solid masonry installations. Anchors shall be installed per manufacturer's instructions and shall be equipped with washers. Adhesive cartridges must remain on the jobsite for inspector verification.

APPROVED ADHESIVE ANCHORS

Manufacturer	Product
ITW Ramset/Red Head	Epcon Acrylic T-HY-20
Hilti	HIT-20

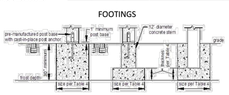
APPROVED WOOD SCREWS



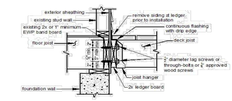
Wood Screws. Approved wood screws listed above with a ¼-inch diameter may be used to attach to wood-framed construction. Wood screws shall have a sufficient length to fully penetrate the existing house band board. Installation shall be in conformance with the manufacturer's instructions.

Manufacturer	Product
FastenMaster	LedgerLok
Simpson Strong-Tie	Strong-Drive Screws (SDS, SDW)

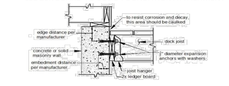
FOOTINGS



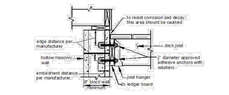
LEDGER BOARD-TO-BAND BOARD ATTACHMENT



LEDGER BOARD-TO-SOLID FOUNDATION ATTACHMENT



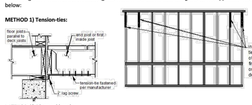
LEDGER BOARD-TO-HOLLOW FOUNDATION ATTACHMENT



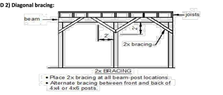
LATERAL SUPPORT

All decks greater than 30 inches above grade must resist lateral load using one of the applicable methods noted below:

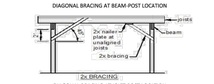
METHOD 1) Tension-ties:



METHOD 2) Diagonal bracing:



DIAGONAL BRACING AT BEAM-POST LOCATION



DIAGONAL BRACING AT JOIST-POST LOCATION

TABLE 4: FOOTING SIZE

Beam Span less than or equal to:	Joist Span less than or equal to:	Size of Square	Size of Round	Minimum Thickness
8'	10'	16"	18"	8"
	14'	20"	22"	8"
	18'	22"	24"	8"
12'	10'	16"	18"	8"
	14'	20"	22"	8"
	18'	22"	24"	10"
17'	10'	22"	24"	10"
	14'	22"	24"	10"

REVISION DESCRIPTION	BY	DATE

MESSICK & ASSOCIATES
CONSULTING ENGINEERS, PLANNERS AND SURVEYORS
7 OLD SOLOMONS ISLAND ROAD, SUITE 202
ANNAPOLIS, MARYLAND 21401
(410) 266-3212 * FAX (410) 266-3502
email: engr@messickandassociates.com
* MESSICK GROUP INC. T/A MESSICK AND ASSOCIATES

STATE OF MARYLAND — WAYNE ALAN HANSON — 21591 — REGISTERED PROFESSIONAL ENGINEER — 4/14/23

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21591, EXPIRATION DATE: MAY 14, 2023.

OWNER/DEVELOPER

TOWN OF CHESAPEAKE BEACH
P.O. BOX 400
CHESAPEAKE BEACH, MD 20732

CONCEPT PLAN

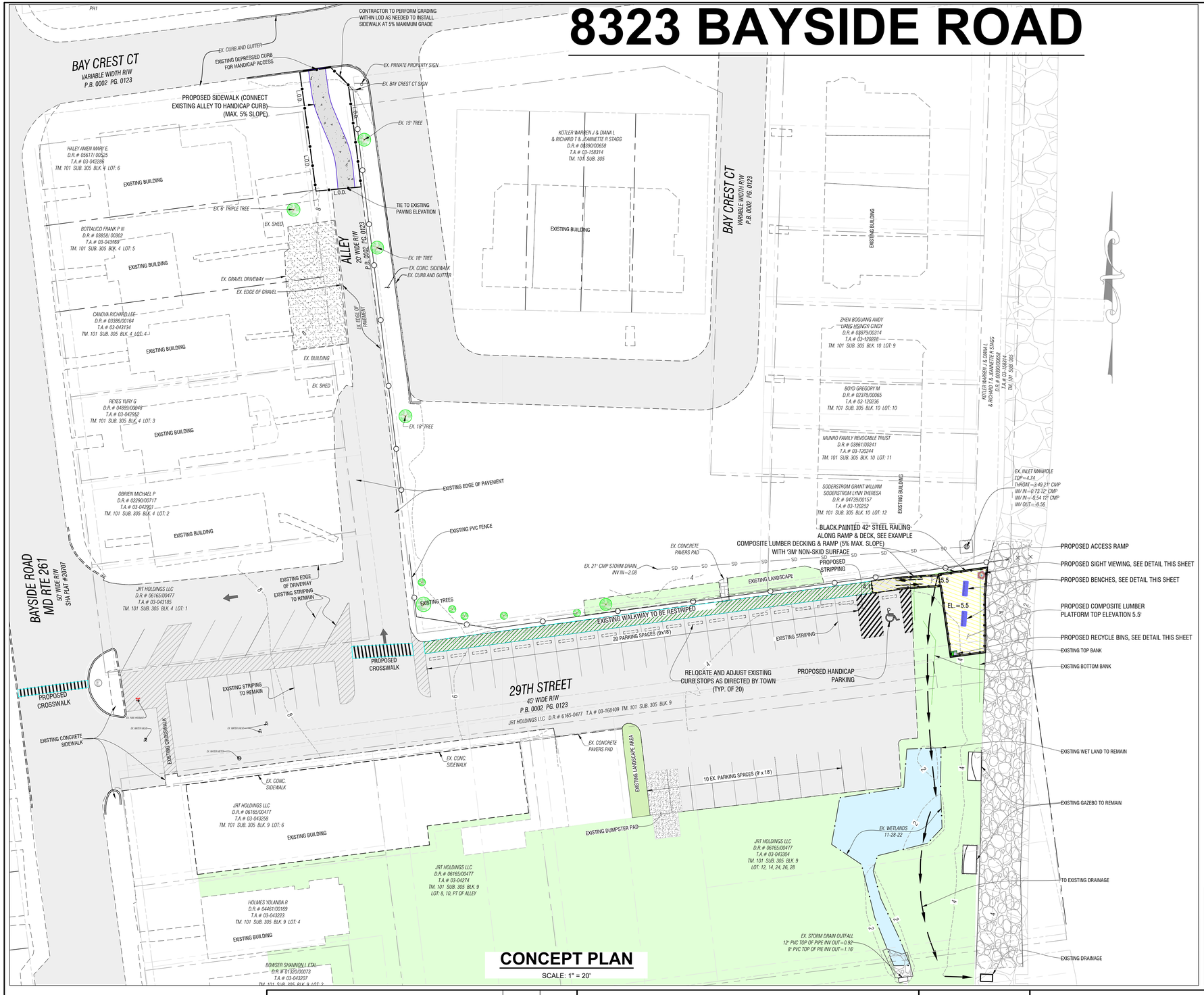
29TH STREET BAYFRONT PARK

8323 BAYSIDE ROAD

TAX MAP: 0101 GRID: 0000 PARCEL: 0000 LOT: 0006
TAX ACCOUNT: 03-043258
THIRD ELECTION DISTRICT CALVERT COUNTY, MARYLAND 20732-0000
SCALE: AS SHOWN DATE: JULY 2022 SHEET 2 OF 2

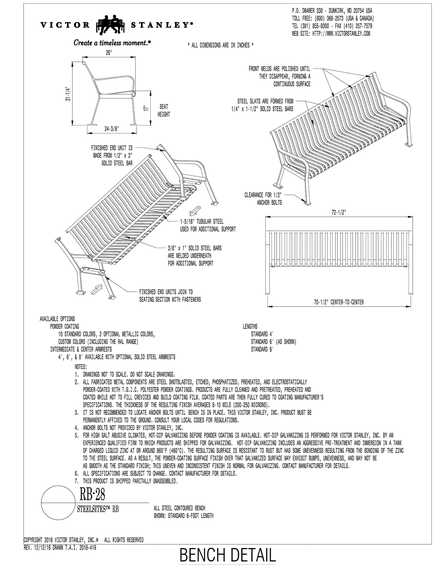
April 2023 FILE: G:\The Town of Chesapeake Beach\Pocket-Parks\DWGS_&_Bay-Side-Street_Pocket_Parks_Concept__11-16-2022.dwg

8323 BAYSIDE ROAD

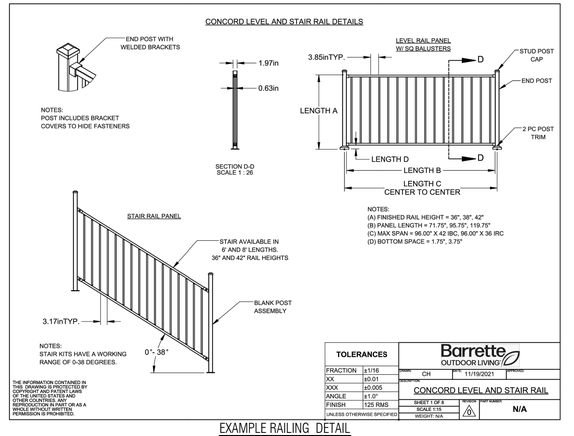


CONCEPT PLAN

SCALE: 1" = 20'



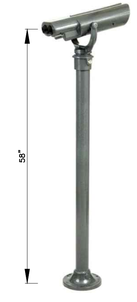
BENCH DETAIL



EXAMPLE RAILING DETAIL

VIEWING SCOPE

MANUFACTURE: ***HDC INTERNATIONAL***
MODEL # ***HDC SC MK2 BINOCULARS*** OR EQUIVALENT
SPECIFICATIONS:
- AUTOMATIC FOCUS: FOCUSES ON OBJECTS 50' TO INFINITY.
- POWER: 10X40, MAGNIFIES BY 10X
- FIELD OF VIEW: 367' AT 1000 YDS
- EXIT PUPIL: .153"
- RELATIVE BRIGHTNESS: 24
- TWILIGHT FACTOR: 20
- EYE HEIGHT: STANDARD 58"
- ACCESSIBILITY: ADA / DDA COMPLIANT HANDICAP BASE 45"
- WEIGHT: 32LBS
- BINOCULAR WIDTH: 12"
- BINOCULAR LENGTH: 16"
- HOUSING MOVEMENT: 360° ROTATION; ELEVATION: 45° UP/DOWN.
- CONSTRUCTION: CAST 356 ALUMINUM ALLOY, 2½" ALUMINUM PIPE.



SCOPE DETAIL

NOT TO SCALE

RECYCLE BIN DETAIL

NOT TO SCALE

RECYCLE/TRASH BIN
MANUFACTURE: ***ARCHITEC PARKVIEW***
MODEL# ***108-1209*** OR EQUIVALENT
SPECIFICATIONS:
-SQUARE POWDER COATED STEEL SLAT TRASH RECEPTACLE - DOUBLE
-CONTRACTOR TO INSTALL AND ANCHOR TRASH BIN

REVISION DESCRIPTION	BY	DATE

MESSICK & ASSOCIATES
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STATE OF MARYLAND · WAYNE ALAN MORRISON · 21591 · REGISTERED PROFESSIONAL ENGINEER
4/14/23

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OWNER/DEVELOPER

TOWN OF CHESAPEAKE BEACH
P.O. BOX 400
CHESAPEAKE BEACH, MD 20732

CONCEPT PLAN

29TH STREET BAYFRONT PARK

8323 BAYSIDE ROAD

TAX MAP: 0101 GRID: 0000 PARCEL: 0000 LOT: 0006
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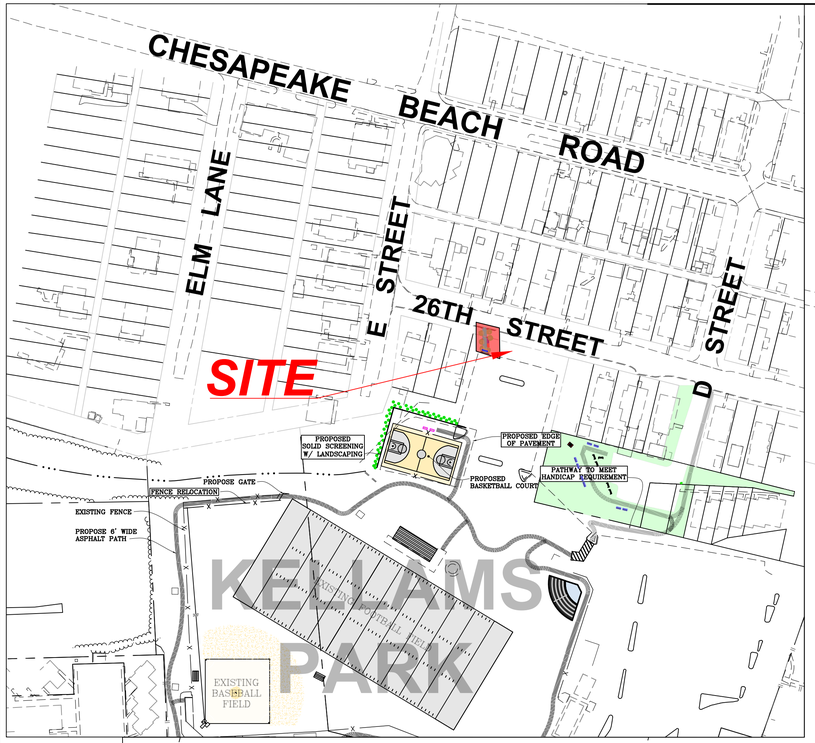
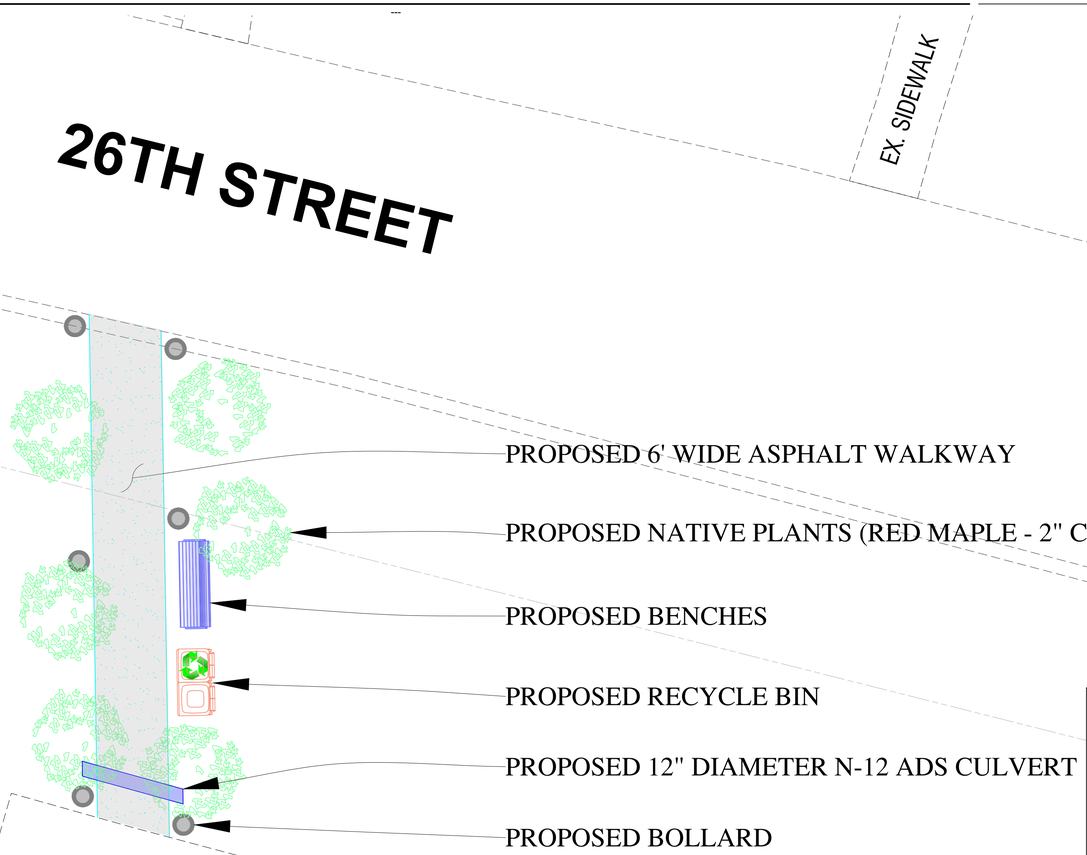
April 2023 FILE: G:\The Town of Chesapeake Beach\Pocket-Parks\DWG\8_s_Bay-Side-Street_Pocket_Parks_Concept_11-16-2022.dwg

KELLAM'S TRAIL CONNECTION



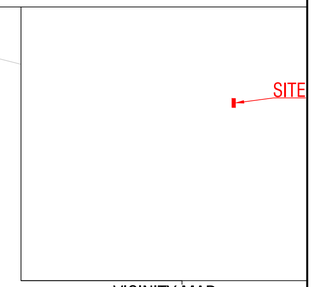
LOCATION MAP

SCALE: 1" = 100'



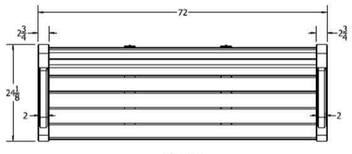
CONCEPT PLAN

SCALE: 1" = 5'

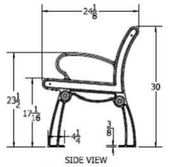


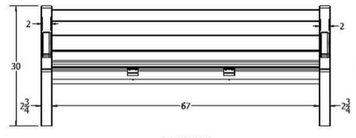
VICINITY MAP

NOT TO SCALE



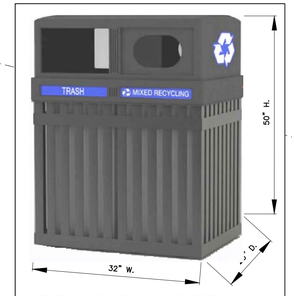
BENCH
MANUFACTURE: ***FROG FURNISHING***
MODEL #*PB 6CEDGFHER* OR EQUIVALENT
-HERITAGE RECYCLED PLASTIC BENCH WITH BACK (6')
-COLOR: BLACK FRAME / GRAY SLAT
-INCLUDE WEDGE ANCHOR
-CONTRACTOR TO INSTALL CONCRETE MOUNT, INCLUDING BENCH





BENCH DETAIL

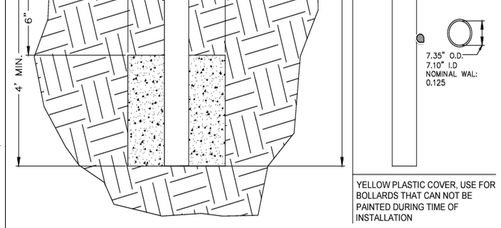
NOT TO SCALE



RECYCLE BIN DETAIL

NOT TO SCALE

RECYCLE/TRASH BIN
MANUFACTURE: ***ARCHTEC PARKVIEW***
MODEL# *108-1209* OR EQUIVALENT
SPECIFICATIONS:
-SQUARE POWDER COATED STEEL SLAT TRASH RECEPTACLE - DOUBLE
-CONTRACTOR TO INSTALL AND ANCHOR TRASH BIN



YELLOW PLASTIC COVER, USE FOR BOLLARDS THAT CAN NOT BE PAINTED DURING TIME OF INSTALLATION

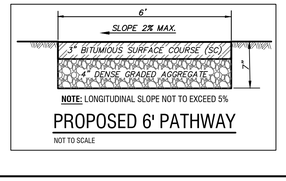
NOTES:

BOLLARDS SHALL CONSIST OF 6" MINIMUM DIAMETER HOT DIP GALVANIZED OR PAINTED STEEL PIPES FILLED WITH CONCRETE. USE PLASTIC BOLLARD COVERS IF BOLLARD CAN NOT BE PAINTED AT THE TIME OF INSTALLATION. BOLLARDS ARE TO BE 5 FEET ABOVE THE GROUND AND A MINIMUM OF 4 FEET BELOW THE GROUND. CONCRETE IS TO BE CROWNED ON TOP OF ALL BOLLARDS. BOLLARDS ARE TO BE SET IN A 12" MINIMUM CONCRETE FOOTING FROM THE BASE WITHIN 6" FROM FINISHED GRADE. SEE DRAWING DETAILS ABOVE.

TAKE INTO ACCOUNT THE PROXIMITY TO TRAFFIC AND TO BUILDINGS AS WELL AS OTHER BARRIERS TO TRAFFIC. S . DELIVERY OF EQUIPMENT SHALL NOT TAKE PLACE UNTIL REQUIRED BOLLARDS HAVE BEEN INSTALLED. THE LOCATION OF BOLLARDS SHALL NOT IMPEDE A DOOR OPENING OF 100°. BOLLARDS SHALL BE INSTALLED WITH DUE CARE TO AVOID INTERFERING WITH GROUND GRID AND CONDUITS.

BOLLARD DETAIL

NOT TO SCALE



NOTE: LONGITUDINAL SLOPE NOT TO EXCEED 5%

PROPOSED 6' PATHWAY

NOT TO SCALE

REVISION DESCRIPTION	BY	DATE

MESSICK & ASSOCIATES
CONSULTING ENGINEERS,
PLANNERS AND SURVEYORS
7 OLD SOLOMONS ISLAND ROAD, SUITE 202
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OWNER/DEVELOPER

TOWN OF CHESAPEAKE BEACH
P.O. BOX 400
CHESAPEAKE BEACH, MD 20732

CONCEPT PLAN

KELLAMS TRAIL CONNECTION

26TH STREET CROSSWALK

3915 GORDON STINNETT AVENUE

TAX MAP: 0101 GRID: 0019 PARCEL: 0058 LOT: F SUB: 0313
TAX ACCOUNT: 03-153576
THIRD ELECTION DISTRICT CALVERT COUNTY, MARYLAND 20732-0000
SCALE: AS SHOWN DATE: JUNE 19, 2023 SHEET 1 OF 1

June 2023 FILE: G:\The Town of Chesapeake Beach\Pocket-Parks\DWG\B_&_Bay-Side-Street_Pocket_Parks_Concept__11-16-2022.dwg

To: The Honorable Mayor and Town Council From Holly Wahl, Town Administrator
Subject: Chesapeake Beach Water Park
Date: June 10, 2023

I. BACKGROUND:

The Chesapeake Beach Water Park ("Water Park") is owned and operated by the Town of Chesapeake Beach ("Town"). The Park is the only municipally owned Water Park in the State of Maryland.

The Town entered into a development agreement ("agreement") with the Board of Calvert County Commissioners ("County) in August of 1993 to develop the land where the Water Park resides today. The agreement refers to the Water Park as a "pool". In the August 1993 Town Meeting Minutes Mayor Donovan described the Water Park as a family-oriented "community pool" of approximately 5,000 square feet.

The Water Park opened in 1995 with approximately 32,000 square feet of pool area, water slides, fountains, waterfalls, a lagoon, and a kid's activity pool. To develop the land, the agreement provided that the Town contribute $500,000 to the development of the Northeast Community Center (NECC) and in addition that the Town cover 100% of the costs to construct and maintain the "pool". The agreement states that the County reserves the right to operate the "pool" if for any reason the Town fails to assign its operation to a third party or if the Town fails to operate the "pool".

GUIDANCE PROVIDED TO THE TOWN:

In September of 2012 Splashtacular ("consultant") provided guidance to the Town related to the significant improvements needed at the Water Park as contracted by Mayor Wahl. To recover the costs of improvements that totaled $6,000,000 (in 2012 dollars) the consultant made several recommendations to recover the costs over a period of approximately 18 years. However, the recommendations do not consider the costs of operating the park in any of the projections. Further, the recommendations did not account for current or future Water Park reserve funding or the potential need for General taxpayer funds to offset expenses.

Without factoring in wages, safety protocols and the expenses necessary to operate the park, the consultant made the following recommendations:

- Increase the cost to enter the park for all categories (Town, County, General Admission) by approximately 50%.
- Increase the capacity to 1,400 in the park at one time to recover the revenue necessary to make improvements.
- Add program space for extended seasons that included a game room and party rooms that operate 365/days a year. Ongoing maintenance considerations for these additions are not included.
- Add new capital improvements to the park to support increased attendance. Ongoing maintenance considerations for these additions are not included.

II. GOALS:

- To determine short- and long-range plans for the Chesapeake Beach Water Park.
- To determine if the Chesapeake Beach Water Park will be positioned to be supported by the general taxpayers for Economic Development purposes or if the Chesapeake Beach Water Park will be positioned to be supported by the general taxpayers as a community amenity.
- To determine a course of short- and long-range plans for improvements.
- To convey the funding necessary for the improvements.
- To convey the funding necessary to support the Chesapeake Beach Water Park's operating costs based on this direction.
- To move forward with planning infrastructure repairs and budgeted operating costs based on this information.

III. FISCAL IMPACT:

There are several factors that affect the revenue streams at the Chesapeake Beach Water Park. These factors are i) capacity, ii) operating costs, and iii) costs not currently accounted for in the Chesapeake Beach Water Park fund.

CAPACITY:

Aiming for large attendance numbers for revenue purposes creates a false sense of profitability and risks safety. The Chesapeake Beach Water Park historically admitted 1000+ guests at a time within a space the size of approximately 32,000 square feet or 0.75 acres. This attendance level has presented significant safety concerns resulting in increased safety incidents to include near drownings due to the inability to see all surface areas of the water.

Aquatics management has noted that when attendance reaches 600 guests - the Park changes significantly from a safety perspective. The park also changes from a guest enjoyment perspective due to overcrowding. At a 600-guest level, guests no longer have access to chairs in the park nor do they have access to tubes. During these periods of an overcrowded park - Town and County residents were the minority in attendance and not the majority.

500-guest capacity limit: The Park has located a threshold of capacity that allows for the safety of guests and staff and reduces the need to move to alternate shifts that increase operating costs. The FY24 Town Council approved budget includes staff hours at a 500-guest capacity limit; therefore, employment decisions are also based on this limit.

Per COMAR, one individual is allowed for every 12 square feet of water surface in shallow areas. The Chesapeake Beach Water Park's pools are all considered to be shallow areas, under 5 ft deep. The pools are at an average of 3-foot-deep with depths ranging from 1.5 to 4 feet.

At the 500 current capacity level: Guests are provided approximately 2 ft between them another guest.

Please see Exhibit A for a breakdown of an approximate view of what it feels like to be a guest at a capacity level of 250, 500, 750, 1000, 1,250. These projections account for a standing room and do not account for tubes, chairs, cabanas in use etc.

OPERATING COSTS:

For the 2023 season, there are unavoidable and substantial price increases due to our current economic environment. Costs include maintaining the aging infrastructure of the park, increased utility costs, increased chemical costs and competitive wages. Town staff presented a FY24 budget to the Town Council with a rate schedule reflecting the costs and capacity at the park. Within the FY24 budget there are additional costs that are not accounted for, these costs include:

1) **General Fund staff time**: the total cost of Town staff time to administer the operations of the park – these total direct costs amount to $100,000 annually in General Fund costs not allocated to the Chesapeake Beach Water Park. There are also indirect costs or the opportunity costs of staff time that could be utilized in other areas in support of General Fund activities.
2) **Utility Fund capital connection fees**: The Town has no record of the Water Park paying the capital connection fees necessary to operate the Park. The connection fees for the infrastructure necessary to support the Water Park in today's dollars amount to $1,860,000. These costs are directly charged to the Town through the operation and maintenance of the Chesapeake Beach Water Reclamation Treatment Plant and the Water services necessary to support the park.

ONGOING INFRASTRUCTURE MAINTENANCE / IMPROVEMENTS:

Maintaining a Water Park inherently is costly; however, the Chesapeake Beach Water Park has some unique constraints that should be considered as look ahead for planning purposes:

Proportion of pool area vs. area to support mechanical operations: Due to the pool encompassing such a large proportion of the parcel of land where the Water Park resides (estimated at approximately 80% of the space), there is not the proper area to house the required plumbing and mechanical equipment. Due to this lack of space, the plumbing is required to be routed within the pool footprint penetrating the pool deck.

Sinking and settling: While the pool, pump room and Park buildings are on pilings, everything else is not. This condition has created an environment where all areas outside of the pool are sinking 1 inch a year. Staff notes settling of features, storm drains and plumbing. Settling has created areas of cracked piping as seen in Figure 1.

Exposed to conditions: A 28-year-old park uncovered, exposed to the elements 24/7, 365 days a year. These conditions include harsh winters & coastal conditions.

See Exhibit B for a site plan showing where pilings are located within the Water Park.

Figure 1: Cracked plumbing pipes due to settling.

Figure 2: Image of the area that is not on pilings housing the mechanical support of pool operations.

Figure 3: Demonstration of sinking at the Water Park on the areas not supported by pilings.

IV. THE 2023 SEASON:

The Water Park is in full operation for the 2023 season offering day passes, season passes, birthday parties, swim lessons, rentals, and a new family pass option. The daily admission rates and season passes for out of the Town of Chesapeake Beach are significantly higher than prior seasons. This cost is reflective of the $60 per person cost to the Town to enter the Park.

During the FY24 budgeting process, staff analyzed multiple scenarios to operate the Water Park under growing constraints related to the aging park structures and inflated operating costs, these constraints were unavoidable. During the planning process Town staff accounted for a decreased attendance at the Water Park due to the increased rates.

Local Employment: The Town is proud to say that we employ 170 of the best of the best. The Water Park has served as a foundation for many local youth who return year after year, receiving promotions, being a part of a team and learning valued skills. We have ensured our staff receive competitive wages to increase retention, attract top talent, and increase overall employee and customer satisfaction.

V. FINANCIALS:

ADMISSION REVENUES BROKEN DOWN BY DAY:

DATE	ADMISSION REVENUE	
5/27/2023	18,643.25	
5/28/2023	4,328.25	
5/29/2023	1,902.50	
6/3/2023	17,785.75	
6/4/2023	10,524.25	
6/10/2023	11,649.50	
6/11/2023	21,119.25	
6/14/2023	4,121.25	
6/15/2023	9,029.50	
6/16/2023	3,813.50	
6/17/2023	12,536.75	
6/18/2023	16,912.25	
6/20/2023	6,550.75	
6/24/2023	4,872.00	
6/25/2023	10,823.25	
6/27/2023	8,067.50	
6/28/2023	4,062.00	
6/30/2023	8,388.75	
	175,130.25	*Admission Revenue*

	SEASON 2018	SEASON 2019	SEASON 2021	SEASON 2022	SEASON 2023
ADMISSION REVENUE	145,617.00	252,459.87	353,201.00	369,535.44	175,130.25
RETAIL STORE SALES - GRILL & STORE	49,723.00	84,040.00	80,205.00	77,786.01	27,712.85
TOTAL	195,340.00	336,499.87	433,406.00	447,321.45	202,843.10
DAILY AVERAGE	13,952.86	14,630.43	21,670.30	26,313.03	11,269.06
SEASON PASSES SOLD	726	968	1,665	2,233	1,126
TOTAL ADMISSIONS	5,678	10,037	9,130	8,473	3,006
AVERAGE ADMISSIONS	406	436	457	498	167

OTHER REVENUES:

	CONV. SEASONAL	
Birthday Parties	8,472.00	*With OA Rep.
BES - DBS	1,055.75	
Prime Time	1,088.50	
Cups	805.00	
Cabanas	3,710.00	
Lockers	247.50	
Pavilions	-	
Swim Lessons	9,240.00	
Fourth of July - FY24	650.00	
Unused DA	6,720.00	
Unused SP	29,128.00	
	61,116.75	***Seasonal Revenue***
	236,247.00	*Total Revenue*
	(5,937.24)	Less: Refunds
	230,309.76	**Net Revenue**

GUEST ATTENDANCE:

Town residents currently make up the largest proportion of patrons at the park -with a current average amount of 57% - this change is a direct result of lower capacity limits and is a significant difference to 2017 and prior.

DATE	TOTAL ADM.	SP	GA	T. TUES	% TOWN	% GEN/CT	% OTHER	
5/27/2023	*270*	*112*	*158*	-	42%	21%	37%	
5/28/2023	*86*	*30*	*56*	-	24%	29%	47%	
5/29/2023	*42*	*20*	*22*	-	50%	21%	29%	
6/3/2023	*209*	*145*	*64*	-	66%	29%	6%	
6/4/2023	*127*	*88*	*39*	-	60%	39%	2%	
6/10/2023	*209*	*121*	*88*	-	53%	34%	13%	
6/11/2023	*273*	*195*	*78*	-	64%	33%	3%	
6/14/2023	*71*	*54*	*17*	-	75%	25%	0%	
6/15/2023	*164*	*118*	*46*	-	65%	27%	7%	
6/16/2023	*50*	*33*	*17*	-	68%	32%	0%	
6/17/2023	*181*	*91*	*90*	-	61%	38%	1%	
6/18/2023	*230*	*118*	*112*	-	58%	41%	1%	
6/20/2023	*116*	*68*	*48*	-	39%	60%	1%	
6/24/2023	*107*	*68*	*39*	-	61%	39%	0%	
6/25/2023	*279*	*173*	*106*	-	66%	32%	2%	
6/27/2023	*323*	*128*	*66*	*129*	36%	15%	50%	
6/28/2023	*116*	*82*	*34*	-	63%	34%	3%	
6/30/2023	*153*	*100*	*53*	-	73%	27%	0%	
	3,006	**1,744**	**1,133**	**129**				*Admission Totals*
	167	*97*	*63*		*57%*	*32%*	*11%*	*Admission Averages*

SEASON PASSES:

66% of the season passes are issued to Town residents: 55% were purchased at the pre-season discounted rate, approximately 45% were purchased at the current rate.

33% of the season passes are issued to County residents: 94% were purchased at the pre-season discounted rate, approximately 6% were purchased at the current rate.

VI. LOOKING FORWARD:

1) High-capacity numbers (500+) do not provide an environment where guests and staff can operate safely.

2) High-capacity numbers (500+) increase costs and risks significantly, these costs were not accounted for in the 2012 consultant study, nor are they accounted for in the currently approved FY24 Chesapeake Beach Water Park budget.

3) High-capacity numbers (500+) decrease attendance by Town and County residents.

4) Direct and Indirect General fund expenses remain unaccounted for in the Chesapeake Beach Water Park budget – these expenses are required to operate the park. A plan to cover these costs should be determined.

5) Direct utility fund expenses are not accounted for in the Chesapeake Beach Water Park budget – these expenses are required to operate the park. A plan to cover these costs should be determined.

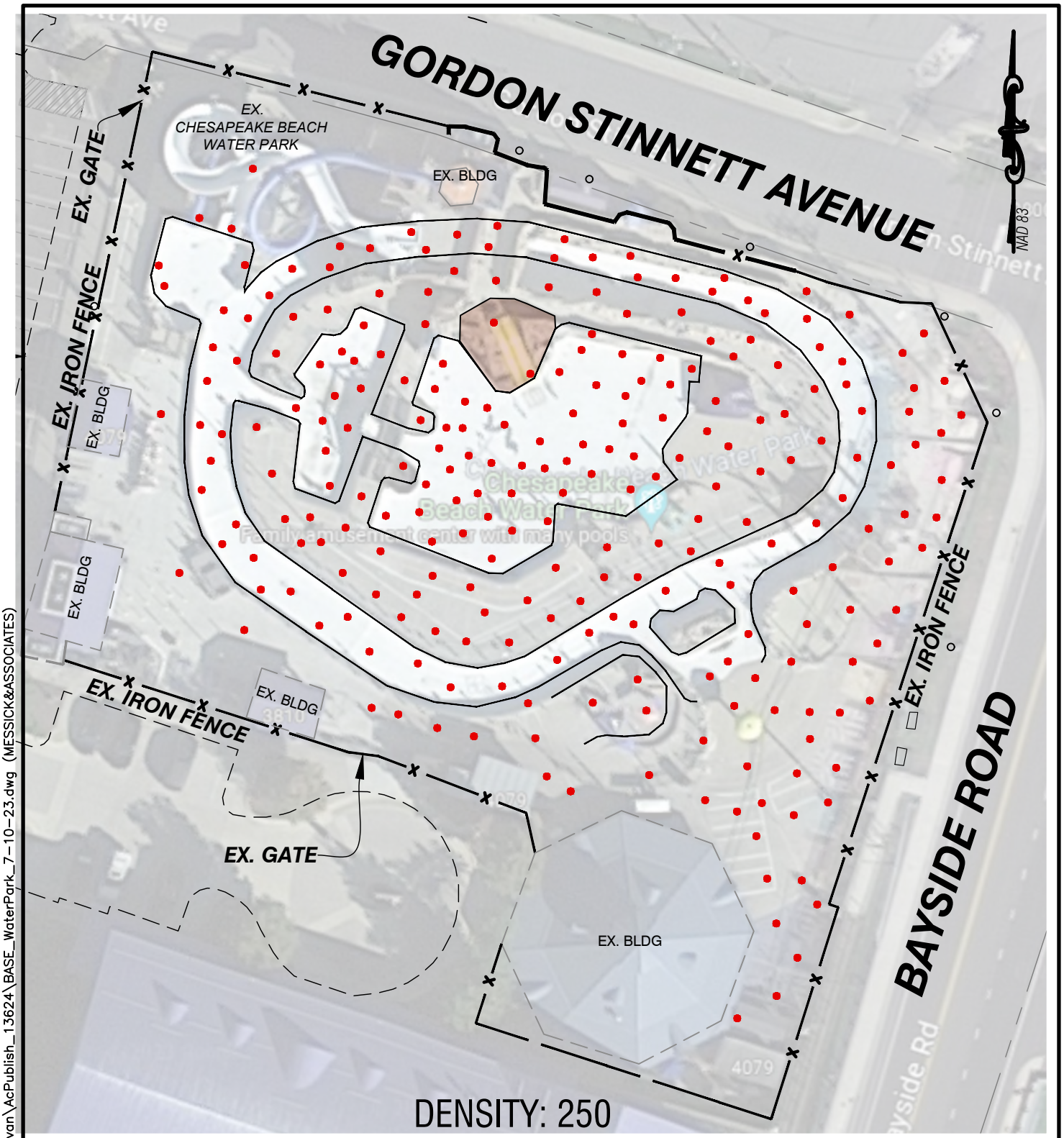
6) There are significant infrastructure improvements needed to operate the park. Short- and long- range plans are needed based on the Town Council's decisions per Town taxpayers' desires to determine the direction of the park moving forward.

Exhibit A

Exhibit A provides Density modeling of the Water Park at several different capacity levels in a standing room view. A standing room view means that the scenario shows the space at multiple different capacity levels as if a person is simply standing.

Activities are not accounted for that take up significant space. These activities include the use of tubes, chairs, rented cabanas areas that are not accessible, life guard chairs and the clearance necessary for lifeguard stations, etc. There are also areas of the Park that are not accessible in this image that are not accounted for; however, it gives an idea of what the space looks like per capacity level. In addition, these images do not account for the 75+ staff at the Park on any given time.

Exhibit A



SCALE: 1" = 40'

EXHIBIT "B"

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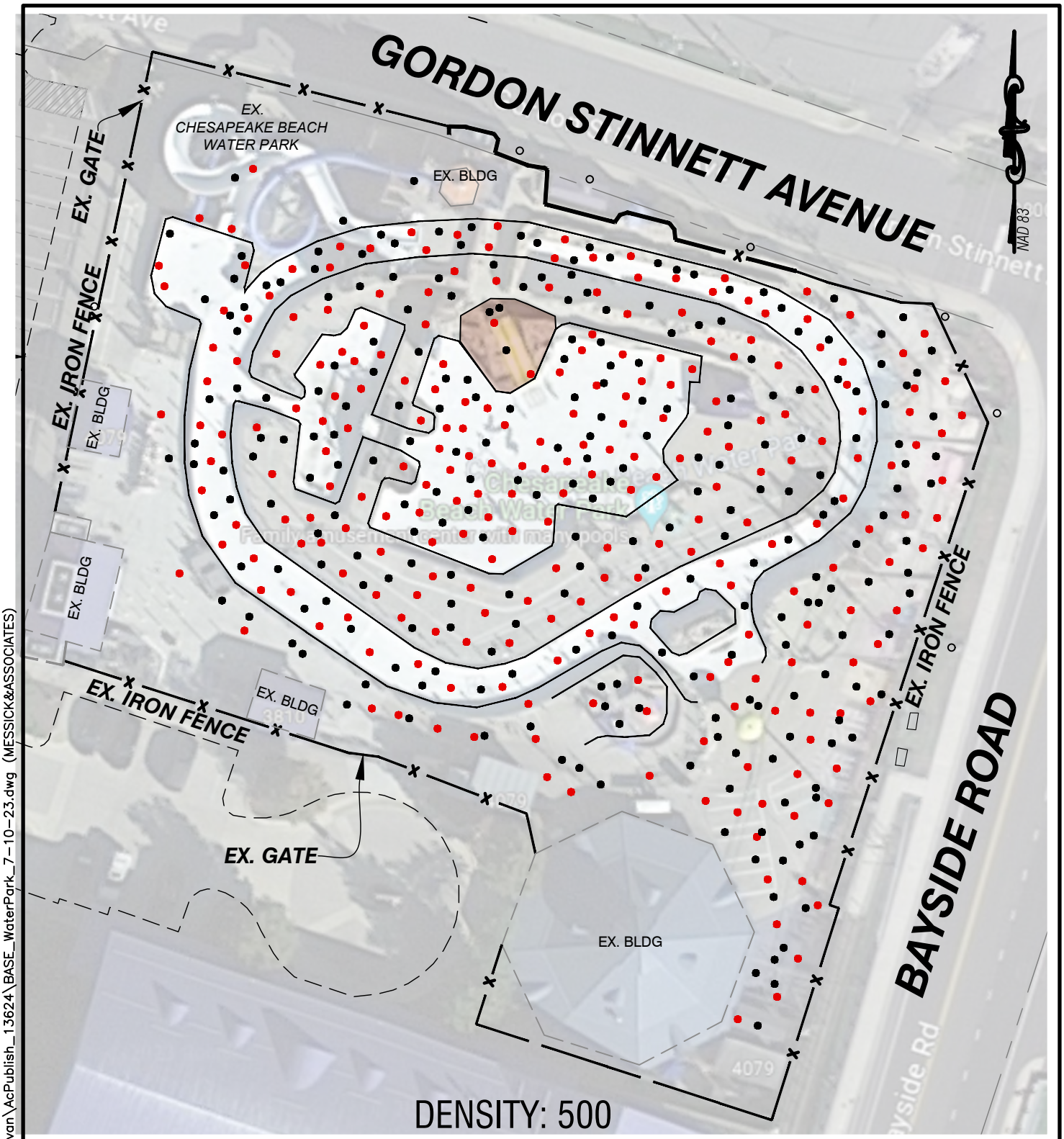
WATER PARK
4079 GORDON STINNETT AVENUE
TAX MAP: 103 GRID: 20 PARCEL: 229 LOT: C
THIRD DISTRICT, CALVERT COUNTY, MD. 20732
SCALE: AS NOTED DATE: JULY, 2023 SHEET: 1 OF 10

July 10 2023 FILE: C:\Users\van\AcPublish_13624\BASE_WaterPark_7-10-23.dwg (MESSICK&ASSOCIATES)



SCALE: 1" = 40'

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SCALE: AS NOTED DATE: JULY, 2023 SHEET: 2 OF 10

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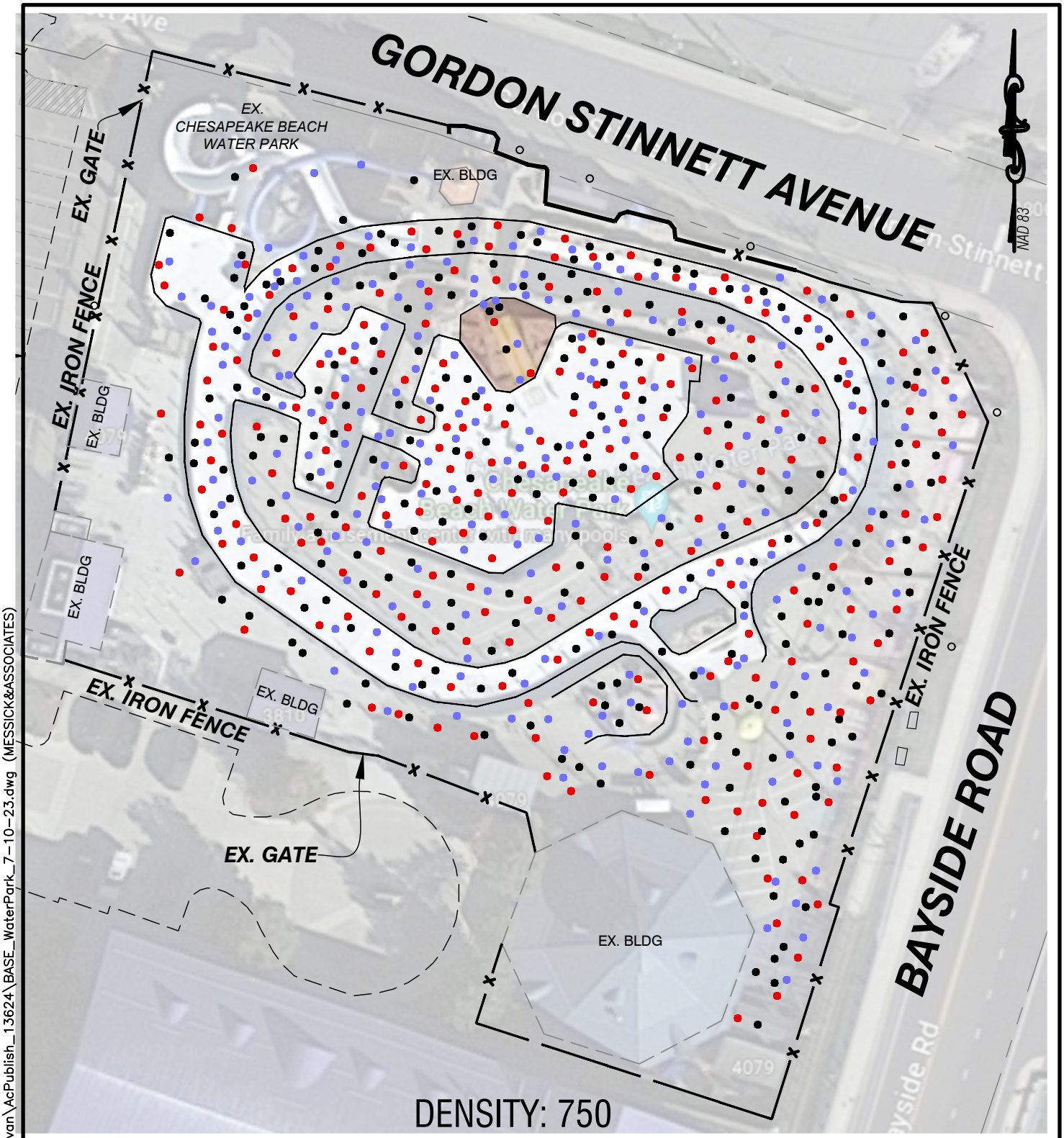

DENSITY: 750

SCALE: 1" = 40'

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TAX MAP: 103 GRID: 20 PARCEL: 229 LOT: C
THIRD DISTRICT, CALVERT COUNTY, MD. 20732
SCALE: AS NOTED DATE: JULY, 2023 SHEET: 3 OF 10

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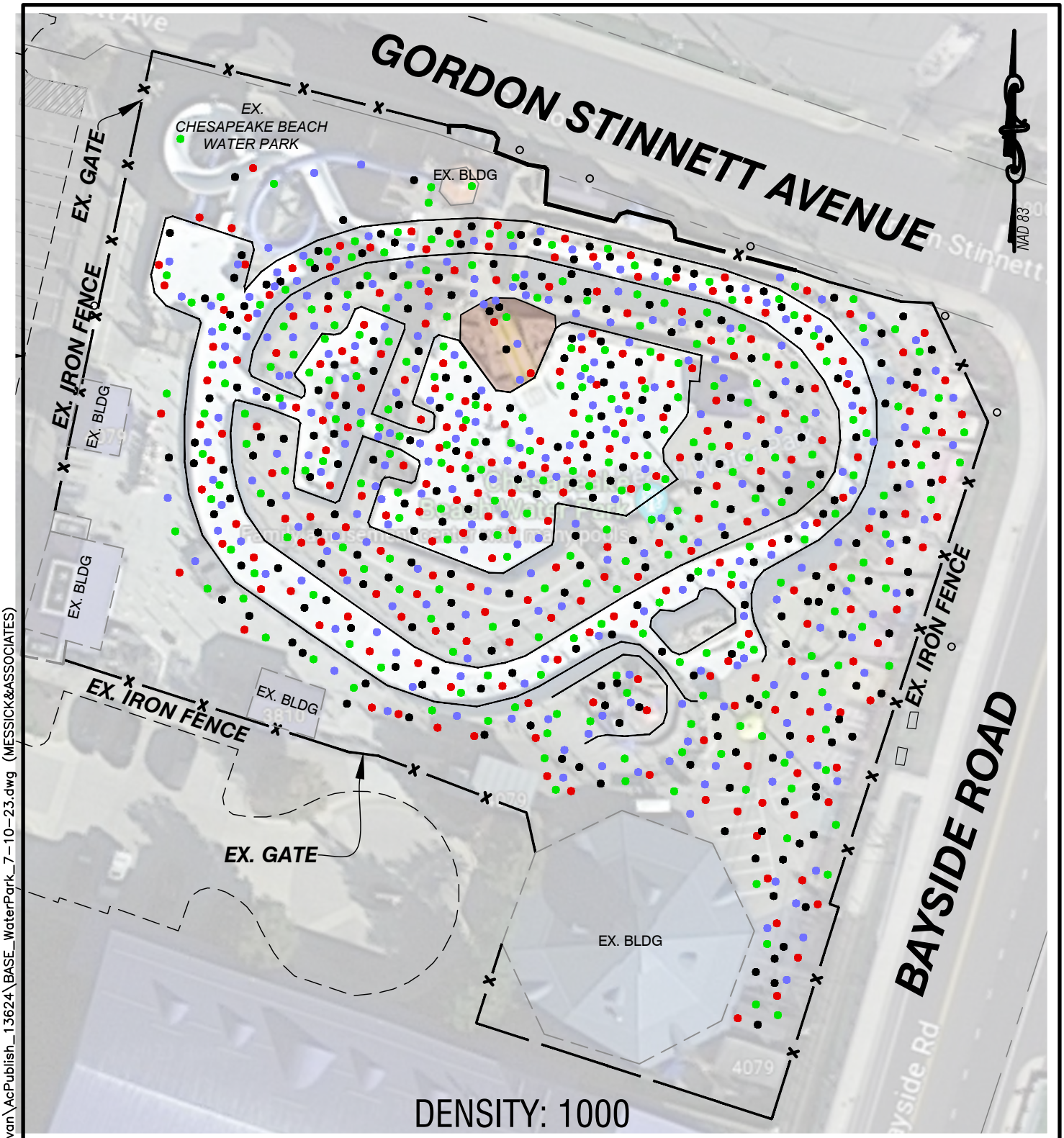

DENSITY: 1000

SCALE: 1" = 40'

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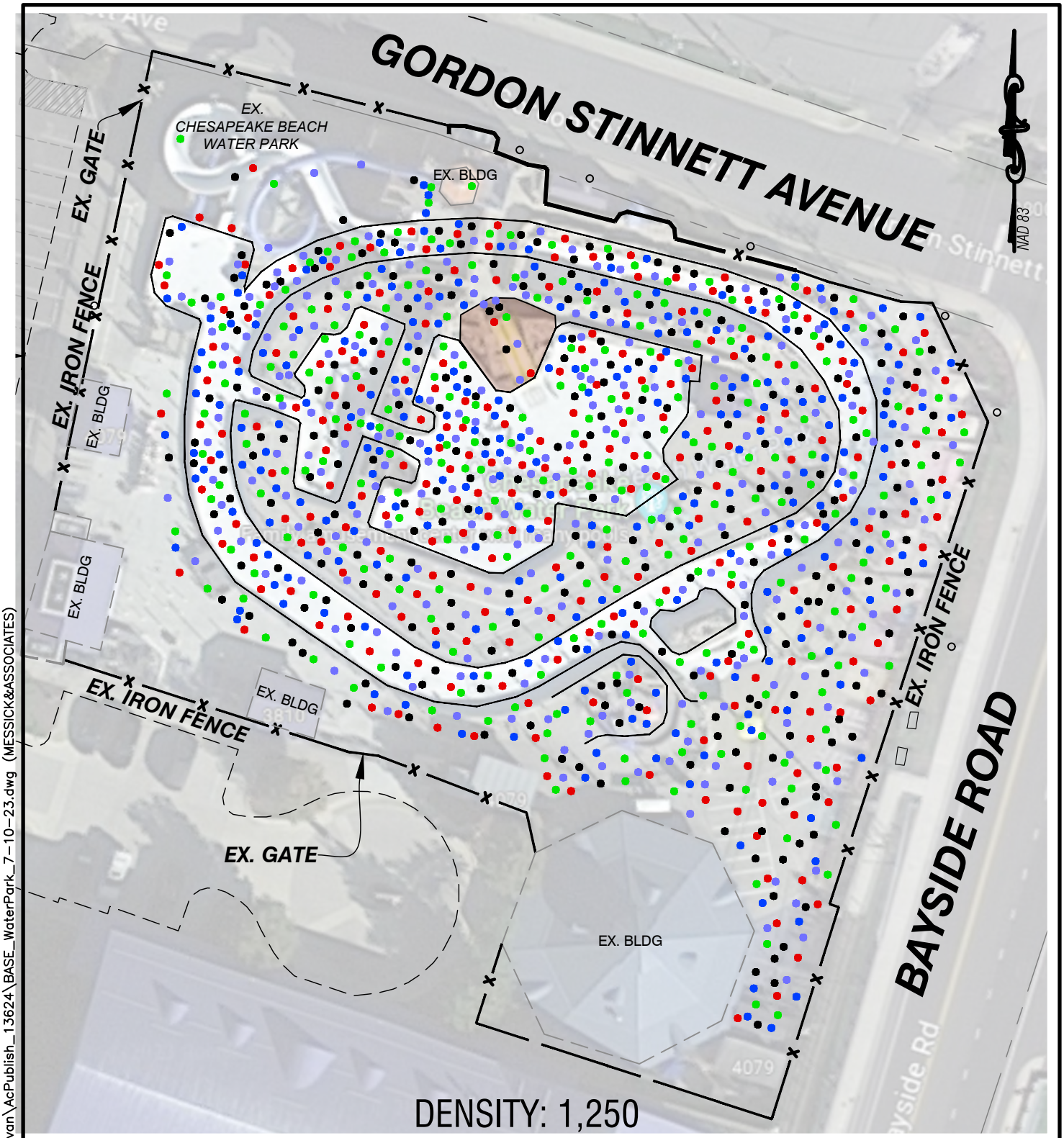
TAX MAP: 103 GRID: 20 PARCEL: 229 LOT: C
THIRD DISTRICT, CALVERT COUNTY, MD. 20732
SCALE: AS NOTED DATE: JULY, 2023 SHEET: 4 OF 10



SCALE: 1" = 40'

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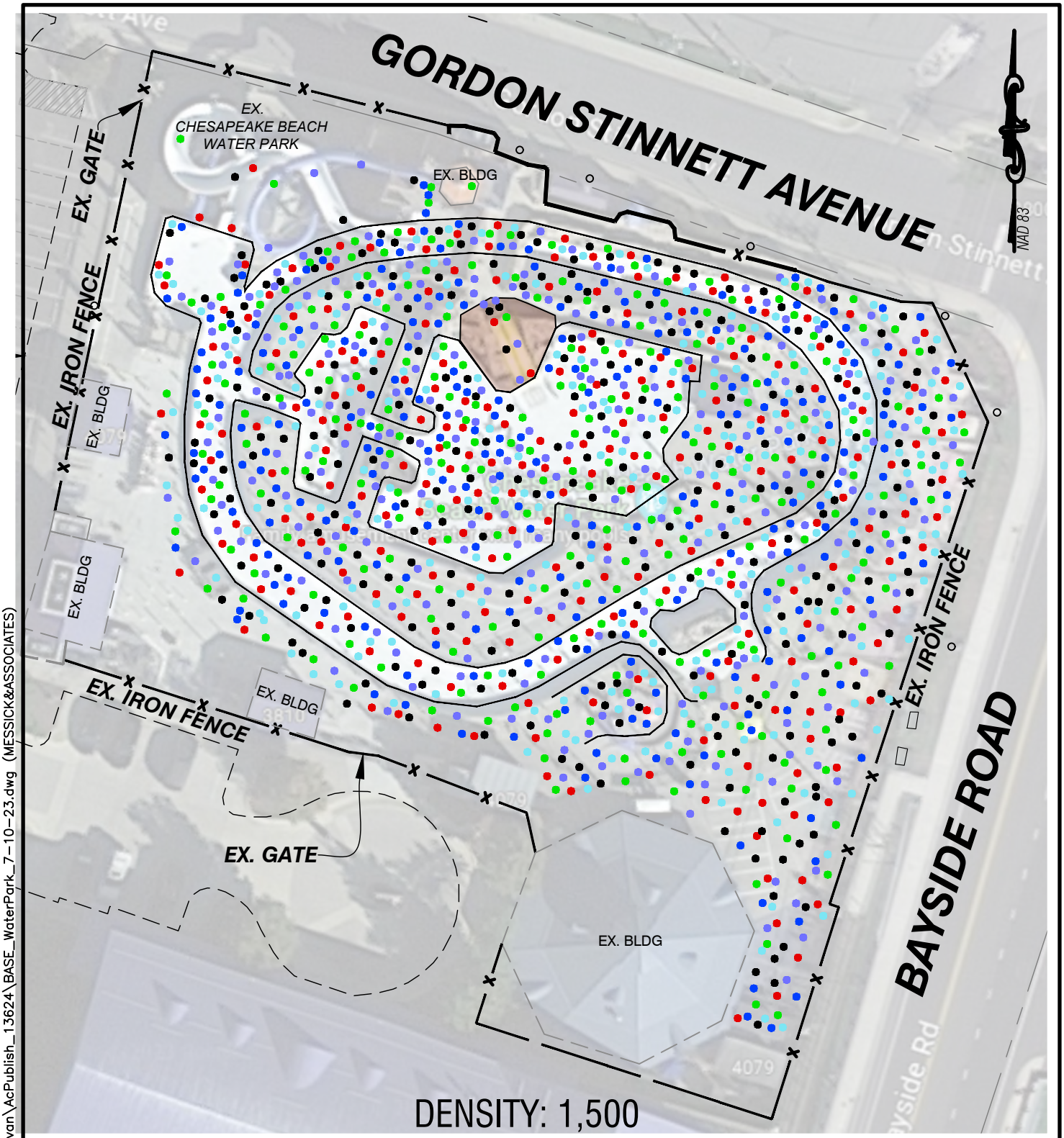

DENSITY: 1,500

SCALE: 1" = 40'

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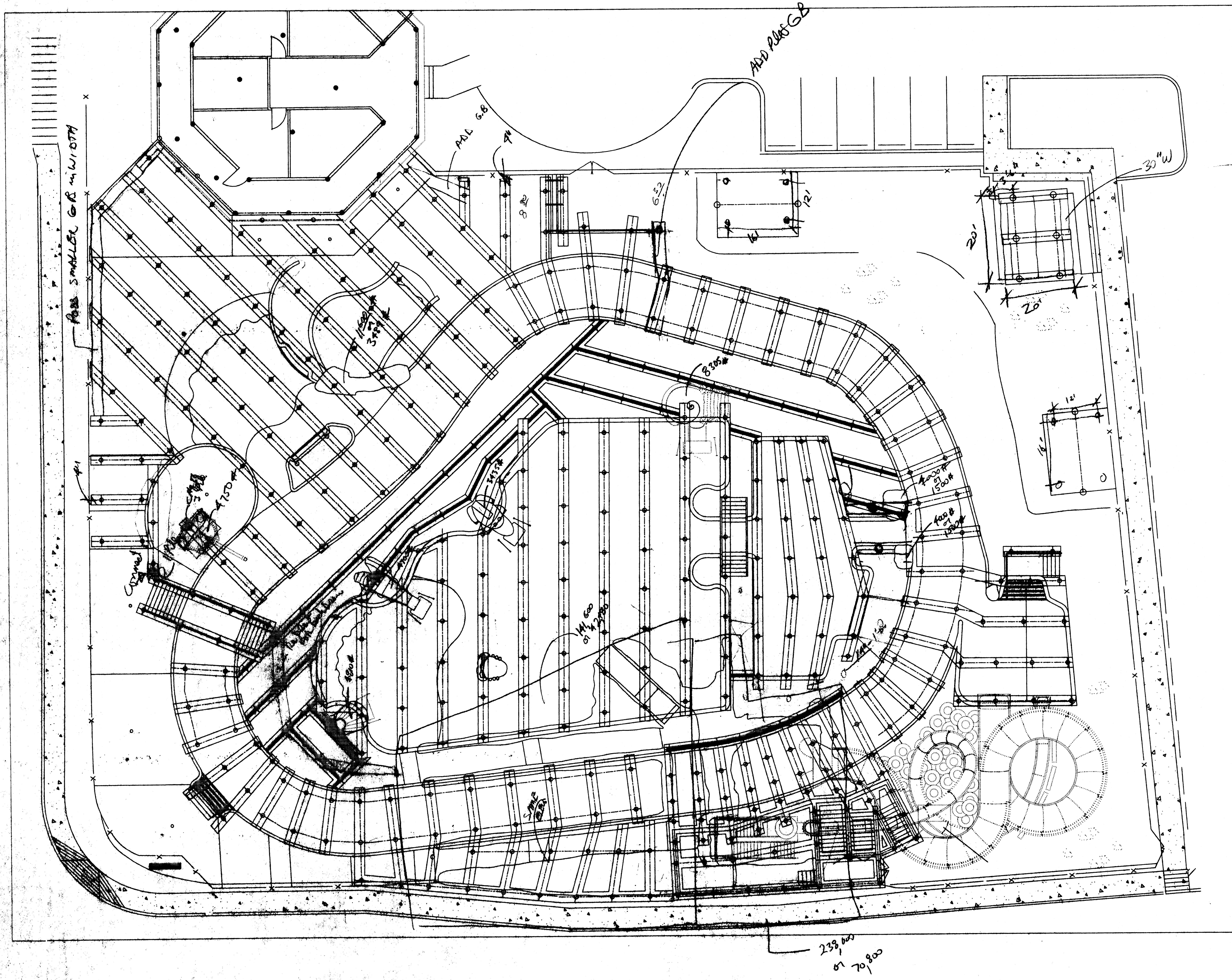
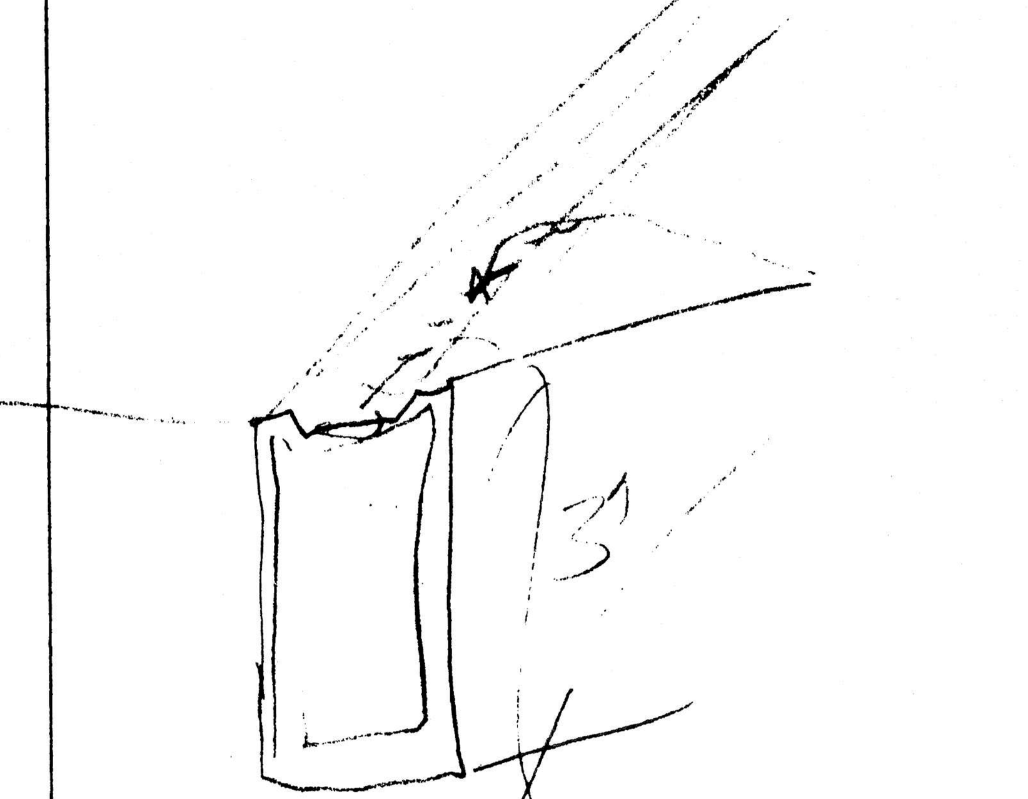
Exhibit B

Exhibit B outlines the areas that are constructed without pilings at the Chesapeake Beach Water Park. The areas without pilings are sinking at a pace of 1 inch a year requiring continual investment. This investment is a baseline maintenance cost to the Town without making improvements to the Park.

Exhibit B





12-20-94

Revised GP/Pile
1105

The WATKINS partnership
Consulting Structural Engineering

3832 Mitchellville Road
Suite 202
Bowie, Maryland 20716
ANNAP. (410)741-1791
WASH. (301)249-0974
FAX (301)249-0976

PROJECT #: 31002A

NORTHEAST COMMUNITY
CENTER POOL

DRAWN BY: MAS

paddock
Swimming Pool Company
15120-C SOUTHLAWN LANE ROCKVILLE, MD. 20850
PHONE: (301)-424-0790

REVISIONS:	SCALE: 3\32" = 1'-0"	JOB NO. 476
	DATE: 11/18/94	SHT. NO. S-2.0

RECEIVED
DEC 22 1994
31002A
THE WATKINS PARTNERSHIP