APPENDIX G – IMPACTS TO WATERS OF THE U.S., REV 2

I-64 Hampton Roads Bridge-Tunnel Expansion Project

Hampton Roads Connector Partners
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Hampton-Norfolk, Virginia
December 19, 2019
ATTACHMENTS

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G.1 INTRODUCTION

The Impact Plates in Attachment G-1 graphically portray the Project’s impacts to regulated Waters of the U.S. (WOUS) and jurisdictional state waters (including subaqueous bottom, tidal wetlands, and dunes/beaches), collectively referred to as “Jurisdictional Areas”. The Impact Plates display the WOUS type or classification, the type of impact, and the specific wetland or WOUS that is affected. Information provided on the Impact Plates includes the following:

G.1.1.1 IMPACTS TO JURISDICTIONAL AREAS

Impacts to jurisdictional areas are based on the Hampton Roads Bridge Tunnel (HRBT)_AqResource file provided by the Virginia Department of Transportation (VDOT) to the U.S. Army Corps of Engineers (USACE) Office of Regulatory Management (ORM) Jurisdictional Determination and Permit Decisions Database. These wetland boundaries were confirmed in two preliminary jurisdictional determinations (PJDs) NAO-1994-01166 dated September 19, 2017 and October 18, 2018. Minor adjustments to project design caused some areas within the Project’s Limits of Disturbance (LOD) to be outside of the confirmed wetland delineation boundary. Hampton Roads Connection Partners (HRCP) performed a field delineation of these areas in November 2019 and a subsequent PJD request is being submitted to USACE concurrently. Additionally, boundaries for the wetland type Estuarine Intertidal Rocky Shore (E2RS2) around the tunnel islands were georeferenced from the Versar Baseline Benthic Survey because this feature was not captured by the PJD delineation (Wong et al. 2018).

WOUS within the Project area include the following:

- E1OW = Estuarine Subtidal Open Water
- E2RF= Estuarine Intertidal Reef
- E2RS2= Estuarine Intertidal Rocky Shore
- E2US2= Estuarine Intertidal Unconsolidated Shore – Sand
- E2US3= Estuarine Intertidal Unconsolidated Shore – Mud
- E2EM= Estuarine Intertidal Emergent Wetland
- E2SS= Estuarine Intertidal Scrub/Shrub Wetland
- E2FO=Estuarine Intertidal Forested Wetland
- PUB= Palustrine Unconsolidated Bottom
- PEM= Palustrine Emergent Wetland
- PSS= Palustrine Scrub/Shrub Wetland
- PFO= Palustrine Forested Wetland
- R2=Riverine-Perennial
- R4=Riverine-Intermittent
- R6=Riverine-Ephemeral
- SAV= Submerged Aquatic Vegetation
  - SAV was separated out from E1OW into its own category.

E1OW were subdivided into habitat categories based on bathymetric data for the Project surveyed by Alpine Ocean Seismic Survey, Inc. in June 2019 to determine permanent impacts due to habitat conversion and support the Habitat Conditions Analysis (Appendix P, Attachment
P-1). E1OW were divided into the following categories based on depth from mean lower low water (MLLW):

- E1OW- Shallow (MLLW to 6.6 feet below MLLW)
  - 6.6 feet depth represents the limit of the photic zone for seagrass
- E1OW- Mid Depth (6.6 to 15 feet below MLLW)
- E1OW- Deep (15 to 30 feet below MLLW)
- E1OW- Deeper (30 to 45 feet below MLLW)
- E1OW- Deepest (>45 feet below MLLW)

Jurisdictional impacts were calculated according to type and duration of projected impact. The impact areas were coded for Impact Type and Wetland ID (based on the ORM shapefile, or designated name during photointerpretation):

Impact Types were categorized as follows:

- P= Permanent Fill
- PC= Permanent Conversion
- PS= Permanent Shading
- ET= Extended Temporary Shading (> 6 months)
- EF=Extended Fill (> 6 months)
- WT= Work Trestle (> 6 months)
- MT= Maintenance of Traffic (MOT) Trestle (> 6 months)
- JT= Jump Trestle (<6 months)
- T= Temporary (< 6 months)
- D= Dredge

Each identified Jurisdictional Area was assigned a unique identifier as follows:

- Numbers 108 thorough 279 are individual wetlands identified in the PJD
- VN and VS are Versar North and Versar South, respectively, and identify the E2RS2 around the North and South Island
- HU, WS, WL, and WP represent wetlands delineated by HRCP during November 2019 since they were outside of the previous PJDs.

Descriptions are defined in Section 8 of the Joint Permit Application (JPA), but are also included below for reference:

- F=fill
- EX=excavation
- S=Structure
- T=tidal
- NT=non-tidal
- TE=temporary
- PE=permanent
- PR=perennial
- IN=intermittent
- SB=subaqueous bottom
- DB=dune/beach
• IS=hydrologically isolated
• V=vegetated
• NV=non-vegetated
• MC=Mechanized Clearing of PFO
(Example: F, NT, PE, V)

Permanent impacts are not counted as temporary impacts to avoid double counting. Similarly, temporary impacts which are later overlain by permanent trestle impacts are not counted. Permanent pile areas were calculated based on the 30 inch pile diameter or 6.25 square feet per pile. For the temporary jump, MOT, and work trestles, the platforms were calculated as opposed to the piles to allow for flexibility during construction.

For the North Island and South Island expansions, areas of undercut dredging that will then be backfilled with fill were included in the permanent fill impacts and not totaled with the dredge impacts.

Shading impacts were considered permanent for any shading of vegetated wetlands for a time period of greater than 6 months. Shading impacts were calculated in GIS based on DEQ’s equation: \( I = L_b (W_b - 1.25H_b) \) Where: \( I \) = wetland impact, \( L_b \) = bridge length over wetlands, \( W_b \) = bridge width, and \( H_b \) = average bridge height over wetlands (DEQ 2018).

Temporary E1OW impacts were only included if disturbance to subaqueous bottom was anticipated (ie in shallow water where culvert repairs will take place).

Mooring, anchoring, and bridge demolition areas were not included in the impact calculations due to the intermittent and temporary nature of the activity.

G.1.2 REFERENCES

ATTACHMENT G-1: JOINT PERMIT APPLICATION IMPACT PLATES
GENERAL EROSION AND SEDIMENT CONTROL NOTES

ES-1: Unless otherwise indicated, all vegetative and structural erosion and sediment control practices will be constructed and maintained according to minimum standards and specifications of the Virginia Erosion and Sediment Control Handbook and Virginia Regulations Erosion and Sediment Control Regulations.

ES-2: The plan approving authority must be notified one week prior to the pre-construction conference, one week prior to the commencement of land disturbing activity, and one week prior to the final inspection.

ES-3: All erosion and sediment control measures are to be placed prior to or as the first step in clearing.

ES-4: A copy of the approved erosion and sediment control plan shall be maintained on the site at all times.

ES-5: Prior to commencing land disturbing activities in areas other than indicated on these plans (including, but not limited to, off-site borrow or waste areas), the contractor shall submit a supplementary erosion control plan to the owner for review and approval by the plan approving authority.

ES-6: The contractor is responsible for installation of any additional erosion control measures necessary to prevent erosion and sedimentation as determined by the plan approving authority.

ES-7: All disturbed areas are to drain to approved sediment control measures at all times during land disturbing activities and during site development until final stabilization is achieved.

ES-8: During dewatering operations, water will be pumped into an approved filtering device.

ES-9: The contractor shall inspect all erosion control measures periodically and after each runoff-producing rainfall event. Any necessary repairs or cleanup to maintain the effectiveness of the erosion control devices shall be made immediately.
NOTES:
1. If any portion of fill is greater than 3', silt fence is required.
   If fill height is less than 3', filter barrier is required.
2. Check dam is to be constructed in accordance with the
   road and bridge specifications, and standard EC-4.

TYPICAL DETAIL FOR TEMPORARY
FILTER BARRIER/CHECK DAM AT TOE OF FILL

SECTION A-A

TEMPORARY SILT FENCE AND FILTER BARRIER

Virginia Department of Transportation
I-64 HAMPTON ROADS BRIDGE-TUNNEL EXPANSION PROJECT
JOINT PERMIT APPLICATION IMPACT PLATES
Sheet ESC 4

EC-7

PLAN VIEW OF TEMPORARY SEDIMENT TRAP

NOTES:
1. CHECK DRI is shown for illustration only and is not included in payment for sediment trap.
2. The sediment storage volume shall be 154 cubic yards or 1.5% of total contributing drainage area and shall consist of half in the form of wet storage and half in the form of dry storage.
3. See plans for dimensions and elevations.

TYPICAL SECTION (A-A) THRU TEMPORARY SEDIMENT TRAP

TYPICAL SEDIMENT TRAP

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE
T-7
303

DEC 19, 2019
NOTES:

1. Dewatering basin size shall be determined by the formula
   16 x 0.5 x (W x H x C) = (P x 0.15 x (W x H x C))
   where:
   - W = width of pumped area
   - H = depth of pumped area
   - C = coefficient of consolidation
   - P = permeability

2. The work shall consist of the construction of a dewatering basin for the purpose of reducing sediment-laden water
   from the point of construction site to allow for infiltration before it reenters the wastewater. Pumping into these basins
   shall cease when the flow from the basin becomes sediment-free.

3. Surface water flow shall be diverted around this device.

4. The outfall from the basins shall have a stabilized conveyance
to receiving waters.

5. Once the dewatering basin becomes filled to half of the excavated
   depth, the excavated sediment shall be removed and disposed of in
   an approved disposal area outside of the 100-year floodplain unless
   otherwise approved on the plans.

6. Sediment control devices are to remain in place until all disturbed
   areas are stabilized and the engineer approves, their removal. Ground
   contours shall be returned to their original condition unless
   specifically approved otherwise by the engineer.

7. Synthetic products approved by VDOT's New Products Committee as a
   substitute may be used in lieu of this design. However, VDOT will only
   compensate the contractor up to the bid price per each at each site.

SPECIFICATION
REFERENCE

DEWATERING BASIN

VA DEPT. OF TRANSPORTATION

114.09
Temporary Diversion Dike

Note:
1. The channel created behind the dike shall have a positive slope to a stabilized outlet. The channel shall be stabilized, as necessary, to prevent erosion.
2. Temporary diversion dike will be measured and paid for in accordance with section 303 of the specifications.

Temporary Diversion Dike

Virginia Department of Transportation

Specification Reference: 303
SUGGESTED METHOD OF TEMPORARILY PLACING RRPRAP FOR EROSION CONTROL IN CHANNELS, DITCHES, & AT TOE OF FILL SLOPES

NOTES:
1. THE DEPTH OF PROTECTION WILL DEPEND ON WHATEVER DEPTH IS ATTAINABLE WITH THE RRPRAP BEING EASILY SPREAD WITH THE QUANTITY SHOWN ON THESE PLANS. RRPRAP MAY BE ADDED OR DELETED AS FOUND NECESSARY BY THE ENGINEER.
2. SIDE SLOPES AND BOTTOM WIDTH (IF TRAPEZOIDAL) SHOWN IN TYPICAL SECTION OF PROPOSED DITCH OR CHANNEL.

MINIMUM REQUIREMENTS FOR STABILIZED CONSTRUCTION ENTRANCE

1. SURFACE WATER SHALL BE PIPED UNDER THE CONSTRUCTION ENTRANCE. IF PIPING IS INAPPROPRIATE, A MOWABLE BERM WITH ST SLOPES WILL BE PERMITTED.

2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT INTO PUBLIC RIGHT OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE. AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANDOUT OF ANY MEASURES USED TO TRAP SEDIMENT, ALL SEDIMENT DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT OF WAY SHALL BE REMOVED IMMEDIATELY.

3. WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE INTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAGS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

4. PERIODIC INSPECTION AND NECESSARY MAINTENANCE SHALL BE PROVIDED AFTER HEAVY USE AND EACH RAIL.

TEMPORARY EROSION & SILTATION CONTROL

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 7/24
15.07
TEMPORARY BERM & SLOPE DRAIN

EARTHEEN BERM

PROFILE

ALTERNATE ENTRANCE TREATMENT

SECTION A-A

PLAN VIEW

PROFILE

SIZE OF SLOPE DRAIN

MAXIMUM DRAINAGE AREA (ACRES) MINIMUM PIPE DIAMETER (IN.)

1.0 0.0

1.5 0.8

2.0 0.7

3.0 0.6

NOTES

1. SLOPE DRAIN SHALL BE SECURELY FASTENED TO THE SLOPE, AT 10 FT OR LESS INTERVALS.

2. THE SLOPE DRAIN SECTIONS SHALL BE SECURELY FASTENED TOGETHER AND HAVE WATER TIGHT FITTINGS.

TEMPORARY EROSION & SILTATION CONTROL

VIRGINIA DEPARTMENT OF TRANSPORTATION

Sheet ESC 8
RESTORATION MEASURES FOR TEMPORARY IMPACTS

Where practicable, the following measures will be implemented to minimize impacts to aquatic resources for temporary impacts:

• E2RS2:
  • Rock/riprap will be replaced once piles are removed to return structural community for benthic wildlife use.
  • Riprap will be clean and from an approved quarry.

• E2US2:
  • Pile holes will be filled with clean fill and will return to existing habitat conditions.
  • Wetland access areas will be graded to pre-existing biological, chemical, and hydrological conditions.

• E2US3:
  • Wetland matting and low ground pressure equipment will be used for temporary access.
  • Pile holes will be filled with clean fill to match adjacent elevations.
  • Wetland matting will be removed and access areas will be returned to original elevations as well as to pre-existing biological, chemical, and hydrological conditions.

• E2EM:
  • Wetland matting and low ground pressure equipment will be used for temporary access.
  • Pile holes will be filled with clean fill to match adjacent elevations.
  • Wetland matting will be removed and access areas will be restored to original elevations as well as to pre-existing biological, chemical, and hydrological conditions.
  • Disturbed areas will be sown with appropriate native vegetation (for example: low marsh = Spartina alterniflora, high marsh = S. patens) to match existing reference wetland.
  • Spartina sowing will consist of nursery stock peat pot plugs planted on one-foot centers.

• E2SS:
  • Shrub may be cleared with stumps left in place. Planting of shrubs is not expected as stump sprout from cut shrubs is expected.
  • Wetland matting and low ground pressure equipment will be used for temporary access.
  • Pile holes will be filled with clean fill to match adjacent elevations.
  • Wetland matting will be removed and access areas will be restored to original elevations as well as to pre-existing biological, chemical, and hydrological conditions.
  • If temporary access areas are denuded of herbaceous vegetation the appropriate salt-tolerant seed mix or plugging of native vegetation will be required.
  • Seeding will follow the VDOT and DEQ recommended densities, fertilizing, and mulching requirements.

• E2FO:
  • Tree limbs may be removed for accessibility.
  • If tree clearing required, stumps will be left in place. Planting of trees is not expected as stump sprout from cut trees is expected.
  • Wetland matting and low ground pressure equipment will be used for temporary access.
  • Pile holes will be filled with clean fill to match adjacent elevations.
  • Wetland matting will be removed and access areas will be restored to original elevations as well as to pre-existing biological, chemical, and hydrological conditions.
  • If temporary access areas are denuded of herbaceous vegetation the appropriate salt-tolerant seed mix or plugging of native vegetation will be required.
  • Seeding will follow the VDOT and DEQ recommended densities, fertilizing, and mulching requirements.

• PEM:
  • Wetland matting and low ground pressure equipment will be used for temporary access.
  • Pile holes will be filled with clean fill to match adjacent elevations.
  • Wetland matting will be removed and access areas will be restored to original elevations as well as to pre-existing biological, chemical, and hydrological conditions.
  • Disturbed areas will be seeded with an approved wetland seed mixture that compares to existing reference wetland, such as ERNMX-120 OBL-FACW Perennial Food and Cover Wetland Mix.
  • Seeding will follow the VDOT and DEQ recommended densities, fertilizing, and mulching requirements.

• PESS:
  • Shrub may be cleared with stumps left in place. Planting of shrubs is not expected as stump sprout from cut shrubs is expected.
  • Wetland matting and low ground pressure equipment will be used for temporary access.
  • Pile holes will be filled with clean fill to match adjacent elevations.
  • Wetland matting will be removed and access areas will be restored to original elevations as well as to pre-existing biological, chemical, and hydrological conditions.
  • If temporary access areas are denuded of herbaceous vegetation the appropriate seed mix or plugging of native vegetation will be required. Seeding will follow the VDOT and DEQ recommended densities, fertilizing, and mulching requirements.

• PFO:
  • Tree limbs may be removed for access.
  • If tree clearing required, stumps will be left in place. Planting of trees is not expected as stump sprout from cut trees is expected.
  • Wetland matting and low ground pressure equipment will be used for temporary access.
  • Pile holes will be filled with clean fill to match adjacent elevations.
  • Wetland matting will be removed and access areas will be restored to original elevations as well as to pre-existing biological, chemical, and hydrological conditions.
  • If temporary access areas are denuded of herbaceous vegetation the appropriate seed mix or plugging of native vegetation will be required. Seeding will follow the VDOT and DEQ recommended densities, fertilizing, and mulching requirements.
  • R2:
  • Will restore grade and banks to existing conditions and to match the upstream and downstream banks.
  • Bare banks will be seeded with an approved riparian seed mixture that compares to existing reference waters, such as ERNMX-892 VA Outer Coastal Plain Riparian Mix.
  • Seeding will follow the recommended densities, fertilizing, and mulching requirements.

• E10W, SAV, and PUB do not currently have any restoration measures.

If, after the aforementioned measures have been implemented, the temporary wetland impact areas fail to exhibit all three wetland parameters (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology) after work has concluded in the area of impact, these would be considered to be permanent wetland losses. HRCP would provide additional compensatory mitigation for these areas at standard compensation ratios based on the pre-disturbance cover-type (e.g., 2:1 ratio for former FFO areas, etc.).
Settlers Landing Rd.

I-64 WB

I-64 EB

12' PAVED SHLDR.

T-108 (PEM)

32 sf

DATA SOURCE: VIMS, VDOT, FHWA

I-64 HAMPTON ROADS BRIDGE-TUNNEL EXPANSION PROJECT

JOINT PERMIT APPLICATION IMPACT PLATES

SHEET 1 OF 38

DECEMBER 19, 2019
Norfolk Harbor Entrance Reach

200' Buffer

HAMPTON ROADS HARBOR

Flood

Ebb

SEE PROPOSED TUNNEL DRAWINGS

MATCHLINE SHEET 10

DATA SOURCE: VIMS, VDOT, FHWA

I-64 HAMPTON ROADS BRIDGE-TUNNEL EXPANSION PROJECT

JOINT PERMIT APPLICATION IMPACT PLATES

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DECEMBER 19, 2019