Public Notice

U.S. Army Corps of Engineers
Baltimore District

In Reply to Application Number
CENAB-OP-RMS (Chesapeake Marshlands NWR-Eastern Neck)
2015-61662

PN 16-23 Comment Period: April 28, 2016 to May 18, 2016

THE PURPOSE OF THIS PUBLIC NOTICE IS TO SOLICIT COMMENTS FROM THE PUBLIC ABOUT THE WORK DESCRIBED BELOW. AT THIS TIME, NO DECISION HAS BEEN MADE AS TO WHETHER OR NOT A PERMIT WILL BE ISSUED.

The Baltimore District has received an application for a Department of the Army (DA) permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act (33 U.S.C. 1344), as described below:

APPLICANT: Chesapeake Marshlands NWR Complex
Mr. Matt Whitbeck
2145 Key Wallace Drive
Cambridge, MD 21613

LOCATION: In the Chesapeake Bay at Eastern Neck NWR near Rock Hall, Kent County, Maryland.

WORK: The project proposes to stabilize an eroded shoreline by constructing nine stone breakwaters with varied amounts of backfill creating approximately 51,820 square feet of tidal wetland, as follows:

Breakwater structure #2-1: To create approximately 2,950 square feet of tidal wetlands by depositing approximately 240 cubic yards of sloped, clean select sand fill stabilized with Spartina alterniflora and to construct a 20.5-foot wide base by 300-foot long stone breakwater to extend no more than 41 feet channelward of the approximate mean high water (MHW) shoreline;

Breakwater structure #2-2: To create approximately 7,670 square feet of tidal wetlands by depositing approximately 548 cubic yards of sloped, clean select sand fill stabilized with Spartina alterniflora and to construct a 21.3-foot wide base by 250-foot long stone breakwater to extend no more than 98 feet channelward of the approximate MHW shoreline;

Breakwater structure #4-1: To create approximately 1,290 square feet of tidal wetlands by depositing approximately 156 cubic yards of sloped, clean select sand fill stabilized with Spartina alterniflora and to construct a 19-foot wide base by 300-foot long stone breakwater to extend no more than 46 feet channelward of the approximate MHW shoreline;

Breakwater structure #4-2: To create approximately 3,770 square feet of tidal wetlands by depositing approximately 701 cubic yards of sloped, clean select sand fill stabilized with Spartina alterniflora and to construct a 21.2-foot wide base by 200-foot long stone breakwater to extend no more than 113 feet channelward of the approximate MHW shoreline;

Breakwater structure #4-3: To create approximately 7,340 square feet of tidal wetlands by depositing approximately 1,208 cubic yards of sloped, clean select sand fill stabilized with Spartina alterniflora and to construct a 21.3-foot wide base by 200-foot long stone breakwater to extend no more than 162 feet channelward of the approximate MHW shoreline;

Breakwater structure #7-1: To create approximately 3,980 square feet of tidal wetlands by depositing approximately 557 cubic yards of sloped, clean select sand fill stabilized with Spartina alterniflora and to construct a 21-foot wide base by 200-foot long stone breakwater to extend no more than 115 feet channelward of the approximate MHW shoreline;

Breakwater structure #7-2: To create approximately 3,010 square feet of tidal wetlands by depositing approximately 485 cubic yards of sloped, clean select sand fill stabilized with Spartina alterniflora and to construct a 21-foot wide base by 300-foot long stone breakwater to extend no more than 85 feet channelward of the approximate MHW shoreline;

Breakwater structure #9-1: To create approximately 24,440 square feet of tidal wetlands by depositing approximately 2,058 cubic yards of sloped, clean select sand fill stabilized with Spartina alterniflora and to construct a 22.4-foot wide base by 475-foot long stone breakwater to extend no more than 152 feet channelward of the approximate MHW shoreline, and to construct a temporary 16-foot wide by 475–foot long sand construction access road which would be restored to its original elevations and condition after construction;

Breakwater structure #10-1: To create approximately 3,910 square feet of tidal wetlands by depositing approximately 682 cubic yards of sloped, clean select sand fill stabilized with Spartina alterniflora and to construct a 22.1-foot wide base by 300-foot long stone breakwater to extend no more than 65 feet channelward of the approximate MHW shoreline;

All work is to be completed in accordance with the proposed plan(s). If you have any questions concerning this matter, please contact Rod Schwarm of this office at 410-820-8550 or via email at Rodney.D.Schwarm@usace.army.mil.

As part of the planning process for the proposed project, steps were taken to ensure avoidance and minimization of impacts to waters of the United States to the maximum extent practicable. There are no wetland or submerged vegetation permanent impacts proposed. Compensatory mitigation is not being proposed as the project would result in the creation of approximately 51,820 square feet of tidal wetlands.

The purpose of the project is to create a living shoreline to protect eroding wetlands.

ESSENTIAL FISH HABITAT: The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 04-267), requires all Federal agencies to consult with the National Marine Fisheries Service (NMFS) on all actions, or proposed actions, permitted, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH). The project site lies in or adjacent to EFH as described under the MSFCMA for *Scopthalmus aquosos* (windowpane flounder) juvenile and adult; *Pomatomus saltatrix* (blue fish) juvenile and adult; *Paralicthys dentatus* (summer flounder) juvenile and adult; and the eggs, larvae, juvenile, and adult stages of *Sciaenops ocellatus* (red drum), *Scomberomorus cavalla* (king mackerel), *Scomberomorus maculatus* (Spanish mackerel), and *Rachycentron canadum* (cobia), managed species under the MSFCMA. The project has the potential to adversely affect EFH or the species of concern by loss of spawning, nursery, forage and/or shelter habitat as described under the MSFCMA for the species and life stages identified above.

The Baltimore District has made a preliminary determination that site-specific impacts would not be substantial and an abbreviated consultation will be conducted with NMFS. No mitigative measures are recommended to minimize adverse effects on EFH at this time. This determination may be modified if additional information indicates otherwise and would change the preliminary determination. The project area is/is not a Habitat Area of Particular Concern (HAPC). The

Baltimore District has determined that the adverse effects of this project would be more than minimal, although not substantial, and an abbreviated consultation will be conducted with NMFS. No mitigative measures are recommended to minimize adverse effects on EFH at this time. This determination may be modified if additional information indicates otherwise and would change the preliminary determination.

The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, and, in general, the needs and welfare of the people.

The Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above.

Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments provided will become part of the public record for this action. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity. Written comments concerning the work described above related to the factors listed above or other pertinent factors must be received by the District Engineer, U.S. Army Corps of Engineers, Baltimore District, PO Box 1715, Baltimore, Maryland 21203-1715, within the comment period as specified above to receive consideration.

The applicant is required to obtain a water quality certification in accordance with Section 401 of the Clean Water Act from the Maryland Department of the Environment. Any written comments concerning the work described above which relate to water quality certification must be received by the Wetlands and Waterways Program, Maryland Department of the Environment, 1800 Washington Blvd. Suite 430, Baltimore, Maryland 21230 within the comment period as specified above to receive consideration. The 401 certifying agency has a statutory limit of one year to make its decision.

The applicant has certified in this application that the proposed activity complies with and will be conducted in a manner consistent with the Maryland Coastal Zone Program. This certification statement is available for inspection in the District Office; however, public comments relating to consistency must be received by the Coastal Zone Division, Maryland Department of the Environment, 1800 Washington Blvd. Suite 430, Baltimore, Maryland 21230, within the comment period as specified above. It should be noted that CZ Division has a statutory limit of 6 months in which to make its consistency determination.

The applicant must obtain any State or local government permits, which may be required.

A preliminary review of this application indicates that the proposed work will not affect listed species or their critical habitat pursuant to Section 7 of the Endangered Species Act as amended. As the evaluation of this application continues, additional information may become available which could modify this preliminary determination.

Review of the latest published version of the National Register of Historic Places indicates that no registered properties listed as eligible for inclusion therein are located at the site of the proposed work. Currently unknown archeological, scientific, prehistoric, or historical data may be lost or destroyed by the work to be accomplished under the requested permit.

The evaluation of the impact of the work described above on the public interest will include application of the guidelines promulgated by the Administrator, U.S. Environmental Protection Agency, under authority of Section 404 of the Clean Water Act. Any person who has an interest, which may be adversely affected by the issuance of this permit, may request a public hearing. The District Engineer must receive the request, which must be in writing, U.S. Army Corps of Engineers, Baltimore District, 10 S. Howard Street, Baltimore, Maryland 21201, within the comment period as specified as above to receive consideration. Also, it must clearly state forth the interest that may be adversely affected by this activity in the manner in which the interest may be adversely affected.

It is requested that you communicate the foregoing information concerning the proposed work to any persons known by you to be interested and not being known to this office, who did not receive a copy of this notice.

FOR THE DISTRICT ENGINEER:

Kathy B. Anderson

Kathy B. Anderson
Chief, Maryland Section Southern

NOT FOR CONSTRUCTION

EASTERN NECK LIVING SHORELINE RESTORATION PROJECT

EASTERN NECK NATIONAL WILDLIFE REFUGE

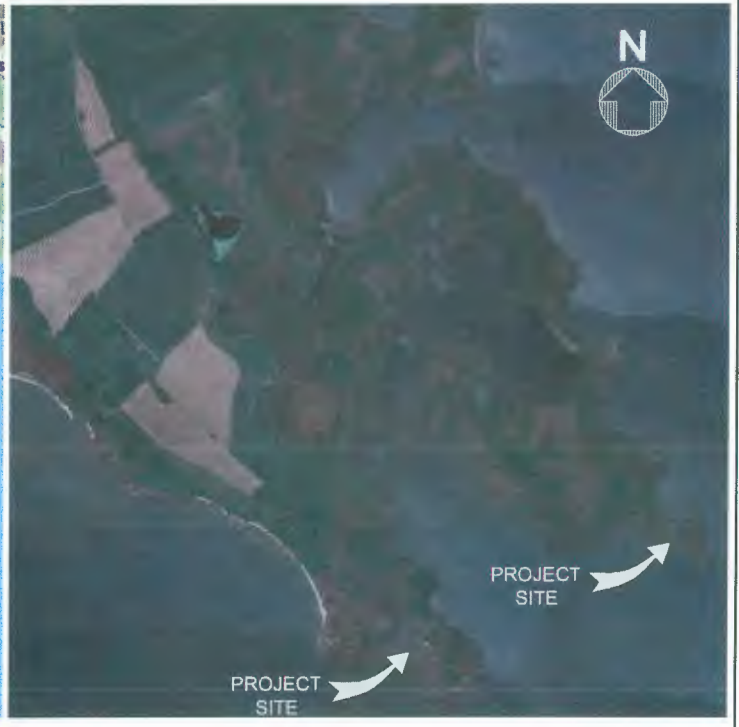
1730 EASTERN NECK ROAD, ROCK HALL, KENT COUNTY, MD 21661

PREPARED FOR: U.S. FISH & WILDLIFE SERVICE
EASTERN NECK NATIONAL WILDLIFE REFUGE
1730 EASTERN NECK ROAD
ROCK HALL, MD 21661
TEL: (410)-639-7056

PREPARED BY: AYUDA, PRIME CONTRACTOR
410 ACOMA ST, SUITE A
DENVER, CO 80204
TEL: (303)-999-2020

PREPARED BY: CH2M HILL, SUBCONTRACTOR
22 CORTLANDT STREET
NEW YORK, NY 10007
TEL: (212)-608-3990

HURRICANE SANDY RESILIENCY PROJECT #57 - HAIL COVE LIVING SHORELINE
RESTORATION, EASTERN NECK NATIONAL WILDLIFE REFUGE



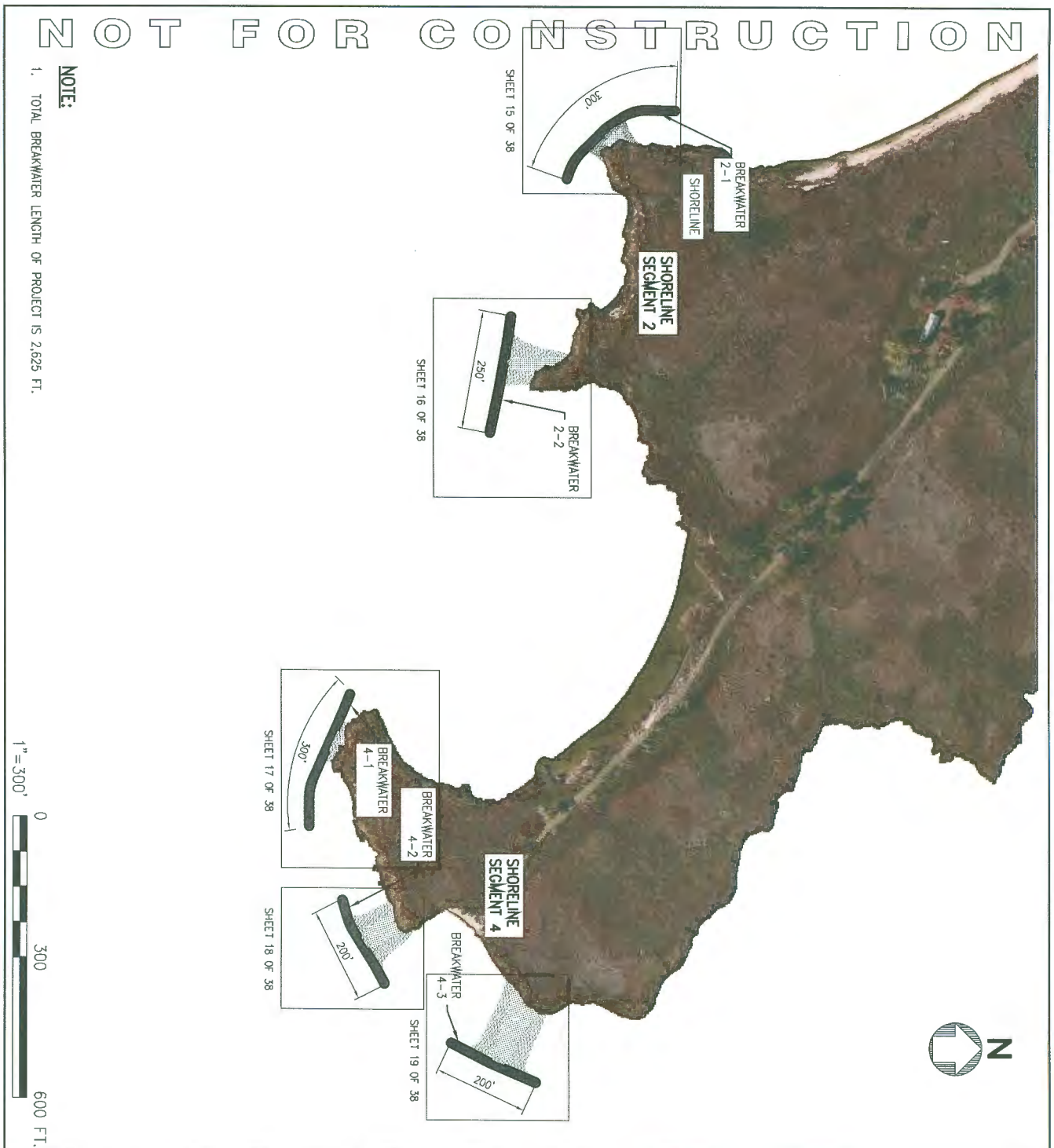
VICINITY MAP AND AERIAL PHOTO

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT
CITY: ROCK HALL
COUNTY: KENT COUNTY, MD
APPLICANT: US FISH AND WILDLIFE SERVICE CHESAPEAKE MARSHLANDS NWR COMPLEX WBRIDGE, MD 21613
DATE: 10-19-15

PURPOSE: EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY CH2MHILL® NEW YORK, NY

NOT FOR CONSTRUCTION



NOTE:

1. TOTAL BREAKWATER LENGTH OF PROJECT IS 2,625 FT.

1"=300' 0 300 600 FT.

PURPOSE:
EASTERN NECK
LIVING SHORELINE PROJECT

PREPARED BY
CH2MHILL
NEW YORK, NY

SEGMENTS 2 AND 4
PROPOSED CONDITIONS
SHEET INDEX
SHEET 1 OF 2

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT
CITY: ROCK HALL
COUNTY: KENT COUNTY, MD
APPLICANT: US FISH AND WILDLIFE SERVICE
CHESAPEAKE MARSHLANDS NWR COMPLEX
CAMBRIDGE, MD 21613
DATE: 10-19-15

PURPOSE:
EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY
CH2MHILL.
NEW YORK, NY

SEGMENTS 7, 9 AND 10
PROPOSED CONDITIONS
SHEET INDEX
SHEET 2 OF 2

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT
CITY: ROCK HALL
COUNTY: KENT COUNTY, MD
APPLICANT: US FISH AND WILDLIFE SERVICE CHESAPEAKE MARSHLANDS NWR COMPLEX CAMBRIDGE, MD 21613
DATE: 10-19-15

NOT FOR CONSTRUCTION

BREAKWATER NAME	BREAKWATER LENGTH (FT)	BREAKWATER WIDTH (FT)	AREA ROCK BREAKWATER (SQ.FT)	AREA CLEAN SANDFILL (SQ.FT)	CHANNELWARD ENCROACHEMENT FROM MHW (FT)	AREA LOW MARSH (SQ.FT)
2-1	300	20.5	6,480	2,950	41	1,310

NOTES:

1. BATHYMETRIC SURVEY PERFORMED BY WATERWAYS SURVEY AND ENGINEERING, LTD ON 9 APRIL 2015.
2. PROVIDED IN MARYLAND STATE PLANE COORDINATE SYSTEM. NAD 1983 (NSRS 2011), NAVD 88 (GEOID12A) AND US SURVEY FEET.
3. TOTAL BREAKWATER LENGTH OF PROJECT IS 2,625 FT.
4. ELEVATIONS IN MLW. MHW = +1.19'
5. END ROUND HEAD OF BREAKWATER TO BE REFINED IN NEXT STAGE.
6. ENCROACH LENGTHS ARE FURTHEST FROM SHORE AT CROSS SECTION.

LEGEND:

ROCK BREAKWATER | SAND BACKFILL | PLANTING (SPARTINA ALTERNIFLORA)

1"=50' 0 50 100 FT.

PURPOSE: EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY CH2MHILL. NEW YORK, NY

BREAKWATER 2-1
PROPOSED CONDITIONS
DETAILED PLAN VIEW
SHEET 1 OF 9

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT

CITY: ROCK HALL

COUNTY: KENT COUNTY, MD

APPLICANT: US FISH AND WILDLIFE SERVICE
CHESAPEAKE MARSHLANDS NWR COMPLEX
CAMBRIDGE, MD 21613

DATE: 10-19-15

NOT FOR CONSTRUCTION

BREAKWATER NAME	BREAKWATER LENGTH (FT)	BREAKWATER WIDTH (FT)	AREA ROCK BREAKWATER (SQ.FT)	AREA CLEAN SANDFILL (SQ.FT)	CHANNELWARD ENCROACHMENT FROM MHW (FT)	AREA LOW MARSH (SQ.FT)
2-2	250	21.3	5,690	7,670	98	2,770

NOTES:

1. BATHYMETRIC SURVEY PERFORMED BY WATERWAYS SURVEY AND ENGINEERING, LTD ON 9 APRIL 2015.
2. PROVIDED IN MARYLAND STATE PLANE COORDINATE SYSTEM. NAD 1983 (NSRS 2011), NAVD 88 (GEOID12A) AND US SURVEY FEET.
3. TOTAL BREAKWATER LENGTH OF PROJECT IS 2,625 FT.
4. ELEVATIONS IN MLW. MHW = +1.19'
5. END ROUND HEAD OF BREAKWATER TO BE REFINED IN NEXT STAGE.
6. ENCROACH LENGTHS ARE FURTHEST FROM SHORE AT CROSS SECTION.

LEGEND:

ROCK BREAKWATER | SAND BACKFILL | PLANTING (SPARTINA ALTERNIFLORA)

1"=50' 0 50 100 FT.

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT

CITY: ROCK HALL

COUNTY: KENT COUNTY, MD

APPLICANT: US FISH AND WILDLIFE SERVICE CHESAPEAKE MARSHLANDS NWR COMPLEX CAMBRIDGE, MD 21613

DATE: 10-19-15

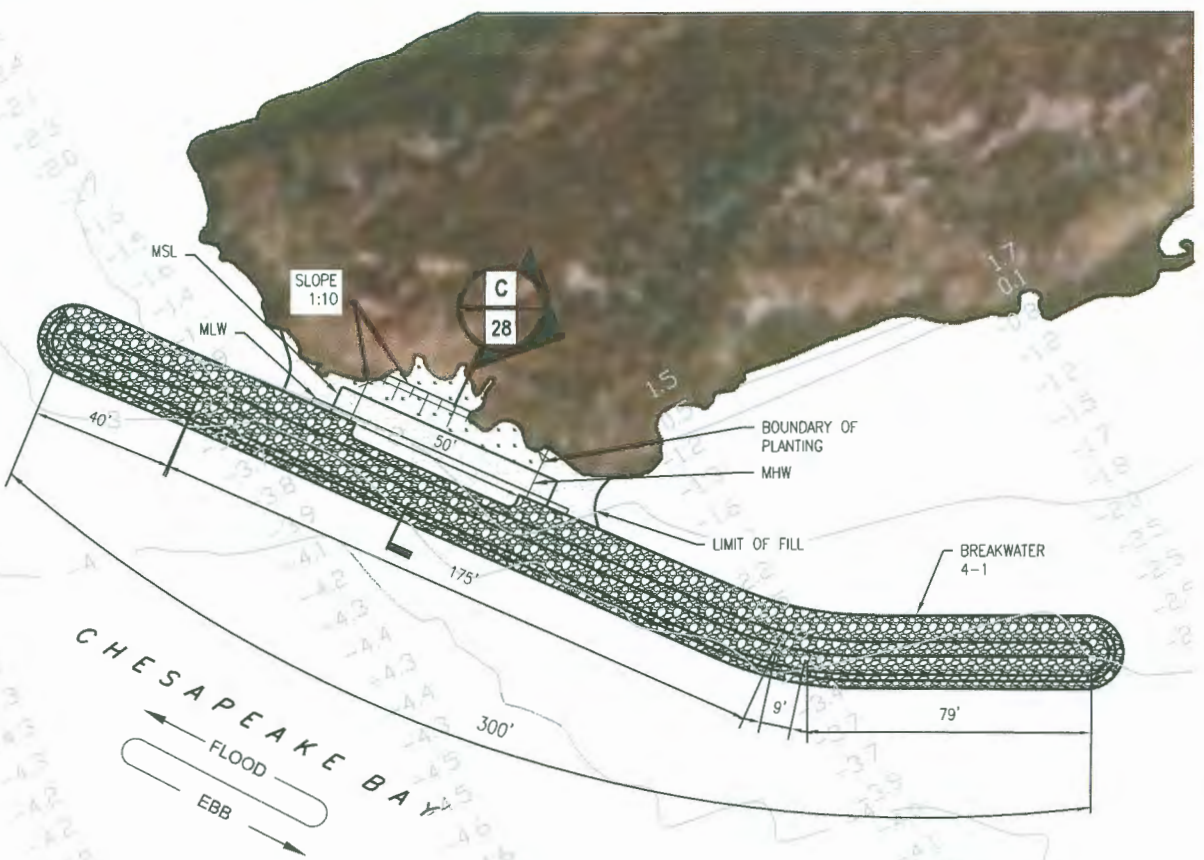
Sheet 5 of 26

BREAKWATER 2-2
PROPOSED CONDITIONS
DETAILED PLAN VIEW
SHEET 2 OF 9

PURPOSE: EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY CH2MHILL. NEW YORK, NY

NOT FOR CONSTRUCTION



BREAKWATER NAME	BREAKWATER LENGTH (FT)	BREAKWATER WIDTH (FT)	AREA ROCK BREAKWATER (SQ.FT)	AREA CLEAN SANDFILL (SQ.FT)	CHANNELWARD ENCROACHMENT FROM MHW (FT)	AREA LOW MARSH (SQ.FT)
4-1	300	19	5,980	1,640	46	1,290

NOTES:

1. BATHYMETRIC SURVEY PERFORMED BY WATERWAYS SURVEY AND ENGINEERING, LTD ON 9 APRIL 2015.
2. PROVIDED IN MARYLAND STATE PLANE COORDINATE SYSTEM. NAD 1983 (NSRS 2011), NAVD 88 (GEOID12A) AND US SURVEY FEET.
3. TOTAL BREAKWATER LENGTH OF PROJECT IS 2,625 FT.
4. ELEVATIONS IN MLW. MHW = +1.19'
5. END ROUND HEAD OF BREAKWATER TO BE REFINED IN NEXT STAGE.
6. ENCROACH LENGTHS ARE FURTHEST FROM SHORE AT CROSS SECTION.

LEGEND:

ROCK BREAKWATER | SAND BACKFILL | PLANTING (SPARTINA ALTERNIFLORA)

1"=50' 0 50 100 FT.

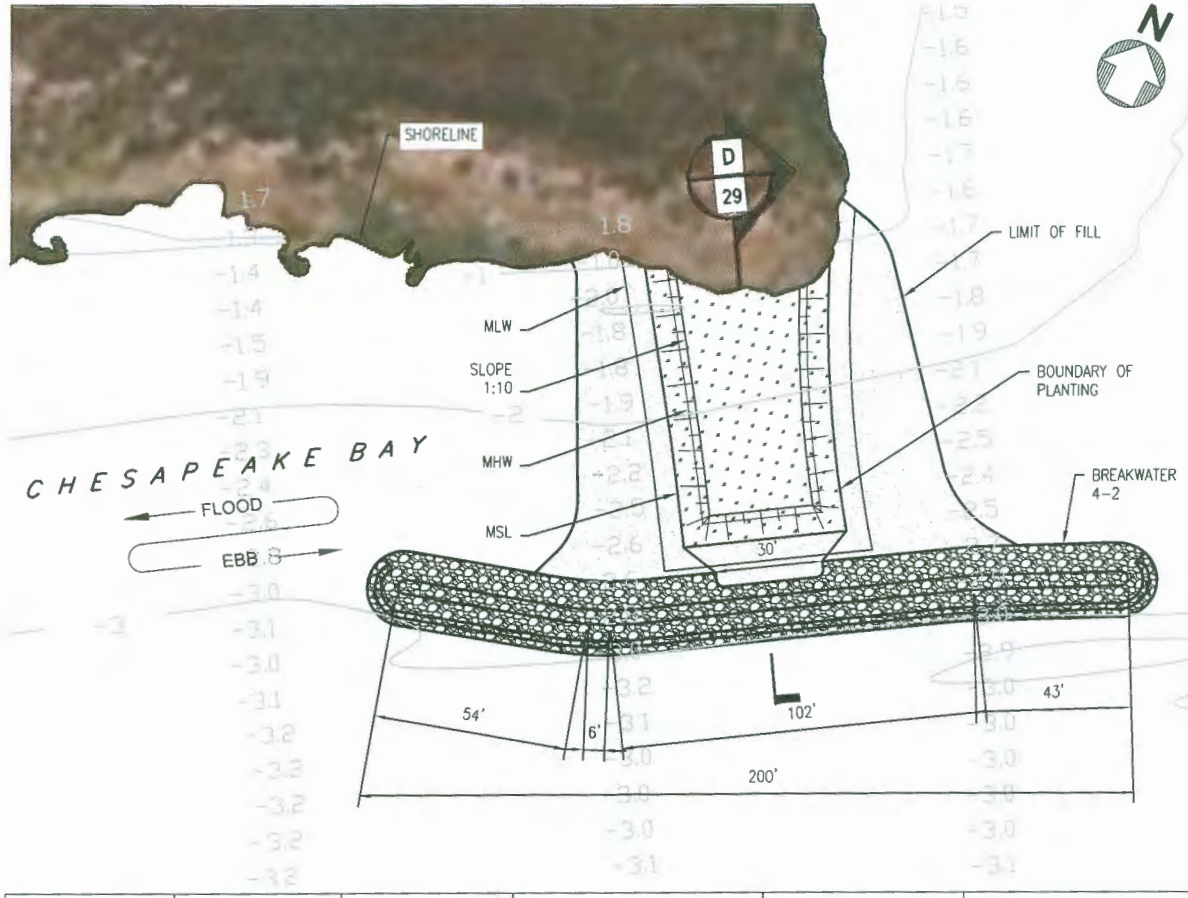
PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT
CITY: ROCK HALL
COUNTY: KENT COUNTY, MD
APPLICANT: US FISH AND WILDLIFE SERVICE CHESAPEAKE MARSHLANDS NWR COMPLEX [illegible]BRIDGE, MD 21613
DATE: 10-19-15
Sheet 6 of 26

BREAKWATER 4-1
PROPOSED CONDITIONS
DETAILED PLAN VIEW
SHEET 3 OF 9

PURPOSE: EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY
CH2MHILL®
NEW YORK, NY

NOT FOR CONSTRUCTION



BREAKWATER NAME	BREAKWATER LENGTH (FT)	BREAKWATER WIDTH (FT)	AREA ROCK BREAKWATER (SQ.FT)	AREA CLEAN SANDFILL (SQ.FT)	CHANNELWARD ENCROACHMENT FROM MHW (FT)	AREA LOW MARSH (SQ.FT)
4-2	200	21.2	4,590	8,620	113	3,770

NOTES:

1. BATHYMETRIC SURVEY PERFORMED BY WATERWAYS SURVEY AND ENGINEERING, LTD ON 9 APRIL 2015.
2. PROVIDED IN MARYLAND STATE PLANE COORDINATE SYSTEM. NAD 1983 (NSRS 2011), NAVD 88 (GEOID12A) AND US SURVEY FEET.
3. TOTAL BREAKWATER LENGTH OF PROJECT IS 2,625 FT.
4. ELEVATIONS IN MLW. MHW = +1.19'
5. END ROUND HEAD OF BREAKWATER TO BE REFINED IN NEXT STAGE.
6. ENCROACH LENGTHS ARE FURTHEST FROM SHORE AT CROSS SECTION.

LEGEND:

ROCK BREAKWATER | SAND BACKFILL | PLANTING (SPARTINA ALTERNIFLORA)

1"=50' 0 50 100 FT.

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT
CITY: ROCK HALL
COUNTY: KENT COUNTY, MD
APPLICANT: US FISH AND WILDLIFE SERVICE CHESAPEAKE MARSHLANDS NWR COMPLEX ^NBRIDGE, MD 21613
DATE: 10-19-15

BREAKWATER 4-2
PROPOSED CONDITIONS
DETAILED PLAN VIEW
SHEET 4 OF 9

Sheet 7 of 26

PURPOSE: EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY
CH2MHILL.
NEW YORK, NY

NOT FOR CONSTRUCTION

BREAKWATER NAME	BREAKWATER LENGTH (FT)	BREAKWATER WIDTH (FT)	AREA ROCK BREAKWATER (SQ.FT)	AREA CLEAN SANDFILL (SQ.FT)	CHANNELWARD ENCROACHMENT FROM MHW (FT)	AREA LOW MARSH (SQ.FT)
4-3	200	21.3	4,620	16,030	162	7,340

NOTES:

1. BATHYMETRIC SURVEY PERFORMED BY WATERWAYS SURVEY AND ENGINEERING, LTD ON 9 APRIL 2015.
2. PROVIDED IN MARYLAND STATE PLANE COORDINATE SYSTEM. NAD 1983 (NSRS 2011), NAVD 88 (GEOID12A) AND US SURVEY FEET.
3. TOTAL BREAKWATER LENGTH OF PROJECT IS 2,625 FT.
4. ELEVATIONS IN MLW. MHW = +1.19'
5. END ROUND HEAD OF BREAKWATER TO BE REFINED IN NEXT STAGE.
6. ENCROACH LENGTHS ARE FURTHEST FROM SHORE AT CROSS SECTION.

LEGEND:

ROCK BREAKWATER | SAND BACKFILL | PLANTING (SPARTINA ALTERNIFLORA)

1"=50' 0 50 100 FT.

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT
CITY: ROCK HALL
COUNTY: KENT COUNTY, MD
APPLICANT: US FISH AND WILDLIFE SERVICE CHESAPEAKE MARSHLANDS NWR COMPLEX CAMBRIDGE, MD 21613
DATE: 10-19-15

Sheet 8 of 26

BREAKWATER 4-3
PROPOSED CONDITIONS
DETAILED PLAN VIEW
SHEET 5 OF 9

PURPOSE: EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY
CH2MHILL.
NEW YORK, NY

NOT FOR CONSTRUCTION

BREAKWATER NAME	BREAKWATER LENGTH (FT)	BREAKWATER WIDTH (FT)	AREA ROCK BREAKWATER (SQ.FT)	AREA CLEAN SANDFILL (SQ.FT)	CHANNELWARD ENCROACHMENT FROM MHW (FT)	AREA LOW MARSH (SQ.FT)
7-1	200	21.0	4,550	7,990	115	3,980

NOTES:

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3. TOTAL BREAKWATER LENGTH OF PROJECT IS 2,625 FT.
4. ELEVATIONS IN MLW. MHW = +1.19'
5. END ROUND HEAD OF BREAKWATER TO BE REFINED IN NEXT STAGE.
6. ENCROACH LENGTHS ARE FURTHEST FROM SHORE AT CROSS SECTION.

LEGEND:

ROCK BREAKWATER | SAND BACKFILL | PLANTING (SPARTINA ALTERNIFLORA)

1"=50'

0 50 100 FT.

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT

CITY: ROCK HALL

COUNTY: KENT COUNTY, MD

APPLICANT: US FISH AND WILDLIFE SERVICE
CHESAPEAKE MARSHLANDS NWR COMPLEX
^MBRIDGE, MD 21613

DATE: 10-19-15

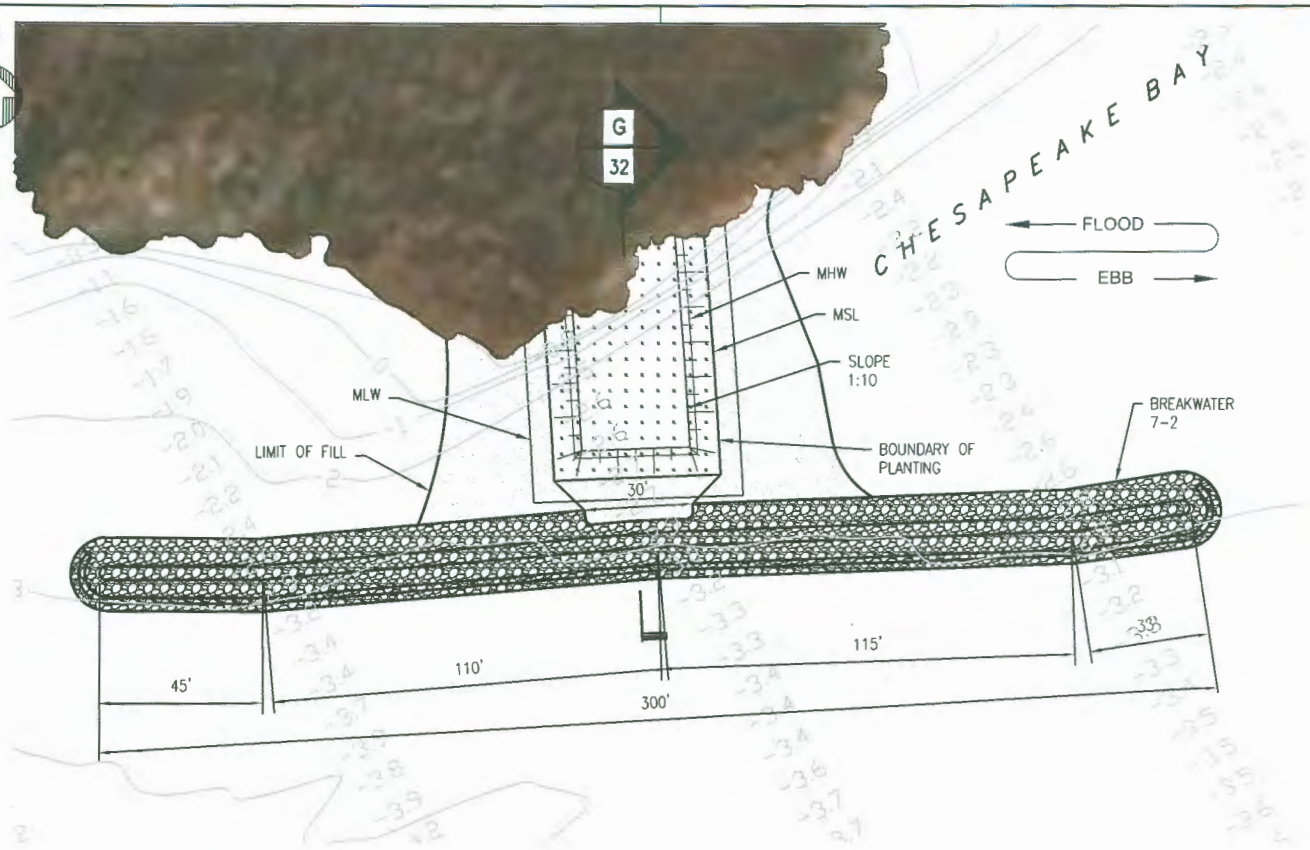
Sheet 9 of 26

BREAKWATER 7-1
PROPOSED CONDITIONS
DETAILED PLAN VIEW
SHEET 6 OF 9

PURPOSE:
EASTERN NECK
LIVING SHORELINE PROJECT

PREPARED BY
CH2MHILL.
NEW YORK, NY

NOT FOR CONSTRUCTION



BREAKWATER NAME	BREAKWATER LENGTH (FT)	BREAKWATER WIDTH (FT)	AREA ROCK BREAKWATER (SQ.FT)	AREA CLEAN SANDFILL (SQ.FT)	CHANNELWARD ENCROACHMENT FROM MHW (FT)	AREA LOW MARSH (SQ.FT)
7-2	300	21.0	6,650	6,820	85	3,010

NOTES:

1. BATHYMETRIC SURVEY PERFORMED BY WATERWAYS SURVEY AND ENGINEERING, LTD ON 9 APRIL 2015.
2. PROVIDED IN MARYLAND STATE PLANE COORDINATE SYSTEM. NAD 1983 (NSRS 2011), NAVD 88 (GEOID12A) AND US SURVEY FEET.
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4. ELEVATIONS IN MLW. MHW = +1.19'
5. END ROUND HEAD OF BREAKWATER TO BE REFINED IN NEXT STAGE.
6. ENCROACH LENGTHS ARE FURTHEST FROM SHORE AT CROSS SECTION.

LEGEND:

ROCK BREAKWATER | SAND BACKFILL | PLANTING (SPARTINA ALTERNIFLORA)

1"=50' 0 50 100 FT.

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT
CITY: ROCK HALL
COUNTY: KENT COUNTY, MD
APPLICANT: US FISH AND WILDLIFE SERVICE CHESAPEAKE MARSHLANDS NWR COMPLEX 2145 WMBRIDGE, MD 21613
DATE: 10-19-15
Sheet 10 of 26

BREAKWATER 7-2
PROPOSED CONDITIONS
DETAILED PLAN VIEW
SHEET 7 OF 9

PURPOSE: EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY
CH2MHILL.
NEW YORK, NY

NOT FOR CONSTRUCTION

BREAKWATER NAME	BREAKWATER LENGTH (FT)	BREAKWATER WIDTH (FT)	AREA ROCK BREAKWATER (SQ.FT)	AREA CLEAN SANDFILL (SQ.FT)	CHANNELWARD ENCROACHMENT FROM MHW (FT)	AREA LOW MARSH (SQ.FT)
9-1	575	22.3	13,050	27,650	152	24,440

NOTES:

1. BATHYMETRIC SURVEY PERFORMED BY WATERWAYS SURVEY AND ENGINEERING, LTD ON 9 APRIL 2015.
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3. TOTAL BREAKWATER LENGTH OF PROJECT IS 2,625 FT.
4. ELEVATIONS IN MLW. MHW = +1.19'
5. END ROUND HEAD OF BREAKWATER TO BE REFINED IN NEXT STAGE.
6. CURRENT MAGNITUDE IS WEAK IN THIS AREA. EBB AND FLOOD SHOW SIMILAR DIRECTIONS.
7. ENCROACH LENGTHS ARE FURTHEST FROM SHORE AT CROSS SECTION.

LEGEND:

ROCK BREAKWATER | SAND BACKFILL | PLANTING (SPARTINA ALTERNIFLORA)

1"=80' 0 80 160 FT.

PURPOSE: EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY CH2MHILL. NEW YORK, NY

BREAKWATER 9-1
PROPOSED CONDITIONS
DETAILED PLAN VIEW
SHEET 8 OF 9

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT
CITY: ROCK HALL
COUNTY: KENT COUNTY, MD
APPLICANT: US FISH AND WILDLIFE SERVICE CHESAPEAKE MARSHLANDS NWR COMPLEX CAMBRIDGE, MD 21613
DATE: 10-19-15

NOT FOR CONSTRUCTION

BREAKWATER NAME	BREAKWATER LENGTH (FT)	BREAKWATER WIDTH (FT)	AREA ROCK BREAKWATER (SQ.FT)	AREA CLEAN SANDFILL (SQ.FT)	CHANNELWARD ENCROACHMENT FROM MHW (FT)	AREA LOW MARSH (SQ.FT)
10-1	300	22.1	7,010	6,000	65	3,910

NOTES:

1. BATHYMETRIC SURVEY PERFORMED BY WATERWAYS SURVEY AND ENGINEERING, LTD ON 9 APRIL 2015.
2. PROVIDED IN MARYLAND STATE PLANE COORDINATE SYSTEM. NAD 1983 (NSRS 2011), NAVD 88 (GEOID12A) AND US SURVEY FEET.
3. TOTAL BREAKWATER LENGTH OF PROJECT IS 2,625 FT.
4. ELEVATIONS IN MLW. MHW = +1.19'
5. END ROUND HEAD OF BREAKWATER TO BE REFINED IN NEXT STAGE.
6. ENCROACH LENGTHS ARE FURTHEST FROM SHORE AT CROSS SECTION.

LEGEND:

ROCK BREAKWATER | SAND BACKFILL | PLANTING (SPARTINA ALTERNIFLORA)

1"=50' 0 50 100 FT.

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT

CITY: ROCK HALL

COUNTY: KENT COUNTY, MD

APPLICANT: US FISH AND WILDLIFE SERVICE
CHESAPEAKE MARSHLANDS NWR COMPLEX
[illegible]BRIDGE, MD 21613

Sheet 12 of 26 DATE: 10-19-15

BREAKWATER 10-1
PROPOSED CONDITIONS
DETAILED PLAN VIEW
SHEET 9 OF 9

PURPOSE: EASTERN NECK LIVING SHORELINE PROJECT

PREPARED BY
CH2MHILL.
NEW YORK, NY

NOT FOR CONSTRUCTION

1"=150'
0
150
300 FT.

PURPOSE:
EASTERN NECK
LIVING SHORELINE PROJECT

PREPARED BY
CH2MHILL.
NEW YORK, NY

DESIGN PLAN
TEMPORARY CONSTRUCTION ACCESS ROAD

PROPOSED: EASTERN NECK LIVING SHORELINE PROJECT
CITY: ROCK HALL
COUNTY: KENT COUNTY, MD
APPLICANT: US FISH AND WILDLIFE SERVICE
CHESAPEAKE MARSHLANDS NWR COMPLEX
CAMBRIDGE, MD 21613
DATE: 10-19-15