Meeting Summary

Project:	**I-64 Hampton Roads Bridge-Tunnel Expansion**
Meeting Title:	Monthly Environmental Agency Meeting
Date:	June 28, 2019
Location:	DoubleTree Inn, Norfolk VA. 1500 N. Military Highway, Norfolk VA 23502

Attendees:

Company	Last Name	First Name	Phone Number	E-mail Address
VDOT	Smizik	Scott	(804) 371-4082	scott.smizik@VDOT.virginia.gov
VDOT	Utterback	James	(757) 802-0005	james.utterback@VDOT.virginia.gov
DEQ	Hannah	Jeff	(757) 518-2146	jeffrey.hannah@deq.virginia.gov
DEQ	Weyland	Janet	(757) 518-2151	janet.weyland@deq.virginia.gov
DEQ	Woodruff	Melinda	(757) 518-2174	melinda.woodruff@deq.virginia.gov
FHWA	Mazur	John	(804) 775-3329	John.mazur@dot.gov
FHWA	Sundra	Ed	(804) 775-3357	ed.sundra@dot.gov
Stantec	Hawley	Brian	(540) 908-5528	brian.hawley@stantec.com
USACE	Janek	George	(757) 201-7135	george.a.janek@usace.army.mil
VHB	Frye	Chris	(757) 503-3796	cfrye@vhb.com
VMRC	Lay	Allison	(757) 247-2254	allison.lay@mrc.virginia.gov
HRCP	Barrier	David	(514) 663-9198	david.barrier@vinci-construction.com
HRCP	Martin Alos	Jose Ignacio	(404) 702-1030	jimartinalosb@dragados-usa.com
HRCP	Vazelle	Solene	(757) 933-0878	solene.vazelle@vinci-construction.com
I-64 DJV	Field/1	David	(371) 212-9332	david.field@mottmac.com
I-64 DJV	Gaffney	Doug	(856) 924-3363	douglas.gaffney@mottmac.com
I-64 DJV	Han	Jeffrey	(646) 235-4288	jeffrey.han@hdrinc.com
I-64 DJV	Pico/1	Tina	732-333-3257	tina.pico@mottmac.com
I-64 DJV	Ryder/1	Matt	(929) 396-8392	matthew.ryder@mottmac.com
I-64 DJV	Stowe	Angela	845-216-3052	angela.stowe@hdrinc.com
I-64 DJV	Sword	Taylor	(757) 672-4528	taylor.sword@mottmac.com
WRA	Sprenkle	Taylor	804-366-4097	tsprenkle@wrallp.com
NOAA	O'Brien	David	804-684-7828	david.l.obrien@noaa.gov

VIMS	Hein	Emily	804-684-7482	eahein@vims.edu
I-64 DJV	Peabody	John	571-451-0954	john.peabody@mottmac.com
I-64 DJV	Whalon	Valerie		valerie.whalon@hdrinc.com
VHB	Murray	Sean		seanmurray@vhb.com
WRA	Drahos	Emily	804-822-2173	edrahos@wrallp.com
I-64 DJV	Benson/1	Craig		Craig.benson@mottmac.com

/1 On phone

Meeting Notes:

Monthly update on progress toward the major permits required for the HRBT Expansion Project

No.	Description	Action
1.	**Welcome and Introductions**	
	DG began the meeting with introductions and the agenda of the meeting. Additional detail will be provided on two topics during this meeting: Dredging and the Habitat Condition Assessment (HCA)	
2.	**Schedule of Major Permits**	

a	NWP6 for supplemental borings
	- Submitted May 24, 2019
	  ○ USACE RFI response sent June 7, 2019
	  ○ VMRC Pending. AL stated that no public notice would be required
	  ○ USCG response pending	

b	VPDES for Water Treatment Plant (WTP) discharge - Pre-App Meeting – Week of Aug 5th ○ Scheduled for August 6, 2019 DEQ agreed - Submit Application to VDEQ with available analyticals – Sept. 9th	DJV to get invite out and hold the date for this pre-app meeting
c	Construction General Permit - Progressing the Application for VDOT Self Certification (South Island - 1st Phase) – Sept 4th.	
d	USCG Bridge Permit - USCG coordination initiated June 2019	
e	Joint Permit Application - Pre-app meeting planned for July 10– outlined, where the project is walked through entirely. VDEQ recommended that all commenting agencies, including Cities of Norfolk and Hampton, be invited.	

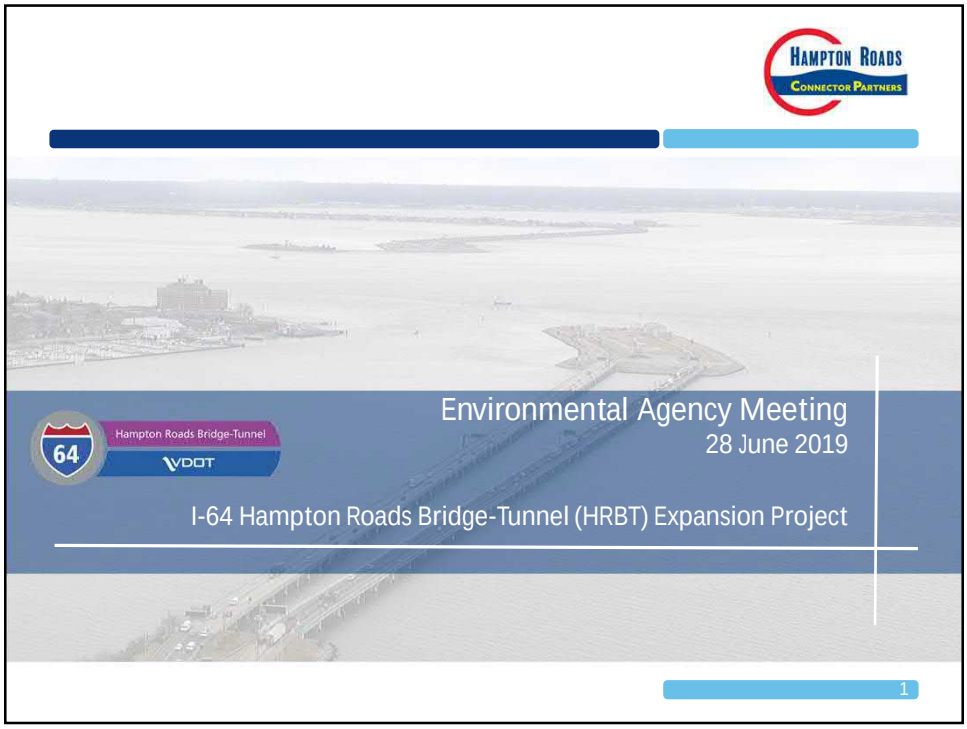
No.	Description	Action
	- Focus on impact areas, and regulatory areas and have a more detailed discussion - Discussed supplemental meetings to support the JPA - Draft page-turn During August Monthly Mtg - JPA submission ~August 30th - JPA post submission follow up Sept (date TBD) - Anticipate USACE Public Notice ~ Sept. 28th Some questions – GJ what percent design goes out with JPA – DG responded that for design elements related to the permits, it will be approximately 65%. GJ asked if there will be substantial change after 65% -- ans. DG responded No, and that efforts are continuing to reduce the foot print. JM – Means and methods are frozen.	
3.	**Dredging**	
a.	Footprints and volumes Slide 4 (presentation attached) – depicts North Island expansion – dredging planned for approximately 19 ac. AL stated that clean sand dredged at North Island might need to go to a local beach for nourishment. *Post meeting note: AL provided language from Virginia Code 10.1-704.* Slide 5 – South Island – volume range discussed - the range is due to dredge depth which is related to geotechnical stability issues, and potential debris (former rip rap, or other sediments not suitable for base) Jeff Hannah - DEQ (JH) asked if this was the material from South Island for fill. DG responded No, the potential fill material is coming from the tri-cell area (area to be excavated for placement of the TBM and entrance). Slide 6 showed the planned areas requiring dredging for access of vessels adjacent to the south trestle alignment from South Island to Willoughby spit. (red areas of shallow water based on bathy survey) that will require removal so to allow vessel access in and adjacent to where the new trestles are to be constructed. AL, JH and GJ stated that dredging of a mud flat at Willoughby spit would be considered a permanent impact. Both VDEQ and USACE stated the importance of not modifying the permits post-issuance to avoid delays in the project schedule.	
b.	Sampling and Analysis Plan Slides 7 – 11 illustrated the location of supplemental borings being slightly moved in response to the bathymetric survey. No increase in number of borings, just the location moved slightly and within the	

No.	Description	Action
	LOD. The location move was to further facilitate sampling of material to be dredged so that this material can be characterized for its determination/ disposal/ reuse – depending on results. The number of planned environmental borings for each zone to characterize the material was presented.	
c.	DMMP AL asked if dredge material is expected to be clean sand? Any clean sand should be considered for beach nourishment. JM responded that if material can be reused, the project would like to reuse it on the project. If it has to go elsewhere, then material may need to be stockpiled for a while. AL- there is a VMRC regulation for clean sand to be used on public beaches. Area to be dredged around Willoughby Spit - Jeff H commented that section 106 coordination may come into play. SS responded that these specific wrecks were identified during the NEPA process, and have been included in the Programmatic Agreement.	
4.	**Habitat Condition Assessment (HCA) and Mitigation**	
a.	Impacts Slide 11 - presented table of permanent impacts and the difference between those that were anticipated in the EA June 2018 versus those that are envisioned by the Design June of 2019. The current design has resulted in an approximate 90% reduction. The majority of the reduction is due to the use of a bored tunnel vs Immersed Tube Tunnel (ITT). Pile footprints are being looked at. Any mud flat dredged (area near Willoughby spit) would be considered a permanent impact. Slide 12 – Open Water Permanent Impacts. Proposed impact areas based on water depth were described for use in the HCA and compensatory mitigation Slide 13 – Impacts at Mallory Street were reviewed. GJ noted that mitigation area here has higher (double the standard) ratios, right now at 2:1 for emergent wetland impacts and 3:1 for any scrub-shrub impacts, since it is a mitigation site. HRCP is continuing to refine the geometry at this location.	

No.	Description	Action
	Slide 17 Willoughby (east) - there is some roadway widening which results in an extension of the toe of slope into the Monkey Bottoms area. GJ – this was an area of prior mitigation site, that will be a higher ratio for mitigation. Same ratios discussed under Slide 13 above. Also discussed some tree cutting in this area. Slide 19 - Mason Creek area. There was a comment on extent of noise barrier – permanent impact. Slide 20 – Table summary of extended temporary impacts >12months was provided. Extended temporary trestle impacts are based on the area of trestle deck. GJ stated that any impacts greater than 12 months may be considered permanent from a mitigation perspective by the Corps. Shading impacts are also under consideration. Slide 21 – Temporary Extended Impacts, along the North Trestle presented. AL commented that if there is an SAV impact – please calculate the area separately. VIMS said yes this will have to be included, also height of trestle, and shading impact needs to be considered. GJ requested that the environmental team think about restoration for impacts greater than 12 months. Restoration/ mitigation may require monitoring. AS stated that SAV shading area is about ½ acre. GJ stated that USACE does not regulate shading. The question of determination for extended vs permanent defines the need of whether mitigation /restoration requirements are applicable. Slide 24 presented the need for, and use of Jump trestles which have temporary impacts less than 2 months	
b.	Shellfish Slide 25 indicated no evidence of widespread occurrence of oysters {[slide source – VIMS, HRBT Shellfish Survey Fall 2018} VIMS commented that another concern is clams in areas of island and dredging – the project might need mitigation for clams. *Post meeting note: AL stated that in the past this mitigation has been a replacement rate of 1.3:1 based on the densities found in the most recent clam survey. This mitigation has been achieved in the past by purchasing chowder clams and placing them on to a public clam bed site. VMRC will consider requiring a similar mitigation for impacts associated with this project as well.*	VMRC/VIMS

No.	Description	Action
	Slide 26 depicts density of clams along the alignment of the HRBT. This data is also from the VIMS HRBT Shellfish Survey Fall 2018. Noted density along the alignment is low and lacking in small (young) clams. Currently the project is not considering mitigation for these. EH stated that she will go back and check. JD stated that the DJV will calculate the density of clams in the impact footprints.	I64-DJV
c.	Anadromous Fish Slide 27 – Atlantic Sturgeon detections in Hampton Roads Phase II VDOT study. Noted importance as a migration corridor, no evidence of staging area for feeding habitats for subadults, adults, residence time short (in hours) so the project is not considering any TOY restrictions. DG added that there is no construction work in the channel, which is the preferred transit corridor for sturgeon. EH requested more information on the noise impacts to help determine status. JD pointed out that DGIF guidelines (July 2018) indicate no TOYR below RT 17 crossing. DJV is currently working on finalizing zones of influence (ZOI) for pile driving for sturgeon, marine mammals and turtles.	HRCP
5.	**Comments, Questions, Next Steps** Slide 29 – Presented the proposed JPA Approval schedule with the target date of issued permits to HRCP in April 2020 to support in-water construction. JM indicated that our goal is to reduce RFIs during the JPA review period. GJ suggested that adjacent property owners will likely have comment. Need to make sure HCA due diligence on mitigation is done, GJ anticipates a lot of comment from the public. The project will have to address comments. HRCP will be involved in helping government respond to comments. JM asked that HRCP be copied on the comment when received. GJ highlighted that if the level of comments received reaches a certain point, a public hearing may be necessary. JH DEQ – there is notification for 1/4mile upstream and downstream property owners bounding in tidal areas, and ½ mile in non-tidal areas downstream. There will be coordination of different agencies, VDH,	

No.	Description	Action
	DGIF, DEQ etc. VMRC notification is within 500 feet of the water (AL to confirm). JH (VDEQ) suggested that the HRCP team conducts the property owner research and provides the mailing labels to VDEQ to expedite the notification process. DEQ also recommended that VDOT/HRCP conducts public outreach and document those efforts. JW described the needs for the VPDES pre-app meeting: Conceptual design, discharge rates, thermal discharges and outfall locations. GJ suggested Aug meeting approximately 2-weeks before submittal (week of Aug 11) – Agree to Aug 20th 10-12 Pre-app for JPA, invite to also go to others specifically, Steve Powell (for Section 408) definitely. 3-weeks after submittal, need to set some dates for meetings, for JPA finalization and follow up. End of Agency meeting 2:06 pm.	HRCP/VDOT



Agenda

- Schedule of Major Permits
  - NWP6 for supplemental borings
  - VPDES for Water Treatment Plant (WTP) discharge
  - Construction General Permit
  - USCG Bridge Permit
  - Joint Permit Application
- Dredging
  - Footprints and volumes
  - Sampling and Analysis Plan (SAP)
  - DMMP
- Habitat Condition Assessment (HCA)
  - Impacts
  - Shellfish
  - Anadromous Fish

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Schedule of Major Permits

- NWP6
  - Submitted – May 24th
    - USACE RFI Response – June 7th
    - VMRC – Pending
    - USCG – Pending
- VPDES for Water Treatment Plant (WTP) Discharge
  - Pre-App Meeting – week of August 5th
  - Submit Application to VDEQ with available analyticals – September 9th
- CGP
  - Progressing the Application for VDOT Self Certification (South Island – 1st Phase) – September 4th
- USCG Bridge Permit
  - USCG Coordination – June 2019
- JPA
  - Pre-App Meeting – July 10th
  - Draft Page Turn – August Monthly Meeting (date – TBD)
  - JPA Submission – August 30th
  - JPA Post-Submission Follow-up – September (date – TBD)
  - Anticipated USACE Public Notice – September 28th

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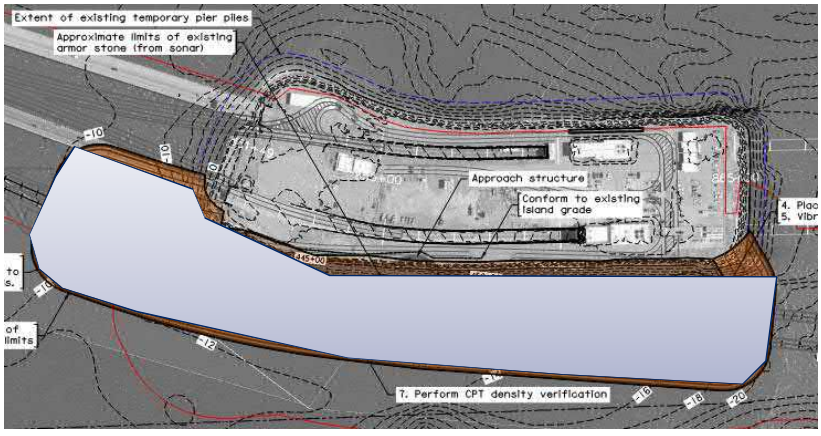
Dredging

- North Island Expansion – Ground improvement and obstruction removal
  - Dredged area ~19 acre
  - Depth ~ 3 FT
  - Volume ~95,000 cyds



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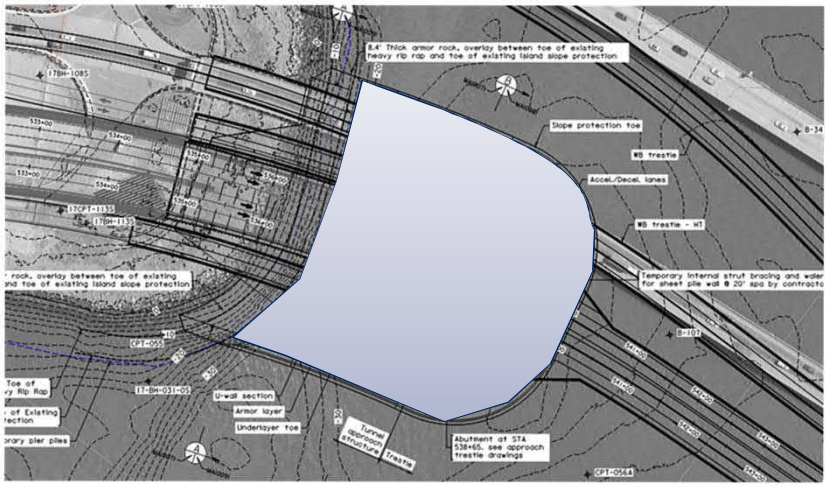
Dredging

- South Island Expansion – Ground Improvement and Obstruction Removal
  - Dredged area ~ 4 acre
  - Dredge depth ~ 3FT – 20FT
  - Volume ~ 20,000 – 125,000 cyds (dependent on geotechnical)



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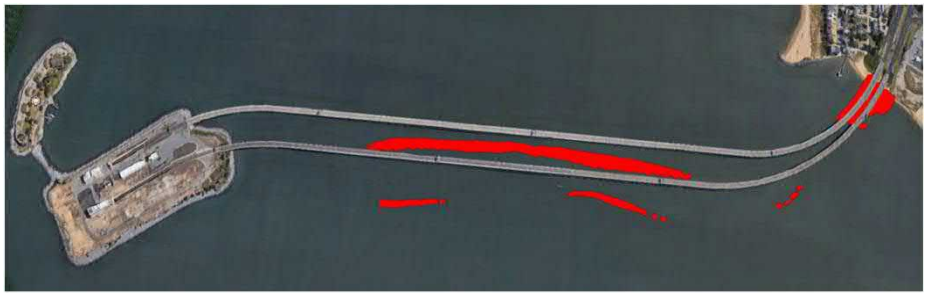
Dredging

- South Trestle Dredge – Construction Vessel Access and Obstruction Removal
  - Potential maintenance cycle



Area (SF)	Volume (CY)	# of Bores to Characterize
150,000	16,700	8
15,000	1,670	2
14,000	1,560	2
4,000	450	1
Willoughby Spit	7,225	3

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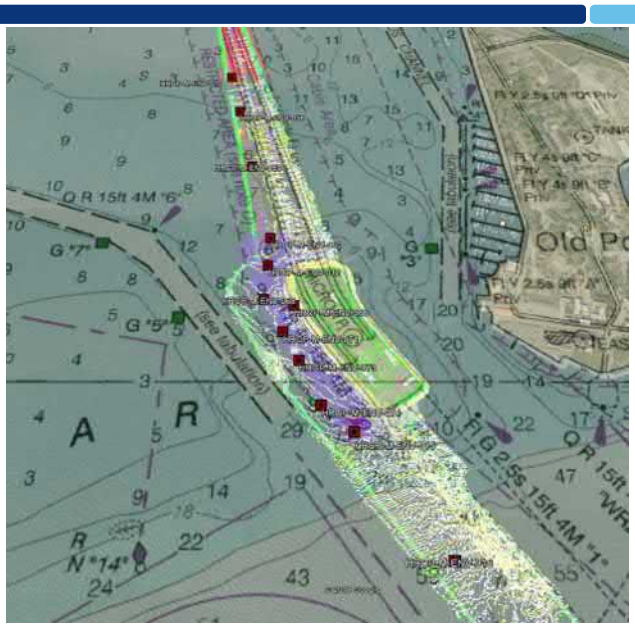
Dredging



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Dredging

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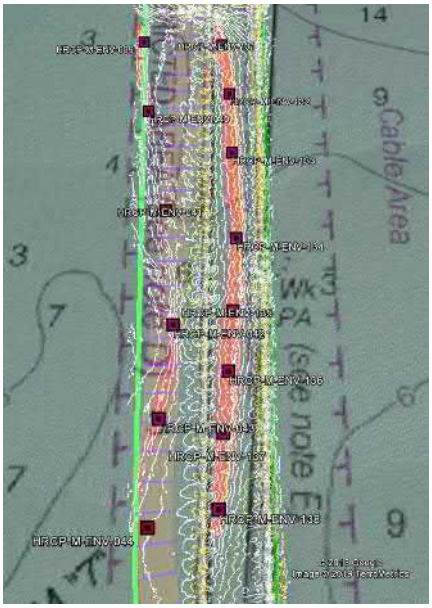
Dredging



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Dredging

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Permanent Impacts (~90% Reduction)

Resources	EA June 2018 (acres)	Design June 28, 2019* (acres)
Estuarine Subtidal Open Water*	233	19.6
Estuarine Intertidal Emergent Marsh*	5.6	0.7
Estuarine Intertidal Scrub Shrub		0.1
Estuarine Intertidal Reef	6.8	0
Estuarine Intertidal Unconsolidated Shore Sand*		1.6
Estuarine Intertidal Unconsolidated Shore Mud		0
Jurisdictional Ditch	0.1	<0.01
Palustine Emergent	2.2	1.0
Palustrine Forested		0.5
Palustrine Scrub Shrub		0.7
Palustrine Unconsolidated Bottom	1.1	0.2
Non-Tidal Open Water	0.8	0
Total	249.6	24.4
Lower Perrenial, Riverine	39 Linear Feet	<0.01
Intermittent, Riverine		0

*Permanent trestle impact based on pile footprints
Shading impacts are under consideration

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Open Water Permanent Impacts

Open Water Resources[1]	Total (acres)
Shallow (photic zone): < 6.6ft[2]	1.02
Mid-Depth: 6.6ft – 15ft	13.97
Deep: 15ft – 30ft	4.50
Deeper: 30ft – 45ft	0.07
Deepest: >45ft	0

[1] Permanent trestle impact based on pile footprints
[2] Photic zone of shallow water <2m (VIMS Center for Coastal Resources Management: https://www.vims.edu/ccrm/research/ecology/coastal%20habitats/index.php)

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Impacts

- Mallory Street

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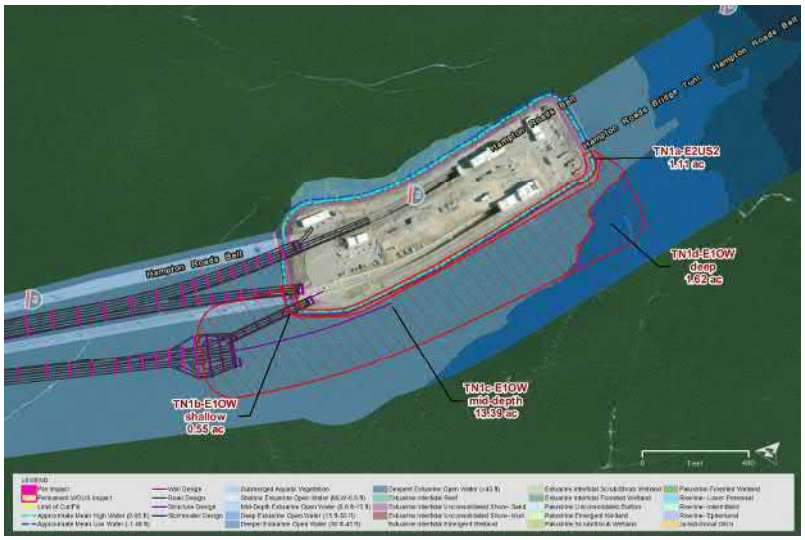
Impacts

- North Island



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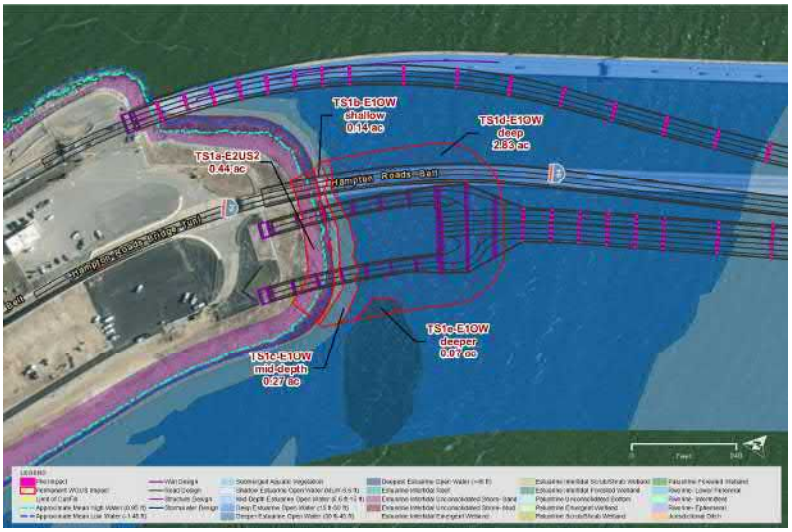
Impacts

- South Island



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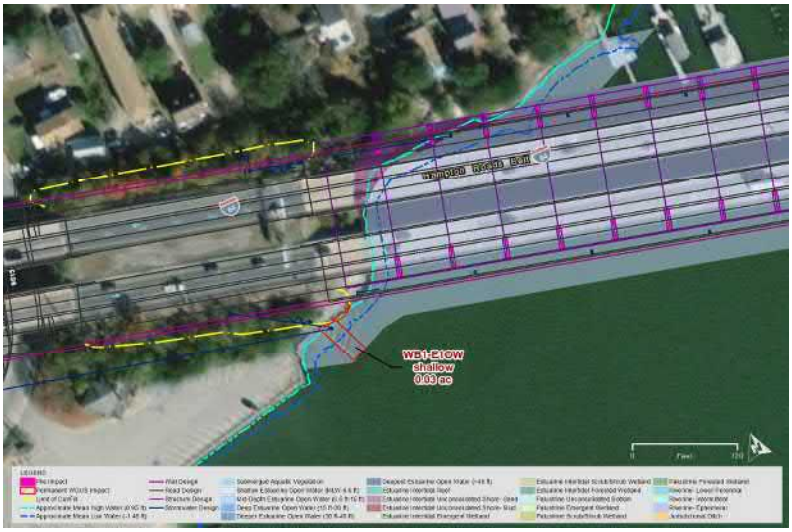
Impacts

- Willoughby (west)



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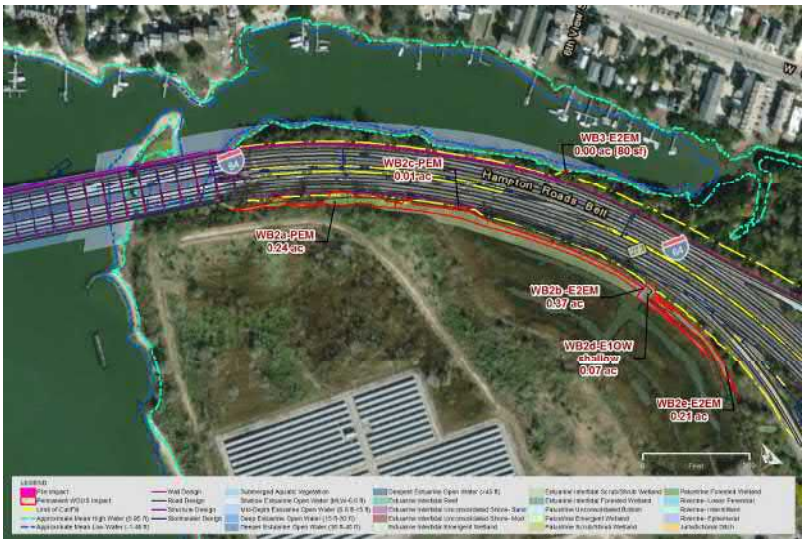
Impacts

- Willoughby (east)



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Impacts

- Oastes Creek

18

Impacts

- Mason Creek

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Extended Temporary Impacts (>12 months)

Resources	Extended Temporary Impacts (acres)
Estuarine Subtidal Open Water deep	0.68
Estuarine Subtidal Open Water mid-depth	1.78
Estuarine Subtidal Open Water shallow	3.35
Estuarine Intertidal Emergent Marsh	0.55
Estuarine Intertidal Scrub Shrub	0.00
Estuarine Intertidal Unconsolidated Shore Sand	0.53
Palustrine Forested	0.01
Palustrine Unconsolidated Bottom	0.01
Grand Total	6.92

- Extended Temporary trestle impact based on the area of the trestle deck
- Shading impacts are under consideration

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Temporary Extended Impacts

- North Trestle

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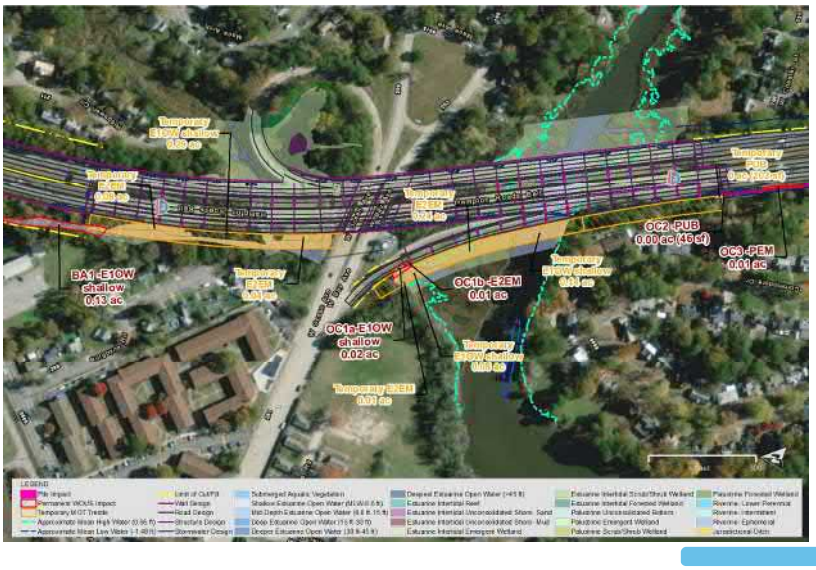
Temporary Extended Impacts

- Oastes Creek



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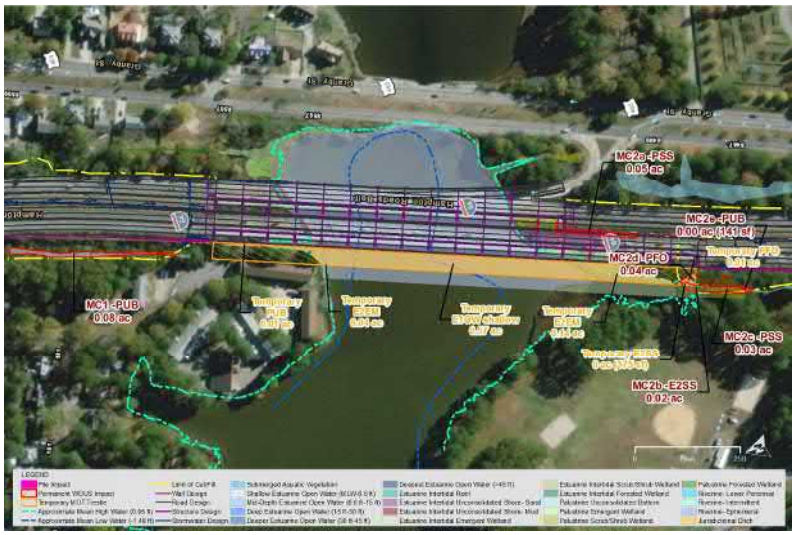
Temporary Extended Impacts

- Mason Creek



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Temporary Impacts (<12mo)

- Jump Trestles (~2 months) 18 to 24 piles each
- Utility Excavations (under development)

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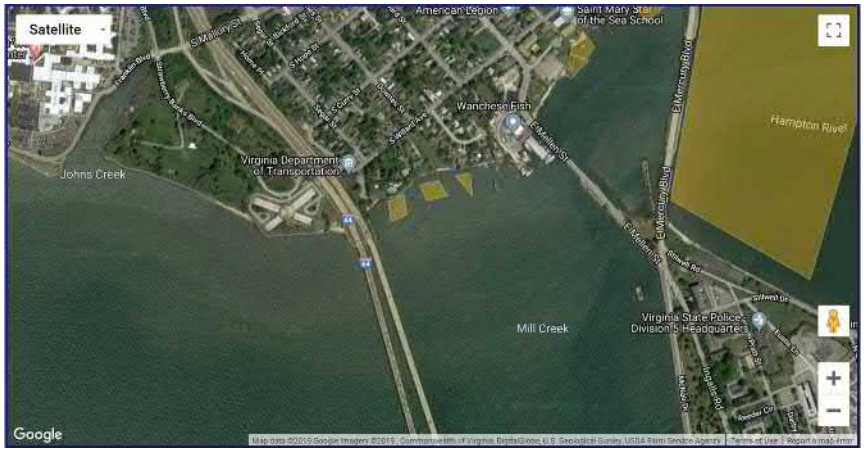
Shellfish

- Oysters: No evidence of widespread occurrence of oysters

(Source: VIMS, HRBT Shellfish Survey, Fall 2018)



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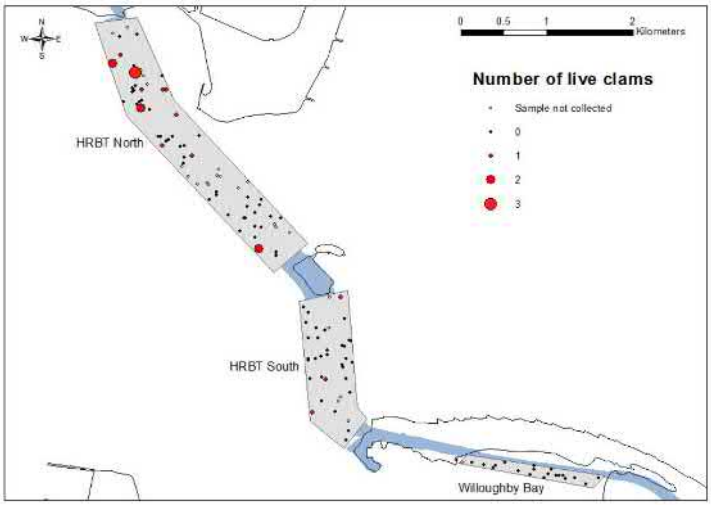
Shellfish

- Clams: Observed densities (low) and size distributions (lacking in small = young clams) are not indicative of regular clam recruitment



Source: VIMS, HRBT Shellfish Survey, Fall 2018

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Anadromous Fish

- Atlantic Sturgeon detections in Hampton Roads Phase II VDOT Study
  - Important as a migration corridor during Spring and late Fall/early Winter for adults and subadults
  - No evidence of important staging or feeding habitats for sub-adults or adults
  - Residence (linger) times by individual adults and sub-adults are short (hours rather than days or weeks)
  - Short linger-times should correlate with a lower risk of adverse impacts
  - Unlikely potential that juveniles overwinter in the study area

	Number of Fish Detected at Receiver		Total Hours at Receiver		Average Hours Fish Spent at Receiver	
Receiver ID	Subadults	Adults	Subadults	Adults	Subadults	Adults
1	0	0	0	0	0	0
2	5	0	7	0	1.4	0
3	6	6	8	8	1.3	1.3
4	17	67	42	346	2.4	5.1, 3*
5	13	82	20	191	1.5	2.3
6	0	0	0	0	0	0
7	0	7	0	8	0	1.1
8	0	1	0	2	0	2
9	0	0	0	0	0	0

Source: Balazik and Garman, May 2019 Draft

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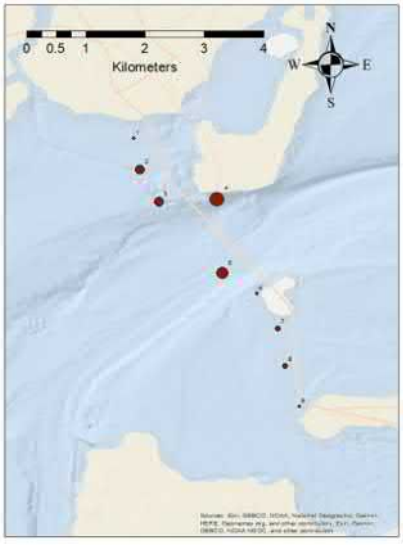
Anadromous Fish

- DGIF TOYR Guidelines (July 2018):
  - No TOYR below Route 17
- Finalizing zones of influence

Atlantic Sturgeon detections in Hampton Roads Phase II VDOT Study



Source: Balazik and Garman, May 2019 Draft

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JPA Approval Schedule

- JPA
  - Pre-App Meeting – July 10th
  - Draft Page Turn – August Monthly Meeting (date - TBD)
  - JPA Submission – August 30th
  - JPA Post-Submission Follow-up – September (date – TBD)
  - Anticipated USACE Public Notice – September 28th
  - RFI Resolution – 2-3 months
  - Draft Permit
  - VMRC/DEQ/VPDES Public Notices
  - Permit to HRCP April 2020

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Comments/Questions?

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Meeting Title :	Pile Driving/ Impacts to Aquatic Species
Meeting Location	Double Tree Hotel Norfolk VA
Meeting Date :	6/28/19

HRBT - Attendance Sheet

Company	Last Name	First Name	Phone Number	E-mail Address	Present
VDOT	Murray	Sean		seanmurray@vhb.com	XX
VDOT	Reilly	Peter	(757) 323-3307	peter.reilly@vdot.virginia.gov	XX
VDOT	Smizik	Scott	(804) 371-4082	scott.smizik@VDOT.virginia.gov	XX
VDOT	Utterback	James	(757) 802-0005	james.utterback@VDOT.virginia.gov	XX
DEQ	Hannah	Jeff	(757) 518-2146	jeffrey.hannah@deq.virginia.gov	XX
DEQ	Weyland	Janet	(757) 518-2151	janet.weyland@deq.virginia.gov	XX
FHWA	Sundra	Ed	(804) 775-3357	ed.sundra@dot.gov	XX
Stantec	Hawley	Brian	(540) 908-5528	brian.hawley@stantec.com	XX
USACE	Janek	George	(757) 201-7135	george.a.janek@usace.army.mil	XX
VHB	Frye	Chris	(757) 503-3796	cfrye@vhb.com	XX
VMRC	Lay	Allison	(757) 247-2254	allison.lay@mrc.virginia.gov	XX
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I-64 DJV	Han	Jeffrey	(646) 235-4288	jeffrey.han@hdrinc.com	XX
I-64 DJV	Stowe	Angela	845-216-3052	angela.stowe@hdrinc.com	XX
I-64 DJV	Sultan	Nels	(206) 450-2620	nels.sultan@mottmac.com	XX
I-64 DJV	Peabody	John		john.peabody@mottmac.com	XX
I-64 DJV	Sword	Taylor	(757) 672-4528	taylor.sword@mottmac.com	XX
I-64 DJV	Whalon	Valerie		Valerie.whalon@hdrinc.com	XX
WRA	Sprenkle	Taylor	804-366-4097	tsprenkle@wrallp.com	XX
WRA	Drahos	Emily		edrahos@wrallp.com	XX
NOAA	Obrien	David	804-684-7828	david.l.obrien@noaa.gov	XX
VIMS	Hein	Emily	804-684-7482	eahein@vims.edu	XX
	Hopper	Brian		on phone	XX
	Speckman	Susan		on phone	XX
NOAA	Pauline	Robert		on phone	XX

Agenda

- Introduction
- Overview of Hampton Roads Bridge-Tunnel (HRBT) construction
- Pile Driving Activities
  - Temporary Platforms
  - Temporary Construction Trestles
  - MOT Trestles
  - Permanent Trestles
  - South Island Expansion
  - North Island Expansion
- Protected species with the potential to occur at the site
  - Marine Mammals (MMPA)
  - ESA-listed Species
- LOA vs IHA
  - Separate the temporary dock and jet grout trestle for the tunnel boring machine under an IHA
  - Remainder of the project components under an LOA
- Avoidance and minimization measures
- Additional Issues/Questions

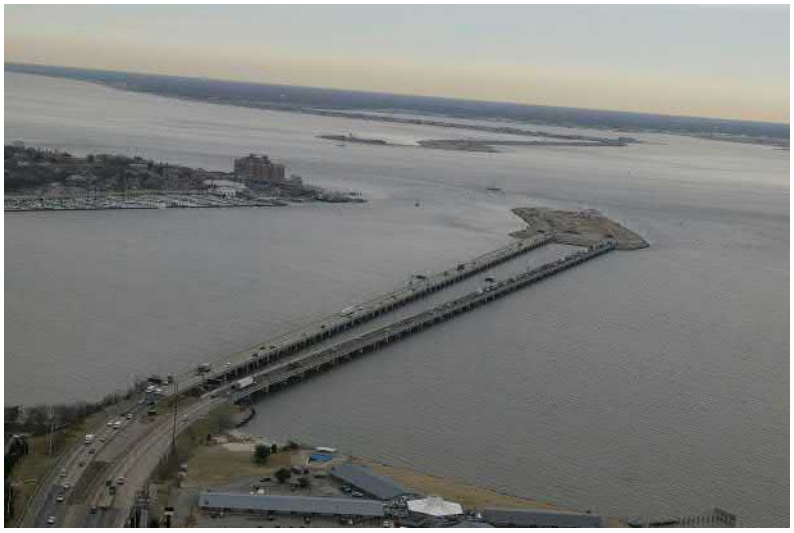
2

Purpose of Meeting

- Provide an overview of the HRBT Expansion Project pile driving plan and schedule
- Present the approach to incidental take (MMPA and ESA Section 7)
- Gain concurrence on approach
- Receive technical advice on issues of concern related to marine mammals and ESA-listed species

3

Introduction



4

Project Segments

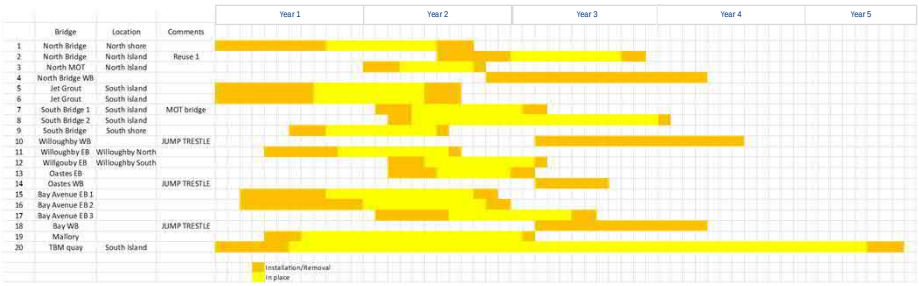
5

Pile Installation and Removal Schedule

Project Component	Permanent or Temporary	Schedule
TBM Platform	Temporary	Receipt of Permits, Remove Jan 2025 – Mar 2025
Jet Grouting Trestles (2 platforms)	Temporary	Receipt of Permits – Dec 2020 Remove May 2024
North Trestle EB	Permanent	Receipt of Permits to Sep 2024
North Trestle WB	Permanent	Receipt of Permits to Sep 2024
North Trestle: MOT Bridges	Temporary	Receipt of Permits to Sep 2024
North Trestle EB North Shore	Temporary	Receipt of Permits – May 2021 Remove Mar 2022 – May 2022
North Trestle WB North Island	Temporary	Install Mar 2022 – Aug 2022 Remove Jun 2023 – Jul 2023
North/Jump Trestle to North EB MOT Bridge	Temporary	Install Sept 2021 – Nov 2021 Remove June 2022
North/Jump Trestle WB North Shore temporary trestle	Temporary	Install/Remove span by span (2 months at one location) Jul 2022 – Dec 2023
South Trestle EB	Permanent	Receipt of Permits to Sep 2024
South Trestle WB	Permanent	Receipt of Permits to Sep 2024
South Trestle South Island temporary trestle #1 for MOT bridge construction	Temporary	Install Oct 2021 – Dec 2021 Remove Oct 2022 – Nov 2022
South Trestle South Island temporary trestle #2 for material delivery	Temporary	Install Nov 2021 – Dec 2021 Remove Sept 2023
South Trestle South Shore	Temporary	Install Mar 2021 – May 2021 Remove Mar 2022
Willoughby Bay Trestle EB	Permanent	Receipt of Permits to Sep 2024
Willoughby Bay Trestle WB	Permanent	Receipt of Permits to Sep 2024
Willoughby WB Jump temporary trestle	Temporary	Install/Remove span by span Nov 2022 – Mar 2024
Willoughby EB North temporary trestle	Temporary	Install Jan 2021 –May 2021 Remove Apr 2022
Willoughby EB South temporary trestle	Temporary	Install Nov 2021 –Jan 2022 Remove Nov 2022

6

Temporary Structures and Schedule



Note: Forecast dates and durations are estimated and subject to review.

7

Pile Types & Hammers

- Piles
  - 24-inch steel pipe piles – 15%
  - 30-inch steel pipe piles – 3%
  - 30-inch square concrete piles – 28%
  - 36-inch steel pipe piles – 50%
  - 42-inch steel pipe piles – 4%
  - 54-inch cylindrical hollow concrete pile
- Pile Installation
  - Vibratory
  - Impact
  - Down-the-hole hammer
  - Jetting
- Pile removal
  - Vibratory
  - Cutting below mud line

8

Sounds Generated

Steel Pipe Piles	Source Level (RMS)
24-inch steel pipe piles (vibratory)	155
24-inch steel pipe piles (impact)	194
30-inch steel pipe piles (vibratory)	175
30-inch steel pipe piles (impact)	195
36-inch steel pipe piles (vibratory)	175
36-inch steel pipe piles (impact)	193
42-inch steel pipe piles (vibratory)	175
42-inch steel pipe piles (impact)	195
Down-the-hole hammer	166
Concrete Piles	
30-inch square concrete piles (vibratory)	174
30-inch square concrete piles (impact)	176
54-inch cylindrical hollow concrete pile (vibratory)	TBD
54-inch cylindrical hollow concrete pile (impact)	TBD
Steel Sheet Piles	
24-inch AZ steel sheet (vibratory)	159

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Methods

- Vibratory

Photo credit: New York State Thruway Authority

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Methods

- Impact

Photo credit: New York State Thruway Authority

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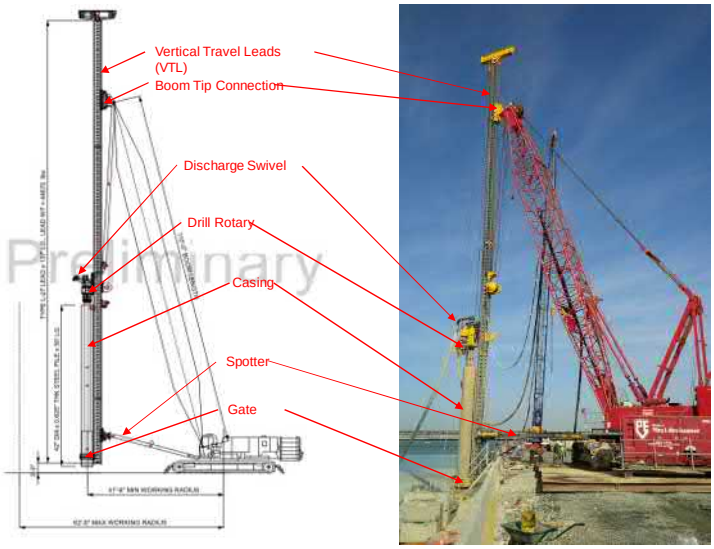
Methods

- Down-the-hole Hammer



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Methods

- Down-the-hole Hammer

All Cuttings are blown back into casing. Casing is drilled against bed rock and casing is closed

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Preliminary Results
Distances to In-water Acoustic Behavioral Thresholds

Fish and Sea Turtles – Impact Pile Installation

Source	Unmitigated	
	Distance to 166 dB RMS (Sea Turtle) (meters)	Distance to 150 dB RMS (Fish) (meters)
Steel Pipe Piles		
24-inch steel pipe piles (impact)	736	8,577
30-inch steel pipe piles (impact)	858	10,000
36-inch steel pipe piles (impact)	631	7,356
42-inch steel pipe piles (impact)	858	10,000
Concrete Piles		
30-inch square concrete piles (impact)	46	541
54-inch cylindrical hollow concrete pile - 8" walls (impact)	TBD	TBD

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Preliminary Results
Distances to In-water Acoustic Behavioral Thresholds

Fish and Sea Turtles– Vibratory Pile Installation

Source	Unmitigated	
	Distance to 166 dB RMS (Sea Turtle) (meters)	Distance to 150 dB RMS (Fish) (meters)
Steel Pipe Piles		
30-inch steel pipe piles (vibratory)	40	464
36-inch steel pipe piles (vibratory)	40	464
42-inch steel pipe piles (vibratory)	40	464
54-inch steel pipe piles (vibratory)	18	215
Concrete Piles		
30-inch square concrete piles (vibratory)	34	398
54-inch cylindrical hollow concrete pile - 8" walls (vibratory)		
Steel Sheet Piles		
24-inch AZ steel sheet (vibratory)	4	44

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Preliminary Results
Distances to In-water Acoustic Behavioral Thresholds

Marine Mammal – Impact Pile Installation

Source	Unmitigated
	Distance to 160 dB RMS (Cetacean/Pinniped - Impulse) (meters)
Steel Pipe Piles	
24-inch steel pipe piles (impact)	1,848
30-inch steel pipe piles (impact)	2,154
36-inch steel pipe piles (impact)	1,585
42-inch steel pipe piles (impact)	2,154
Concrete Piles	
30-inch square concrete piles (impact)	117
54-inch cylindrical hollow concrete pile (impact)	TDB

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Seasonal Occurrence of Marine Species Known to Occur in the Hampton Roads Bridge-Tunnel Project Area

Cetaceans and Pinnipeds

Species/Stock	Seasonal Occurrence in Project Area
Humpback whale (Megaptera novaeangliae) Gulf of Maine	Year-Round
Bottlenose dolphin (Tursiops truncatus) Western North Atlantic Offshore; Western North Atlantic Northern Migratory Coastal; Western North Atlantic Southern Migratory Coastal	Spring–Fall
Bottlenose dolphin (Tursiops truncatus) Northern North Carolina Estuarine System	Summer–Fall
Harbor porpoise (Phocoena phocoena) Gulf of Maine-Bay of Fundy	Winter–Spring
Harbor seal (Phoca vitulina) Western North Atlantic	Winter–Spring
Gray seal (Halichoerus grypus atlantica) Western North Atlantic	Winter–Spring

Sea Turtles and Fish

Species/DPS	Seasonal Occurrence in Project Area
Green sea turtle (Chelonia mydas) North Atlantic DPS	Spring–Fall
Loggerhead sea turtle (Caretta caretta) Northwest Atlantic DPS	Spring–Fall
Kemp's ridley sea turtle (Lepidochelys kempii)	Spring–Fall
Leatherback sea turtle (Dermochelys coriacea)	Spring–Fall
Atlantic Sturgeon (Acipenser oxyrinchus oxyrinchus) New York Bight DPS, Chesapeake Bay DPS, South Atlantic and Carolina DPS, Gulf of Maine DPS	Spring and Fall

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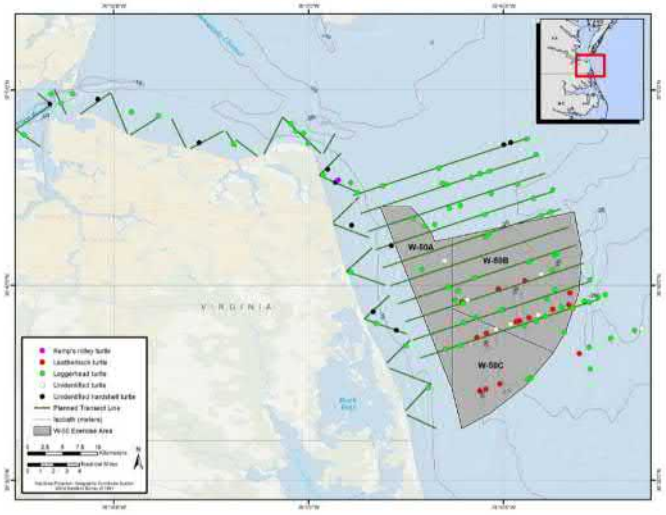
Density Estimates

- Engelhaupt et al. 2016 and considering additional sources

Sea turtle sightings during all line-transect surveys between August 2012 and August 2015.



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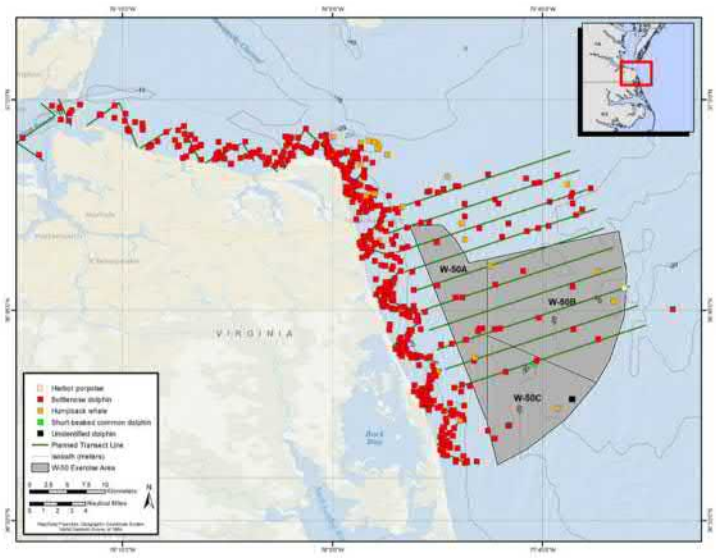
Density Estimates

. Marine mammal sightings during all line-transect surveys between August 2012 and August 2015.



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Mitigation Measures

- Ramp up
- Bubble curtains
- Protected species observers

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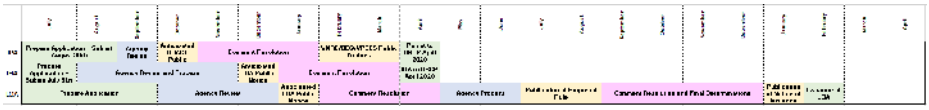
MMPA Incidental Take Authorization Approach

- No take of ESA-listed marine mammals anticipated
- Per communications with NOAA our approach is:
  - Submit IHA and LOA applications concurrently
  - Perform work under phased authorizations;
- Request USACE to issue public notice and permits while IHA and LOA processes are ongoing;
- The benefits of this approach would be:
  - Expedited process of the near critical activities to allow construction to start under an IHA
  - Avoidance of several IHA's applications for different fragmented activities and yearly renewals of the same applications



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MAJI4

MMPA ESA Incidental Take Authorization Approach

Segment	Project Component	Permanent or Temporary	Schedule
IHA			
2a Tunnel	TBM Platform	Temporary	Install on receipt of permits (<1 year duration)
2a Tunnel	Jet grout South Island (2 platforms)	Temporary	Install on receipt of permits (<1 year duration)
LOA			
Segment 1 b North Trestles	North Trestle	Permanent	5 years
Segment 1 b North Trestle	MOT Bridge	Temporary	5 years
Segment 1 b North Trestle	Work Trestles and Moorings	Temporary	5 years
Segment 3a South Trestle	South Trestle	Permanent	5 years
Segment 3a South Trestle	MOT Bridge		5 years
Segment 3a South Trestle	Work Trestles and Moorings	Temporary	5 years
Segment 3b Willoughby Bay	Willoughy Bay Trestle	Permanent	5 years
Segment 3b Willoughby Bay	Work Trestles and Moorings	Temporary	5 years

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Summary

- IHA – Critical path and other work beginning April 2020 to LOA Issuance
- LOA – Remaining permanent work through temporary work removal in 2025
- Underwater noise mitigation under consideration
  - Ramp up / soft start process
  - Hammer cushion / cushion block
  - Unconfined bubble curtains
  - Protected species observers
- Pile template spuds (set and remove) – de minimis

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Additional Issues

Questions and Discussion

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Meeting Summary

Project:	**I-64 Hampton Roads Bridge-Tunnel Expansion**
Meeting Title:	JPA Pre-application Meeting
Date:	July 10, 2019
Location:	DoubleTree Inn, Norfolk VA. 1500 N. Military Highway, Norfolk VA 23502

Attendees:

Company	Last Name	First Name	Phone Number	E-mail Address
VDOT	Smizik	Scott	(804) 371-4082	scott.smizik@VDOT.virginia.gov
VDOT	Utterback	James	(757) 802-0005	james.utterback@VDOT.virginia.gov
DEQ	Hannah	Jeff	(757) 518-2146	jeffrey.hannah@deq.virginia.gov
DEQ	Weyland	Janet	(757) 518-2151	janet.weyland@deq.virginia.gov
DEQ	Woodruff	Melinda	(757) 518-2174	melinda.woodruff@deq.virginia.gov
HRCP	Rogerson	Jeff		jrogerson@flatironcorp.com
VHB	Blossom	Kim	(757) 509-0736	kblossom@vhb.com
Stantec	Hawley	Brian	(540) 908-5528	brian.hawley@stantec.com
USACE	Janek	George	(757) 201-7135	george.a.janek@usace.army.mil
VHB	Frye	Chris	(757) 503-3796	cfrye@vhb.com
VMRC	Lay	Allison	(757) 247-2254	allison.lay@mrc.virginia.gov
HRCP	Barrier	David	(514) 663-9198	david.barrier@vinci-construction.com
HRCP	Martin Alos	Jose Ignacio	(404) 702-1030	jimartinalosb@dragados-usa.com
HRCP	Vazelle	Solene	(757) 933-0878	solene.vazelle@vinci-construction.com
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I-64 DJV	Han	Jeffrey	(646) 235-4288	jeffrey.han@hdrinc.com
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I-64 DJV	Ryder/1	Matt	(929) 396-8392	matthew.ryder@mottmac.com
I-64 DJV	Stowe	Angela	845-216-3052	angela.stowe@hdrinc.com
I-64 DJV	Sword	Taylor	(757) 672-4528	taylor.sword@mottmac.com
WRA	Sprenkle	Taylor	804-366-4097	tsprenkle@wrallp.com
VDOT	Reilly	Peter	(757) 323-3307	peter.reilly@vdot.virginia.gov

VIMS	Hein	Emily	804-684-7482	eahein@vims.edu
I-64 DJV	Peabody	John	571-451-0954	john.peabody@mottmac.com
I-64 DJV	Castrogiovanni	Guido	(732) 540-0742	guido.castrogiovanni@mottmac.com
I-64 DJV	Oza	Ceyda	(757)513-8937	ceyda.oza@hdrinc.com
VDOT	Ambrose	Larissa	757-297-6891	larissa.ambrose@vdot.virginia.gov
I-64 DJV	Wageley	Nathan	703-470-2040	nathan.wageley@mottmac.com
I-64 DJV	Sultan	Nels	(206) 450-2620	nels.sultan@mottmac.com
VIMS	Lewis	Cecilia	804-684-7381	cmlewis@vims.edu
VDOT	Deem	Angel	804-371-6756	angle.deem@vdot.virginia.gov
I-64 DJV	Benson/1	Craig		Craig.benson@mottmac.com

/1 On phone

Meeting Notes:

Monthly update on progress toward the major permits required for the HRBT Expansion Project

No.	Description	Action
1.	**Welcome and Introductions**	
	DG began the meeting with introductions and the agenda of the meeting. Project Segments 1 through 5 were covered showing existing and proposed final conditions. MOT and Jump trestles will be indicated in later slides in the presentation. A drawing set had been provided a week earlier, and hard copies were available at the meeting. This drawing set showed impact areas and design/construction elements.	
2.	**Schedule of Major Upcoming Permit activities**	
a	Joint Permit Application - VPDES pre-app meeting August 6 - JPA draft page-turn During August Monthly Mtg ~20 Aug - JPA submission ~Aug 30 - Anticipate USACE Public Notice ~ Sept. 15 - JPA post submission follow up ~Sept 26 (30 days after JPA submittal)	
3.	**Habitat Condition Assessment (HCA)**	
a.	Condition scores for various habitats were proposed (see presentation slides 18 and 19). Scores for fish and protected species were proposed based on level of impact (see presentation slides 20 and 21). The project team stated that they have developed a scoring system that they would distribute for review.	

No.	Description	Action
b.	The proposed Impact Categories include: - Permanent Fill Impact - Permanent Secondary Impact (isolation and/or impoundment from fill) - Permanent Conversion Impact (dredging, shading) - Extended Temporary Impact (> 12 months) - Temporary Impact (≤ 12 months)	
	The potential for two impact scenarios at the South Island approach was discussed due to the geotechnical information not yet available for the ultimate design. Agencies agreed it was OK to present two possible construction techniques as long as the final permanent impact areas are equal. GJ requested that any areas where multiple design options are proposed be specifically called out on the plans.	HRCP
	JH (VDEQ) stated that the DEQ threshold for temporary impacts is 6 months. Since it is anticipated that the proposed temporary structures will not fall into the duration between 6 and 12 months, this definition should not present a change to the project.	HRCP
	At the Monkey Bottom mitigation site, JH and GJ agreed that tree clearing for the Navy should be removed from the HRBT drawings since this is a different project.	
	JH requested that HRCP clearly define the Limit of Disturbance (LOD) on the plans, especially in locations that are very close to regulated areas. JH and others also stated that the LOD should be clearly marked in the field during construction.	
	JH requested a table in the JPA regarding avoidance measures at each impact area.	VDOT
	At Mallory Street culvert leading to wetlands, construction access and temporary impact buffers need to be shown. In general, HRCP should confirm limit of impact taking into account all construction access and temporary pads.	
	In other cases, perimeter control such as silt fence may be inadequate to prevent unintentional impacts. Signage and high visibility fence (e.g. 4-ft orange construction fence or wide yellow and black nylon ribbon) may be required. GJ stated that a 2:1 ratio is appropriate for the emergent wetlands and 3:1 for scrub shrub (double the standard ratio since it is a mitigation site). GJ also encouraged being reasonable in the design and impact limits to allow room for construction access in the form of temporary impacts versus an unintended violation	

No.	Description	Action
	occurring in the field that would require an after-the-fact violation and additional mitigative measures. Indicate the boundaries of the two areas on Mallory Street and Monkey Bottom that are impacting the mitigation sites. JH suggested that a declaration of deed may need to be undone. As a VDOT site, it would not typically be deed restricted, but would be recorded in VDOT's tracking system and any impacts would have to be reconciled between VDOT and the USACE/DEQ. SS to investigate. GJ mentioned that the project extends within two HUC's.	VDOT
4.	**Extended Impacts**	
a.	Extended impacts were tabulated on slide 45 (see attached). - Temporary North Trestle (Slide 47) may have incorrect labelling re: mooring points since this is very shallow water and SAV. EH (VIMS) suggested identifying the best practices to minimize impacts to SAV. - Dredge volumes in the vicinity of the south trestle should be "worse case" and include the entire footprint including side slopes. Delineation of the dredge area is fixed in the permit. GJ stated that once permitted, there is no "trading" of impact locations within a sum total of mitigation credits. - JH reminded the team of DEQ's "major permit mod" versus "minor permit mod" and that a major mod would require a new public notice, a permit modification fee, renewed coordination with State and/or Federal agencies, and in some cases, new notifications to landowners. For DEQ, cumulative changes in footprint exceeding ¼ acres will require a major permit modification and public notice. - AL stated that any clean sand that is dredged needs to be prioritized for use on public beaches, and indicated that both Hampton and Norfolk had needs for beach sand. - It can be stockpiled before it is moved to the public beaches. It also does not have a time restriction. Just need to explain in the permit application on means and methods. - Needs to be tested and has to be free of contamination. - A conversation regarding the concept of temporary or permanent impacts related to dredging was held. Dredging at the north and south islands is accounted for since the footprints are the same as the expansions. Dredging in the waterways to support navigation is "just dredging." One exception is if dredging extends into mud flats as this would be a loss of a habitat type.	

No.	Description	Action
	- GJ/JH – would not expect compensation for construction dredging as there is no permanent conversion.	
4.	**Temporary Impacts**	
a.	Piles on the jump trestles needs to be accounted for. GJ stated that dredging impacts are generally considered temporary.	HRCP
b.	Temporary Piles will be vibrated out. Extended piles will need to be cut off 2 to 3-ft below the mud line when removed. This information should be included in the plans to support the 408 determination.	HRCP
5.	**VPDES** EH (VIMS) requested that elutriate testing be conducted on the fines and filter cake during the bench scale testing. This is to replicate what could possibly happen if solids were accidentally released into the James River. Whole effluent toxicity (WET) testing to be completed on the filtrate water. DG reminded all that the Bench Scale testing will not be complete in time for initial submission of the JPA. Results will be provided during the review period. Proposed outfall locations were discussed regarding the VPDES permit application requirements and the project team stated that there would be outfalls on the west side of both the North and South Islands. The TBM slurry treatment plant was discussed in detail.	HRCP
6.	**Compensatory Mitigation**	
	T Sprenkle (HRCP) identified which mitigation credits were available, which would be coming on line, and a tabulation of potential subaqueous impact areas by water depth. A separate Workshop for mitigation should be scheduled after the HCA is done. This could be a webinar in early August. GJ suggested that the following agencies be invited to the HCA workshop/webinar: VIMS, VMRC, EPA, DEQ, NMFA (Dave O'Brien); EH requested time to review the HCA. GJ requested a transparent and simple mitigation strategy in the JPA package.	
7.	**MMPA & ESA:** JD described the results of Simplified Attenuation Formula modeling (SAF). This indicated that there would be an open corridor for the transit of anadromous fish during simultaneous pile driving.	

No.	Description	Action
	The next step will be to schedule a meeting with NOAA to gain concurrence as to which model is acceptable for which species. VMRC would like to attend this meeting as well.	HRCP
8.	**NHPA Section 106** The baseline assessment on the emancipation oak will be completed before the JPA application and it will be included in the permit. DHR is party to the programmatic agreement. GJ stated that the proposed anchorages need to be addressed in more detail with FHWA.	HRCP/VDOT
9.	**Navigation**	
	As a result of the bathymetric survey, some boring locations have been moved - these revisions and dredge area updates will be sent to USACE, VMRC and VDEQ soon. *Post meeting note: the revised boring locations were sent to agencies on 20 July 2019.* DG indicated that the potential mooring areas are also in Baylor grounds. AL (VMRC) indicated that she would investigate the requirements for mooring construction vessels in these areas, and what can be permitted in the Baylor grounds. These locations are not set and HRCP is awaiting input from VMRC on Baylor Grounds and assessing historic property implications before settling on final mooring locations. JH stated that mooring areas need to be shown on the JPA exhibits. Off-site alternatives will need to be discussed in the JPA and impact calculations and depictions need to be clear.	I64 DJV VMRC
10	**Comments/Question** • HRCP intends to utilize Willoughby Spit as a lay down area and staging area for personnel and small boats. The designs are presently being completed. JG reminded the team that neighbors in the area may comment on the permit application due to previous construction experiences. GJ also commented on the presence of wetlands on the spit. • DG stated that all meeting minutes will be submitted as part of the JPA in an appendix. • For the avoidance and minimization section of the JPA, HRCP needs to reference the reduction in impacts due to bored tunnel versus immersed tube tunnel. GJ requested the A&M narrative be consolidated to one concise section of the application to avoid having to chase the text throughout the entire document. GJ also suggested the sound mitigation be included in A&M. • JH (DEQ) requested mailing labels for all adjacent property owners in specified proximity to tidal in non-tidal wetland and	

No.	Description	Action
	surface water impact areas as needed for VWP notification requirements.	

Agenda

1. HRBT Segments (9:00 – 9:30am)
2. Habitat Assessment and Impacts (9:30 – 10:15am)

Break (10:15 – 10:30am)

3. Compensatory Mitigation (10:30 – 11:15am)
4. VPDES (11:15 – 11:30)

Lunch (11:30 – 12:15pm)

5. MMPA and ESA (12:15 – 12:45pm)
6. NHPA Section 106 (12:45 – 1:00pm)
7. Navigation (1:00 – 1:30pm)

Comments/Questions (1:30 – 2:00pm)

2

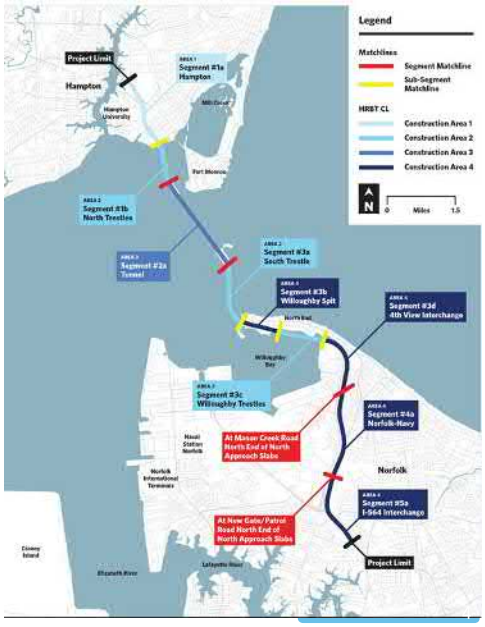
1. HRBT Segments/Zones

- Project Schedule
- Permits
  - VPDES Pre-Application Meeting (VDEQ) – August 6th
  - Presubmittal Page Turn – August 20, 2019
  - JPA submission – August 30, 2019
  - Anticipated public notice date September 15, 2019
  - JPA Post-Submission Follow-up – September 26, 2019
  - Anticipated permit issuance – April 2020
- Construction
  - Commence field construction activities – scheduled for April 2020
  - Project Completion – July 2025

3

1. HRBT Segments/Zones

- Construction Areas
  - Tunnels
    - Tunnel Boring
    - Tunnel Portals – South Portal, North Portal
    - Tunnel Approach Structures (TAS)
  - Island Expansions
    - North Island
    - South Island
  - Trestles
    - North Trestle
    - South Trestle
    - Willoughby Bay Bridge
  - Landside
    - Roadway and bridge improvements
    - Roadway widening
    - New bridge abutments
    - Mallory Street Bridge replacement



1. HRBT Segments/Zones

- Segment1a – Hampton National Cemetery

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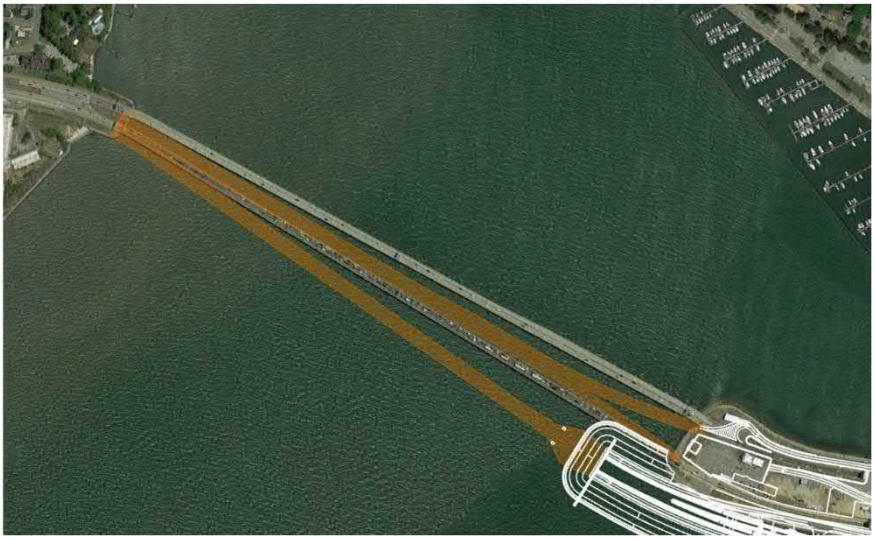
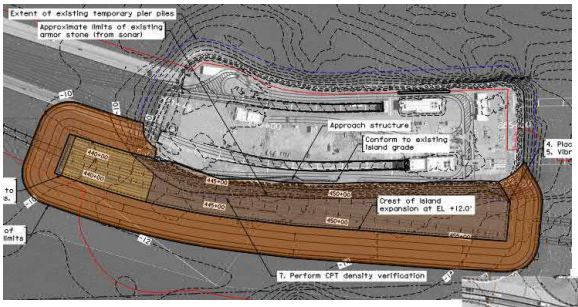
1. HRBT Segments/Zones

- Segment 1b – North Trestle Construction



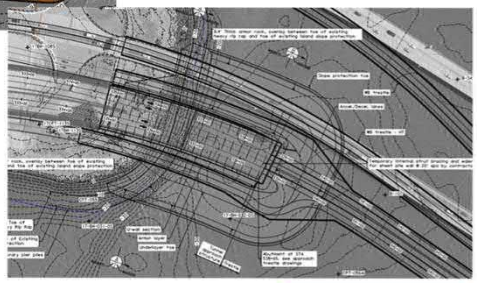
6

1. HRBT Segments/Zones



- Segment 2a – North Island Expansion, Dredging and Debris Removal

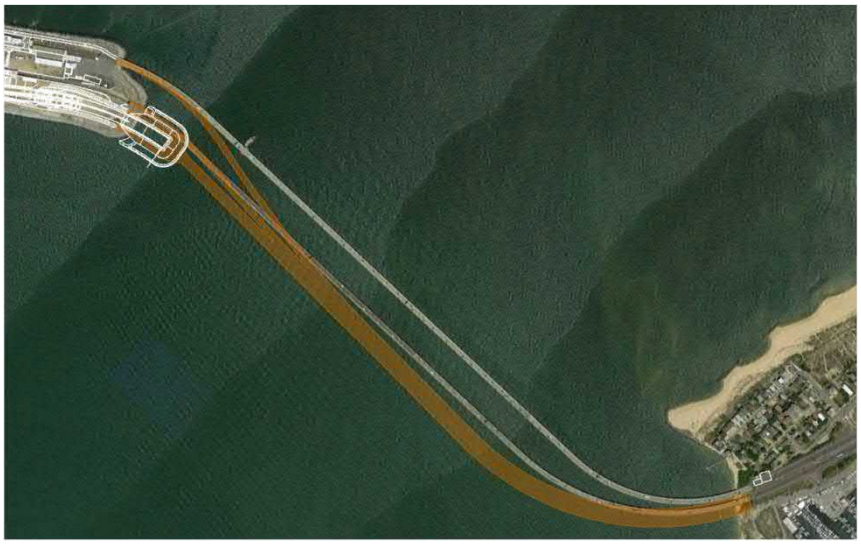
- Segment 2a – South Island Expansion, Dredging and Debris Removal



7

1. HRBT Segments/Zones

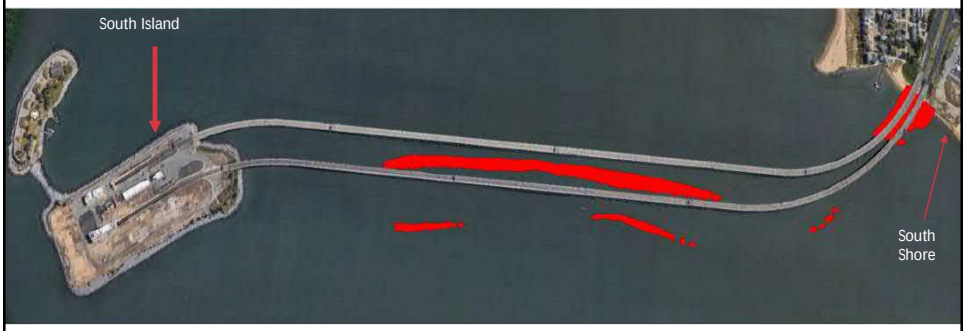
- Segment 3a – South Trestle Construction



8

1. HRBT Segments/Zones

- Segment 3a – South Trestle Dredging and Debris Removal



Area (SF)	Volume (CY)	Dredge Depth (ft)
150,000	16,700	3
15,000	1,670	3
14,000	1,560	3
4,000	450	3
~45,000 (Willoughby Spit)	7,225	N/A – Debris Removal

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1. HRBT Segments/Zones

- Segment 3b – Willoughby Spit

10

1. HRBT Segments/Zones

- Segment 3c – Willoughby Bay Bridge Construction

11

1. HRBT Segments/Zones

- Segment 4a – Oastes Creek

12

1. HRBT Segments/Zones

- Segment 4a – Mason Creek

13

1. HRBT Segments/Zones

- Segment 5a – I-564 Interchange

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2. Habitat Condition Assessment (HCA) and Impacts

15

2. Habitat Condition Assessment (HCA) and Impacts

- Preliminary Jurisdictional Determination (PJD)
  - Original PJD – September 19, 2017
  - Supplemental PJD – October 8, 2018
    - Additional Limits of Disturbance

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2. Habitat Condition Assessment (HCA) and Impacts

- HCA

Indicator or Feature	Habitat Condition Scores				
	1	2	3	4	5
Water Quality (based on CBP and VECOS data)	Poor water quality; dissolved oxygen (DO) meets restoration goal up to 50% of the time.	Seasonally low DO; DO meets restoration goal 51 to 75% of the time.	DO usually supports aquatic life year round; DO meets restoration goal 76 to 90% of the time.	DO supports aquatic life year-round; stable foraging habitat; DO meets restoration goal 91 to 99% of the time.	DO supportive of aquatic life; DO meets restoration goal 100% of the time (HRBT pre-construction condition)
Shellfish Resources (based on data in VIMS 2018 clam survey)	No shellfish habitat (0 live clams m^{-2}); depth >15 ft. and substrate does not support bivalves.	Isolated patches of potential shellfish habitat; No existing or historic shellfish beds; depth <15 feet.	Existing shellfish beds limited or absent (<1 live clams m^{-2}); historic record of shellfish beds; depth <15 feet.	Some/moderate shellfish habitat (1-2 live clams m^{-2}); known moderately productive existing shellfish beds/reefs; depth <15 ft.	Extensive shellfish habitat (2-3 live clams m^{-2}); known highly productive existing shellfish beds/reefs; depth <15 ft.
SAV (based on 2013-2017 VIMS SAV data)	No suitable SAV habitat present; depth >6.6 feet.	No SAV present; no historic record of SAV; depth <6.6 ft.	No SAV present; historic presence of SAV in area documented; depth <6.6 ft.	Sparse SAV present; depth <6.6 feet.	Stable SAV population present; depth ≤6.6 ft.

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2. Habitat Condition Assessment (HCA) and Impacts

- HCA

Indicator or Feature	Habitat Condition Scores				
	1	2	3	4	5
Epibenthic Habitat (based on Versar 2018 epibenthic survey and VIMS 2018 clam survey)	Predominantly silt/clay substrate conditions, habitat does not support epibenthic organisms.	Predominantly soft bottom (sand) substrate in depths of >6.6 feet; limited hard surface for epibenthic organisms.	Predominantly soft bottom substrate in depths of <6.6 feet.; some hard surface for epibenthic organisms (e.g., gravel).	Predominantly rock substrate >6.6 feet; majority of the area provides hard substrate for epibenthic organisms.	Predominantly rock substrate <6.6 feet.; Varied substrate sizes that provide extensive/diverse habitat for epibenthic organisms.
Benthic Community (based on Versar 2018 benthic survey)	Severely degraded benthic community; Benthic Index of Biotic Integrity (B-IBI) score of <2.0; poor abundance and diversity of species; populations present only seasonally.	Degraded community; B-IBI score of 2.0 – 2.5; low abundance and diversity of species. Areas encompassing Deepest Water not included in 2018 benthic survey are scored as "2.25" to reflect seasonal DO impairments expected to control benthic community structure at those depths.	Fair community; B-IBI score of 2.6 – 2.9; to account for potential (seasonal) DO reduction, a score of "2.75" is assigned to Deeper Water areas not included in the 2018 benthic survey.	Good community; B-IBI score of 3.0 – 4.0; moderate to high diversity and abundance; populations present year-round.	Excellent community; B-IBI score of 4.1 – 5.0; high diversity and abundance; stable community present year-round.

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2. Habitat Condition Assessment (HCA) and Impacts

- HCA

Indicator or Feature	Habitat Condition Scores				
	1	2	3	4	5
Fish	General: few or no fish present; present species are irregular transients; habitat does not support fish populations.	General: poor diversity; relatively high abundance of one species; poor habitat for fish populations; population is marginally sustainable	General: moderate diversity and abundance of species; adequate habitat for fish populations.	General: moderate to high diversity of species; high abundance of several species; good habitat for fish populations; stable fish population.	General: high diversity and abundance of species in all seasons; excellent habitat for fish populations; stable fish population at carrying capacity for available habitat.
	Anadromous: none present.	Anadromous: historic use; no known current activity.	Anadromous: present during migration season; no known spawning habitat in project area.	Anadromous: present during migration season; opportunistic spawning documented in project area.	Anadromous: present during migration season; suitable spawning habitat present, documented spawning in project area.
	EFH: no EFH species present.	EFH: transient EFH species present.	EFH: Seasonal use by EFH species.	EFH: use by transient/seasonal EFH species.	EFH: EFH species present.
	HAPC: no HAPC present	HAPC: no HAPC Present.	HAPC: no HAPC present.	HAPC: mapped HAPC present in Shallow Water and Mid-Depth Areas	HAPC: mapped HAPC Present in Shallow Water and Mid-Depth areas

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2. Habitat Condition Assessment (HCA) and Impacts

- HCA

Indicator or Feature	Habitat Condition Scores				
	1	2	3	4	5
Protected Species	Whales/Dolphins: habitat not present.	Whales/Dolphins: transient use.	Whales/Dolphins: Seasonal use.	Whales/Dolphins: species present year-round.	Whales/Dolphins: species present year-round; breeding grounds present.
	Seals: suitable habitat not present.	Seals: transient/occasional use of Shallow and/or Mid-Depth areas as potential foraging habitat; resting or "haul-out" areas present.	Seals: seasonal use; a variety of water depths available as potential habitat.	Seals: species present year-round.	Seals: breeding grounds and species present.
	Sea Turtles: suitable habitat not present.	Sea Turtles: transient/occasional use.	Sea Turtles: seasonal use.	Sea Turtles: year-round use	Sea Turtles: year-round use; beach/nesting habitat and species present.
	Atlantic Sturgeon: suitable habitat not present.	Atlantic Sturgeon: transient use.	Atlantic Sturgeon: seasonal use.	Atlantic Sturgeon: species present year-round.	Atlantic Sturgeon: spawning habitat and species present.

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2. Habitat Condition Assessment (HCA) and Impacts

- Proposed Impact Categories:
  - Permanent Fill Impact
  - Permanent Secondary Impact (isolation and/or impoundment from fill)
  - Permanent Conversion Impact (dredging, shading)
  - Extended Temporary Impact (> 12 months)
  - Temporary Impact (≤ 12 months)

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2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts

Resource	Fills (acres)	Piles (acres)	Shading (acres)
Estuarine Subtidal Open Water (Breakdown provided on following slide)	19.11	0.45	N/A
Estuarine Subtidal Open Water w/ SAV	-	<0.01	0.04
Estuarine Intertidal Emergent Marsh	0.61	0.01	2.93
Estuarine Intertidal Scrub Shrub	0.07	<0.01	0.03
Estuarine Intertidal Reef	-	-	-
Estuarine Intertidal Unconsolidated Shore Sand	1.56	0.01	-
Estuarine Intertidal Unconsolidated Shore Mud	-	-	-
Jurisdictional Ditch	<0.01 (18 lf)	-	-
Palustine Emergent	0.50	-	0.02
Palustrine Forested	0.13	-	-
Palustrine Scrub Shrub	0.25	<0.01	0.14
Palustrine Unconsolidated Bottom	0.14	-	-
Total	22.37	0.47	3.15
Lower Perrenial, Riverine	<0.01 (3 lf)	-	-
Intermittent, Riverine	-	-	-

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2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts
  - Estuarine Subtidal Open Water – Breakdown

Resource - Estuarine Subtidal Open Water	Shallow (photic zone): < 6.6ft (acres)	Mid-Depth: 6.6ft – 15ft (acres)	Deep: 15ft – 30ft (acres)	Deeper: 30ft – 45ft (acres)
Estuarine Subtidal Open Water - Fills				
North Island Expansion	0.60	13.18	1.77	-
South Island Expansion	0.14	0.27	2.83	0.07
Willoughby Bay – Grading & Outfall Reconstruction	0.02	-	-	-
4th View – EB Widening/Ramp	0.01	-	-	-
4th View – Navy Clearing	0.06 (not included in total)	-	-	-
Bay Ave – EB Road Widening	0.13	-	-	-
Oastes Creek - Culvert	0.02	-	-	-
Subtotal: Estuarine Subtidal Open Water - Fills	0.99	13.45	4.60	0.07
Estuarine Subtidal Open Water - Piles	0.11	0.28	0.06	-
Totals	1.10	13.73	4.66	0.07

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2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - Settlers Landing

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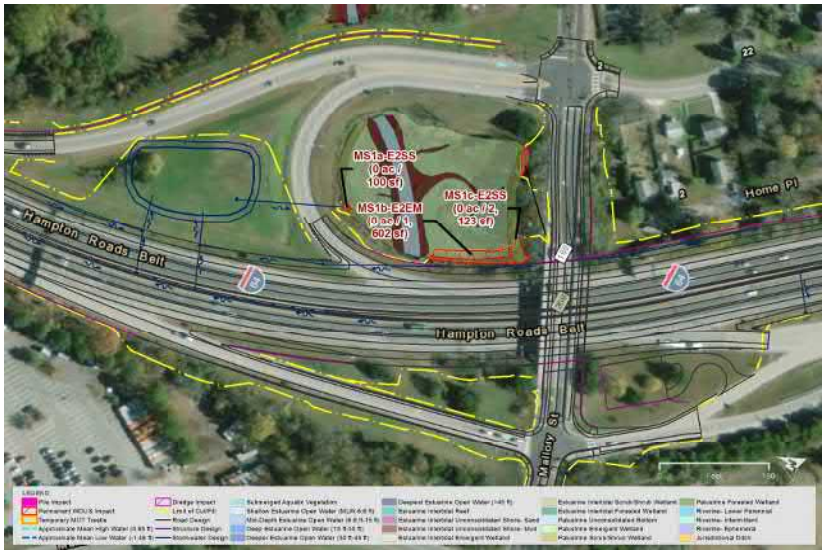
2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - Mallory Street



25

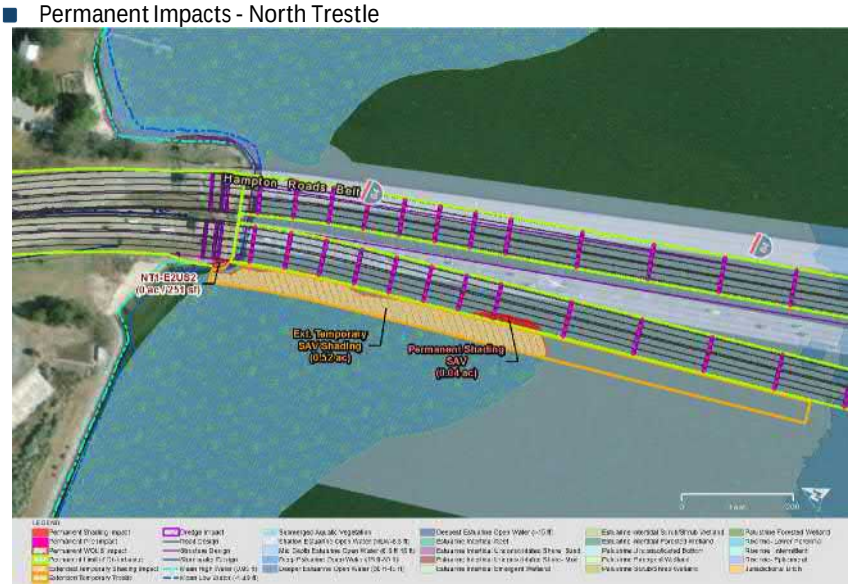
2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - Switch Gear

26

2. Habitat Condition Assessment (HCA) and Impacts

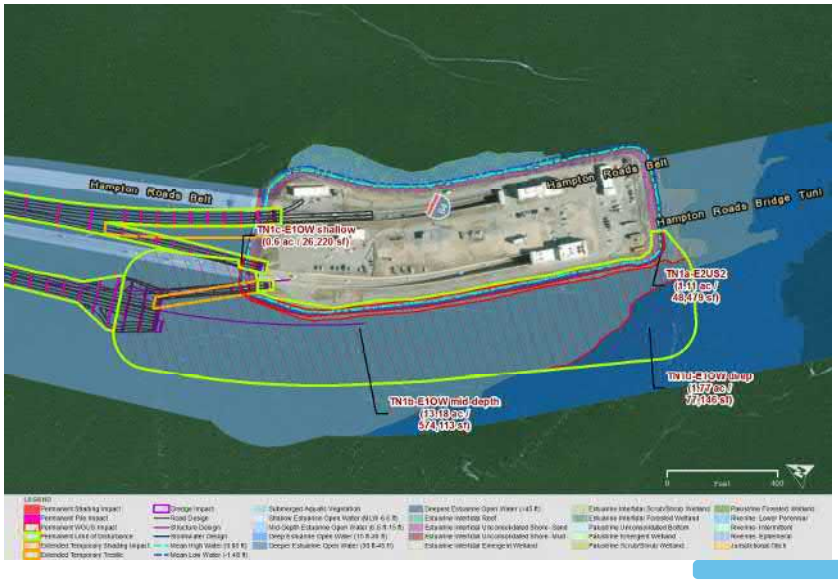
- Permanent Impacts - North Trestle



27

2. Habitat Condition Assessment (HCA) and Impacts

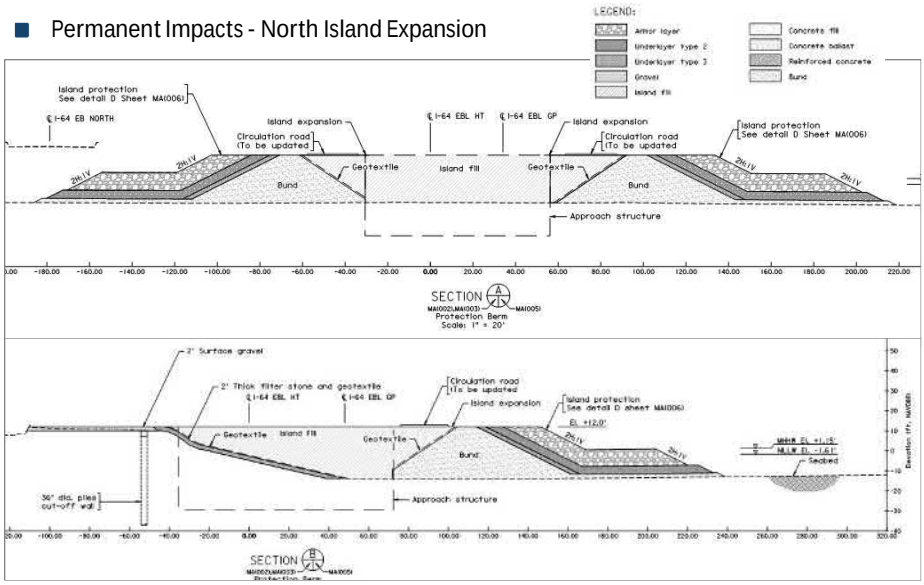
- Permanent Impacts - North Island Expansion



28

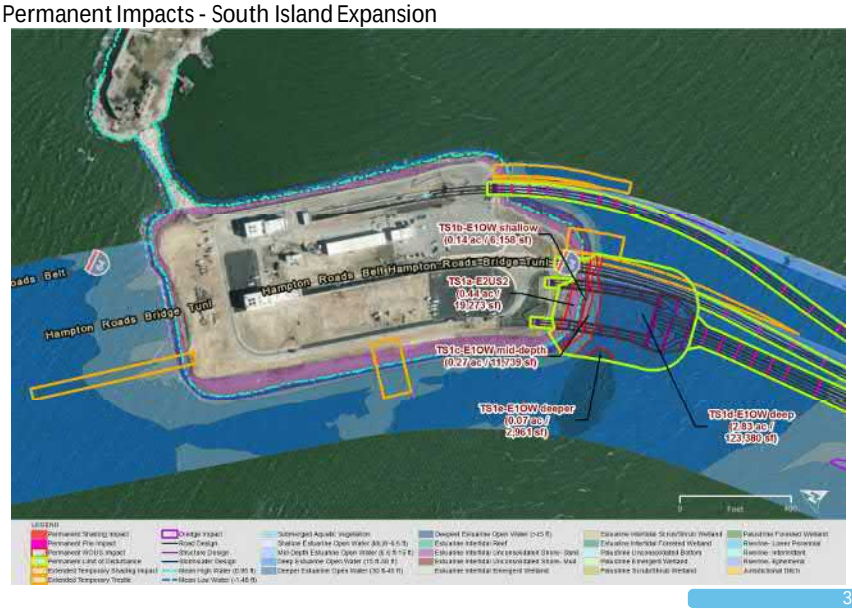
2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - North Island Expansion



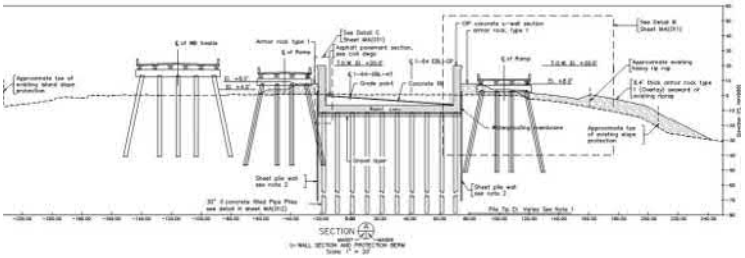
2. Habitat Condition Assessment (HCA) and Impacts

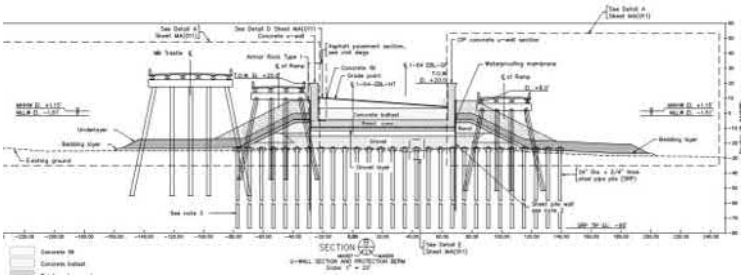
- Permanent Impacts - South Island Expansion



2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - South Island Expansion

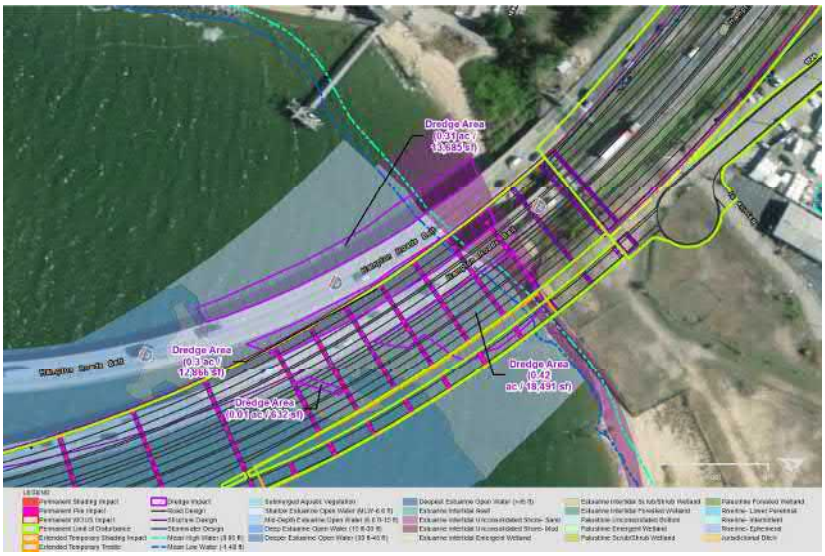




31

2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - Willoughby Spit



32

2. Habitat Condition Assessment (HCA) and Impacts

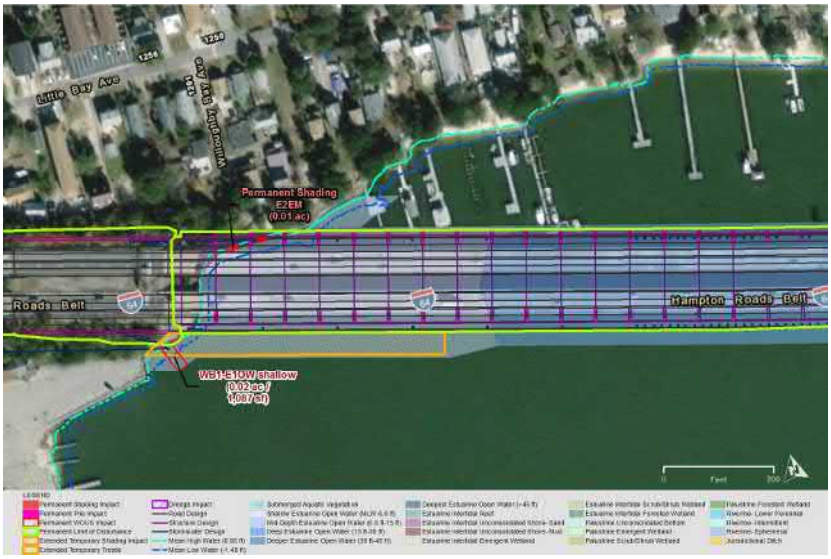
- Permanent Impacts - Bayville Street Ramp

33

2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - Willoughby Bay

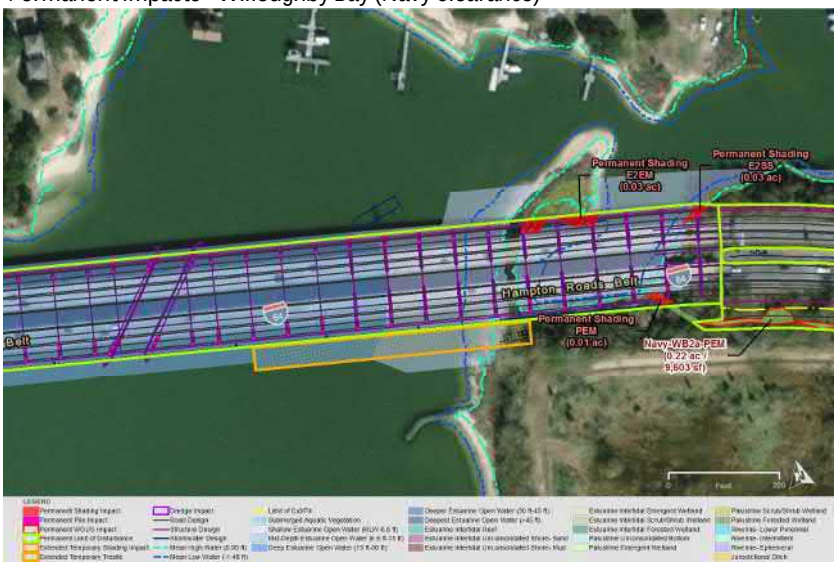
WR4



34

2. Habitat Condition Assessment (HCA) and Impacts

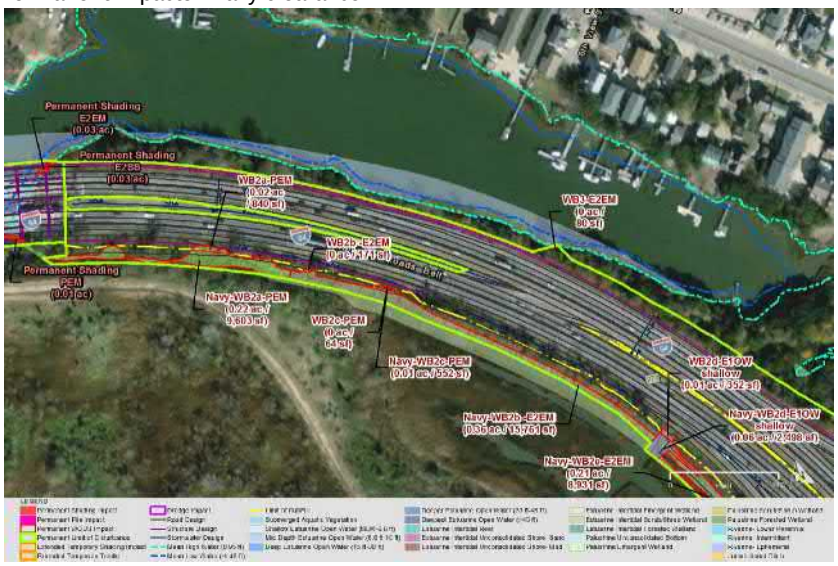
- Permanent Impacts - Willoughby Bay (Navy Clearance) WR5



35

2. Habitat Condition Assessment (HCA) and Impacts

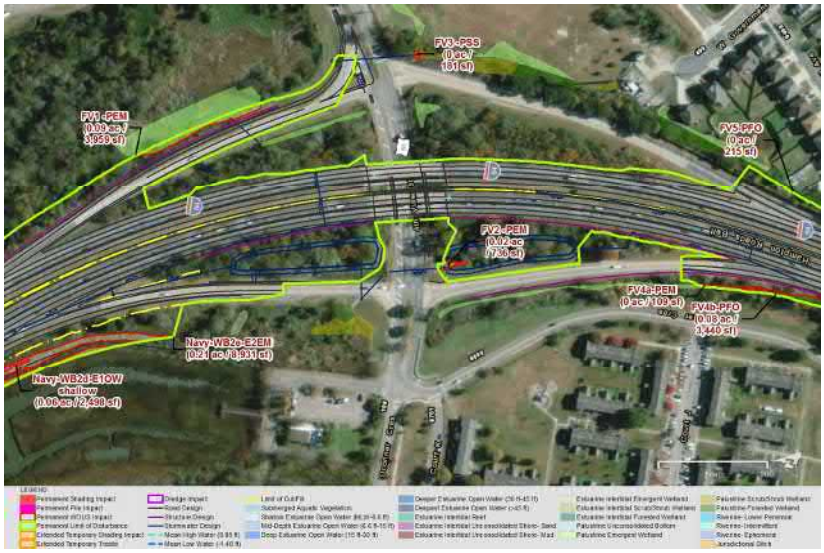
- Permanent Impacts - Navy Clearance



36

2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - 4th View Street



37

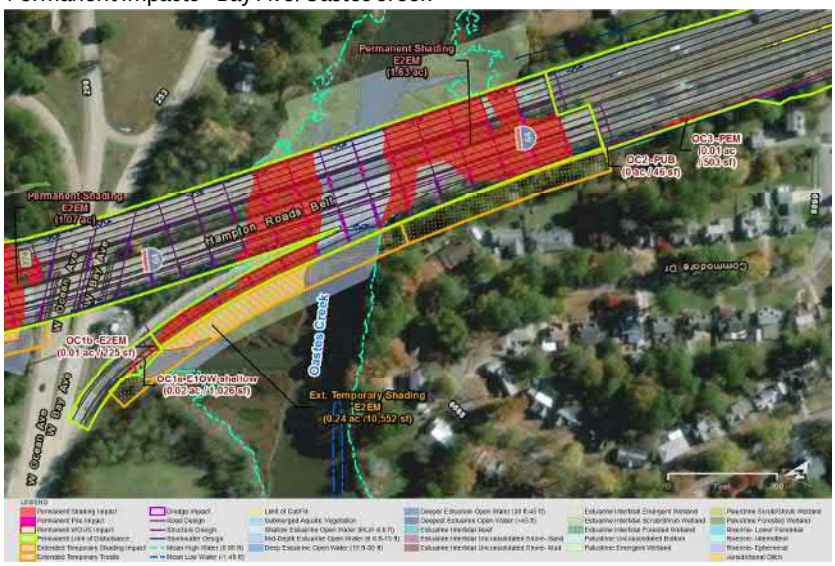
2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - Bay Ave/Oastes Creek

38

2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - Bay Ave/Oastes Creek



39

2. Habitat Condition Assessment (HCA) and Impacts

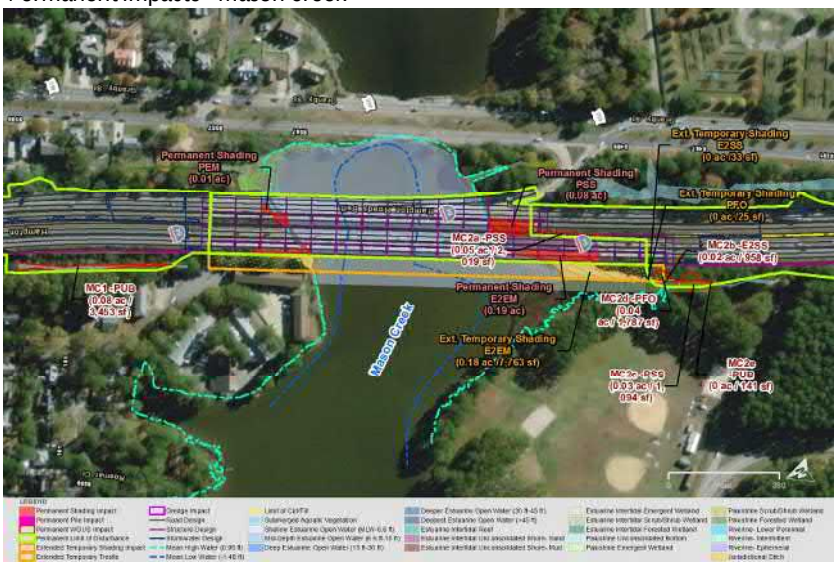
- Permanent Impacts - Bayville Blvd.

40

2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - Mason Creek

WR6



41

2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - Bayville Blvd.

42

2. Habitat Condition Assessment (HCA) and Impacts

- Permanent Impacts - I-64 & I-564

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2. Habitat Condition Assessment (HCA) and Impacts

- Extended Temporary Impacts (>12 Months)

Resource	Piles (acres)	Shading (acres)
Estuarine Subtidal Open Water - Shallow (photic zone): < 6.6ft	0.2	-
Estuarine Subtidal Open Water - Mid-Depth: 6.6ft – 15ft	0.2	-
Estuarine Subtidal Open Water - Deep: 15ft – 30ft	0.1	-
Estuarine Subtidal Open Water w/ SAV	-	0.6
Estuarine Intertidal Emergent Marsh	<0.01	0.6
Estuarine Intertidal Scrub Shrub	-	<0.01
Estuarine Intertidal Reef	-	-
Estuarine Intertidal Unconsolidated Shore Sand	<0.01	-
Estuarine Intertidal Unconsolidated Shore Mud	-	-
Jurisdictional Ditch	-	-
Palustine Emergent	-	-
Palustrine Forested	-	<0.01
Palustrine Scrub Shrub	-	-
Palustrine Unconsolidated Bottom	-	-
Total	0.52	1.22
Lower Perrenial, Riverine	-	-
Intermittent, Riverine	-	-

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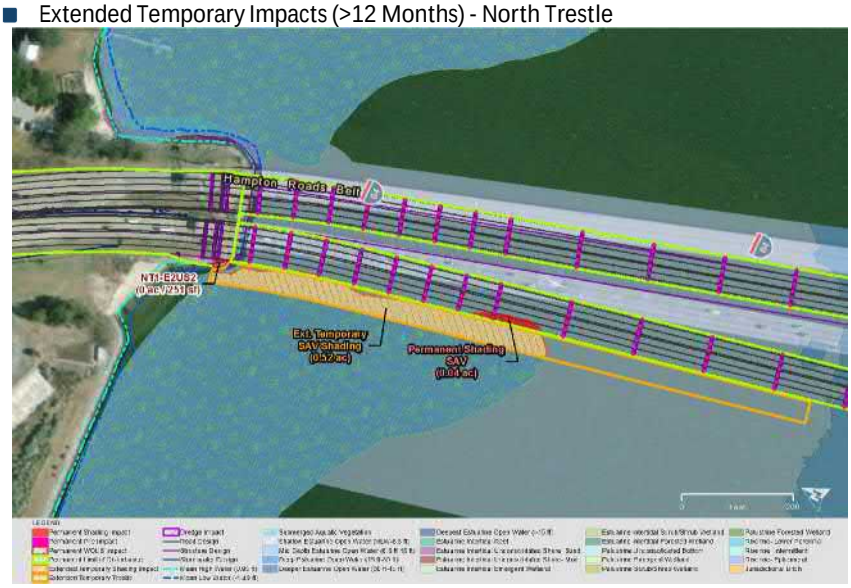
2. Habitat Condition Assessment (HCA) and Impacts

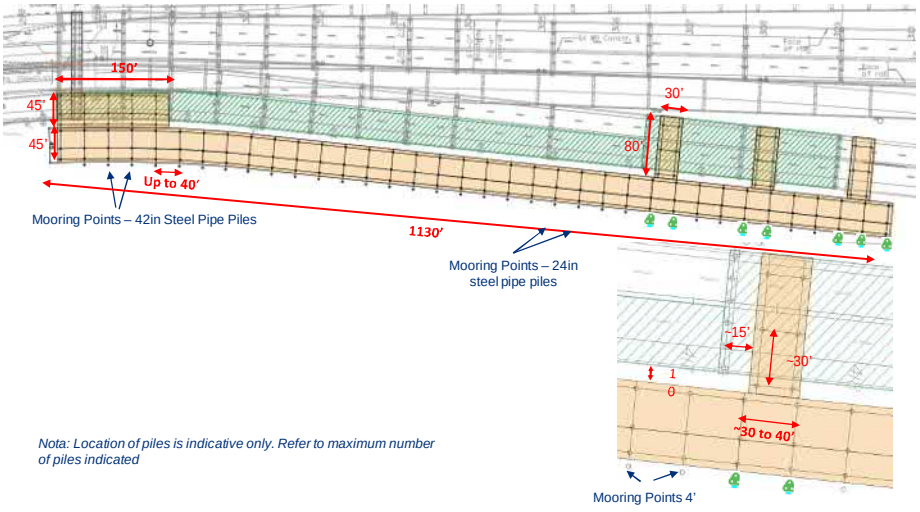
- Extended Temporary Impacts (>12 Months) - North Trestle



45

2. Habitat Condition Assessment (HCA) and Impacts

- Extended Temporary Impacts (>12 Months) - North Trestle



Nota: Location of piles is indicative only. Refer to maximum number of piles indicated

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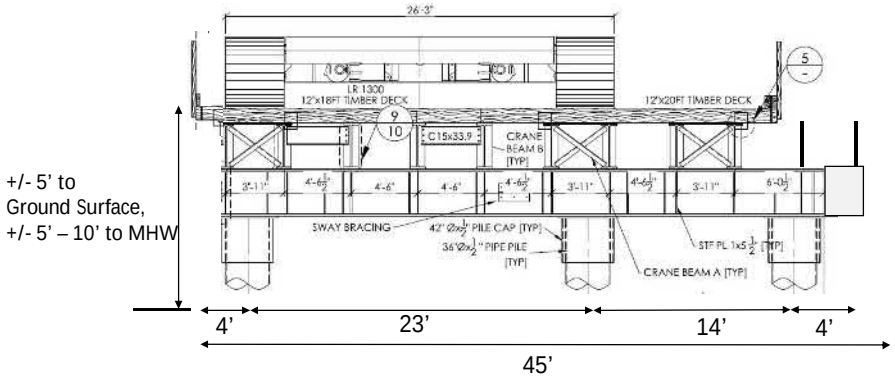
2. Habitat Condition Assessment (HCA) and Impacts

- Extended Temporary Impacts (>12 Months) - Typical Temporary Trestle
  - 36" steel pipe piles

Main transverse section



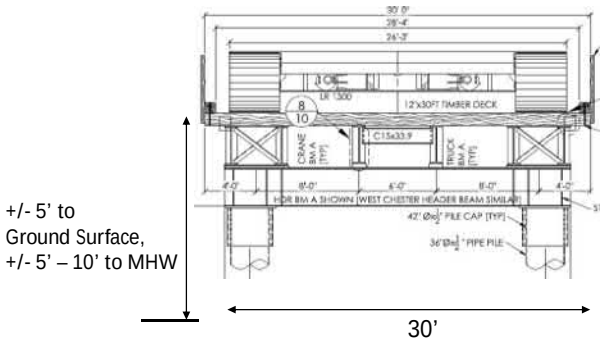
Nota: Dimensions / Measures subject to vary +/- 5ft

47

2. Habitat Condition Assessment (HCA) and Impacts

- Extended Temporary Impacts (>12 Months) - Typical Temporary Trestle
  - 36" steel pipe piles

Finger transverse section

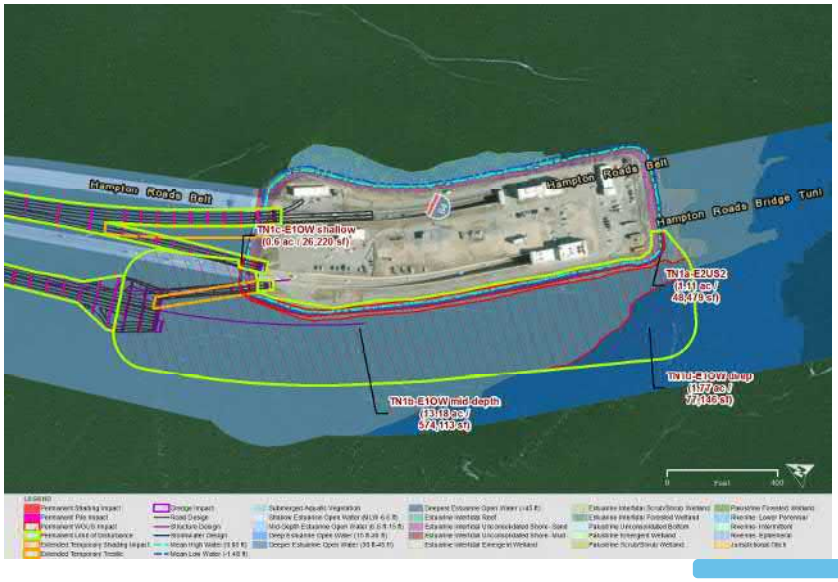


Nota: Dimensions / Measures subject to vary +/- 5ft

48

2. Habitat Condition Assessment (HCA) and Impacts

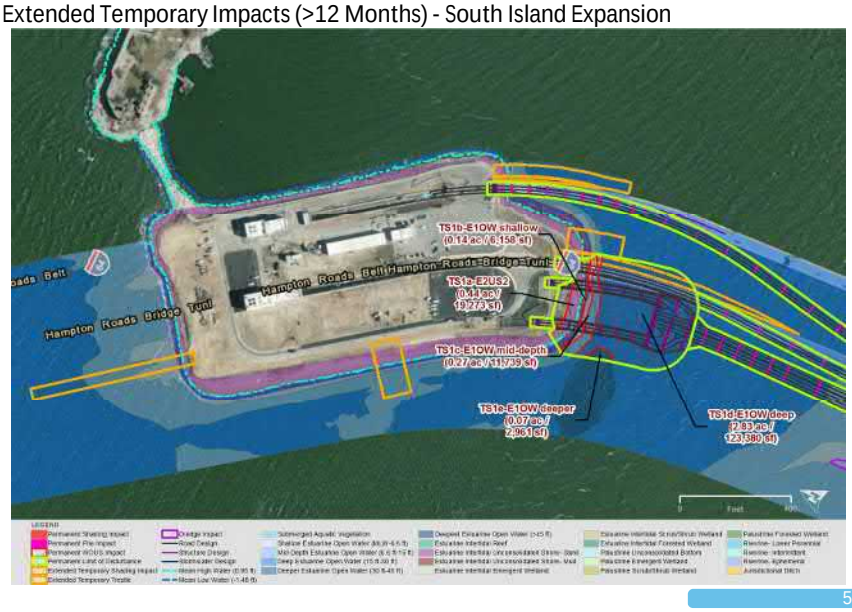
- Extended Temporary Impacts (>12 Months) - North Island Expansion



49

2. Habitat Condition Assessment (HCA) and Impacts

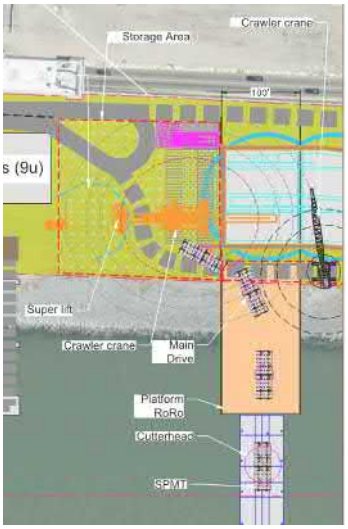
- Extended Temporary Impacts (>12 Months) - South Island Expansion



50

2. Habitat Condition Assessment (HCA) and Impacts

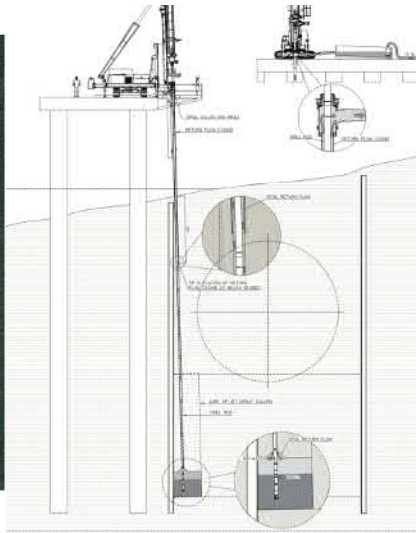
- Extended Temporary Impacts (>12 Months)
  - South Island TBM/Supply Platform
  - Conveyor – TBM Spoil Movement



51

2. Habitat Condition Assessment (HCA) and Impacts

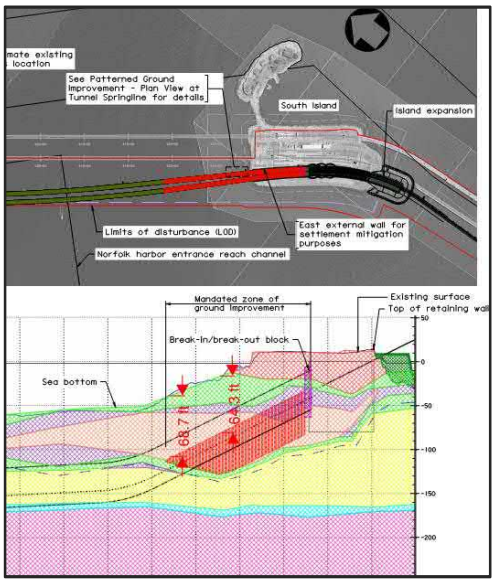
- Extended Temporary Impacts (>12 Months) - South Island Jet Grout Trestles

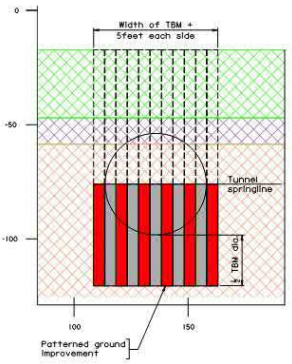


52

2. Habitat Condition Assessment (HCA) and Impacts

- Extended Temporary Impacts (>12 Months) - South Island Jet Grout Trestles





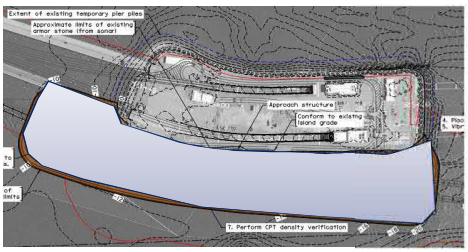
PATTERNED GROUND IMPROVEMENT -

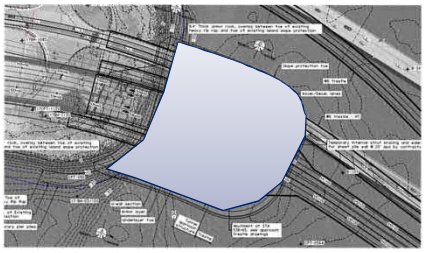
53

2. Habitat Condition Assessment (HCA) and Impacts

- Dredging - North and South Island Ground Improvement and Obstruction Removal

Resource	Area (acres)	Volume cyds
North Island Expansion – Ground improvement and obstruction removal		
Estuarine Subtidal Open Water - Shallow (photic zone): < 6.6ft	0.6	~95,000
Estuarine Subtidal Open Water - Mid-Depth: 6.6ft – 15ft	13.4	
Estuarine Subtidal Open Water - Deep: 15ft – 30ft	1.7	
South Island Expansion – Ground Improvement and Obstruction Removal		
Estuarine Subtidal Open Water - Shallow (photic zone): < 6.6ft	0.2	~20,000 – 125,000
Estuarine Subtidal Open Water - Mid-Depth: 6.6ft – 15ft	0.3	
Estuarine Subtidal Open Water - Deep: 15ft – 30ft	2.9	





54

2. Habitat Condition Assessment (HCA) and Impacts

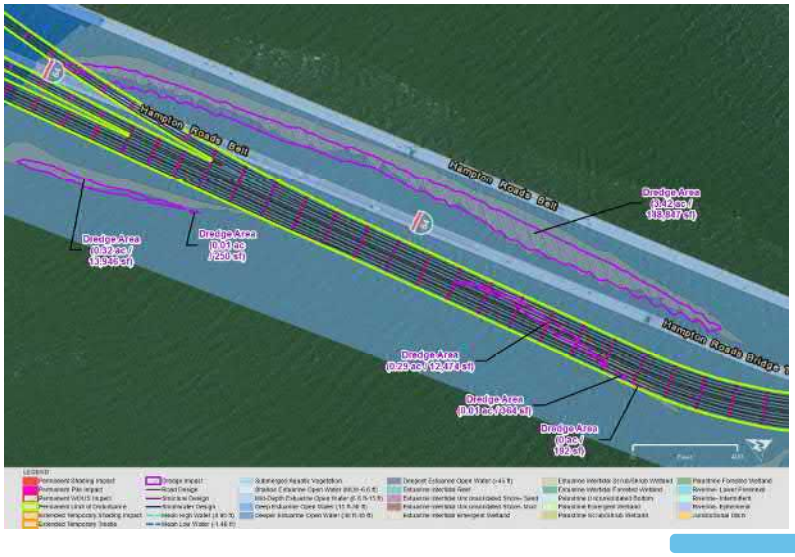
- Extended Temporary Impacts (>12 Months) – South Trestle Dredging and Debris Removal

Resource	Area (acres)	Volume (cyds)
South Trestle Dredge – Construction Vessel Access and Obstruction Removal		
Estuarine Subtidal Open Water - Shallow (photic zone): < 6.6ft	4	TBD
Estuarine Intertidal Unconsolidated Shore Sand	0.2	
Total	4.2	

55

2. Habitat Condition Assessment (HCA) and Impacts

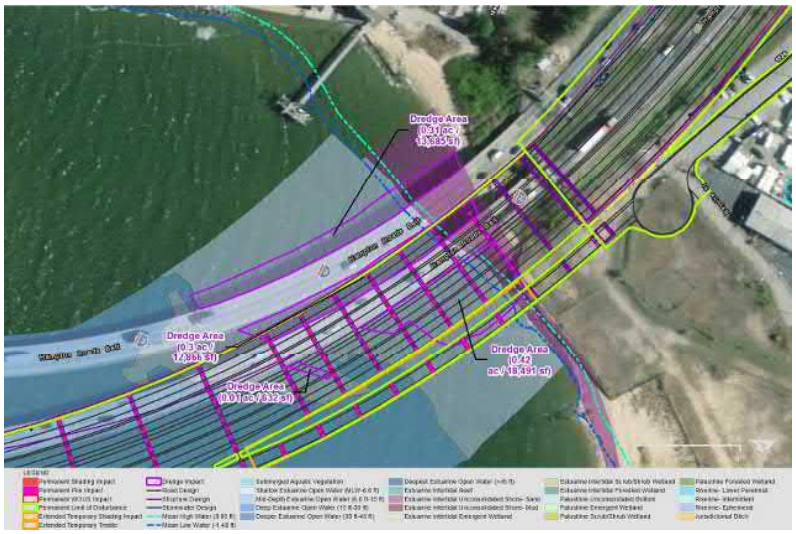
- Extended Temporary Impacts (>12 Months) – South Trestle Dredging and Debris Removal



56

2. Habitat Condition Assessment (HCA) and Impacts

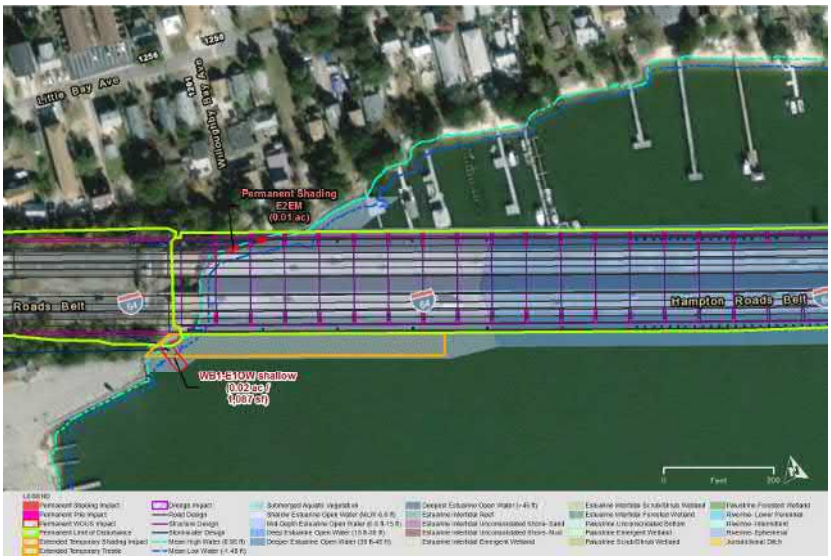
- Extended Temporary Impacts (>12 Months) – Willoughby Spit, Dredging and Debris Removal



57

2. Habitat Condition Assessment (HCA) and Impacts

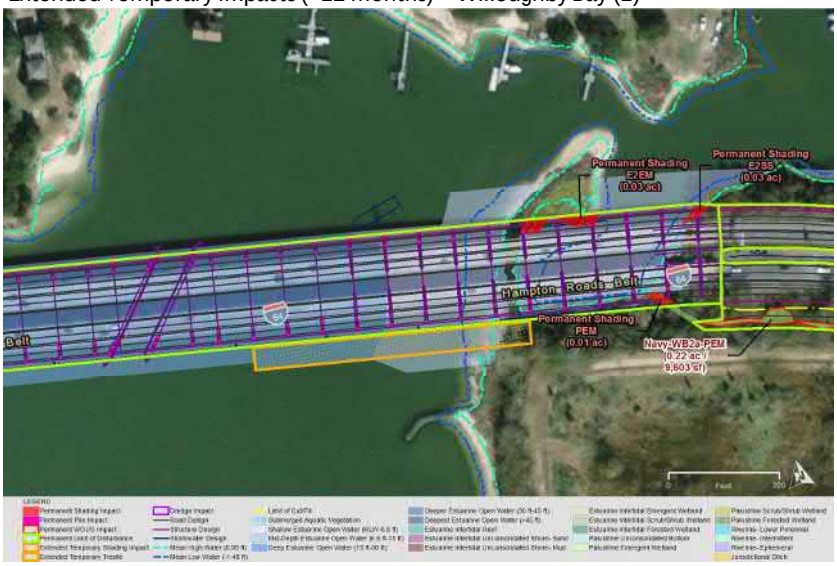
- Extended Temporary Impacts (>12 Months) – Willoughby Bay (W)



58

2. Habitat Condition Assessment (HCA) and Impacts

- Extended Temporary Impacts (>12 Months) – Willoughby Bay (E)



59

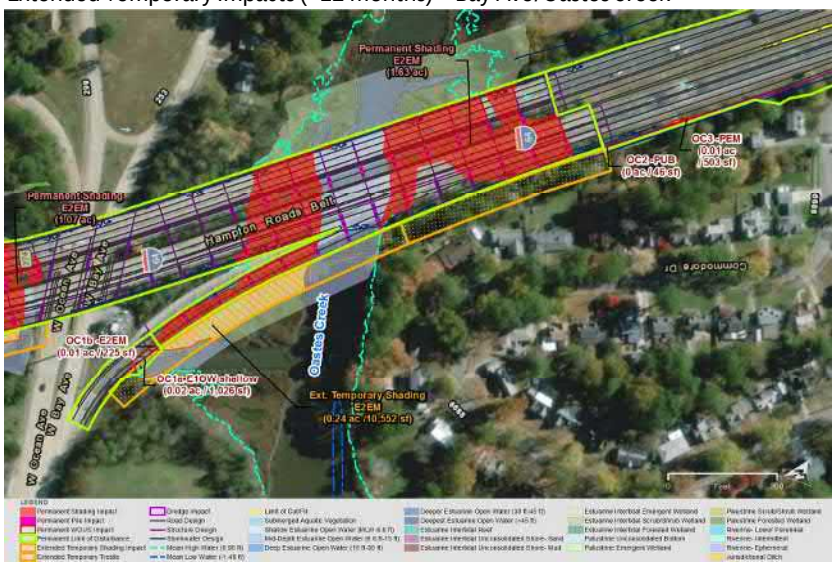
2. Habitat Condition Assessment (HCA) and Impacts

- Extended Temporary Impacts (>12 Months) – Bay Ave/Oastes Creek

60

2. Habitat Condition Assessment (HCA) and Impacts

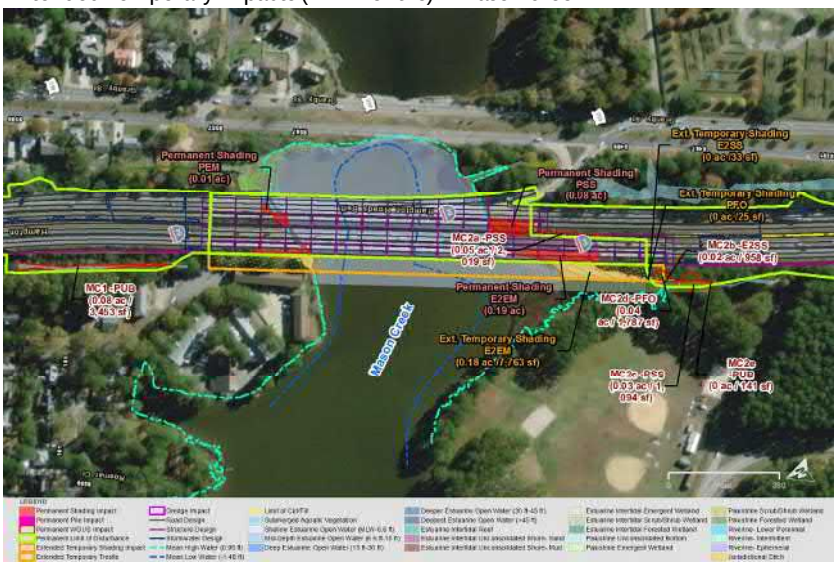
- Extended Temporary Impacts (>12 Months) – Bay Ave/Oastes Creek



61

2. Habitat Condition Assessment (HCA) and Impacts

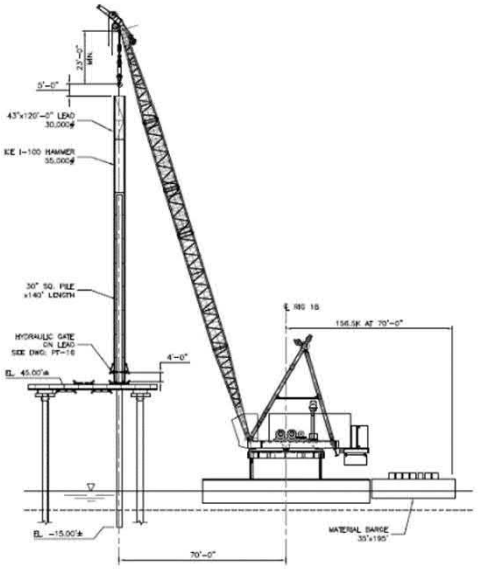
- Extended Temporary Impacts (>12 Months) – Mason Creek



62

2. Habitat Condition Assessment (HCA) and Impacts

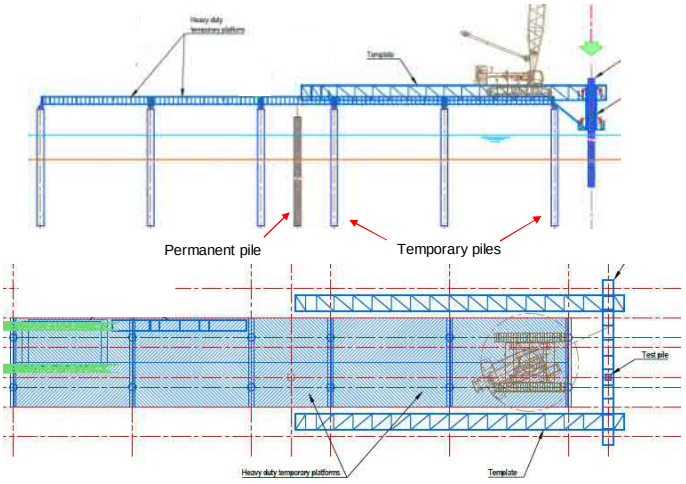
- Temporary Impacts (<12 months)
  - Templates
    - Accommodates 3 permanent piles
    - Four 42" pipe piles to set



63

2. Habitat Condition Assessment (HCA) and Impacts

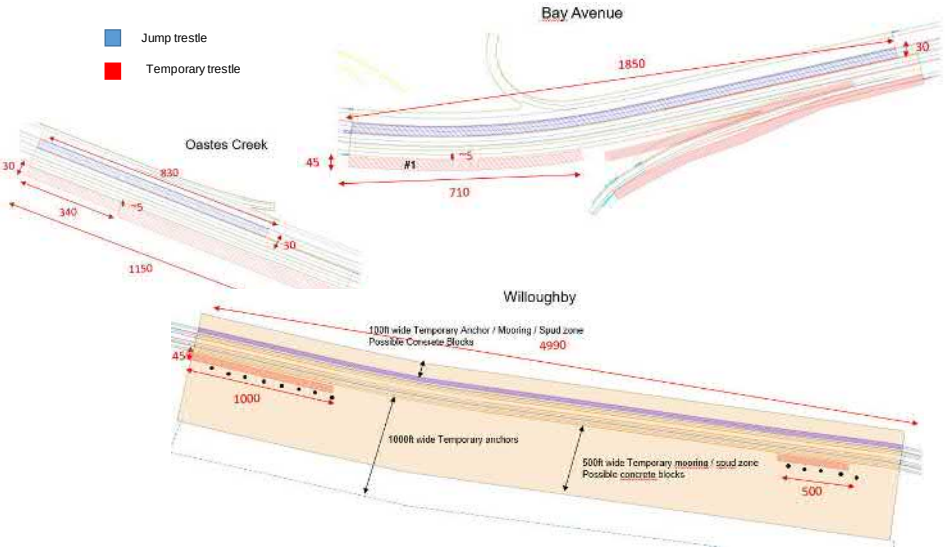
- Temporary Impacts (<12 months) - Jump Trestle - Heavy duty moving platform
  - Open Ended 36'' Steel Pipe Piles



64

2. Habitat Condition Assessment (HCA) and Impacts

- Temporary Impacts (<12 months) - Jump Trestle



65

2. Habitat Condition Assessment (HCA) and Impacts

- Preliminary Avoidance and Minimization
  - Bored tunnel vs. immersed tube tunnel
    - Reduced impacts to navigation

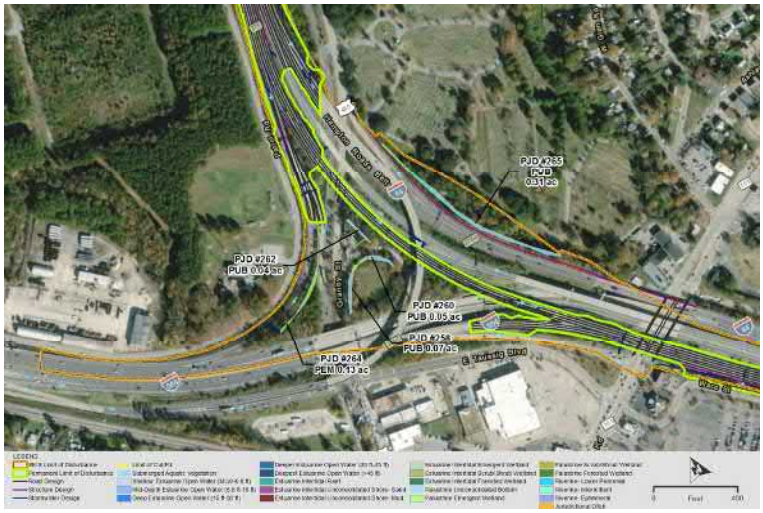
	EA June 2018 (acres)	Design June 28, 2019* (acres)
Estuarine Subtidal Open Water	233	19.6

  - Temp Trestle vs. Causeways
    - Reduce impacts to wetlands
    - Minimize dredging
  - Elimination of the I-564 Additional Ramp
  - BMPs Outside of Wetlands
  - General Avoidance and Minimization for Roadway
    - Reduced footprint
    - Pulling in slopes
    - Retaining walls

66

2. Habitat Condition Assessment (HCA) and Impacts

- Preliminary Avoidance and Minimization
  - Elimination of the I-564 Ramp Structure



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Break

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3. Compensatory Mitigation

3. Compensatory Mitigation

- Permanent Impacts

Resource	Fills (acres)	Proposed Compensation Ratio	Piles (acres)	Proposed Compensation Ratio	Shading (acres)	Proposed Compensation Ratio
Estuarine Subtidal Open Water	19.11	HCA*	0.45	HCA*	-	-
Estuarine Subtidal Open Water w/ SAV	-	-	<0.01	-	0.04	2:1
Estuarine Intertidal Emergent Marsh	0.57	1:1	0.01	-	2.93	1:1
Estuarine Intertidal Scrub Shrub	0.02	1.5:1	<0.01	-	0.03	1:1
Estuarine Intertidal Scrub Shrub/Emergent Marsh (Mallory Street)	0.09	2:1	-	-	-	-
Estuarine Intertidal Reef	-	-	-	-	-	-
Estuarine Intertidal Unconsolidated Shore Sand	1.56	HCA*	0.01	HCA*	-	-
Estuarine Intertidal Unconsolidated Shore Mud	-	-	-	-	-	-
Jurisdictional Ditch	18 lf	-	-	-	-	-
Palustine Emergent	0.50	1:1	-	-	0.02	1:1
Palustrine Forested	0.13	2:1	-	-	-	1:1
Palustrine Scrub Shrub	0.25	1.5:1	<0.01	-	0.14	1:1
Palustrine Unconsolidated Bottom	0.14	0.5:1	-	-	-	-
Total	22.37		0.47		3.15	
Lower Perennial, Riverine	3 lf	1.5:1	-	-	-	-

*Compensation to be determined pending results of the HCA and Agency Coordination

3. Compensatory Mitigation

- Extended Temporary Impacts >12 Months

Resource	Piles (acres)	Proposed Compensation Ratio	Shading (acres)	Proposed Compensation Ratio
Estuarine Subtidal Open Water	0.28	-	-	-
Estuarine Subtidal Open Water w/ SAV	0.02	-	0.52	1:1
Estuarine Intertidal Emergent Marsh	0.01	-	0.55	1:1
Estuarine Intertidal Scrub Shrub	-	-	<0.01	1:1
Estuarine Intertidal Reef	-	-	-	-
Estuarine Intertidal Unconsolidated Shore Sand	<0.01	-	-	-
Estuarine Intertidal Unconsolidated Shore Mud	-	-	-	-
Jurisdictional Ditch	-	-	-	-
Palustine Emergent	-	-	-	-
Palustrine Forested	-	-	<0.01	1:1
Palustrine Scrub Shrub	-	-	-	-
Palustrine Unconsolidated Bottom	-	-	-	-
Total	0.32		1.09	
Lower Perrenial, Riverine	-	-	-	-

*Compensation to be determined pending results of the HCA and Agency Coordination

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3. Compensatory Mitigation

- Temporary Wetland, Stream, and Other Habitat Impacts
  - No mitigation is proposed for temporary impacts <12 months

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3. Compensatory Mitigation

- Mitigation Source

Resource	Compensation Required (Credits)	Compensation Available		Proposed Compensation Source
		Current	Future	
Estuarine Subtidal Open Water	TBD	TBD	TBD	TBD
Estuarine Subtidal Open Water w/ SAV	0.60	TBD	TBD	TBD
Estuarine Intertidal Emergent Marsh	4.13	4	8	Mitigation Bank
Estuarine Intertidal Scrub Shrub	0.44			
Estuarine Intertidal Reef	-	-	-	-
Estuarine Intertidal Unconsolidated Shore Sand	TBD	TBD	TBD	TBD
Estuarine Intertidal Unconsolidated Shore Mud	-	-	-	-
Jurisdictional Ditch	-	-	-	-
Palustine Emergent	1.38	Pre-Purchased by VDOT		
Palustrine Forested				
Palustrine Scrub Shrub				
Palustrine Unconsolidated Bottom				
Lower Perennial, Riverine	4.50	>6,500	-	Mitigation Bank

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4. VPDES

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4. VPDES

- Application comprised of
  - Form 1 - General Information
  - Form 2A - Application Overview
  - Form 2C- Wastewater Discharge Information
  - Form 2D - New Sources and New Dischargers, Application for Permit to Discharge Process Wastewater

Key Components
- Outfall Location Map
- Process Flow Diagram
- Additional Information / Narrative

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4. VPDES

- Form 2C- Wastewater Discharge Information
- Specific information regarding the planned outfalls
  - Specific Location lat/long –
  - Flow Rate
  - Contributing processes, as to where the water is coming, how it was generated
  - Treatment codes from Table 2C-1 codes denoting treatment processes for the water, i.e. Chemical treatment through carbon adsorption and others

1. OUT-FALL NO. (*list*)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
	a. OPERATION (*list*)	b. AVERAGE FLOW (*include units*)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1
001	Jet Grouting / Slurry Wall construct	300-500 gpm	residual return water	1-U, 1-T, 2-K
	Tunnel Boring Machine, TBM excavatio	~ 350 gpm	water from slurry/	1-T, 1-Q, 2-K, 2-A
	excavation dewatering	200 gpm	water from dewatering excavation	1-U, 1-T, 2-K
	NCCW from TBM	50 gpm intermitten	non-contact coolant water/TBM	1-T, 1-Q, 2-K, 2-A
002	Jet Grouting / Slurry Wall construct	300-500 gpm	residual return water	1-U, 1-T, 2-K
	excavation dewatering	200 gpm	water from dewatering excavation	1-U, 1-T, 2-K

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4. VPDES

- Point source discharge of construction process water
- Characterized as Industrial Minor
- Flow rate <0.5 MDG
- Two planned outfalls 001 and 002
  - 001 South Island
    - Water treatment from
      - Jet Grouting – construction
      - Slurry Wall - construction
      - Excavation water of tri-cell (Pit for TBM entry) north bore
      - TBM boring of tunnels
  - 002 North Island
    - Water treatment from
      - Jet Grouting – construction
      - Slurry Wall - construction
      - Excavation of water tri-cell for south bore of TBM

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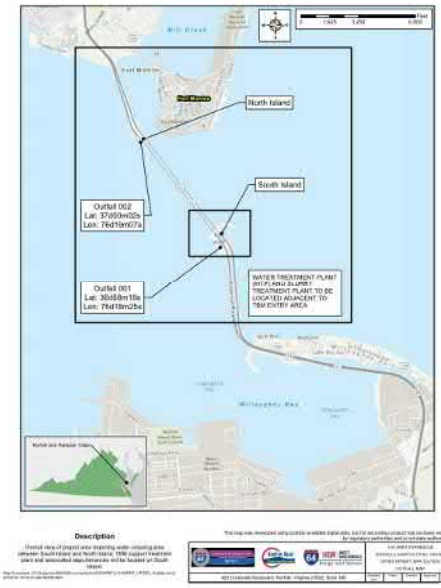
4. VPDES

- Planned Outfall Locations



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4. VPDES

- Form 2D New Sources and New Dischargers, Application for Permit to Discharge Process Wastewater
  - Effluent data will be provided for chemical compounds that are suspected to be in process water.
  - Bench scale testing will be performed on samples collected and will emulate the slurry treatment plant processes
  - Provide a process flow diagram.
- Form 2C- Wastewater Discharge Information

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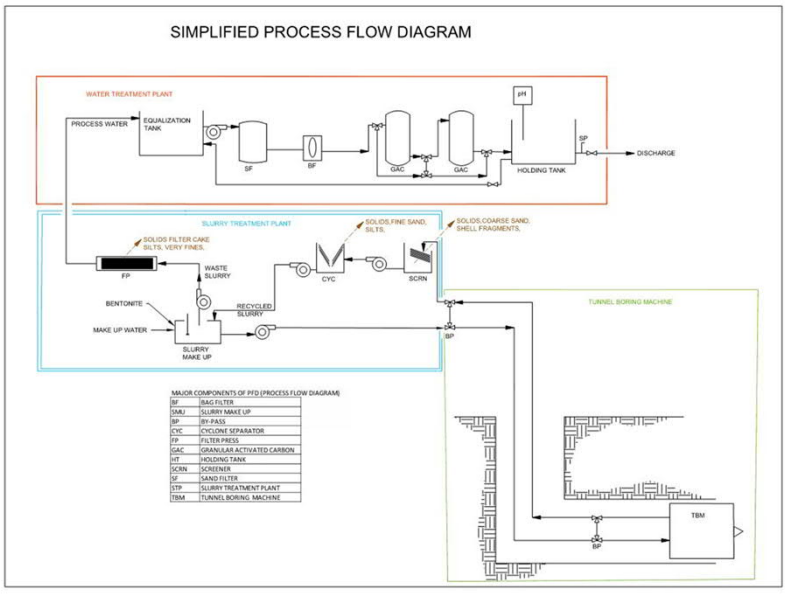
4. VPDES



80

4. VPDES

- Nutrients N and P
  - If the discharge is in exceedance or planned exceedance of limit, offset credits are required to be purchased.
- Treatment system nutrient limits for total Nitrogen and total Phosphorus are:
  - N = 2,300 lb/yr
  - P = 300 lb/yr

Based on a 0.5 MGD industrial minor discharge

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Lunch

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5. MMPA and ESA

- Preliminary Results
  Distances to In-water Acoustic Behavioral Thresholds

Fish and Sea Turtles – Unmitigated Impact Pile Installation

Model	PSLM		SAF	
Source	Distance to 166 dB RMS (Sea Turtle) (meters)	Distance to 150 dB RMS (Fish) (meters)	Distance to 166 dB RMS (Sea Turtle) (meters)	Distance to 150 dB RMS (Fish) (meters)
24-inch steel pipe piles (impact)	736	8,577	87	140
30-inch steel pipe piles (impact)	858	10,000	58	90
36-inch steel pipe piles (impact)	631	7,356	58	90
42-inch steel pipe piles (impact)	858	10,000	105	185
30-inch square concrete piles (impact)	46	541	18	50
54-inch cylindrical hollow concrete pile (impact)	TBD	TBD	TBD	TBD

Practical Spreading Loss Model (PSLM)
Simplified Attenuation Formula (SAF)

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5. MMPA and ESA

- Preliminary Results
  Distances to In-water Acoustic Behavioral Thresholds

Fish and Sea Turtles – Unmitigated Vibratory Pile Installation

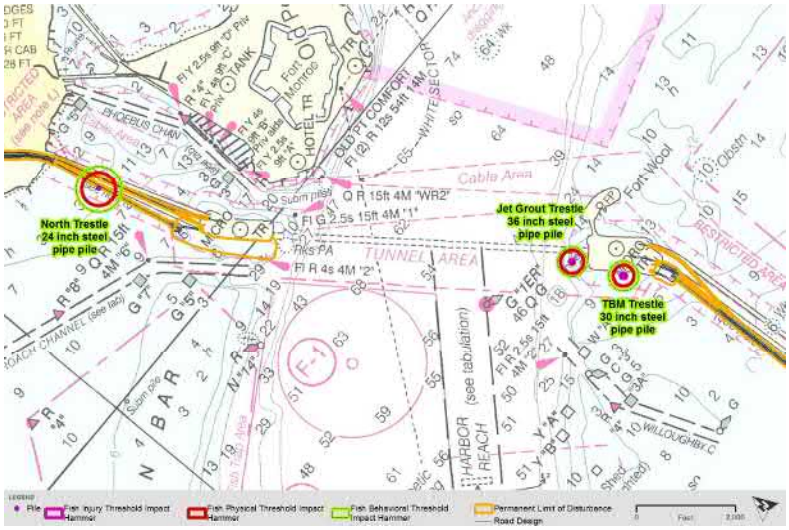
Model	PSLM		SAF	
Source	Distance to 166 dB RMS (Sea Turtle) (meters)	Distance to 150 dB RMS (Fish) (meters)	Distance to 166 dB RMS (Sea Turtle) (meters)	Distance to 150 dB RMS (Fish) (meters)
24-inch steel pipe piles (vibratory)	40	464	54	107
30-inch steel pipe piles (vibratory)	40	464	38	70
36-inch steel pipe piles (vibratory)	40	464	28	60
42-inch steel pipe piles (vibratory)	18	215	TBD	TBD
30-inch square concrete piles (vibratory)	34	398	TBD	TBD
54-inch cylindrical hollow concrete pile (vibratory)	TBD	TBD	TBD	TBD
24-inch AZ steel sheet (vibratory)	4	44	TBD	40

Practical Spreading Loss Model (PSLM)
Simplified Attenuation Formula (SAF)

84

5. MMPA and ESA

- Preliminary Results
  Distances to In-water Acoustic Behavioral Thresholds



85

5. MMPA and ESA

- Minimization
  - Bubble curtain
  - Marine mammal observers
  - Ramp up

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6. NHPA Section 106

- Commitments in the Programmatic Agreements
  - No permanent acquisition of property from Hampton University
  - Memorandum of agreement outlining terms for temporary Hampton University property
  - Emancipation Oak: No encroachment into the Tree Limit of Disturbance
    - Baseline Assessment & Monitoring Plan
  - Noise Barriers
    - Hampton Institute Historic District & Hampton Institute National Historic Landmark
    - Pasture Point Historic District
    - Hampton National Cemetery
    - Phoebus–Mill Creek Terrace Neighborhood Historic District
    - Norfolk Naval Base Historic District

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6. NHPA Section 106

- Emancipation Oak

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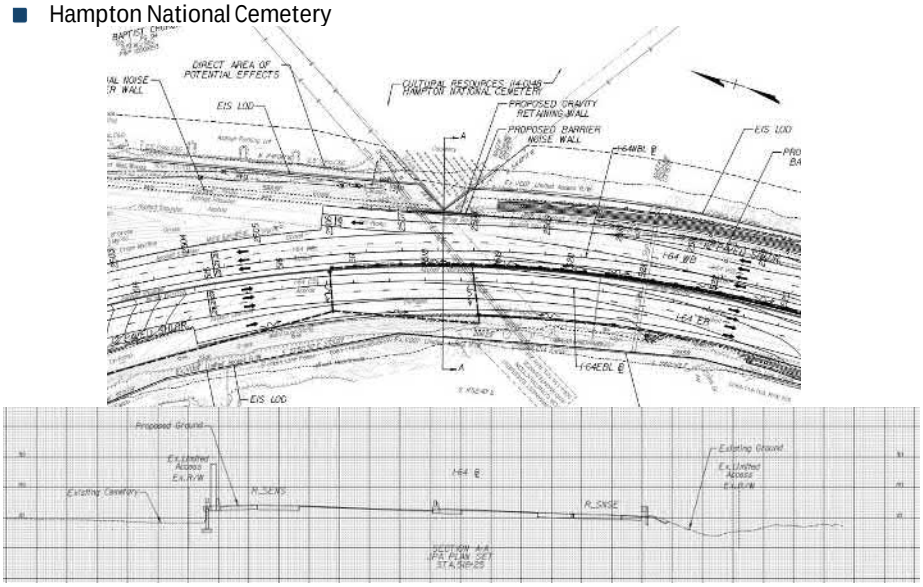
6. NHPA Section 106

- Hampton National Cemetery



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6. NHPA Section 106

- Hampton National Cemetery

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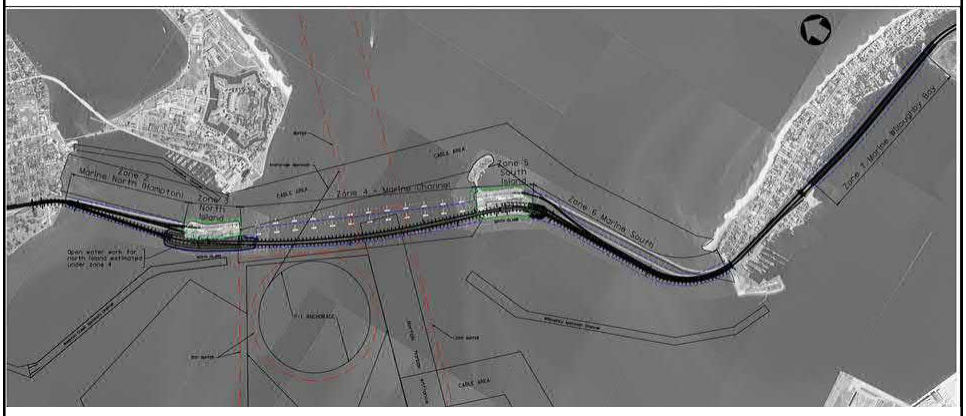
7. Navigation

7. Navigation

- Section 408
  - Navigation Safety Risk Assessment
  - Tunnel Construction Plan
  - Marine Operations Plan for Construction
  - Stakeholder Meeting
- USCG Bridge Permit
  - Potential USCG Meeting the week of July 22nd

7. Navigation



- Existing channels and anchorages
- The dashed red line denotes a buffer around the federal channel and anchorage

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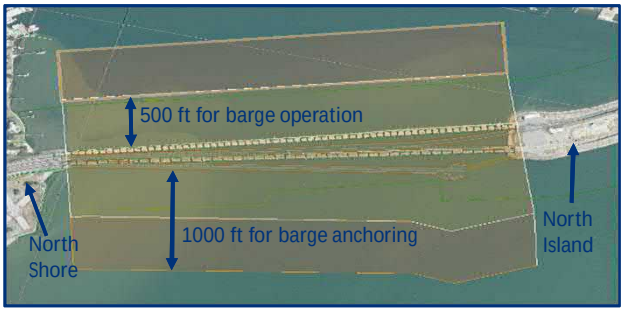
7. Navigation



- North Trestle
  - Mooring area to be created near North Shore
  - Spud barges used in areas with more than 4.5 ft of water (at MLW)
  - At peak, ~15 working barges
  - First activity after receipt of the JPA
  - Last activity in September 2024 + 6 months to remove structures

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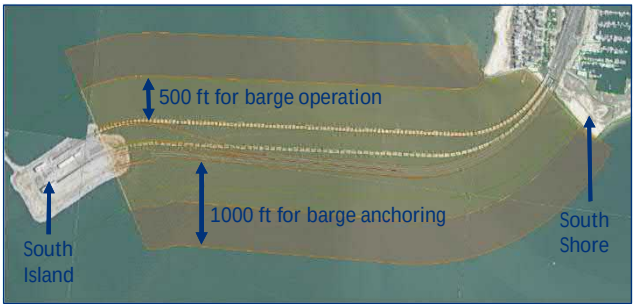
7. Navigation

- North & South Island
  - Mooring area to be created near North and South Island Expansions
  - 1 mooring pile (42'' pipe pile) every 40FT around the footprint of the islands
  - Spud barges used in areas with more than 4.5 ft of water (at MLW)
  - 1000 ft from expansion boundary for barge anchoring
  - 500 ft from expansion boundary for barge operation
  - At peak, ~15 working barges
  - First activity after receipt of the JPA
  - Last activity in September 2024 + 6 months to remove structures

95

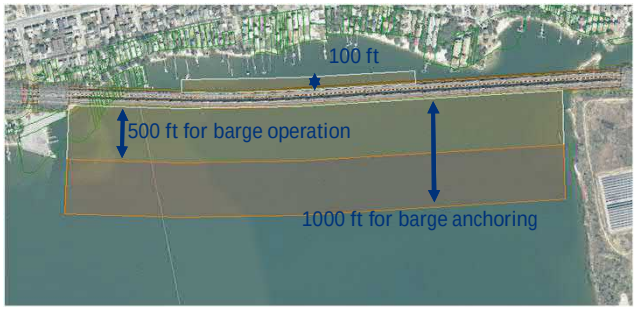
7. Navigation



- South Trestle
  - Spud barges used in areas with more than 4.5 ft of water (at MLW)
  - At peak, ~25 working barges
  - First activity after receipt of the JPA
  - Last activity in September 2024 + 6 months to remove structures

96

7. Navigation



- Willoughby Bay
  - Mooring area to be created in Willoughby Bay with mooring piles (42" pipe piles)
  - Spud barges used in areas with more than 4.5 ft of water (at MLW)
  - At peak, ~15 working barges
  - First activity after receipt of the JPA
  - Last activity in December 2024 + 3 months to remove structures

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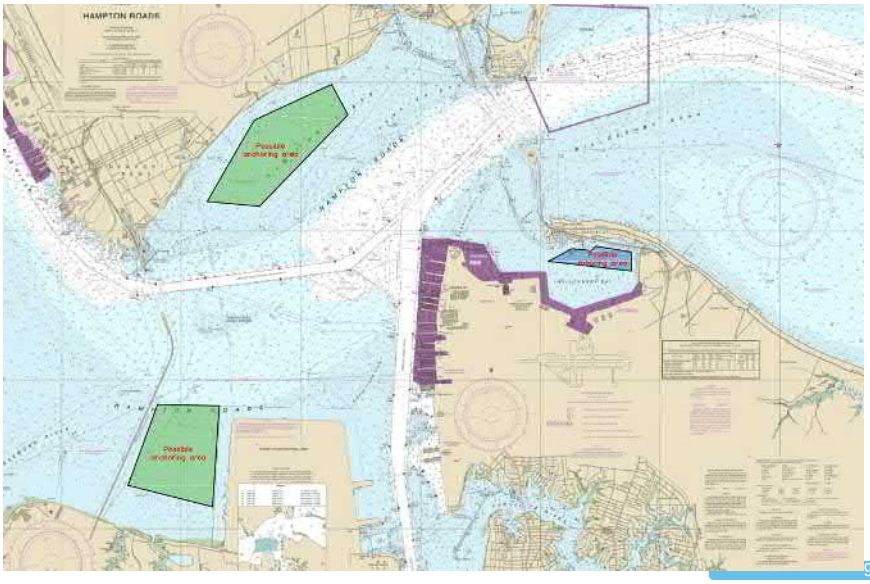
7. Navigation

- Potential mooring and anchoring areas



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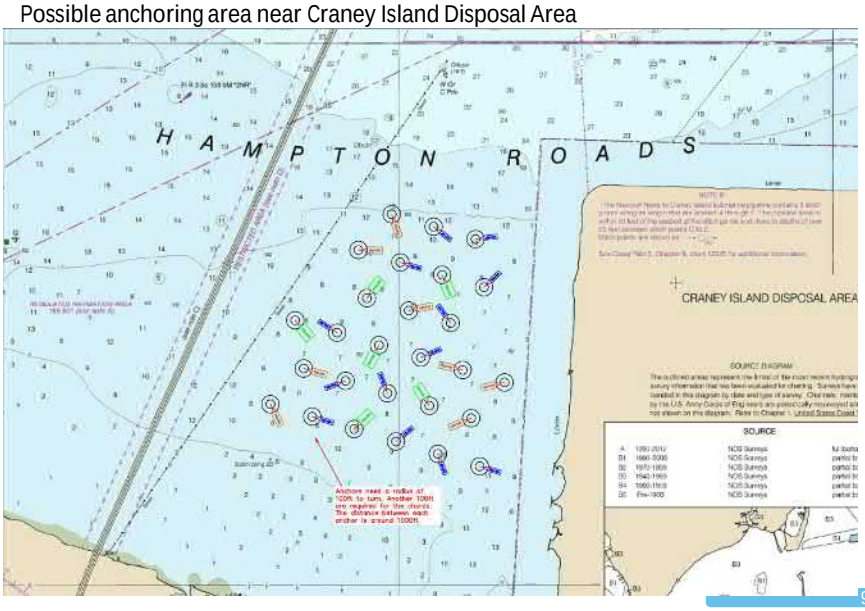
7. Navigation

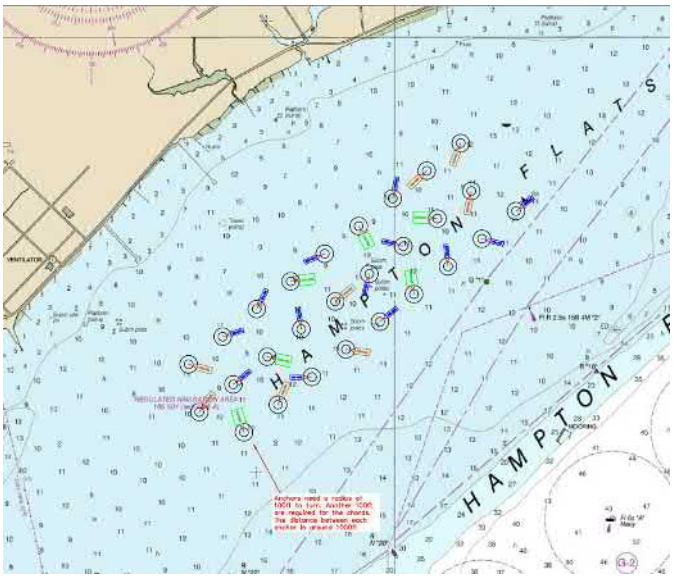
- Possible anchoring area near Craney Island Disposal Area



99

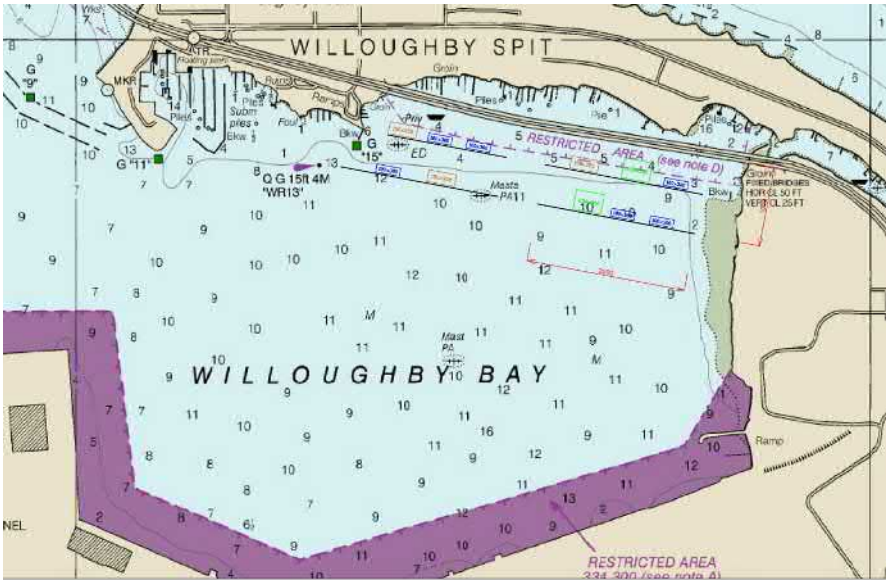
VS1

7. Navigation



100

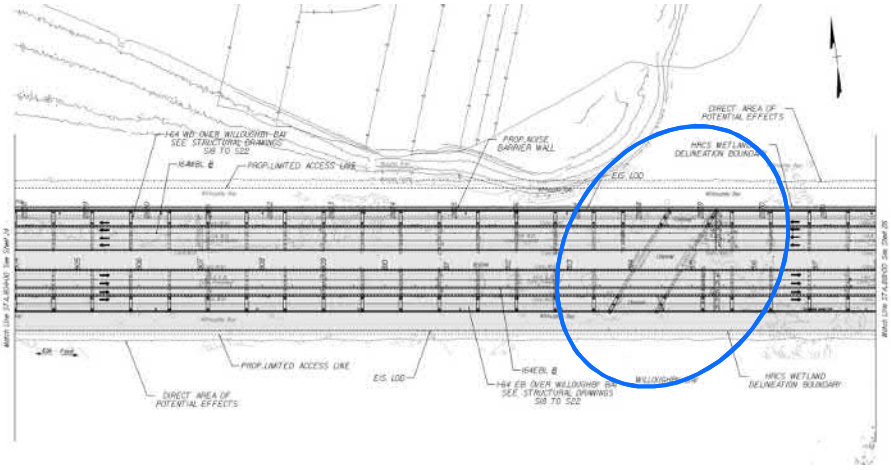
7. Navigation



101

Navigation

- Willoughby Bay
  - Remove existing non-functioning lighting and fenders



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Comments/Questions?

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