Ocean Wind
An Ørsted & PSEG project

Appendix K
Flood Hazard Area Engineering Reports

Ocean Wind
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BL England Flood Hazard Area Engineering Report

ENGINEERING REPORT for
FLOOD HAZARD AREA VERIFICATION

For:

BL ENGLAND ONSHORE SUBSTATION AND ONSHORE CABLE ROUTE

BLOCK 479, LOT 76
UPPER TOWNSHIP AND OCEAN CITY
CAPE MAY COUNTY
NEW JERSEY

Ocean Wind 1
An Ørsted & PSEG project

Applicant/Owner:
Ocean Wind 1

Prepared By:

E2 Project Management
2517 Route 35 Building I, Suite 101
Manasquan, New Jersey 08736

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July 2022

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining and preparing the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment.

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1.0 Executive Summary

This Flood Hazard Area Verification Engineering Report is being submitted as the material required to fulfill the regulatory requirements for the Flood Hazard Control Act (FHACA) Rules (N.J.A.C. 7:13-1.1 et seq.) for determining the flood hazard area design flood elevation (FHADFE) and limits of the flood hazard area (FHA) for the proposed BL England onshore electrical substation in Upper Township, and the onshore electrical cable route that will run from the BL England Substation, through Upper Township and Ocean City in Cape May County, to the Atlantic Ocean. This report serves as the Engineering Report for the application and has been prepared in accordance with the following:

- NJDEP Flood Hazard Area Control Act (FHACA) Rules (N.J.A.C. 7:13), last amended October 5, 2021; and
- NJDEP Flood Hazard Technical Manual (2018).

FHA verification is required because flood hazard areas are shown on FEMA's Flood Insurance Rate Maps (FIRMs) in the vicinity of the project area. All elevations within this report refer to the NAVD 88 vertical datum unless otherwise noted.

The proposed improvements are part of the Ocean Wind 1 project, which is a 1.1 GW offshore wind farm being proposed approximately 15 miles off the coast of Atlantic City, New Jersey. An offshore substation will be constructed to collect wind turbine partial outputs from the offshore wind farm. As part of this project, one (1) circuit of offshore 275 kV sub-sea cables, also known as export cables, will make landfall in Ocean City, New Jersey and terminate at the proposed BL England Substation (see Figures 1 and 2). The BL England Substation and the export cable route through Ocean City and Upper Township are the primary points of discussion within this report.

1.1 Site and Project Description

The BL England Substation is planned to be a 275/138kV high voltage AC substation and is proposed to be located near the decommissioned BL England Generating Station (also known as the Beesleys Point Generating Station) on Block 479, Lot 76 in Upper Township in the northern part of Cape May County. In general, the purpose of the substation is to transform the voltage from the 275kV connection from the wind farm to the 138kV voltage commonly used in New Jersey and used at nearby utility substations, as well as to provide sufficient harmonic filtration and reactive compensation for power stability. The export cables will enter the proposed B. L. England Substation property off Clay Avenue to the east. The cable route runs south/southwest down New Jersey State Highway Route 9 then runs southeast down Roosevelt Boulevard where it eventually enters the Atlantic Ocean off 35th Street in Ocean City, New Jersey (see Figures 1 and 2).

B. L. England Substation

The former Beesleys Point Generating Station property is located adjacent to the Great Egg Harbor Bay and the Tuckahoe River. The BL England Substation will be located on a 10.5-acre parcel that will be subdivided off the east side of the overall 298.6-acre Beesleys Point Generating Station property. The BL England Substation will front on Clay Street to the northeast and generally be bound by the former generating station to the north, south, east and west. Residential properties are located further away to the southeast (see Figure 1 and 2) of the proposed substation parcel. The 10.5-acre parcel of land proposed for

development for the substation is the former BL England Golf Course with existing grades being generally flat varying from elevation 4 (NAVD 88) to elevation 7.

Onshore Export Cable Route

The underground onshore export cable will be installed between the BL England Substation and the Atlantic Ocean within municipal street rights-of-way running through residential neighborhoods in Upper Township and Ocean City, New Jersey. Part of the cable route will be installed via horizontal directional drilling (HDD) under the Peck Bay/Crook Horn Creek, as shown on Figures 1 and 2.

2.0 Regulatory Requirements

2.1 Flood Hazard Area Verification

This application requests FHA Verification under Method 2 (N.J.A.C. 7:13-3.4(d)), FEMA delineation of tidally-influenced water bodies. Table 2-1 lists the effective FEMA FIRMs that cover the BL England Substation and export cable route and were referenced to determine the location of floodways and flood hazard areas that will be impacted by this project. It should be noted that the project area has not been studied or delineated by the NJDEP. For regulated waters for which a NJDEP delineation does not exist, the flood hazard area and floodway can be determined using Method 2 for tidally influenced surface waters mapped on FEMA FIRMs. If both a NJDEP delineated study (Method 1) and a FEMA flood insurance study (Method 2) are available for a regulated water, the flood hazard area and/or floodway are determined based on whichever method results in a higher flood hazard area design flood elevation (FHADFE) and wider floodway limit.

Table 2-1 – FEMA FIRM Maps

Location	Map			NJDEP Delineated Map
	Type	Number	Map Date	
Upper Township, Cape May County, NJ Starting at Block 479, Lot 76 to NJ Route 9 intersection with Staples Court	Effective Map	34009C0067F	10/5/2017	None
Upper Township, Cape May County, NJ Starting at NJ Route 9 intersection with Staples Court to intersection with Roosevelt Blvd ending at bridge over Great Egg Harbor Bay	Effective Map	34009C0069F	10/5/2017	None
Ocean City, Cape May County, NJ Starting at bridge over Great Egg Harbor Bay ending at 35th Street and Asbury Ave	Effective Map	34009C0088F	10/5/2017	None
Ocean City, Cape May County, NJ Starting at 35th Street and Asbury Ave and ending at 35th Street and	Effective Map	34009C0176F	10/5/2017	None

the Atlantic Ocean				

Based on the FEMA FIRMs listed in Table 2-1, the project area lies within the Zone AE – "Base Flood Elevations" determined for the Tuckahoe River/Great Egg Harbor Bay and Atlantic Ocean, which are all tidally influenced water bodies (see Figure 4 and Appendix A). Since the regulated waterbodies are all tidally influenced, the flood hazard area design flood elevation is the same as the 100-year base flood elevation in accordance with NJAC 7:13-3.4(d)1. Table 2-2 below provides the 100-year base flood elevation and flood hazard area design flood elevations located throughout the project area.

Table 2-2 – 100-Base Flood and FHA Design Flood Elevation

Location/FIRM Map Number	Regulated Water Body	FEMA 100-Year Base Flood (NAVD 88)	FHADFE
Upper Township, Cape May County, NJ Starting at Block 479, Lot 76 to Clay Avenue /34009C0067F	Tuckahoe River/Great Egg Harbor Bay	9	9
Upper Township, Cape May County, NJ Starting at Clay Avenue ending at intersection with US/34009C0067F	Tuckahoe River/Great Egg Harbor Bay	8	8
Upper Township, Cape May County, NJ Starting at Roosevelt Blvd and Garden State Parkway underpass ending at parkway exit ramp/34009C0069F	Great Egg Harbor Bay	9	9
Upper Township, Cape May County, NJ Starting at Roosevelt Blvd/parkway exit ramp ending at bridge over Great Egg Harbor Bay/34009C0069F	Great Egg Harbor Bay	10	10
Upper Township, Cape May County, NJ Starting at bridge over Great Egg Harbor Bay ending at 35th Street and Asbury Ave/34009C0088F	Great Egg Harbor Bay	9	9
Ocean City, Cape May County, NJ Starting at 35th Street and Central Ave and ending at 35th Street and Wesley Ave/34009C0088F	Atlantic Ocean	8	8

Ocean City, Cape May County, NJ Starting at 35th Street and Wesley Ave and ending at 35th Street and Atlantic Ocean/34009C0088F	Atlantic Ocean	9	9

The 100-year base flood elevations and FHADFEs listed above were used to delineate the flood hazard areas for the project based on local topography. This delineation is shown on Figures 5 through 12.

3.0 Determining the Riparian Zone

According to the NJDEP GIS digital data layer entitled, "Surface Water Quality Classifications", the Crook Horn Creek, the Tuckahoe River, the uncoded tributaries, the Flat Creek and its tributaries throughout the adjacent wetlands are classified as a FW2-NT/SE1. These ditches and water bodies are not utilized for trout production or trout maintenance. Therefore, the width of the riparian zones for these features would 50 feet, as measured landward from the top of bank, or the edge of open water. However, the proposed location of the BL England Substation and the export cable route, including the horizontal direction drilling sending and receiving pits adjacent to the Crook Horn Creek, are not close enough to any of these water bodies that riparian zones could be impacted. Therefore, this application does not request a riparian zone verification.

4.0 Conclusion

The purpose of this FHA verification application is to establish the limits of the FHA, based on Method 2 - FEMA tidal mapping along the project area for the Tuckahoe River, Great Egg Harbor Bay, and the Atlantic Ocean.

~END~

FIGURES

NORTH


SITE LOCATION

SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK. BY

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PROJECT NAME

OCEAN WIND OFFSHORE WIND
BL ENGLAND ON SHORE
SUBSTATION AND
ONSHORE CABLE ROUTE
UPPER TOWNSHIP, NEW JERSEY
BLOCK 479, LOT 76

DRAWING TITLE

USGS SITE LOCATION MAP

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FIG 1

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UPPER TOWNSHIP, NEW JERSEY
BLOCK 479, LOT 76

DRAWING TITLE

AERIAL SITE LOCATION MAP

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FIG 2

0 2500 5000 10000

SCALE: 1"=5000'

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UPPER TOWNSHIP, NEW JERSEY
BLOCK 479, LOT 76

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WATERSHED
MANAGEMENT AREA MAP

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PROJECT #: P-21-58-01	FIRST ISSUE:11/15/2021

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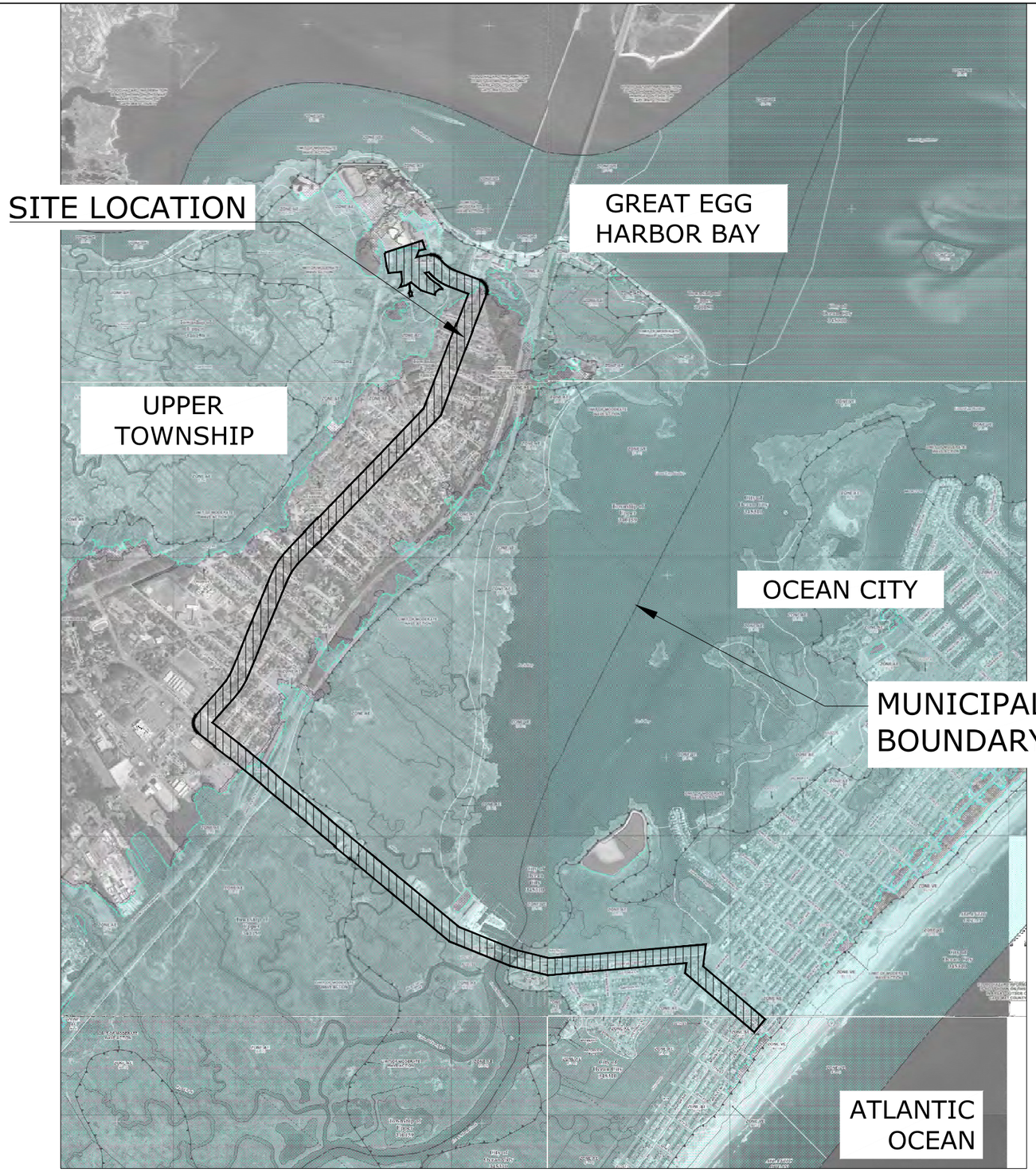
FIG 3

\\192.168.1.99\SHARED DRIVE\PROJECTS\A&E SERVICES\PSEG\OCEAN WIND_GSOE\TASK 1A - UPPER TOWNSHIP SITE PLAN\FLOOD HAZARD ENGINEERING REPORT\FIGURES\SHEET FILES\FIGURE 3 - WMA MAP.DWG



REFERENCES:
THE BASE MAP SHOWN HEREIN IS FROM EFFECTIVE FLOOD INSURANCE RATE MAPS NUMBER 34009C0067F, 34009C0069F, 34009C0086F, 34009C0088F, 34009C0157F, AND 34009C0176F DATED OCTOBER 5, 2017.

0 1000 2000 4000

SCALE: 1"=2000'

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BL ENGLAND ON SHORE SUBSTATION AND
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UPPER TOWNSHIP, NEW JERSEY
BLOCK 479, LOT 76

DRAWING TITLE

FEMA FLOOD MAP

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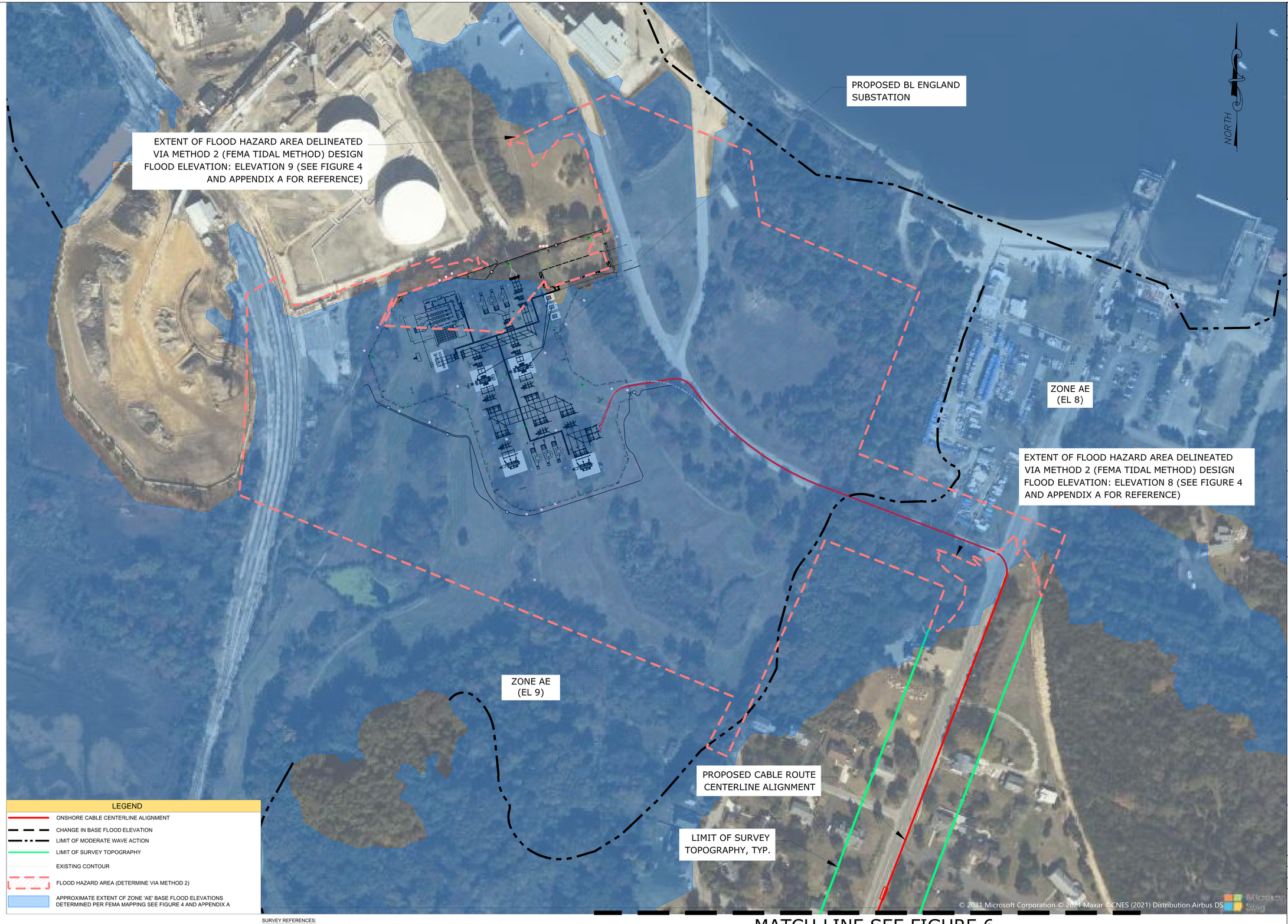
FIG 4

\\192.168.1.99\SHARED DRIVE\PROJECTS\ARE SERVICES\PSEG\OCEAN WIND_GSOE\TASK 1A - UPPER TOWNSHIP SITE PLAN\FLOOD HAZARD ENGINEERING REPORT\FIGURES\SHEET FILES\FIGURE 4 - FEMA.DWG



MATCH LINE SEE FIGURE 6

REFERENCES:
1. THE FLOOD HAZARD AREA DESIGN FLOOD ELEVATIONS DETERMINED VIA METHOD 2 FEMA TIDAL METHOD SHOWN HEREIN WERE DETERMINED FROM EFFECTIVE FLOOD INSURANCE RATE MAP NUMBER 34009C0067F DATED OCTOBER 5, 2017.
2. BL ENGLAND SUBSTATION ONSHORE SUBSTATION GENERAL ARRANGEMENT PLAN PREPARED BY BURNS AND MCDONNELL.

SURVEY REFERENCES:
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0 50 100 200
SCALE: 1"=100'

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BLOCK 479, LOT 76

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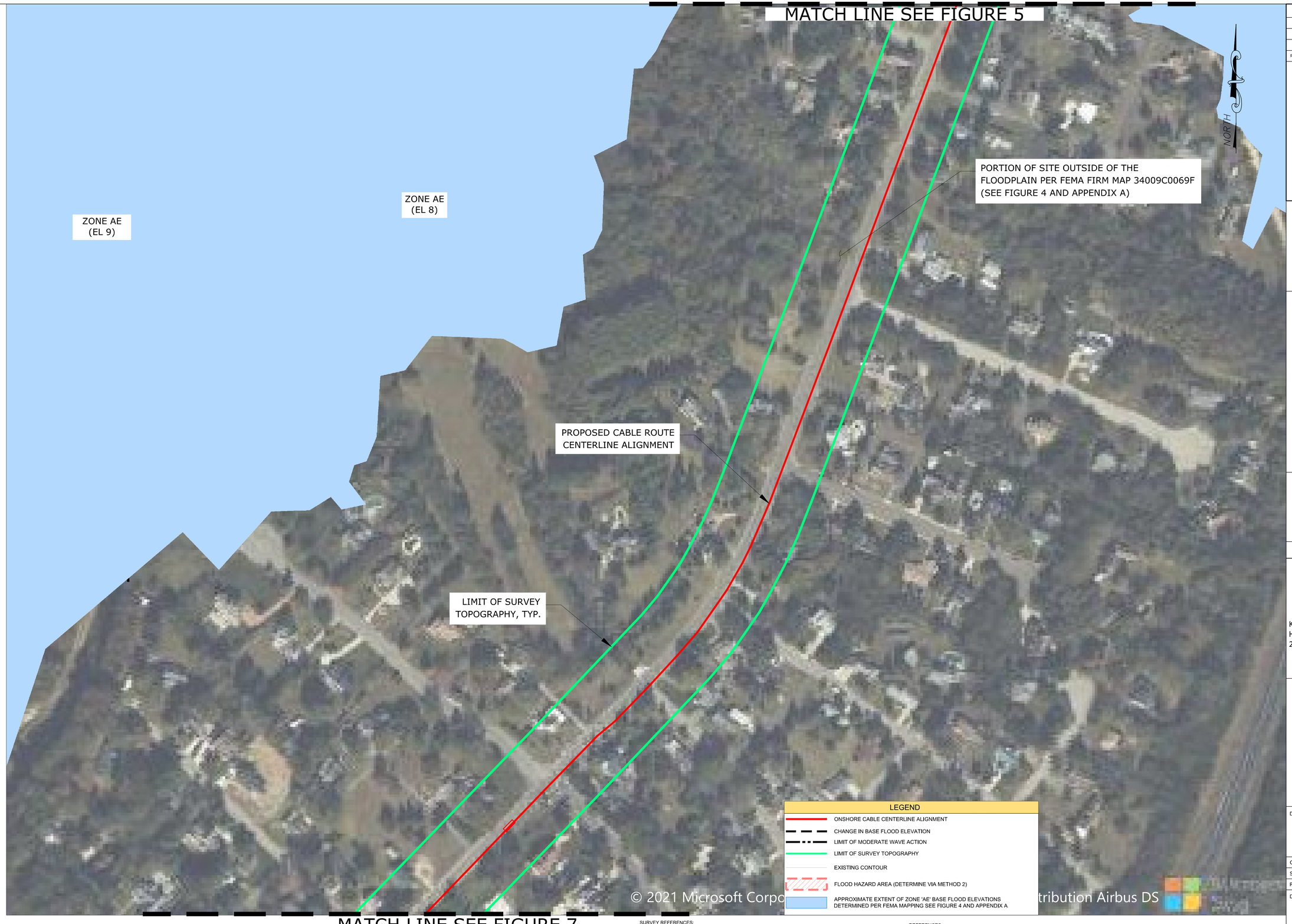
FIGURE 5



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0 50 100 200
SCALE: 1"=100'

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FIGURE 6

MATCH LINE SEE FIGURE 6

NORTH

LIMIT OF MODERATE WAVE ACTION, TYP.

ZONE AE (EL 9)

PROPOSED CABLE ROUTE CENTERLINE ALIGNMENT

PORTION OF SITE OUTSIDE OF THE FLOODPLAIN PER FEMA FIRM MAP 34009C0069F (SEE FIGURE 4 AND APPENDIX A)

LIMIT OF SURVEY TOPOGRAPHY, TYP.

MATCH LINE SEE FIGURE 8

LEGEND

- ONSHORE CABLE CENTERLINE ALIGNMENT
- CHANGE IN BASE FLOOD ELEVATION
- LIMIT OF MODERATE WAVE ACTION
- LIMIT OF SURVEY TOPOGRAPHY
- EXISTING CONTOUR
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
- APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4 AND APPENDIX A

SURVEY REFERENCES:

1. TOPOGRAPHIC DATA FOR THE BL ENGLAND SUBSTATION AREA AND CABLE ROUTE ALIGNMENT WAS OBTAINED FROM A MAP ENTITLED "OFFSHORE WIND, BEESLEY'S POINT ROUTE, EXISTING CONDITIONS," PREPARED BY PSEG SERVICES CORPORATION, SURVEYS & MAPPING, 80 PARK PLAZA, T6B, NEWARK, N.J. 07102, AND DATED OCTOBER 8, 2021.
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0 50 100 200

SCALE: 1"=100'

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BLOCK 479, LOT 76

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FIGURE 7

MATCH LINE SEE FIGURE 7

NORTH

PROPOSED CABLE ROUTE CENTERLINE ALIGNMENT

LIMIT OF SURVEY TOPOGRAPHY, TYP.

PORTION OF SITE OUTSIDE OF THE FLOODPLAIN PER FEMA FIRM MAP 34009C0069F (SEE FIGURE 4 AND APPENDIX A)

ZONE AE (EL 9)

LEGEND

- ONSHORE CABLE CENTERLINE ALIGNMENT
- CHANGE IN BASE FLOOD ELEVATION
- LIMIT OF MODERATE WAVE ACTION
- LIMIT OF SURVEY TOPOGRAPHY
- EXISTING CONTOUR
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
- APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4 AND APPENDIX A

MATCH LINE SEE FIGURE 9

REFERENCES:
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0 50 100 200
SCALE: 1"=100'

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Digitally signed by Katherine L. Hering P. E. 24GE04226900 Date: 2022.07.18 15:50:44 -04'00'

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BLOCK 479, LOT 76

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FLOOD HAZARD VERIFICATION PLAN

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SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 11/15/2020

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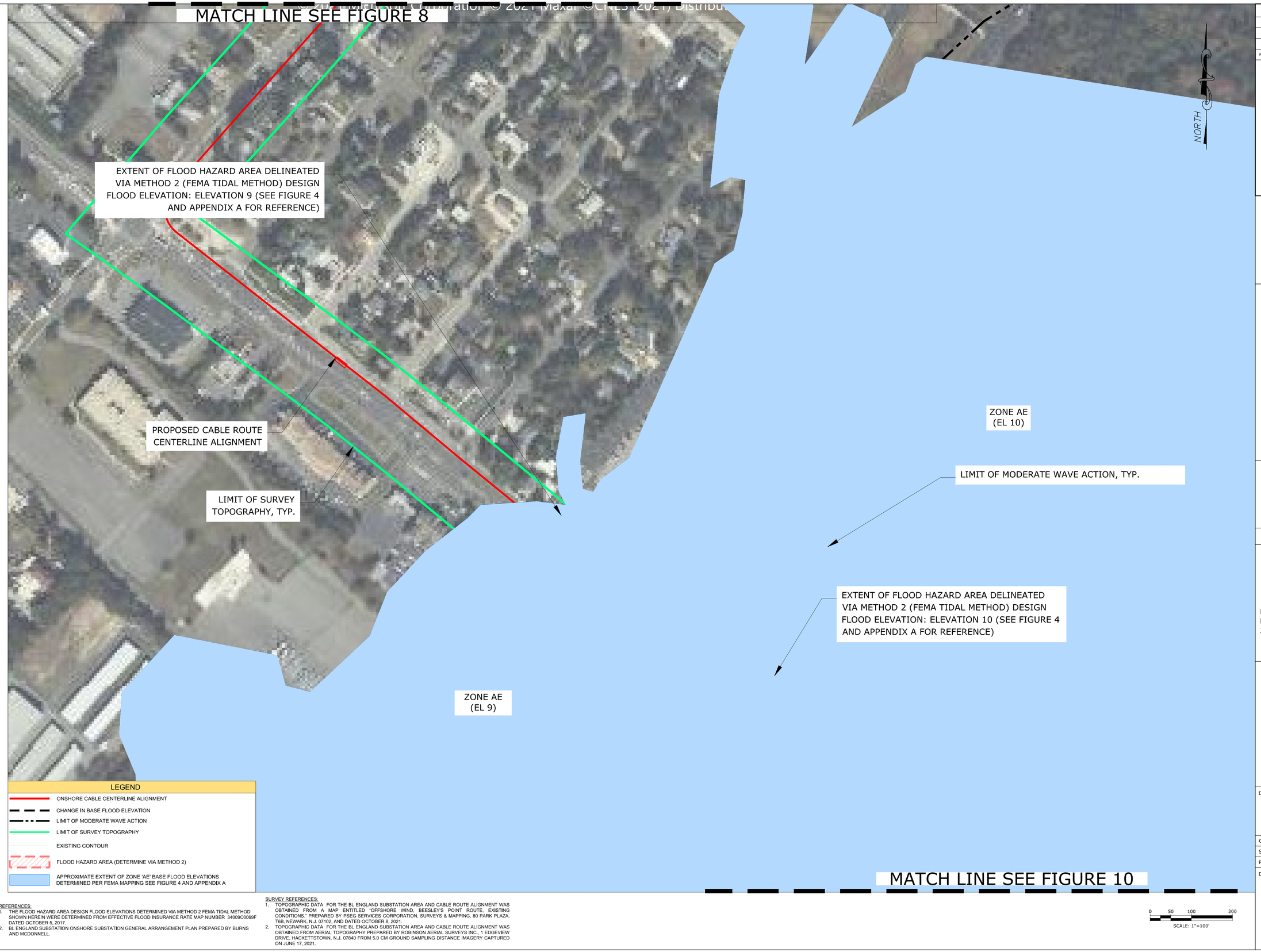
FIGURE 8



REFERENCES:

1. THE FLOOD HAZARD AREA DESIGN FLOOD ELEVATIONS DETERMINED VIA METHOD 2 FEMA TIDAL METHOD SHOWN HEREIN WERE DETERMINED FROM EFFECTIVE FLOOD INSURANCE RATE MAP NUMBER 34009C0089F DATED OCTOBER 5, 2017.
2. BL ENGLAND SUBSTATION ONSHORE SUBSTATION GENERAL ARRANGEMENT PLAN PREPARED BY BURNS AND MCDONNELL.

SURVEY REFERENCES:

1. TOPOGRAPHIC DATA FOR THE BL ENGLAND SUBSTATION AREA AND CABLE ROUTE ALIGNMENT WAS OBTAINED FROM A MAP ENTITLED "OFFSHORE WIND, BEESLEY'S POINT ROUTE, EXISTING CONDITIONS." PREPARED BY PSEG SERVICES CORPORATION, SURVEYS & MAPPING, 80 PARK PLAZA, T6B, NEWARK, N.J. 07102, AND DATED OCTOBER 8, 2021.
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0 50 100 200
SCALE: 1"=100'

SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK. BY

E 2 PROJECT MANAGEMENT LLC
87 HIBERNIA AVENUE
ROCKAWAY, N.J. 07866
PHONE: (973) 299-5200
FAX: (973) 299-5059
www.E2PM.com

I CERTIFY THAT THESE PLANS HAVE BEEN PREPARED UNDER MY SUPERVISION

Katherine L. Hering P. E. 24GE04226900

Digitally signed by Katherine L. Hering P. E. 24GE04226900
Date: 2022.07.18 15:49:20 -04'00'

STATE OF NEW JERSEY · KATHERINE L. HERING · No. GE42269 · LICENSED PROFESSIONAL ENGINEER

KATHERINE L. HERING, P.E., N.J. NO. 24GE04226900
LICENSED PROFESSIONAL ENGINEER

OCEAN WIND OFFSHORE WIND
BL ENGLAND ONSHORE SUBSTATION AND
ONSHORE CABLE ROUTE
UPPER TOWNSHIP, NEW JERSEY
BLOCK 479, LOT 76

DRAWING TITLE

FLOOD HAZARD VERIFICATION PLAN

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 11/15/2020

DRAWING NO.

FIGURE 9

MATCH LINE SEE FIGURE 9

LIMIT OF MODERATE WAVE ACTION, TYP.

NORTH

ZONE AE
(EL 10)

LIMIT OF SURVEY
TOPOGRAPHY, TYP.

PROPOSED CABLE ROUTE
CENTERLINE ALIGNMENT

EXTENT OF FLOOD HAZARD AREA DELINEATED VIA METHOD 2 (FEMA TIDAL METHOD) DESIGN FLOOD ELEVATION: ELEVATION 10 (SEE FIGURE 4 AND APPENDIX A FOR REFERENCE)

MATCH LINE SEE FIGURE 11

LEGEND

- ONSHORE CABLE CENTERLINE ALIGNMENT
- CHANGE IN BASE FLOOD ELEVATION
- LIMIT OF MODERATE WAVE ACTION
- LIMIT OF SURVEY TOPOGRAPHY
- EXISTING CONTOUR
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
- APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4 AND APPENDIX A

REFERENCES:
1. THE FLOOD HAZARD AREA DESIGN FLOOD ELEVATIONS DETERMINED VIA METHOD 2 FEMA TIDAL METHOD SHOWN HEREIN WERE DETERMINED FROM EFFECTIVE FLOOD INSURANCE RATE MAP NUMBER 34009C0069F DATED OCTOBER 5, 2017.
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0 50 100 200
SCALE: 1"=100'

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Katherine L. Hering P. E. 24GE04226900

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Date: 2022.07.18 15:48:49 -04'00'

STATE OF NEW JERSEY · KATHERINE L. HERING · No. GE42269 · LICENSED PROFESSIONAL ENGINEER

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OCEAN WIND OFFSHORE WIND
BL ENGLAND ONSHORE SUBSTATION AND
ONSHORE CABLE ROUTE
UPPER TOWNSHIP, NEW JERSEY
BLOCK 479, LOT 76

DRAWING TITLE

FLOOD HAZARD VERIFICATION PLAN

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SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 11/15/2020

DRAWING NO.

FIGURE 10

MATCH LINE SEE FIGURE 10

MATCH LINE SEE FIGURE 12

ZONE AE
(EL 10)

LIMIT OF MODERATE
WAVE ACTION, TYP.

LIMIT OF SURVEY
TOPOGRAPHY, TYP.

PROPOSED CABLE ROUTE
CENTERLINE ALIGNMENT

EXTENT OF FLOOD HAZARD AREA DELINEATED
VIA METHOD 2 (FEMA TIDAL METHOD) DESIGN
FLOOD ELEVATION: ELEVATION 9 (SEE FIGURE 4
AND APPENDIX A FOR REFERENCE)

ZONE AE
(EL 9)

NORTH

LEGEND

- ONSHORE CABLE CENTERLINE ALIGNMENT
- CHANGE IN BASE FLOOD ELEVATION
- LIMIT OF MODERATE WAVE ACTION
- LIMIT OF SURVEY TOPOGRAPHY
- EXISTING CONTOUR
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
- APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4 AND APPENDIX A

REFERENCES:

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SCALE: 1"=100'

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Date: 2022.07.18 15:48:22 -04'00'

STATE OF NEW JERSEY
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No. GE42269
LICENSED PROFESSIONAL ENGINEER

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OCEAN WIND OFFSHORE WIND
BL ENGLAND ONSHORE
SUBSTATION AND
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UPPER TOWNSHIP, NEW JERSEY
BLOCK 479, LOT 76

DRAWING TITLE

FLOOD HAZARD VERIFICATION PLAN

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 11/15/2020

DRAWING NO.

FIGURE 11

MATCH LINE SEE FIGURE 11

ZONE AE
(EL 10)

LIMIT OF SURVEY
TOPOGRAPHY, TYP.

PROPOSED CABLE ROUTE
CENTERLINE ALIGNMENT

EXTENT OF FLOOD HAZARD AREA DELINEATED
VIA METHOD 2 (FEMA TIDAL METHOD) DESIGN
FLOOD ELEVATION: ELEVATION 9 (SEE FIGURE 4
AND APPENDIX A FOR REFERENCE)

ZONE AE
(EL 9)

ZONE AE
(EL 10)

NORTH

LEGEND

- ONSHORE CABLE CENTERLINE ALIGNMENT
- CHANGE IN BASE FLOOD ELEVATION
- LIMIT OF MODERATE WAVE ACTION
- LIMIT OF SURVEY TOPOGRAPHY
- EXISTING CONTOUR
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
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0 50 100 200
SCALE: 1"=100'

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Katherine L. Hering P.E. 24GE04226900

Digitally signed by Katherine L. Hering P. E. 24GE04226900
Date: 2022.07.18 15:47:47 -04'00'

STATE OF NEW JERSEY
KATHERINE L. HERING
No. GE42269
LICENSED PROFESSIONAL ENGINEER

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OCEAN WIND OFFSHORE WIND
BL ENGLAND ONSHORE
SUBSTATION AND
ONSHORE CABLE ROUTE
UPPER TOWNSHIP, NEW JERSEY
BLOCK 479, LOT 76

DRAWING TITLE

FLOOD HAZARD VERIFICATION PLAN

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 11/15/2020

DRAWING NO.

FIGURE 12

APPENDIX A – FEMA FLOOD INSURANCE RATE MAPS

NOTES TO USERS

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

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

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

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

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

The **projection** used in the preparation of this map was New Jersey State Plane (FIPS 2900) zone. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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

Base map information shown on this FIRM was developed from high-resolution orthophotography provided by the State of New Jersey. This information was derived from digital orthophotos produced at a scale of 1:2400 with a 1-foot pixel resolution from photography dated 2012.

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

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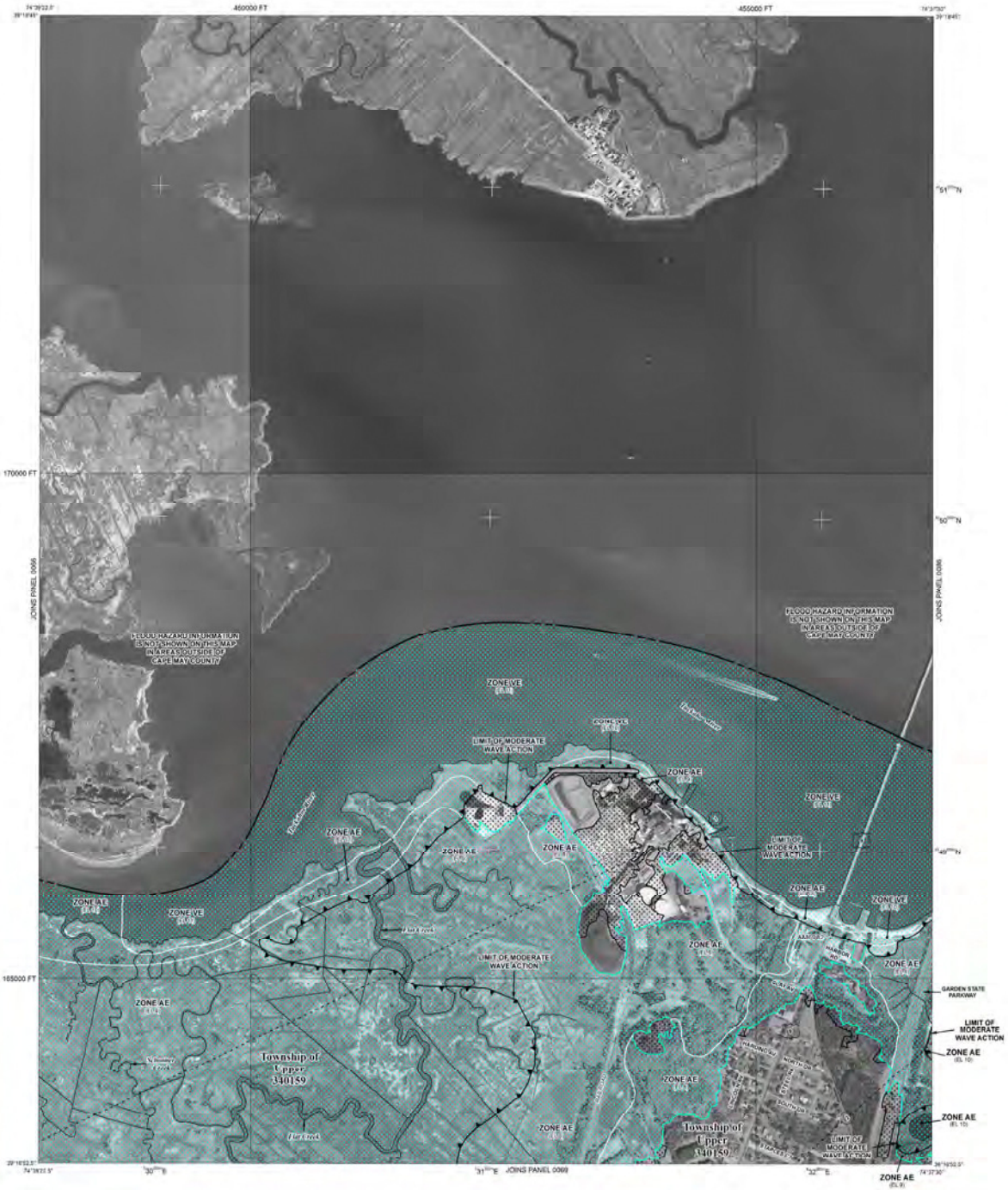
For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can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

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



LEGEND

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

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to special flood hazard areas.

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

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Pedestrian Bridge
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 18
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
October 5, 2017

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

SCALE

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0067F

FIRM

FLOOD INSURANCE RATE MAP

CAPE MAY COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 67 OF 311
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
UPPER, TOWNSHIP OF	340159	0067	F

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

MAP NUMBER
34009C0067F

EFFECTIVE DATE
OCTOBER 5, 2017

Federal Emergency Management Agency

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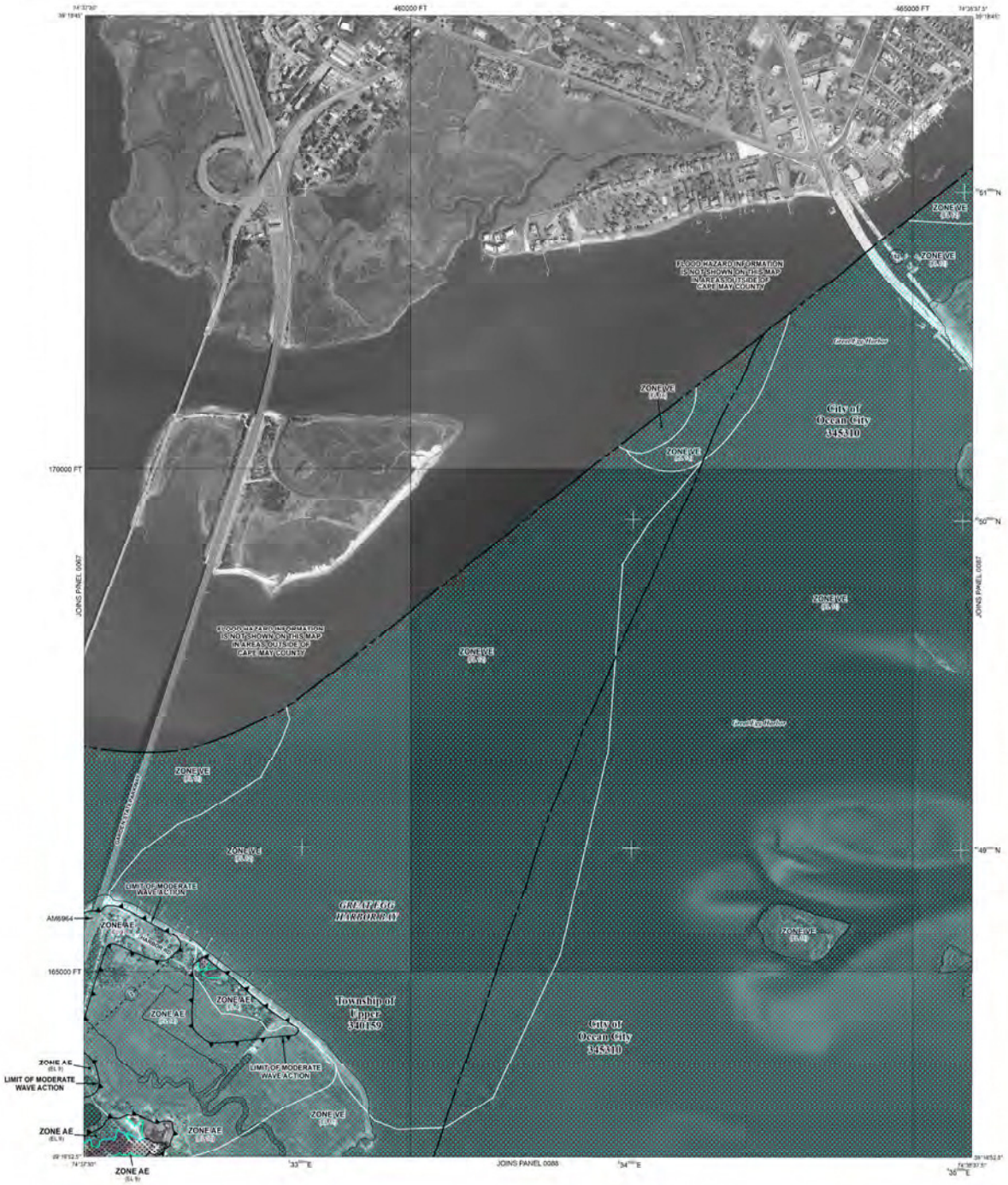

LEGEND

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to special flood hazard areas.

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

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Roadside
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4278000 FT — 1000-meter Universal Transverse Mercator grid values, zone 18
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
October 5, 2017

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0086F

FIRM

FLOOD INSURANCE RATE MAP

CAPE MAY COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 86 OF 311
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OCEAN CITY, CITY OF	345318	0086	F
UPPER, TOWNSHIP OF	340159	0086	F

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

MAP NUMBER
34009C0086F

EFFECTIVE DATE
OCTOBER 5, 2017

Federal Emergency Management Agency

NOTES TO USERS

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

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

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

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

The **projection** used in the preparation of this map was New Jersey State Plane (FIPS 2900) zone. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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

Base map information shown on this FIRM was developed from high-resolution orthophotography provided by the State of New Jersey. This information was derived from digital orthophotos produced at a scale of 1:2400 with a 1-foot pixel resolution from photography dated 2012.

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

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

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

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

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

LEGEND

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

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AR/A, AR/AE, AR/AH, AR/AO, AR/A1–AR/A30, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to special flood hazard areas.

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

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4278000 FT — 1000-meter Universal Transverse Mercator grid values, zone 18
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
October 5, 2017

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

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

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0069F

FIRM

FLOOD INSURANCE RATE MAP

CAPE MAY COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 69 OF 311
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OCEAN CITY, CITY OF	345319	0069	F
UPPER TOWNSHIP OF	340159	0069	F

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

MAP NUMBER
34009C0069F

EFFECTIVE DATE
OCTOBER 5, 2017

Federal Emergency Management Agency

NOTES TO USERS

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

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

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

The **projection** used in the preparation of this map was New Jersey State Plane (FIPS 2900) zone. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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

Base map information shown on this FIRM was developed from high-resolution orthophotography provided by the State of New Jersey. This information was derived from digital orthophotos produced at a scale of 1:2400 with a 1-foot pixel resolution from photography dated 2012.

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

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

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LEGEND

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

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

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to special flood hazard areas.

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

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Pedestrian Bridge
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 7°45'00"N — 2000-meter Universal Transverse Mercator grid values, zone 18
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
October 5, 2017

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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SCALE
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250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0088F

FIRM

FLOOD INSURANCE RATE MAP

CAPE MAY COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 88 OF 311
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
OCEAN CITY, CITY OF	345410	0088	F
UPPER TOWNSHIP OF	340159	0088	F

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MAP NUMBER
34009C0088F

EFFECTIVE DATE
OCTOBER 5, 2017

Federal Emergency Management Agency

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NGS Information Services
NOAA, N/NGS12
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SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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COASTAL BARRIER RESOURCES SYSTEM (CBRS) LEGEND

11-16-1990 CBRS Area

FLOOD INSURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR SUBSTANTIALLY IMPROVED ON OR AFTER OCTOBER 1, 1983, IN DESIGNATED CBRS AREAS.

2-24-1997 CBRS Area

FLOOD INSURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR SUBSTANTIALLY IMPROVED ON OR AFTER NOVEMBER 16, 1990, IN DESIGNATED CBRS AREAS.

11-16-1991 Otherwise Protected Area (OPA)

FLOOD INSURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR SUBSTANTIALLY IMPROVED ON OR AFTER NOVEMBER 16, 1991, IN DESIGNATED OPAs WITHIN THE CBRS.

Boundaries of the John H. Chafee Coastal Barrier Resources System (CBRS) shown on this FIRM were transferred from the official CBRS source map(s) for this area and are depicted on this FIRM for informational purposes only. The official CBRS maps are enacted by Congress via the Coastal Barrier Resources Act, as amended, and maintained by the U.S. Fish and Wildlife Service (FWS). The official CBRS maps used to determine whether or not an area is located within the CBRS are available for download at http://www.fws.gov. For an official determination of whether or not an area is located within the CBRS, or for any questions regarding the CBRS, please contact the FWS field office for this area at 609-646-9310.

LEGEND

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

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ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS AREAS AND OPAs are normally located within or adjacent to special flood hazard areas.

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

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Pendock or Aqueduct
- Road or Railroad Bridge
- Footbridge
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 76°N — 2000-meter Universal Transverse Mercator grid values, zone 18
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
October 5, 2017

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

PANEL 0157F

FIRM

FLOOD INSURANCE RATE MAP

CAPE MAY COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 157 OF 311
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OCEAN CITY, CITY OF	345310	0157	F
UPPER TOWNSHIP OF	340159	0157	F

NOTICE TO USER: THE MAP NUMBER SHOWN BELOW SHOULD BE USED WHEN PLACING MAP ORDERS; THE COMMUNITY NUMBER SHOWN ABOVE SHOULD BE USED ON INSURANCE APPLICATIONS FOR THE SUBJECT COMMUNITY.

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

MAP NUMBER
34009C0157F

EFFECTIVE DATE
OCTOBER 5, 2017

Federal Emergency Management Agency

NOTES TO USERS

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

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

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

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

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

The **projection** used in the preparation of this map was New Jersey State Plane (FIPS 2900) zone. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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

Base map information shown on this FIRM was developed from high-resolution orthophotography provided by the State of New Jersey. This information was derived from digital orthophotos produced at a scale of 1:2400 with a 1-foot pixel resolution from photography dated 2012.

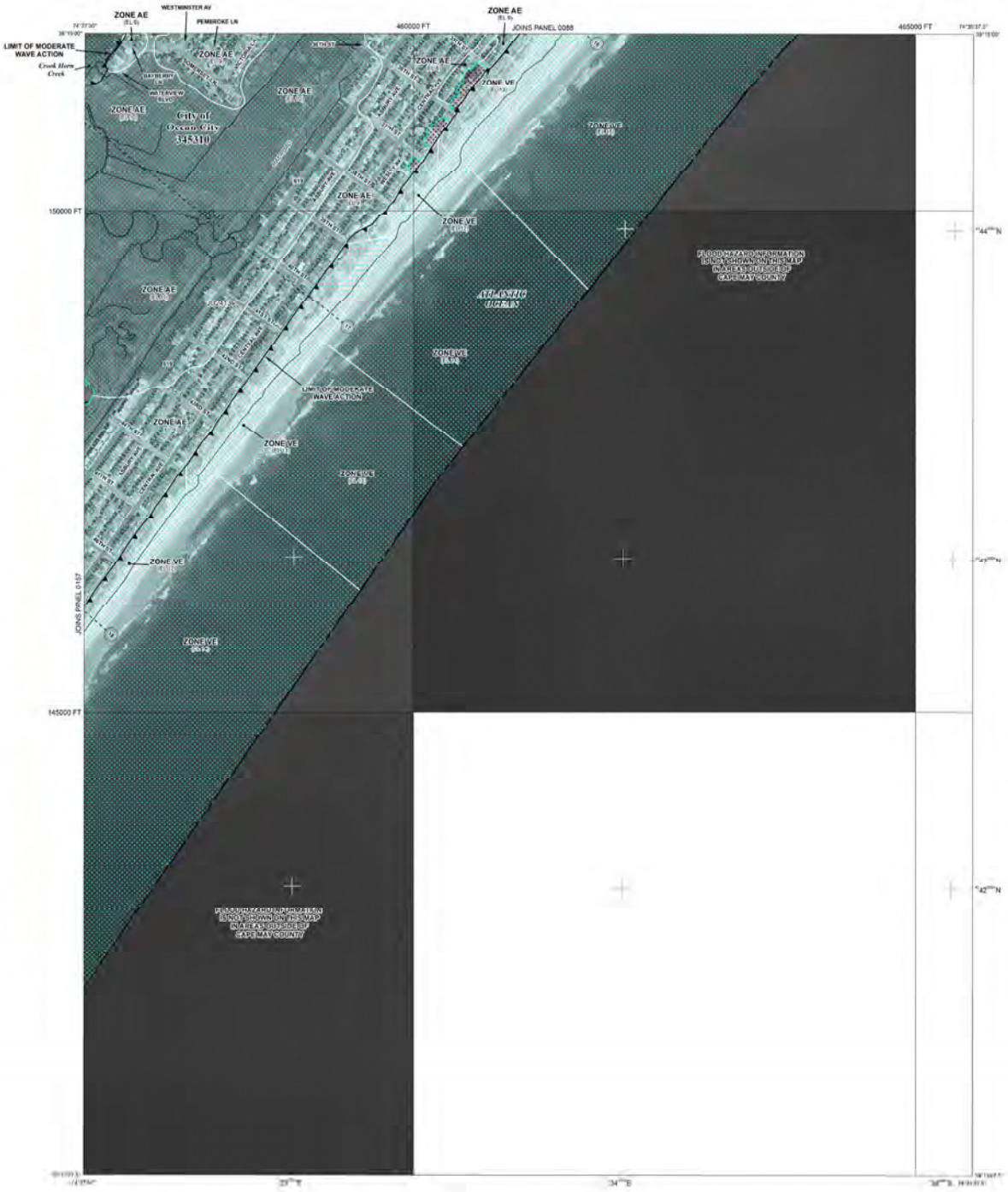
Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report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

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

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

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

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



LEGEND

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

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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- 0.2% annual chance floodplain boundary
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- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones, and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of moderate wave action
- 513 — Base Flood Elevation line and value; elevation in feet*
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* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Roadside
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000 mN — 1000-meter Universal Transverse Mercator grid values, zone 18
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
October 5, 2017

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0176F

FIRM

FLOOD INSURANCE RATE MAP

CAPE MAY COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 176 OF 311
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OCEAN CITY, CITY OF	345311	0176	F

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

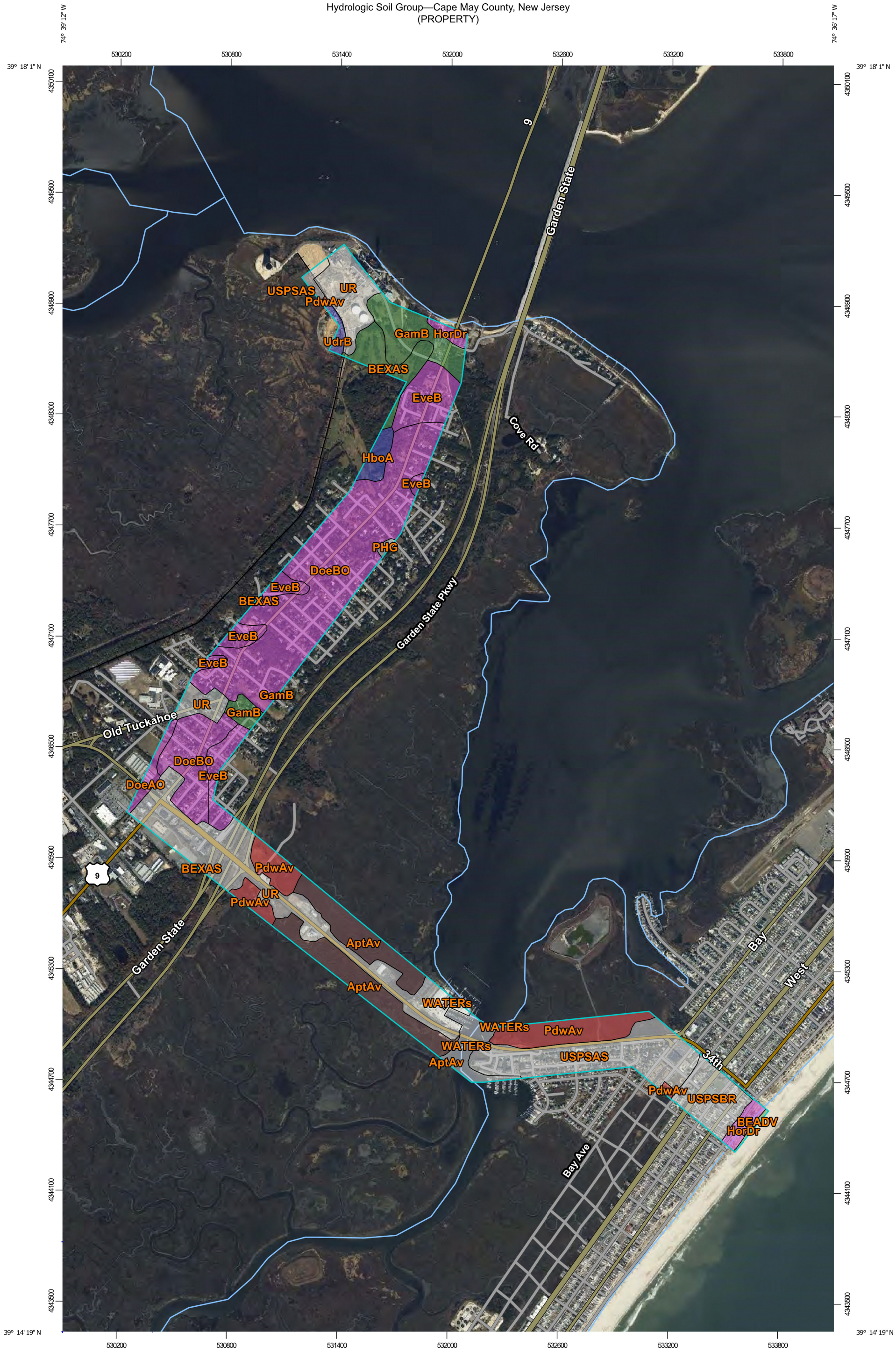
MAP NUMBER
34009C0176F

EFFECTIVE DATE
OCTOBER 5, 2017

Federal Emergency Management Agency

APPENDIX B – SOIL MAP

Hydrologic Soil Group—Cape May County, New Jersey
(PROPERTY)



Map Scale: 1:19,200 if printed on B portrait (11" x 17") sheet.

Meters: 0 250 500 1000 1500

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cape May County, New Jersey
Survey Area Data: Version 17, Aug 30, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AptAv	Appoquinimink-Transquaking-Mispillion complex, 0 to 1 percent slopes, very frequently flooded	B/D	56.0	9.0%
BEADV	Beaches, 0 to 15 percent slopes, very frequently flooded	A/D	1.1	0.2%
BEXAS	Berryland and Mullica soils, 0 to 2 percent slopes, occasionally flooded	A/D	17.9	2.9%
DoeAO	Downer sandy loam, 0 to 2 percent slopes, Northern Tidewater Area	A	6.3	1.0%
DoeBO	Downer sandy loam, 2 to 5 percent slopes, Northern Tidewater Area	A	174.7	28.2%
EveB	Evesboro sand, 0 to 5 percent slopes	A	47.1	7.6%
GamB	Galloway loamy sand, 0 to 5 percent slopes	A/D	31.8	5.1%
HboA	Hammonton sandy loam, 0 to 2 percent slopes	B	7.5	1.2%
HorDr	Hooksan sand, 2 to 15 percent slopes, rarely flooded	A	10.0	1.6%
PdwAv	Pawcatuck-Transquaking complex, 0 to 1 percent slopes, very frequently flooded	D	43.0	6.9%
PHG	Pits, sand and gravel		1.2	0.2%
UdrB	Udorthents, refuse substratum, 0 to 8 percent slopes	B	3.3	0.5%
UR	Urban land		117.8	19.0%
USPSAS	Urban land-Psamments, sulfidic substratum complex, 0 to 2 percent slopes, occasionally flooded		62.3	10.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
USPSBR	Urban land-Psamments, wet substratum complex, 0 to 2 percent slopes, rarely flooded		25.6	4.1%
WATERs	Water, saline		14.6	2.4%
Totals for Area of Interest			**620.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Ocean Wind
An Ørsted & PSEG project

BL England Structural and Building Design Supporting Calculations

7/27/2022

Re: Ocean Wind's 275/138kV BL England Substation — Civil & Structural Flood Design Calculations.

Dear Reviewer:

According to the Technical Manual (Flood Hazard Area Control Act Rules NJAC 7:13), all structures shall be designed to resist the flood loads as prescribed in NJAC 7:13 — 12.4.

As such, BL England structures and foundations will be designed to resist impact from water and debris, resist uplift, flotation, collapse, and displacement due to hydrostatic and hydrodynamic forces, resist overturning and sliding pressure, as well as pressure from the freeze/thaw cycle of the soil with design flood elevation 12ft per NAVD88, 3ft above the 100-year FEMA base flood elevation of 9ft in accordance with ASCE 7-16 Chapter 5. This design flood elevation exceeds the requirements outlined in NJAC 7:13 Method 3 which requires the design flood elevation to be 1ft above the 100-year FEMA flood elevation. A brief outline of the considered design requirements is provided below.

Impact

Impact loading due to debris during the design flood will be calculated in accordance with ASCE 7-16 Section 5.4.5 and Commentary Section C5.4.5.

Hydrostatic

Hydrostatic loads will be calculated in accordance with ASCE 7-16 Section 5.4.2. Where applicable, hydrostatic loads will be applied to the structures and foundations, increasing load with water depth using 64.0 lb/ft^3 for the density of water and applied as a resultant force acting at 1/3 of the water depth measured from grade. In cases of structures and foundations where the water depth is equal on all sides, hydrostatic loading would not be applicable.

Hydrodynamic

Hydrodynamic loads will be calculated in accordance with ASCE 7-16 Section 5.4.3. If the calculated velocity of water does not exceed 10 ft/s, hydrodynamic loads will be converted into equivalent hydrostatic loads by an equivalent surcharge depth as outlined in ASCE 7-16. Equivalent hydrostatic loads will be applied to all structures and foundations regardless of whether the water depth is equal on all sides.

Overturning, Sliding, and Freeze/Thaw

All foundations will be designed to resist overturning and sliding due to flood loading. The base of the foundations will be extended to below the frost depth or supported on non-frost-susceptible material so that the foundations are not subject to pressures due to the freeze/thaw cycle.

Sincerely,

Rachel Plank, PE
Civil/Structural Engineer
LIC No. 24GE05732600, Expires 4/30/2024
P: 475-212-5966

7/26/2022

Re: Ocean Wind's 275/138kV BL England Substation — Building Structural Flood Design Calculations.

Dear Reviewer:

According to the Technical Manual (Flood Hazard Area Control Act Rules NJAC 7:13), state flood regulations only apply to habitable buildings. Utility buildings are not classified as habitable buildings and are not required to comply with all requirements outlined in NJAC 7:13 — 12.5; however, all buildings shall be designed to resist the flood loads as prescribed in NJAC 7:13 — 12.5.

As such, BL England DRC building and control house foundations are designed for hydrostatic and hydrodynamic loads as well as buoyancy with flood water level at design flood elevation +12ft (NAVD88), 3ft above the 100-year FEMA base flood elevation of 9ft in accordance with ASCE 7-16 Chapter 5. This design flood elevation exceeds the requirements outlined in NJAC 7:13-3.4 (e) Method 3 which requires the design flood elevation to be 1ft above the 100-year FEMA flood elevation and NJAC7:13-12.5 which requires buildings to be designed for flooding at least one foot above the design flood elevation.

Finished floor elevation of both buildings are at EL.+12ft, and the water velocity is 4.57ft/s. A brief outline of the considered design requirements and conclusions is provided below.

Hydrostatic

Hydrostatic loads were applied to the foundation walls, columns and braces in design, increasing load with water depth and using 62.4lb/ft3 for the density of water. These calculations were produced based on a water level elevation of +12ft.

Hydrodynamic

In accordance with ASCE 7-10 with velocity of water less than 10ft/s, dynamic effects of moving water shall be permitted to be converted into equivalent hydrostatic load by increasing the DFE for design purposes by an equivalent surcharge depth dh on the headwater side and above the ground level only. Per BMcD analysis, dh=0.41ft for both buildings, the building vertical components are sufficient to resist the lateral loads due to flooding.

Buoyancy

Buoyancy was also considered during design. Based on current building design uplift load combinations, a minimum factor of safety of 1.67 (1/0.6) should be used. According to calculations performed by BMcD, the factor of safety associated with buoyancy is 1.75 (the buildings could sustain 1.75 times the buoyancy force applied to the structure during a flood). This factor of safety exceeds the minimum required.

Sincerely,

Nanci Buscemi, PE
Structural Engineer
LIC No. 24GE04641400 Expires 4/30/2024
P: 973-370-2960

Ocean Wind
An Ørsted & PSEG project

Oyster Creek Flood Hazard Area Engineering Report

ENGINEERING REPORT for FLOOD HAZARD AREA & RIPARIAN ZONE LINE VERIFICATION

For:

THE OYSTER CREEK SUBSTATION AND ONSHORE CABLE ROUTE

BLOCK 100, LOTS 1.05, 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06
LACEY TOWNSHIP, OCEAN COUNTY
NEW JERSEY

Ocean Wind
An Orsted & PSEG project

Applicant/Owner:

Ocean Wind

Prepared By:

E2 Project Management
2517 Route 35 Building I, Suite 101
Manasquan, New Jersey 08736

Katherine L. Hering
P. E. 24GE04226900

Digitally signed by Katherine L. Hering P. E. 24GE04226900
Date: 2022.01.19 16:35:05 -05'00'

STATE OF NEW JERSEY
KATHERINE L. HERING
No. GE42269
LICENSED
PROFESSIONAL ENGINEER

Katherine L. Hering, P.E., P.P., C.M.E.
NJPE License No. 24GE04226900

January 2022

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining and preparing the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment.

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

1.0 Executive Summary

This Flood Hazard Area and Riparian Zone Line Verification Engineering Report is being submitted as the material required to fulfill the regulatory requirements for the Flood Hazard Control Act (FHACA) Rules (N.J.A.C. 7:13-1.1 et seq.) for determining the flood hazard area design flood elevation (FHADFE), limits of the flood hazard area (FHA) and the riparian zone line for the proposed Oyster Creek Substation in Lacey Township, and the onshore electrical cable route that will run from the Oyster Creek Substation, through Lacey Township in Ocean County, to the Barnegat Bay. The cable route will continue across Island Beach State Park and connect to the offshore cable route in the Atlantic Ocean. This report serves as the Engineering Report for the application and has been prepared in accordance with the following:

- NJDEP Flood Hazard Area Control Act (FHACA) Rules (N.J.A.C. 7:13), last amended October 5, 2021; and
- NJDEP Flood Hazard Technical Manual (2018).

FHA verification is required because flood hazard areas are shown on FEMA's Flood Insurance Rate Maps (FIRMs) in the vicinity of the project area. All elevations within this report refer to the NAVD 88 vertical datum unless otherwise noted.

The proposed improvements are part of the Ocean Wind project, which is a 1 GW offshore wind farm being proposed approximately 15 miles off the coast of Atlantic City, New Jersey. An offshore substation will be constructed to collect wind turbine partial outputs from the offshore wind farm. As part of this project, two (2) circuit of offshore 230 kV sub-sea cables, also known as export cables, will make landfall in Lacey Township, New Jersey and terminate at the proposed Oyster Creek Substation (see Figures 1 and 2). The Oyster Creek Substation and the export cable routes through Lacey Township are the primary points of discussion within this report.

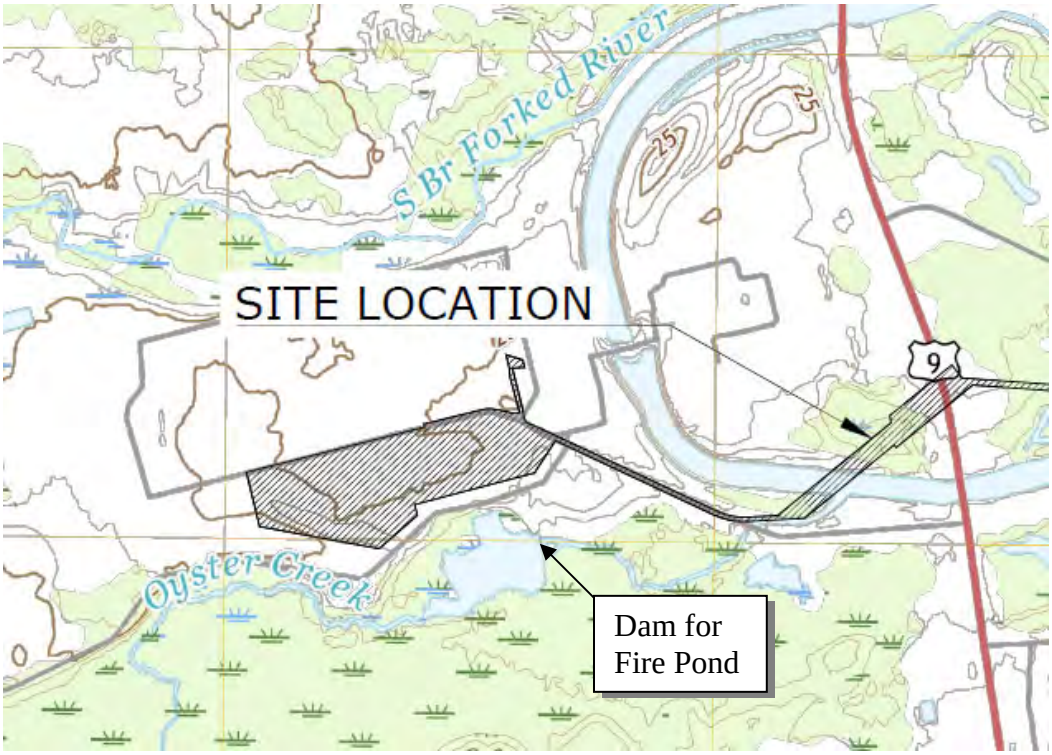
1.1 Site and Project Description

The Oyster Creek Substation is planned to be a 230/230kV high voltage alternating current (AC) substation and is proposed to be located near the decommissioned Oyster Creek Nuclear Generating Station on Block 1001, Lot 4.05 in Lacey Township, New Jersey. In general, the purpose of the substation is to transmit the power from the 230kV connection from the wind farm to the 230kV rated facility commonly used in New Jersey as well as to provide filtration and reactive compensation for power stability. The export cables will enter the proposed Oyster Creek Substation property off Discharge Drive, the private road located just to the north of the project. The cable route runs south/southeast down Discharge Drive where it changes course traveling north/northeast crossing under the Oyster Creek and New Jersey State Highway Route 9. The cable route then runs due east through undeveloped forested wetland areas where it eventually enters the Barnegat Bay. The cable route continues under the Barnegat Bay, makes landfall at Island Beach State Park, and then enters the Atlantic Ocean to connect to the offshore wind farm. (See Figures 1 through 2C).

Oyster Creek Substation Site

The Oyster Creek Substation will be located on Block 1001, Lot 4.05, which is a 31.49-acre parcel located behind/to the west of the decommissioned Oyster Creek Nuclear Generating Station located off New Jersey State Highway Route 9. Block 1001, Lot 4.05 is generally bound by Discharge Drive to the north and east, the Oyster Creek to the south, and undeveloped open space to the west, beyond which is the Garden State Parkway. The portion of the site to be disturbed for the construction of the Oyster Creek Substation is approximately 12.14 acres, with existing grades being generally flat varying from elevation 21 to elevation 27 (NAVD 88).

As depicted on the USGS map below, the Oyster Creek is located directly to the south of the proposed Oyster Creek Substation. As part of the Oyster Creek Nuclear Power Plant operations, a dam was installed on the Oyster Creek to impound water as a source of water for emergency firefighting. Below this dam, the Oyster Creek is tidally influenced, for which this application seeks FHA verification under Method 2. Above the dam, the Oyster Creek is fluvial and mapped by FEMA, for which this application seeks FHA verification under Method 3.



Onshore Export Cable Route

The underground onshore export cable will be installed between the Oyster Creek Substation and the Barnegat Bay within undeveloped portions of private property in Lacey Township, New Jersey, as shown on Figures 1 through 2C.

As stated previously, the proposed Oyster Creek Substation and export cable route are located in flood hazard areas identified on FEMA FIRMs. This application is being submitted for NJDEP verification of the flood hazard areas to determine what activities proposed by the project will be regulated by the NJDEP under the FHACA rules.

2.0 Regulatory Requirements

2.1 Flood Hazard Area Verification Method 2 – FEMA Tidal Method

This application requests FHA Verification under Method 2 (N.J.A.C. 7:13-3.4(d)), FEMA delineation of tidally-influenced water bodies. Table 2-1 lists the effective FEMA FIRMs that cover the Oyster Creek Substation and export cable route which were referenced to determine the location of floodways and flood hazard areas that will be impacted by this project. It should be noted that the project area has not been studied or delineated by the NJDEP. For regulated waters for which a NJDEP delineation does not exist, the flood hazard area and floodway can be determined using Method 2 for tidally influenced surface waters mapped on FEMA FIRMs. If both a NJDEP delineated study (Method 1) and a FEMA flood insurance study (Method 2) are available for a regulated water, the flood hazard area and/or floodway are determined based on whichever method results in a higher flood hazard area design flood elevation (FHADFE) and wider floodway limit.

Table 2-1 – FEMA FIRM Maps

Location	**Map**			**NJDEP Delineated Map**
	Type	**Number**	**Map Date**	
Lacey Township, Ocean County, NJ; Starting at Block 1001, 4.05 to the NJ Route 9 crossing over the Oyster Creek	Preliminary Map	34029C0412G	03/28/2014	None
Lacey Township, Ocean County, NJ; Starting at NJ Route 9 crossing over the Oyster Creek to the eastern end of Block 100, Lot 1.05	Preliminary Map	34029C0404G	03/28/2014	None
Lacey Township, Ocean County, NJ; Starting at the eastern end of Block 100, Lot 1.05 to the eastern end of Block 100, Lot 1.06.	Preliminary Map	34029C0408G	03/28/2014	None
Lacey Township, Ocean County, NJ; Starting at the eastern end of Block 100, Lot 1.06 to the Barnegat Bay	Preliminary Map	34029C0416G	01/30/2015	None
Township of Berkeley, Ocean County, NJ; Block 1750, Lot 1	Preliminary Map	34029C0427G	03/28/2014	None

Based on the FEMA FIRMs listed in Table 2-1, the project area below/east of the Oyster Creek dam lies within the Zone AE – "Base Flood Elevations" determined for the tidally influenced portion of the Oyster Creek as well as the Barnegat Bay and Atlantic Ocean, which are also tidally influenced throughout the entirety of the water body (see Figures 4A, 4B, and Appendix A). Since all the regulated waterbodies are tidally influenced, the flood hazard area design flood elevation is the same as the 100-year base flood elevation in accordance with N.J.A.C. 7:13-3.4(d)1. Table 2-2 below provides the 100-year base flood elevation and flood hazard area design flood elevations (FHADFE) located throughout the project area.

Table 2-2 – 100-Base Flood and FHA Design Flood Elevation

Location/FIRM Map Number	Regulated Water Body	FEMA 100-Year Base Flood (NAVD 88)	FHADFE
Lacey Township, Ocean County, NJ; Starting at Block 1001, 4.05 to the NJ Route 9 crossing over the Forked River / 34029C0412G	Oyster Creek (Tidally Influenced Portion)	7	7
Lacey Township, Ocean County, NJ; Starting at NJ Route 9 crossing over the Oyster Creek to the eastern end of Block 100, Lot 1.05 / 34029C0404G	Oyster Creek (Tidally Influenced Portion)	7	7
Lacey Township, Ocean County, NJ; Starting at the eastern end of Block 100, Lot 1.05 to the eastern end of Block 100, Lot 1.06/ 34029C0408G	Oyster Creek (Tidally Influenced Portion)	7	7
Lacey Township, Ocean County, NJ; Starting at the eastern end of Block 100, Lot 1.05 to the eastern end of Block 100, Lot 1.06/ 34029C0408G	Barnegat Bay	8	8
Lacey Township, Ocean County, NJ; Starting at the eastern end of Block 100, Lot 1.05 to the eastern end of Block 100, Lot 1.06/ 34029C0408G	Barnegat Bay	7	7
Lacey Township, Ocean County, NJ; Starting at the eastern end of Block 100, Lot 1.06 to the Barnegat Bay / 34029C0416G	Barnegat Bay	10	10
Township of Berkeley, Ocean County, NJ; Block 1750, Lot 1	Atlantic Ocean	7	7

Township of Berkeley, Ocean County, NJ; Block 1750, Lot 1	Atlantic Ocean	13	13
Township of Berkeley, Ocean County, NJ; Block 1750, Lot 1	Atlantic Ocean	15	15

The 100-year base flood elevations and FHADFEs listed above were used to delineate the flood hazard areas for the project based on local topography. Where local/surveyed topography is not available beyond the project limits, the FHA line from the effective FEMA FIRMs becomes the FHA for verification. This delineation is shown on Figures 5 through 10.

2.2 Flood Hazard Area Verification Method 3 – FEMA Fluvial Method

This application also requests FHA Verification under Method 3 (N.J.A.C. 7:13-3.4(e)), FEMA delineation of fluvial water bodies. For regulated waters for which a NJDEP delineation does not exist, the flood hazard area and floodway can be determined using Method 3 for fluvial waters mapped on FEMA FIRMs. If both a NJDEP delineated study (Method 1) and a FEMA flood insurance study (Method 3) are available for a regulated water, the flood hazard area and/or floodway are determined based on whichever method results in a higher flood hazard area design flood elevation (FHADFE) and wider floodway limit. Under Method 3, the FHADFE is equal to one foot above the FEMA 100-year flood elevation. Table 2-3 lists the effective FEMA FIRM that covers the proposed Oyster Creek Substation and area upstream of the dam, along with the 100-year base flood elevation and FHADFE.

Table 2-3 – 100-Base Flood and FHA Design Flood Elevation

Location/FIRM Map Number	Regulated Water Body	FEMA 100-Year Base Flood (NAVD 88)	FHADFE
Lacey Township, Ocean County, NJ; Upstream of fire water pond dam/ 34029C0412G	Oyster Creek (Fluvial Portion)	6	7

3.0 Determining the Riparian Zone

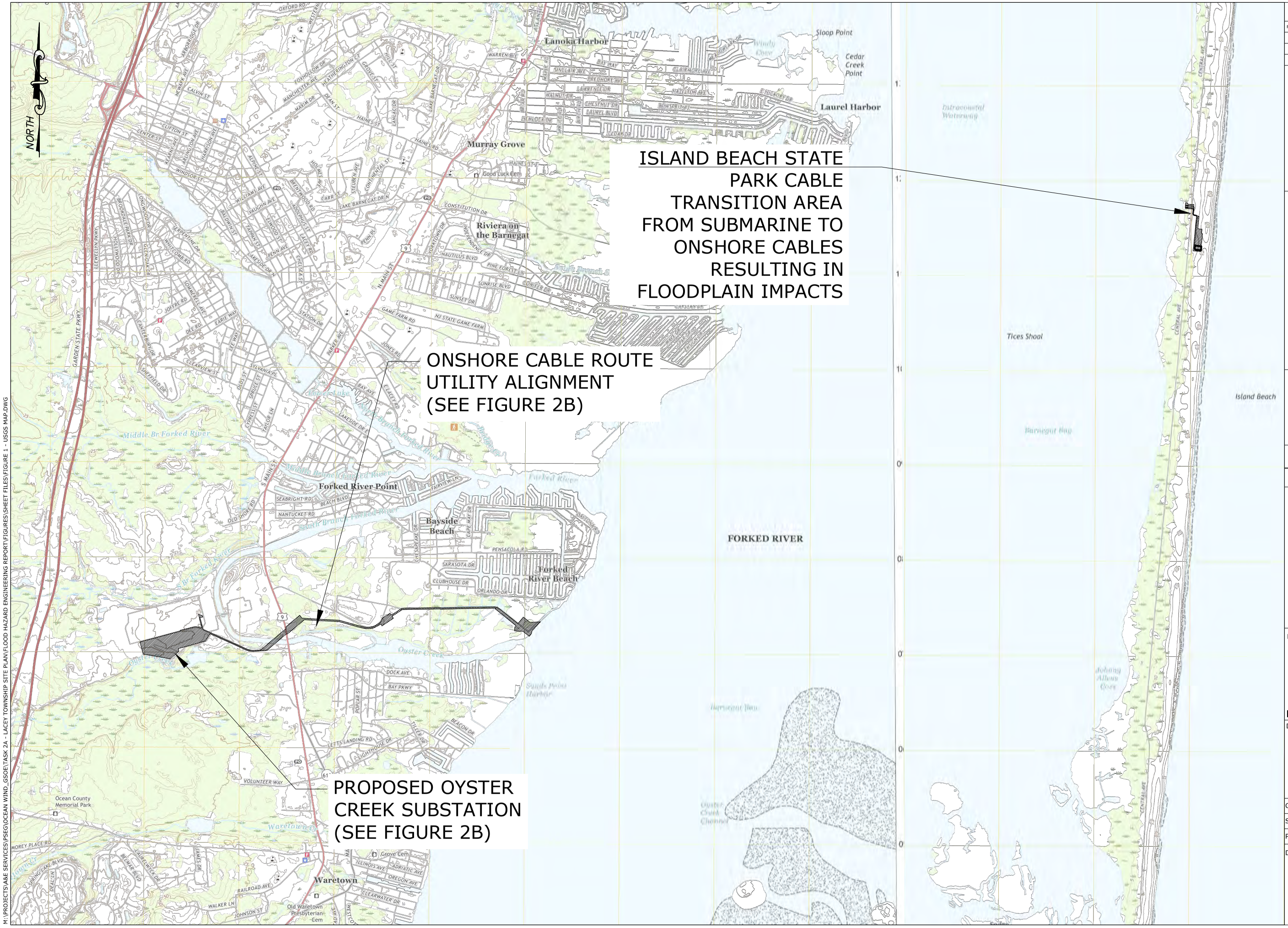
The riparian zone has been depicted on the permitting plans in accordance with N.J.A.C. 7:13-4.1(c)3. According to the NJDEP GIS digital data layer entitled, “Surface Water Quality Classifications”, the Oyster Creek is classified as a FW2-NT/SE1. It is not utilized for trout production or trout maintenance. Therefore, the width of the riparian zone is 50 feet, as measured landward from the top of bank, or the edge of open water where no discernable top of bank exists.

4.0 Conclusion

The primary purpose of the FHA verification application is to establish the limits of the FHA along the Oyster Creek, the Barnegat Bay, and the Atlantic Ocean. Secondly, this application also requests verification of the riparian zone along the Oyster Creek, as measured outward fifty feet (50') from the top of bank upstream of the dam on the creak.

~END~

FIGURES



M:\PROJECTS\A&E SERVICES\PSEG\OCEAN WIND_GSOE\TASK 2A - LACEY TOWNSHIP SITE PLAN\FLOOD HAZARD ENGINEERING REPORT\FIGURES\SHEET FILES\FIGURE 1 - USGS MAP.DWG

SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK. BY

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N.J. ENGINEERING CERTIFICATE OF AUTHORIZATION No. 24GA28118200

I CERTIFY THAT THESE PLANS HAVE BEEN PREPARED UNDER MY SUPERVISION

PROJECT NAME

OCEAN WIND OFFSHORE WIND
OYSTER CREEK ONSHORE SUBSTATION AND
ONSHORE CABLE ROUTE
LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

USGS SITE LOCATION MAP

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: NTS	
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

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FIG 1

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BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

AERIAL SITE LOCATION MAP

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: 1" = 3000'	
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 2A

M:\PROJECTS\A&E SERVICES\PSEG\OCEAN WIND_GSOE\TASK 2A - LACEY TOWNSHIP SITE PLAN\FLOOD HAZARD ENGINEERING REPORT\FIGURES\SHEET FILES\FIGURE 2 - AERIAL.DWG

M:\PROJECTS\A&E SERVICES\PSEG\OCEAN WIND_GSOE\TASK 2A - LACEY TOWNSHIP SITE PLAN\FLOOD HAZARD ENGINEERING REPORT\FIGURES\SHEET FILES\FIGURE 2 - AERIAL.DWG

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SUBSTATION AND
ONSHORE CABLE ROUTE
LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

AERIAL SITE LOCATION MAP

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: 1" = 1000'	
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 2B

M:\PROJECTS\A&E SERVICES\PSEG\OCEAN WIND_GSOE\TASK 2A - LACEY TOWNSHIP SITE PLAN\FLOOD HAZARD ENGINEERING REPORT\FIGURES\SHEET FILES\FIGURE 2 - AERIAL.DWG

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LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

AERIAL SITE LOCATION MAP

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: 1" = 250'	
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 2C

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ONSHORE CABLE ROUTE
LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

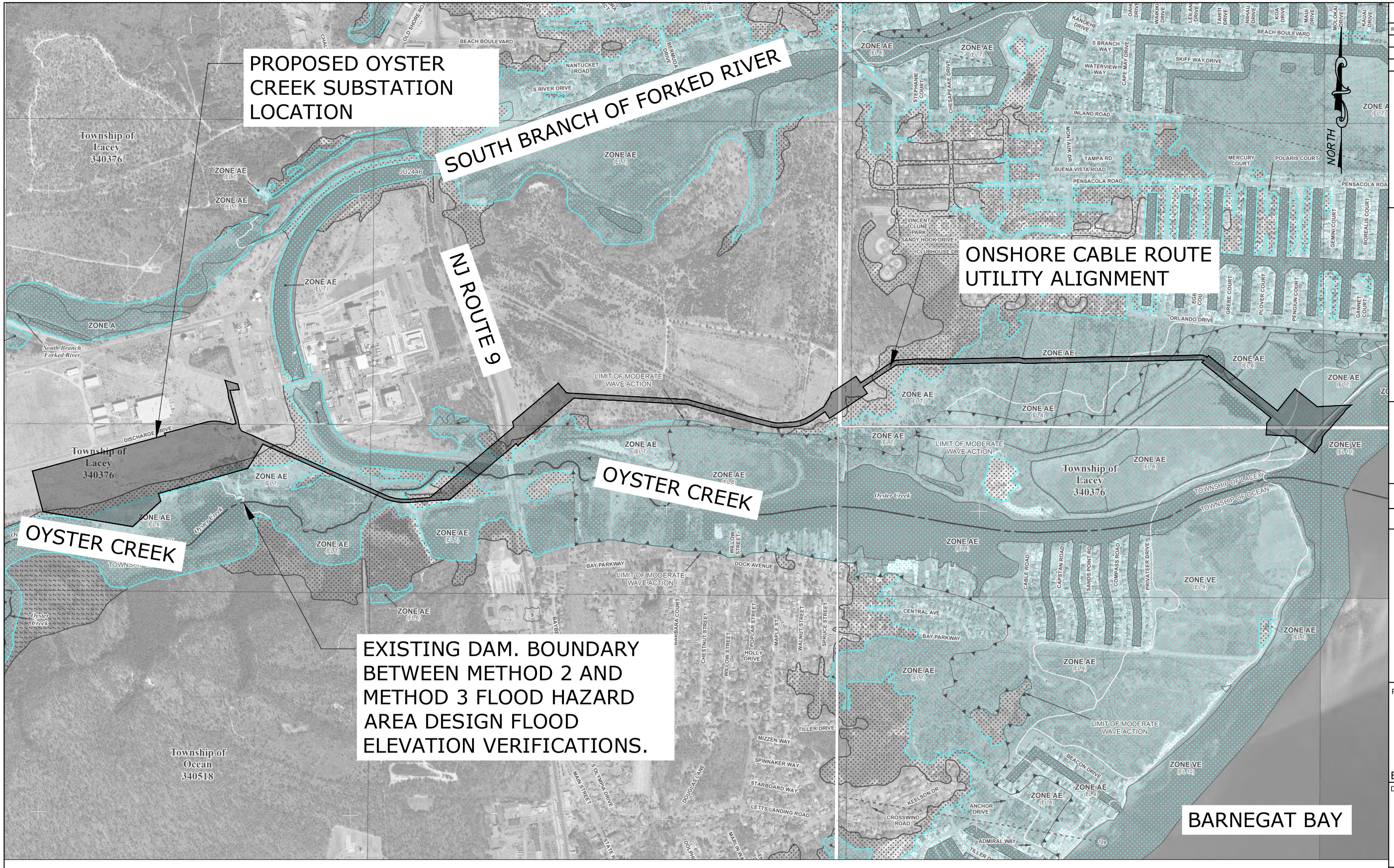
WATERSHED MANAGEMENT AREA MAP

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: 1" = 5000'	
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 3

M:\PROJECTS\A&E SERVICES\PSEG\OCEAN WIND_GSOE\TASK 2A - LACEY TOWNSHIP SITE PLAN\FLOOD HAZARD ENGINEERING REPORT\FIGURES\SHEET FILES\FIGURE 3 - WMA MAP.DWG



REFERENCES:
THE BASE MAP SHOWN HEREIN IS FROM PRELIMINARY FLOOD INSURANCE RATE MAPS NUMBER 34029C0404G, 34029C0408G, AND 34029C0412G DATED MARCH 28, 2014 AND FIRM MAP NUMBER 34029C0416G DATED JANUARY 30, 2015. THE PRELIMINARY MAPS ARE SHOWN HEREIN AS THEY SHOW HIGHER BASE FLOOD ELEVATIONS THAN THE RESPECTIVE EFFECTIVE MAPS.

0 500 1000 2000

SCALE: 1"=1000'

SCHEDULE OF REVISIONS

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LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

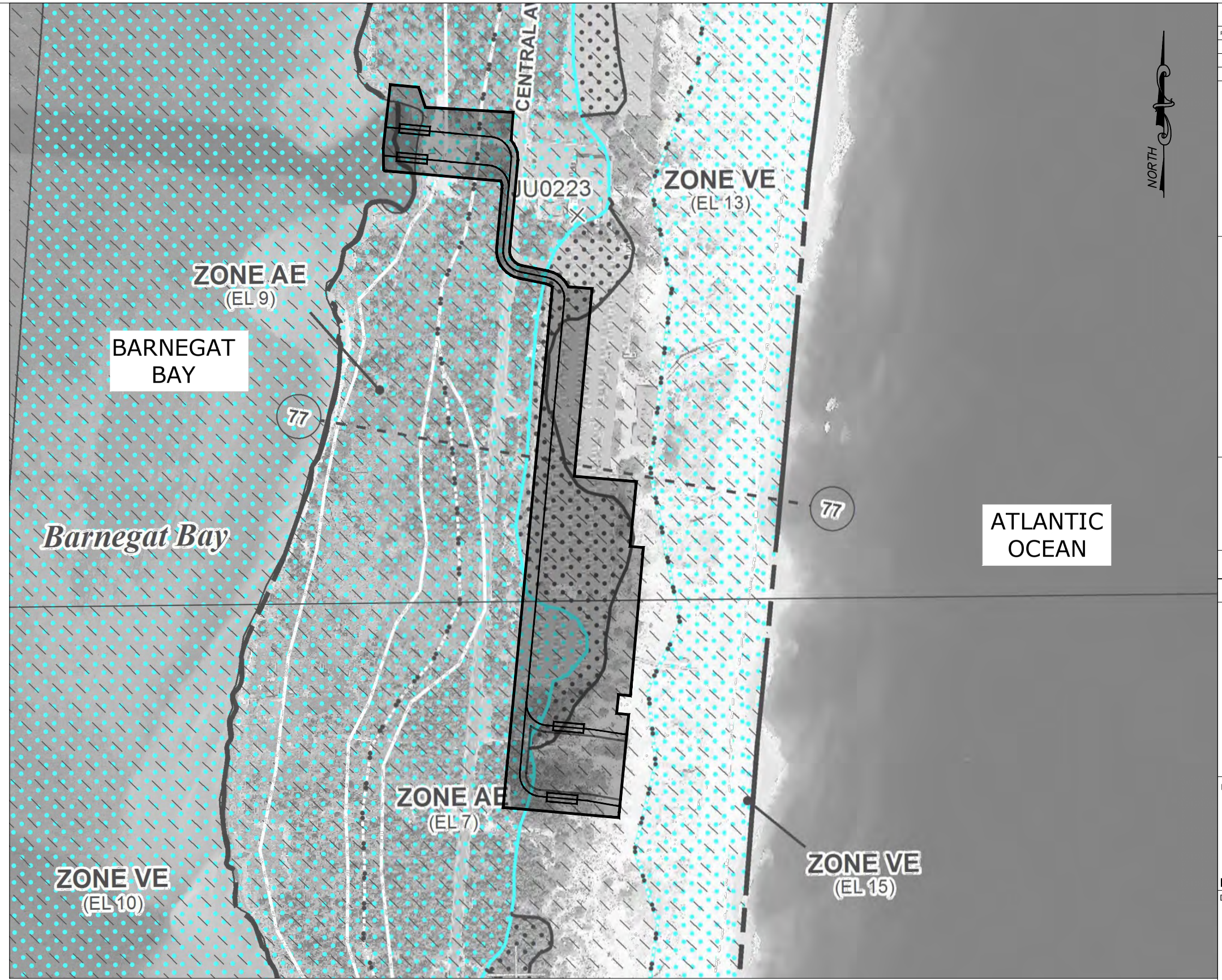
DRAWING TITLE

FEMA FLOOD MAP
(SUBSTATION AND
CABLE ROUTE)

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: 1" = 1000'	
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 4A



REFERENCES:
THE BASE MAP SHOWN HEREIN IS FROM PRELIMINARY FLOOD INSURANCE RATE MAP NUMBER 34029C0427G DATED MARCH 28, 2014. THE PRELIMINARY MAPS ARE SHOWN HEREIN AS THEY SHOW HIGHER BASE FLOOD ELEVATIONS THAN THE RESPECTIVE EFFECTIVE MAPS.

0 125 250 500
SCALE: 1"=250'

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ONSHORE CABLE ROUTE
LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE
FEMA FLOOD MAP
(ISLAND BEACH STATE PARK SUBMARINE TO LAND CABLE TRANSITION)

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: 1" = 250'	
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.
FIG 4B

MATCH LINE SEE FIGURE 6

NORTH

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LICENSED PROFESSIONAL ENGINEER

KATHERINE L. HERING, P.E. N.J. NO. 24GE04226900
LICENSED PROFESSIONAL ENGINEER

OCEAN WIND OFFSHORE WIND
OYSTER CREEK ONSHORE SUBSTATION
AND ONSHORE CABLE ROUTE
LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

FLOOD HAZARD AREA DELINEATION PLAN

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SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 5

LEGEND

- LIMIT OF DISTURBANCE
- CHANGE IN BASE FLOOD ELEVATION
- LIMIT OF MODERATE WAVE ACTION
- LIMIT OF SURVEY TOPOGRAPHY
- EXISTING CONTOUR
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 3)
- APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4A

REFERENCES:

1. THE FLOOD HAZARD AREA DESIGN FLOOD ELEVATIONS DETERMINED VIA METHOD 2 FEMA TIDAL METHOD SHOWN HEREIN WERE DETERMINED FROM PRELIMINARY FLOOD INSURANCE RATE MAP NUMBER 34029C0412G, DATED MARCH 28, 2014. THE PRELIMINARY MAPS ARE SHOWN HEREIN AS THEY SHOW HIGHER BASE FLOOD ELEVATIONS THAN THE RESPECTIVE EFFECTIVE MAPS.
2. OYSTER CREEK SUBSTATION ONSHORE SUBSTATION GENERAL ARRANGEMENT PLAN PREPARED BY BURNS AND MCDONNELL.

SURVEY REFERENCES:

1. TOPOGRAPHIC DATA FOR THE OYSTER CREEK SUBSTATION AREA AND CABLE ROUTE ALIGNMENT WAS OBTAINED FROM A MAP ENTITLED "OFFSHORE WIND, OYSTER CREEK - FARMLAND ROUTE, EXISTING CONDITIONS." PREPARED BY PSEG SERVICES CORPORATION, SURVEYS & MAPPING, 80 PARK PLAZA, T6B, NEWARK, N.J. 07102, AND DATED SEPTEMBER 30, 2021 AND REVISED ON JANUARY 7, 2022.
2. TOPOGRAPHIC DATA FOR THE OYSTER CREEK SUBSTATION AREA AND CABLE ROUTE ALIGNMENT WAS OBTAINED FROM AERIAL TOPOGRAPHY PREPARED BY ROBINSON AERIAL SURVEYS INC., 1 EDGEVIEW DRIVE, HACKETTSTOWN, N.J. 07840 FROM 5.0 CM GROUND SAMPLING DISTANCE IMAGERY CAPTURED ON JUNE 18, 2021.
3. TOPOGRAPHIC DATA FOR ISLAND BEACH STATE PARK AREA WAS OBTAINED FROM A MAP ENTITLED "PUBLIC SERVICE ELECTRIC & GAS CO., PRJ 19048 OFFSHORE WIND PROJECT, ISLAND BEACH STATE PARK, BERKLEY TOWNSHIP, OCEAN COUNTY, GREEN ACRES SURVEY" PREPARED BY FRALINGER ENGINEERING, 629 SHILOH PIKE, BRIDGETON, N.J. 08302 AND DATED SEPTEMBER 30, 2021 AND REVISED ON JANUARY 7, 2022.
4. TOPOGRAPHIC DATA FOR ISLAND BEACH STATE PARK AREA WAS OBTAINED FROM AERIAL TOPOGRAPHY PREPARED BY ROBINSON AERIAL SURVEYS INC., 1 EDGEVIEW DRIVE, HACKETTSTOWN, N.J. 07840 FROM 5.0 CM GROUND SAMPLING DISTANCE IMAGERY CAPTURED ON JUNE 30, 2021.

0 50 100 200
SCALE: 1"=100'

MATCH LINE SEE FIGURE 5

MATCH LINE SEE FIGURE 7

APPROXIMATE LIMIT OF DISTURBANCE

LIMIT OF SURVEYED TOPOGRAPHY, TYP.

NJ ROUTE 9

OYSTER CREEK

ZONE AE (EL 8)

ZONE AE (EL 7)

EXTENT OF FLOOD HAZARD AREA DELINEATED VIA METHOD 2 (FEMA TIDAL METHOD) DESIGN FLOOD ELEVATION: ELEVATION 7.00 (SEE FIGURE 4A FOR REFERENCE)

APPROXIMATE LIMIT OF MODERATE WAVE ACTION (SEE FIGURE 4A FOR REFERENCE)

NORTH

REFERENCES:

1. THE FLOOD HAZARD AREA DESIGN FLOOD ELEVATIONS DETERMINED VIA METHOD 2 FEMA TIDAL METHOD SHOWN HEREIN WERE DETERMINED FROM PRELIMINARY FLOOD INSURANCE RATE MAP NUMBER 34029C0404G AND 34029C0412G DATED MARCH 28, 2014. THE PRELIMINARY MAPS ARE SHOWN HEREIN AS THEY SHOW HIGHER BASE FLOOD ELEVATIONS THAN THE RESPECTIVE EFFECTIVE MAPS.
2. OYSTER CREEK SUBSTATION ONSHORE SUBSTATION GENERAL ARRANGEMENT PLAN PREPARED BY BURNS AND MCDONNELL.

LEGEND

- LIMIT OF DISTURBANCE
- CHANGE IN BASE FLOOD ELEVATION
- LIMIT OF MODERATE WAVE ACTION
- LIMIT OF SURVEY TOPOGRAPHY
- EXISTING CONTOUR
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 3)
- APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4A

SURVEY REFERENCES:

1. TOPOGRAPHIC DATA FOR THE OYSTER CREEK SUBSTATION AREA AND CABLE ROUTE ALIGNMENT WAS OBTAINED FROM A MAP ENTITLED "OFFSHORE WIND, OYSTER CREEK - FARMLAND ROUTE, EXISTING CONDITIONS." PREPARED BY PSEG SERVICES CORPORATION, SURVEYS & MAPPING, 80 PARK PLAZA, T6B, NEWARK, N.J. 07102, AND DATED SEPTEMBER 30, 2021 AND REVISED ON JANUARY 7, 2022.
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4. TOPOGRAPHIC DATA FOR ISLAND BEACH STATE PARK AREA WAS OBTAINED FROM AERIAL TOPOGRAPHY PREPARED BY ROBINSON AERIAL SURVEYS INC., 1 EDGEVIEW DRIVE, HACKETTSTOWN, N.J. 07840 FROM 5.0 CM GROUND SAMPLING DISTANCE IMAGERY CAPTURED ON JUNE 30, 2021.

0 50 100 200

SCALE: 1"=100'

SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK. BY

E 2 PROJECT MANAGEMENT LLC

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KATHERINE L. HERING, P.E. N.J. NO. 24GE04226900
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LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

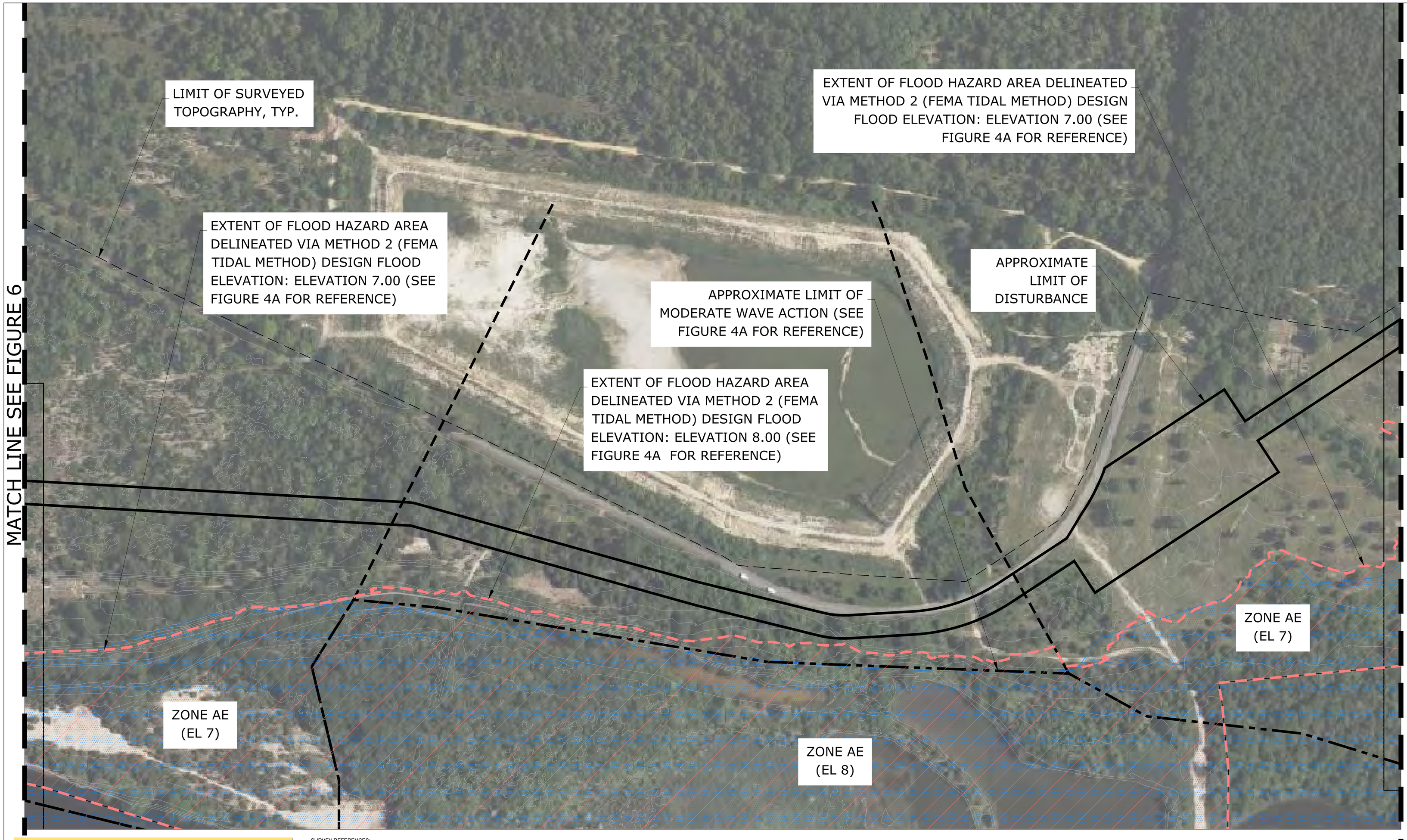
DRAWING TITLE

FLOOD HAZARD AREA DELINEATION PLAN

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 6



LEGEND

- LIMIT OF DISTURBANCE
- CHANGE IN BASE FLOOD ELEVATION
- LIMIT OF MODERATE WAVE ACTION
- LIMIT OF SURVEY TOPOGRAPHY
- EXISTING CONTOUR
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 3)
- APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4A

SURVEY REFERENCES:

1. TOPOGRAPHIC DATA FOR THE OYSTER CREEK SUBSTATION AREA AND CABLE ROUTE ALIGNMENT WAS OBTAINED FROM A MAP ENTITLED "OFFSHORE WIND, OYSTER CREEK - FARMLAND ROUTE, EXISTING CONDITIONS." PREPARED BY PSEG SERVICES CORPORATION, SURVEYS & MAPPING, 80 PARK PLAZA, T6B, NEWARK, N.J. 07102, AND DATED SEPTEMBER 30, 2021 AND REVISED ON JANUARY 7, 2022.
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REFERENCES:

1. THE FLOOD HAZARD AREA DESIGN FLOOD ELEVATIONS DETERMINED VIA METHOD 2 FEMA TIDAL METHOD SHOWN HEREIN WERE DETERMINED FROM PRELIMINARY FLOOD INSURANCE RATE MAP NUMBER 34029C0404G AND 34029C0412G DATED MARCH 28, 2014. THE PRELIMINARY MAPS ARE SHOWN HEREIN AS THEY SHOW HIGHER BASE FLOOD ELEVATIONS THAN THE RESPECTIVE EFFECTIVE MAPS.
2. OYSTER CREEK SUBSTATION ONSHORE SUBSTATION GENERAL ARRANGEMENT PLAN PREPARED BY BURNS AND MCDONNELL.

0 50 100 200
SCALE: 1"=100'

NORTH

SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK. BY

E 2 PROJECT MANAGEMENT LLC
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I CERTIFY THAT THESE PLANS HAVE BEEN PREPARED UNDER MY SUPERVISION

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KATHERINE L. HERING
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LICENSED PROFESSIONAL ENGINEER

KATHERINE L. HERING, P.E. N.J. NO. 24GE04226900
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OCEAN WIND OFFSHORE WIND
OYSTER CREEK ONSHORE SUBSTATION
AND ONSHORE CABLE ROUTE
LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

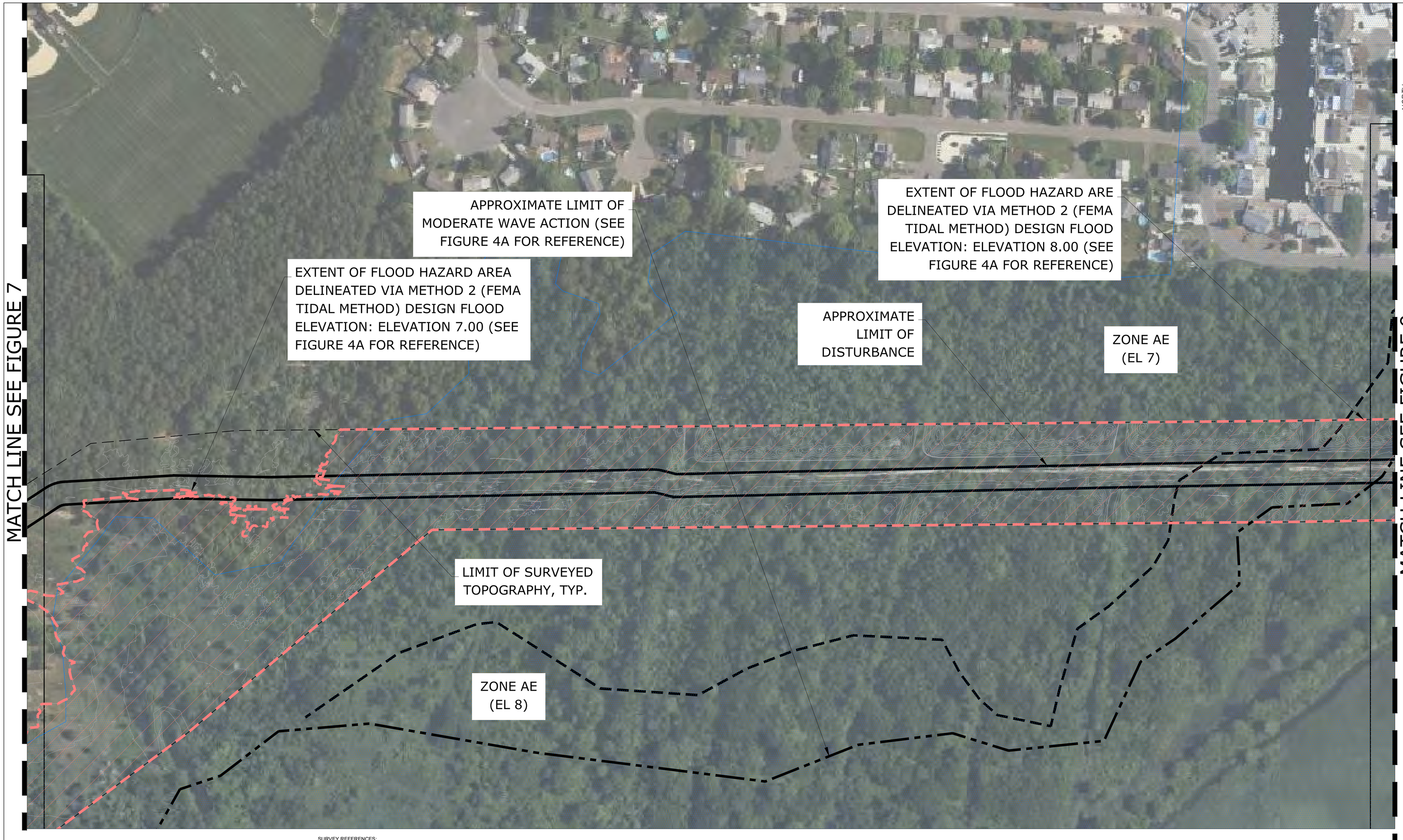
FLOOD HAZARD AREA DELINEATION PLAN

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 7

X:\PROJECTS\MA OSW\DOCS\PROGRAMS\ONSHORE\ENGINEERING\REPORTS\ISSUED SHEET FILES\FIGURE 7 - FLOOD HAZARD AREA MAP.DWG



LEGEND
LIMIT OF DISTURBANCE
CHANGE IN BASE FLOOD ELEVATION
LIMIT OF MODERATE WAVE ACTION
LIMIT OF SURVEY TOPOGRAPHY
EXISTING CONTOUR
FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
FLOOD HAZARD AREA (DETERMINE VIA METHOD 3)
APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4A

REFERENCES:

1. THE FLOOD HAZARD AREA DESIGN FLOOD ELEVATIONS DETERMINED VIA METHOD 2 FEMA TIDAL METHOD SHOWN HEREIN WERE DETERMINED FROM PRELIMINARY FLOOD INSURANCE RATE MAP NUMBER 34029C0408G DATED MARCH 28, 2014. THE PRELIMINARY MAPS ARE SHOWN HEREIN AS THEY SHOW HIGHER BASE FLOOD ELEVATIONS THAN THE RESPECTIVE EFFECTIVE MAPS
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3. TOPOGRAPHIC DATA FOR ISLAND BEACH STATE PARK AREA WAS OBTAINED FROM A MAP ENTITLED "PUBLIC SERVICE ELECTRIC & GAS CO., PRJ 19048 OFFSHORE WIND PROJECT, ISLAND BEACH STATE PARK, BERKLEY TOWNSHIP, OCEAN COUNTY, GREEN ACRES SURVEY" PREPARED BY FRALINGER ENGINEERING, 629 SHILOH PIKE, BRIDGETON, N.J. 08302 AND DATED SEPTEMBER 30, 2021 AND REVISED ON JANUARY 7, 2022.
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0 50 100 200
SCALE: 1"=100'

SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK. BY

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87 HIBERNIA AVENUE
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PHONE: (973) 299-5200
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KATHERINE L. HERING
No. GE42269
LICENSED PROFESSIONAL ENGINEER

KATHERINE L. HERING, P.E. N.J. NO. 24GE04226900
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OCEAN WIND OFFSHORE WIND
OYSTER CREEK ONSHORE SUBSTATION
AND ONSHORE CABLE ROUTE
LACEY TOWNSHIP, NEW JERSEY
BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

FLOOD HAZARD AREA
DELINEATION PLAN

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 8

MATCH LINE SEE FIGURE 8

APPROXIMATE LIMIT OF MODERATE WAVE ACTION (SEE FIGURE 4A FOR REFERENCE)

EXTENT OF FLOOD HAZARD AREA DELINEATED VIA METHOD 2 (FEMA TIDAL METHOD) DESIGN FLOOD ELEVATION: ELEVATION 8.00 (SEE FIGURE 4A FOR REFERENCE)

APPROXIMATE LIMIT OF DISTURBANCE

ZONE AE (EL 8)

ZONE AE (EL 7)

EXTENT OF FLOOD HAZARD AREA DELINEATED VIA METHOD 2 (FEMA TIDAL METHOD) DESIGN FLOOD ELEVATION: ELEVATION 7.00 (SEE FIGURE 4A FOR REFERENCE)

ZONE AE (EL 10)

BARNEGAT BAY

EXTENT OF FLOOD HAZARD AREA DELINEATED VIA METHOD 2 (FEMA TIDAL METHOD) DESIGN FLOOD ELEVATION: ELEVATION 10.00 (SEE FIGURE 4A FOR REFERENCE)

LIMIT OF SURVEYED TOPOGRAPHY, TYP.

NORTH

LEGEND
LIMIT OF DISTURBANCE
CHANGE IN BASE FLOOD ELEVATION
LIMIT OF MODERATE WAVE ACTION
LIMIT OF SURVEY TOPOGRAPHY
EXISTING CONTOUR
FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
FLOOD HAZARD AREA (DETERMINE VIA METHOD 3)
APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4A

REFERENCES:

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2. OYSTER CREEK SUBSTATION ONSHORE SUBSTATION GENERAL ARRANGEMENT PLAN PREPARED BY BURNS AND MCDONNELL.

SURVEY REFERENCES:

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0 50 100 200
SCALE: 1"=100'

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BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

FLOOD HAZARD AREA DELINEATION PLAN

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 9

NORTH

SCHEDULE OF REVISIONS

REV.	DATE	DESCRIPTION OF CHANGES	DRAWN BY	CHK. BY

LEGEND

- LIMIT OF DISTURBANCE
- CHANGE IN BASE FLOOD ELEVATION
- LIMIT OF MODERATE WAVE ACTION
- LIMIT OF SURVEY TOPOGRAPHY
- EXISTING CONTOUR
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 2)
- FLOOD HAZARD AREA (DETERMINE VIA METHOD 3)
- APPROXIMATE EXTENT OF ZONE 'AE' BASE FLOOD ELEVATIONS DETERMINED PER FEMA MAPPING SEE FIGURE 4B
- APPROXIMATE EXTENT OF ZONE 'VE' COASTAL FLOOD ZONE WITH VELOCITY HAZARD (WAVE ACTION) BASE FLOOD ELEVATIONS DETERMINE DETERMINED PER FEMA MAPPING SEE FIGURE 4B

SURVEY REFERENCES:

1. TOPOGRAPHIC DATA FOR THE OYSTER CREEK SUBSTATION AREA AND CABLE ROUTE ALIGNMENT WAS OBTAINED FROM A MAP ENTITLED "OFFSHORE WIND, OYSTER CREEK - FARMLAND ROUTE, EXISTING CONDITIONS." PREPARED BY PSEG SERVICES CORPORATION, SURVEYS & MAPPING, 80 PARK PLAZA, T6B, NEWARK, N.J. 07102, AND DATED SEPTEMBER 30, 2021 AND REVISED ON JANUARY 7, 2022.
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BLOCK 100, LOTS 1.05 AND 1.06
BLOCK 1001, LOTS 4.02, 4.05, 4.06

DRAWING TITLE

FLOOD HAZARD AREA DELINEATION PLAN

CHECKED BY: ENS	DRAWN BY: ENS
SCALE: AS SHOWN	SHEET NO:
PROJECT #: P-21-58-01	FIRST ISSUE: 01/13/2022

DRAWING NO.

FIG 10

APPENDIX A – FEMA FLOOD MAPS

NOTES TO USERS

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

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

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

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

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

The **projection** used in the preparation of this map was New Jersey State Plane (FIPS Zone 2900). The **horizontal datum** was North America Datum 1983 (NAD 83), Geodetic Reference System 1980 (GRS 80) spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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

Base map information shown on this FIRM was derived from New Jersey Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS). This information was derived from digital orthophotos produced at a scale of 1:2400 (1"=200') with a 1 foot pixel resolutions from photography dated 2012.

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

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

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

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

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

LEGEND

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

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

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

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 2976000mN — 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- ● M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 29, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0412G

FIRM

FLOOD INSURANCE RATE MAP

OCEAN COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 412 OF 660

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LACEY, TOWNSHIP OF	340376	0412	G
OCEAN, TOWNSHIP OF	340518	0412	G

PRELIMINARY
MARCH 28, 2014

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

MAP NUMBER 34029C0412G

MAP REVISED

Federal Emergency Management Agency

NOTES TO USERS

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

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

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

The **projection** used in the preparation of this map was New Jersey State Plane (FIPS Zone 2900). The **horizontal datum** was North America Datum 1983 (NAD 83), Geodetic Reference System 1980 (GRS 80) spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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

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

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

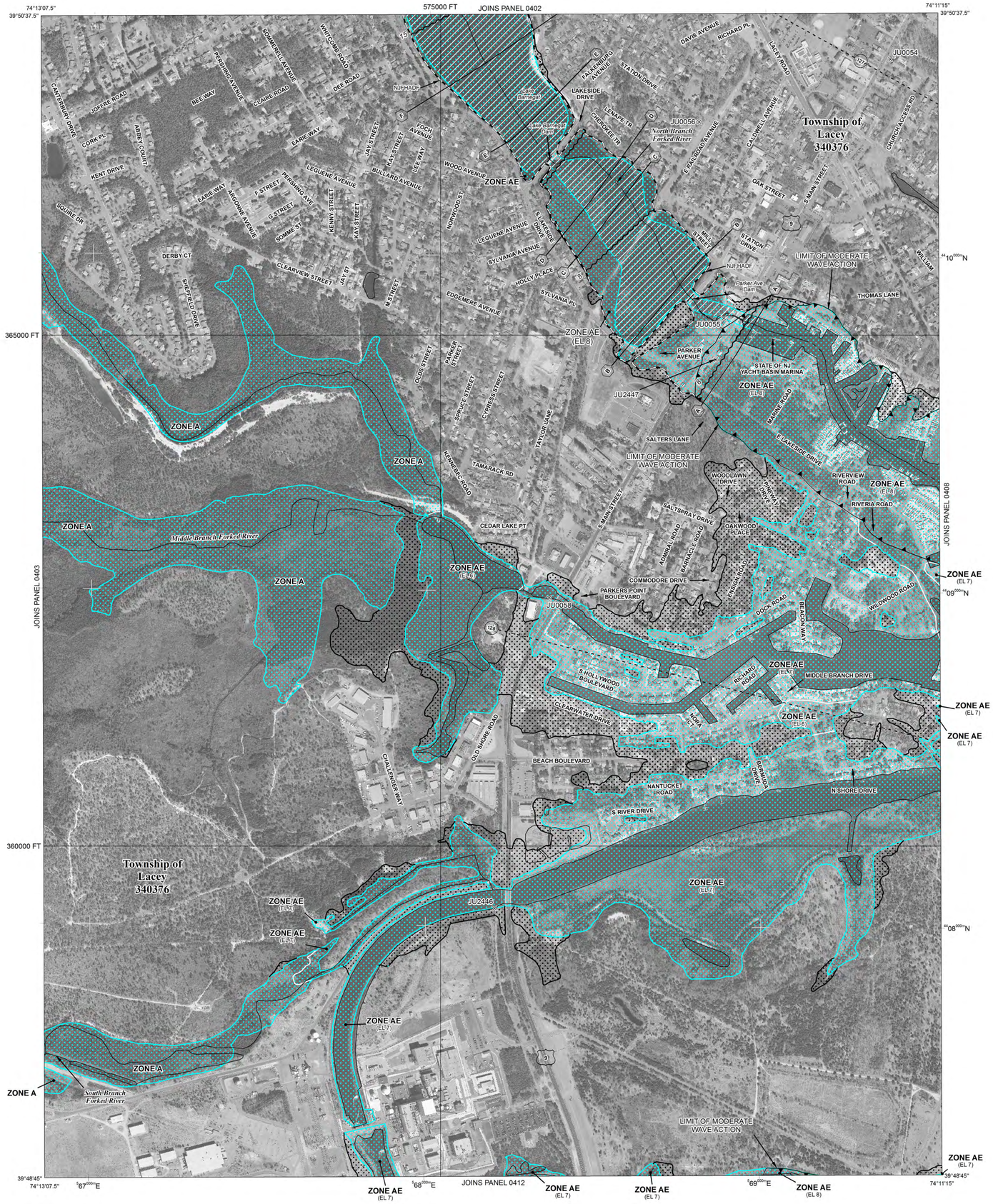
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

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

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

NJFHADF is equal to the 1-percent-annual chance flood plus an additional 25% in flow, and not to exceed the 0.2-percent-annual chance flood. NJFHADF boundary is to regulate disturbance to the land and vegetation within flood hazard area of a water body. This regulation is set forth by the State of New Jersey Flood Hazard Area Control Act Rules N.J.A.C. 7:13, and is administered by New Jersey Department of Environmental Protection (NJDEP).



LEGEND

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

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

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

* Referenced to the North American Vertical Datum of 1988

- A–A — Cross section line
- 23–23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000mN — 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 29, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0404G

FIRM

FLOOD INSURANCE RATE MAP

OCEAN COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 404 OF 660

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LACEY, TOWNSHIP OF	340376	0404	G

PRELIMINARY
MARCH 28, 2014

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

MAP NUMBER
34029C0404G

MAP REVISED

Federal Emergency Management Agency

NOTES TO USERS

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

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

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

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

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

The **projection** used in the preparation of this map was New Jersey State Plane (FIPS Zone 2900). The **horizontal datum** was North America Datum 1983 (NAD 83), Geodetic Reference System 1980 (GRS 80) spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

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

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LEGEND

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

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

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
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ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

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

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 2976000mN — 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 29, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0408G

FIRM

FLOOD INSURANCE RATE MAP

OCEAN COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 408 OF 660

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LACEY, TOWNSHIP OF	340376	0408	G

PRELIMINARY
MARCH 28, 2014

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

MAP NUMBER
34029C0408G

MAP REVISED

Federal Emergency Management Agency

NOTES TO USERS

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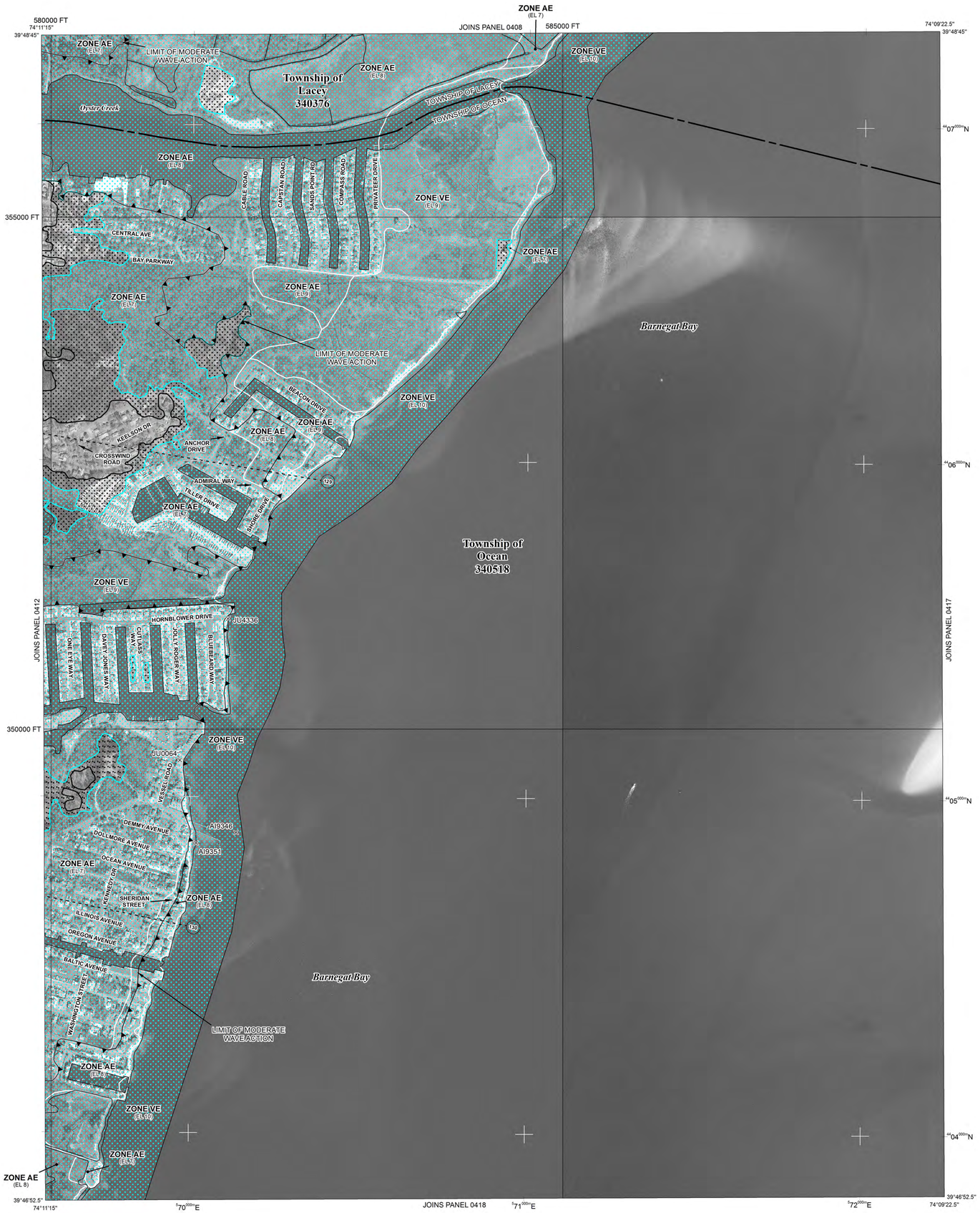

LEGEND

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

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
	Limit of Moderate Wave Action
513	Base Flood Elevation line and value; elevation in feet*
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A A	Cross section line
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87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4376000mN	1000-meter Universal Transverse Mercator grid values, zone 18N
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DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 29, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0416G

FIRM

FLOOD INSURANCE RATE MAP

OCEAN COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 416 OF 660

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LACEY, TOWNSHIP OF	340376	0416	G
OCEAN, TOWNSHIP OF	340518	0416	G

REVISED PRELIMINARY
JANUARY 30, 2015

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

MAP NUMBER
34029C0416G

MAP REVISED

Federal Emergency Management Agency

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

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

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

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

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

The **projection** used in the preparation of this map was New Jersey State Plane (FIPS Zone 2900). The **horizontal datum** was North America Datum 1983 (NAD 83), Geodetic Reference System 1980 (GRS 80) spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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

Base map information shown on this FIRM was derived from New Jersey Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS). This information was derived from digital orthophotos produced at a scale of 1:2400 (1"=200') with a 1 foot pixel resolutions from photography dated 2012.

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

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

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

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

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov/.

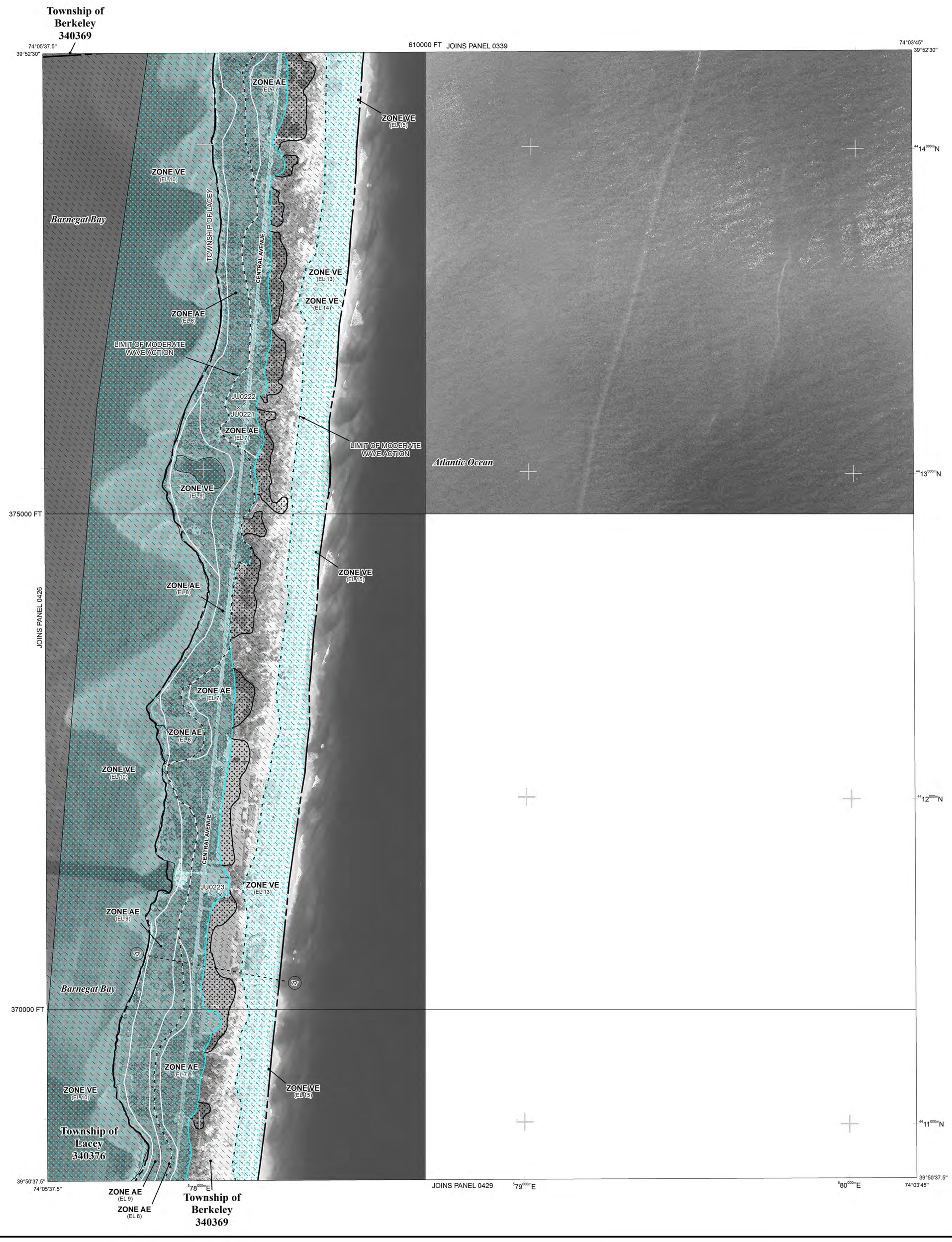
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) LEGEND

11-16-1991 Otherwise Protected Area (OPA)

FLOOD INSURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR SUBSTANTIALLY IMPROVED ON OR AFTER NOVEMBER 16, 1991 - IN DESIGNATED OPAs WITHIN THE CBRS

Boundaries of the John H. Chafee Coastal Barrier Resources System (CBRS) shown on this FIRM were transferred from the official CBRS source map(s) for this area and are depicted on this FIRM for informational purposes only. The official CBRS maps are enacted by Congress via the Coastal Barrier Resources Act, as amended, and maintained by the U.S. Fish and Wildlife Service (FWS). The official CBRS maps used to determine whether or not an area is located within the CBRS are available for download at http://www.fws.gov. For an official determination of whether or not an area is located within the CBRS, or for any questions regarding the CBRS, please contact the FWS field office for this area at (609) 646-9310.



LEGEND

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

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

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

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 2976000mN — 1000-meter Universal Transverse Mercator grid values, zone 18N
- 600000 FT — 5000-foot grid values: New Jersey State Plane coordinate system (FIPSZONE 2900), Transverse Mercator projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 29, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0427G

FIRM

FLOOD INSURANCE RATE MAP

OCEAN COUNTY, NEW JERSEY
(ALL JURISDICTIONS)

PANEL 427 OF 660

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BERKELEY, TOWNSHIP OF	340369	0427	G
LACEY, TOWNSHIP OF	340376	0427	G

PRELIMINARY
MARCH 28, 2014 -NOTE-

THIS MAP INCLUDES BOUNDARIES OF THE COASTAL BARRIER RESOURCES SYSTEM ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND/OR SUBSEQUENT ENABLING LEGISLATION.

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

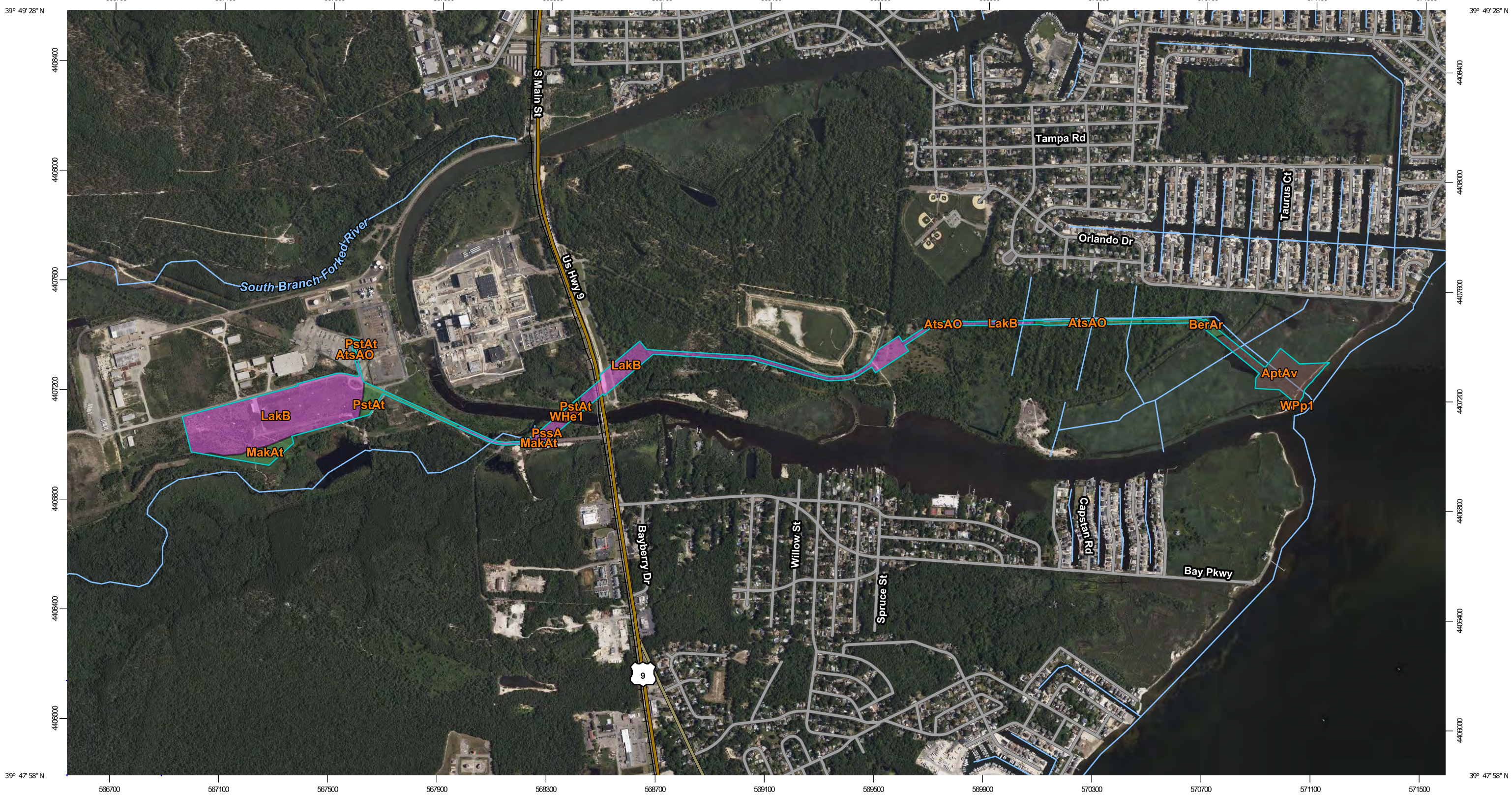
MAP NUMBER
34029C0427G

MAP REVISED

Federal Emergency Management Agency

APPENDIX B – SOIL MAP

Hydrologic Soil Group—Ocean County, New Jersey
(SITE BOUNDARY)



Map Scale: 1:13,600 if printed on B landscape (17" x 11") sheet.

N

Meters: 0 200 400 800 1200

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ocean County, New Jersey
Survey Area Data: Version 19, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 13, 2021—Sep 14, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AptAv	Appoquinimink-Transquaking-Mispillion complex, 0 to 1 percent slopes, very frequently flooded	B/D	7.8	13.1%
AtsAO	Atsion sand, 0 to 2 percent slopes, Northern Tidewater Area	A/D	2.2	3.7%
BerAr	Berryland sand, 0 to 2 percent slopes, rarely flooded	A/D	1.4	2.4%
LakB	Lakehurst sand, 0 to 5 percent slopes	A	40.0	66.8%
MakAt	Manahawkin muck, 0 to 2 percent slopes, frequently flooded	A/D	2.7	4.6%
PssA	Psamments, 0 to 2 percent slopes	A	2.1	3.4%
PstAt	Psammaquents, sulfidic substratum, 0 to 2 percent slopes, frequently flooded	A/D	2.8	4.7%
WHe1	Herring Creek mucky silt loam, 0 to 1 meter water depth	D	0.7	1.2%
WPp1	Pasture Point loamy fine sand, 0 to 1 meter water depth	D	0.0	0.0%
WTs2	Truitt-Southpoint complex, 1 to 2 meter water depth	D	0.0	0.0%
Totals for Area of Interest			**59.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Ocean County, New Jersey
(Island Beach Soil Map)

Map Scale: 1:1,730 if printed on B portrait (11" x 17") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ocean County, New Jersey
Survey Area Data: Version 19, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 13, 2021—Sep 14, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HorsC	Hooksan fine sand, 2 to 10 percent slopes	A	2.1	29.8%
UR	Urban land		4.8	70.2%
Totals for Area of Interest			**6.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher