E 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XD544]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Parallel Thimble Shoal Tunnel Project, Virginia Beach, Virginia

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments on proposed authorization and possible renewal.

SUMMARY: NMFS has received a request from the Chesapeake Tunnel Joint Venture (CTJV) for authorization to take marine mammals incidental to the Parallel Thimble Shoal Tunnel Project (PTST) in Virginia Beach, Virginia**.** Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-time, 1-year renewal that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorization and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service

and should be submitted via email to *ITP.pauline@noaa.gov*. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities*. In case of problems accessing these documents, please call the contact listed above.

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments, including all attachments, must not exceed a 25-megabyte file size. All comments received are a part of the public record and will generally be posted online at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities* without change. All personal identifying information (*e.g.*, name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Robert Pauline, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are proposed or, if the taking is limited to harassment, a notice of a proposed IHA is provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NAO 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA request.

Summary of Request

On July 28, 2023, NMFS received a request from CTJV for an IHA to take marine mammals incidental to in-water construction activities associated with the PTST project near Virginia Beach, VA. Following NMFS' review of the initial application, CTJV submitted several revised versions of the application based on NMFS' comments. The final version was submitted on November 7, 2023, and was deemed adequate and complete on November 13, 2023. CTJV's request is for take of 5 species by Level B harassment and, for a subset of three of these species, by Level A harassment. Neither CTJV nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS most recently issued an IHA to CTJV for similar work on November 8, 2022, (87 FR 68462; November 15, 2022). CTJV complied with all the requirements (*e.g.*, mitigation, monitoring, and reporting) of the previous IHA, and information regarding their monitoring results may be found in the **Estimated Take** section.

This proposed IHA would cover 1 year of a larger project for which CTJV obtained IHAs for similar work (83 FR 36522, July 30, 2018; 85 FR 16061, March 20, 2020; 86 FR 14606, March 17, 2021; 86 FR 67024, November 24, 2021; and 87 FR 68462, November 15, 2022). The larger multi-year PTST project consists of the construction of a two-lane parallel tunnel to the west of the existing Thimble Shoal Tunnel, connecting Portal Island Nos. 1 and 2 as part of the 23-mile Chesapeake Bay Bridge-Tunnel (CBBT) facility.

Description of Proposed Activity

Overview

The purpose of the project is to build an additional two lane vehicle tunnel under the navigation channel as part of the CBBT. The PTST project will address existing constraints to regional mobility based on current traffic volume, improve safety, improve the ability to conduct necessary maintenance with minimal impact to traffic flow, and

ensure reliable hurricane evacuation routes. In-water construction work would include the removal of a total of 158 36-inch steel piles on the temporary dock and trestle on Portal Islands Nos. 1 and 2 as well as the removal of steel mooring piles on both Portal Islands (97 total on Portal Island No.1); the removal of 36" steel piles on the trestle (34 total on Portal Island No. 2); and the removal of 36" steel mooring piles on both Island 1 (9 piles) and Island No. 2 (18 piles). All steel piles are hollow pipe piles. The proposed impact and vibratory pile removal activities can introduce sound into the water environment which can result in take of marine mammals by behavioral harassment and, for some species, by auditory injury. Proposed construction activities are expected to be completed from January-April as well as in December 2024. Note that the term "pile driving" is only used to refer to pile removal activities. No pile installation activities are planned by CTJV.

Dates and Duration

The proposed in-water removal of a total of 158 piles would occur over 80 days. Removal will begin on Portal Island No. 1 in January through April 2024 for 54 days then will resume on Portal Island No. 2 in December 2024 for 26 days. No pile removal work will take place in the interim. The project schedule is shown in table 1.

Specific Geographic Region

The PTST project is located between Portal Islands No.1 and No. 2 of the CBBT as shown in Figure 1. A 6,525 lineal foot (ft) (1,989 meters(m)) tunnel will be bored underneath the Thimble Shoal Channel connecting the Portal Islands located near the mouth of the Chesapeake Bay. The CBBT is a 23-mile (37 km) long facility that connects the Hampton Roads area of Virginia to the Eastern Shore of Virginia. Water depths within the PTST construction area range from 0 to 60 ft (18.2 m) below Mean Lower Low Water (MLLW). The Thimble Shoal Channel is 1,000 ft (305 m) wide and is maintained at a depth of 50 ft (15.2 m) MLLW.

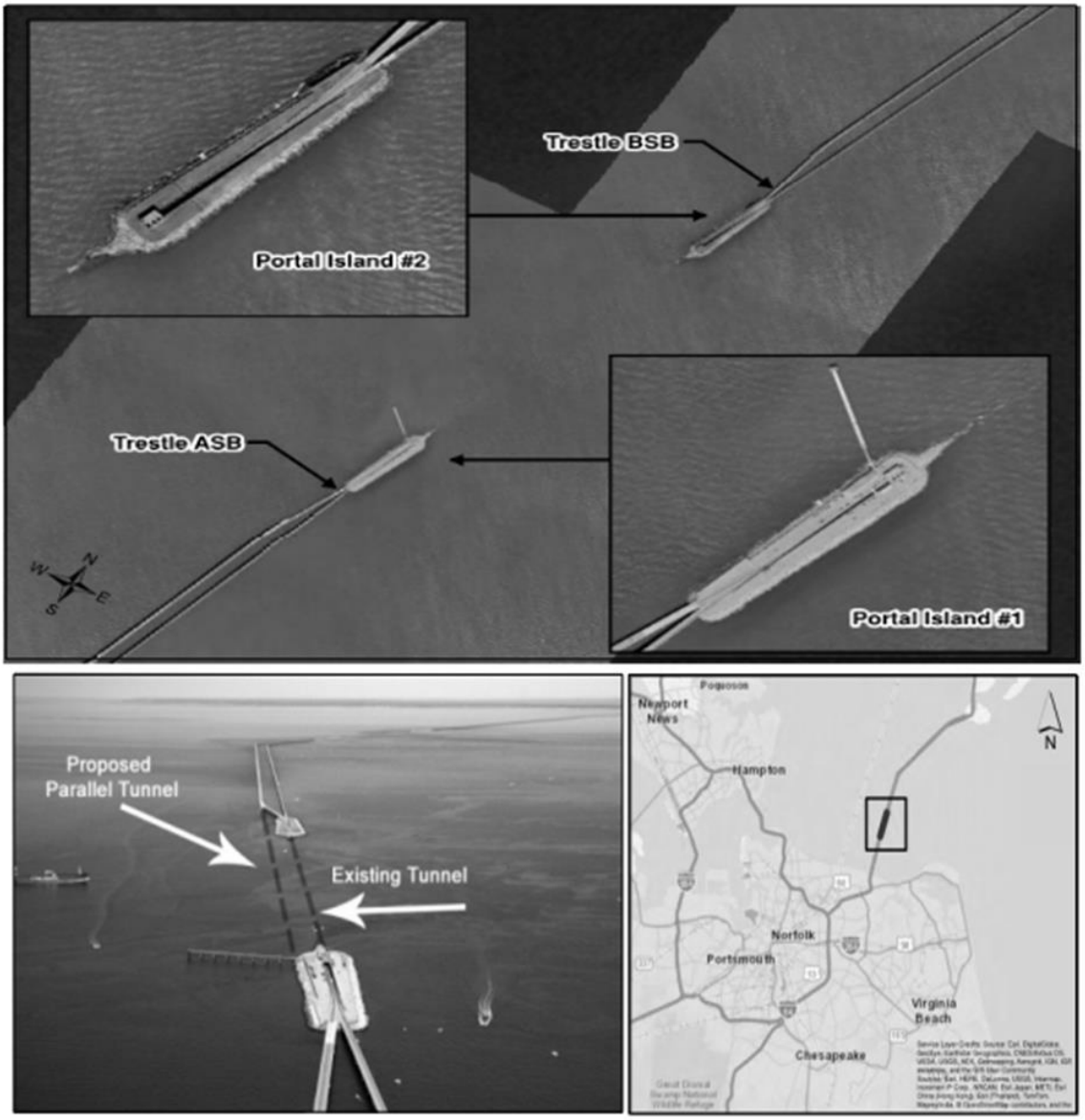

Figure 1 -- Map of Proposed Project Area near Virginia Beach, Virginia

Detailed Description of the Specified Activity

The PTST project consists of the construction of a two lane tunnel parallel and to the west of the existing tunnel, connecting Portal Islands No. 1 and No. 2. A tunnel

boring machine (TBM) will both excavate material and construct the tunnel as it progresses from Portal Island No. 1 to Portal Island No. 2. Precast concrete tunnel segments will be transported to the TBM for installation. The TBM will assemble the tunnel segments in-place as the tunnel is bored. After the tunnel structure is completed, final upland work for the PTST Project will include installation of the final roadway, lighting, finishes, mechanical systems, and other required internal systems for tunnel use and function. In addition, the existing fishing pier will be repaired and refurbished.

Descriptions of additional upland activities may be found in the application but such actions will not affect marine mammals and are not described here.

Proposed in-water activities during this IHA include the removal of 36-inch steel piles on the temporary dock and trestle (97 total on Portal Island No.1) and the removal of 36-inch steel piles on the trestle (34 total on Portal Island No.2) as well as the removal of 36-inch steel mooring piles on both Portal Islands (9 piles on Portal Island No. 1 and 18 total on Portal Island No. 2). A total of 158 piles will be removed over 80 in-water work days. Pile driving activities will be conducted by initially using an impact hammer, if necessary, to break the friction on the previously installed piles. If an impact hammer is not required to initially break friction, then a vibratory hammer will be used for extraction. If the pile cannot be removed with this method, the pile will then be cut off a minimum of three feet below the stabilized, post construction sediment-water interface. There will be no concurrent pile driving activity.

Table 1 -- Anticipated Pile Installation Schedule (January 2024-December 2024)

Pile Location	Pile Function	Pile Type	Installation/ Removal Method	Bubble Curtain Yes/No	Number of Piles	Number of Days per Activity (Total)	Number of Piles/ Days per Activity (Per Hammer Type)	Anticipated Installation Date
Portal Island No. 1	Mooring dolphins	36-inch Diameter Steel Pipe Pile	Impact (if needed)	Yes	9	5	(2 Piles/Day)	**1 January through 28 February 2024**
			Vibratory (Removal)	Yes		5	(2 Piles/Day)	
Portal Island No. 1	Temporary Dock/ Trestle	36-inch Diameter Steel Interlocked Pipe Piles	Impact (if needed)	Yes	97	49	(2 Piles/Day)	**1 January through 30 April 2024**
			Vibratory (Removal)	Yes		49	(2 Piles/Day)	
Portal Island No. 2	Mooring dolphins	36-inch Diameter Steel Pipe Pile	Impact (if needed)	Yes	18	9	*(2 Piles/Day)*	**December 1-31, 2024**
			Vibratory (Removal)	Yes		9	(2 Piles/Day)	
Portal Island No. 2	Omega Trestle	36-inch Diameter Steel Interlocked Pipe Piles	Impact (if needed)	Yes	34	17	*(2 Piles/Day)*	**December 1-31, 2024**
			Vibratory (Removal)	Yes		17	*(2 Piles/Day)*	

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see **Proposed Mitigation** and **Proposed Monitoring and Reporting**)

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the potentially affected species. NMFS fully considered all of this information, and we refer the reader to these descriptions, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species)*.

Table 2 lists all species or stocks for which take is expected and proposed to be authorized for this activity and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no serious injury or mortality is anticipated or proposed to be authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species or stocks and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated

within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Atlantic and Gulf of Mexico SARs (Hayes *et al.* 2023). All values presented in table 2 are the most recent available at the time of publication and are available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*.

Table 2 -- Species Likely Impacted by the Specified Activities

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV, N_{min}, most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Balaenopteridae (rorquals)						
Humpback whale	*Megaptera novaeangliae*	Gulf of Maine	-,-; N	1,393 (0; 1,375, 2016)	22	12.15
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Bottlenose dolphin	*Tursiops truncatus*	WNA Coastal, Northern Migratory	-,-; Y	6,639 (0.41; 4,759; 2016)	48	12.2-21.5
		WNA Coastal, Southern Migratory	-,-; Y	3,751 (0.06; 2,353; 2016)	24	0-18.3
		Northern North Carolina Estuarine System	-,-; Y	823 (0.06; 782; 2017)	7.8	7.2-30
Family Phocoenidae (porpoises)						
Harbor porpoise	*Phocoena phocoena*	Gulf of Maine/Bay of Fundy	-, -; N	95,543 (0.31; 74,034; 2016)	851	164
Order Carnivora – Superfamily Pinnipedia						
Family Phocidae (earless seals)						
Harbor seal	*Phoca vitulina*	WNA	-, -; N	61,336 (0.08, 57,637, 2018)	1,729	339
Gray seal[4]	*Halichoerus grypus*	WNA	-, -; N	27,300 (0.22, 22,785, 2016)	1,458	4,453

[1] - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2]- NMFS marine mammal stock assessment reports online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance.

[3] - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.*, commercial fisheries, ship strike). Annual Mortality/ Serious Injury (M/SI) often cannot be determined precisely and is in some cases presented as a minimum value or range.

[4] - The NMFS stock abundance estimate applies to U.S. population only, however the actual stock abundance is approximately 505,000. The PBR value is estimated for the U.S. population, while the M/SI estimate is provided for the entire gray seal stock (including animals in Canada).

As indicated above, all five species (with seven managed stocks) in table 2 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. While North Atlantic right whale and fin whale could potentially occur in the area, occurrence of these species is very rare, the species are readily observed, and the applicant would shut down pile driving activity if they enter the project area. Thus take is not expected to occur, and they are not discussed further.

Humpback Whale

The humpback whale is found worldwide in all oceans. In winter, humpback whales from waters off New England, Canada, Greenland, Iceland, and Norway migrate to mate and calve primarily in the West Indies, where spatial and genetic mixing among these groups occurs. For the humpback whale, NMFS defines a stock on the basis of feeding location, *i.e.*, Gulf of Maine. However, our reference to humpback whales in this document refers to any individuals of the species that are found in the specific geographic region. These individuals may be from the same breeding population (*e.g.*, West Indies breeding population of humpback whales) but visit different feeding areas.

Based on photo-identification only 39 percent of individual humpback whales observed along the mid- and south Atlantic U.S. coast are from the Gulf of Maine stock (Barco *et al*., 2002). Therefore, the SAR abundance estimate underrepresents the relevant population, *i.e.*, the West Indies breeding population.

Prior to 2016, humpback whales were listed under the ESA as an endangered species worldwide. Following a 2015 global status review (Bettridge *et al*., 2015), NMFS established 14 Distinct Population Segments (DPSs) with different listing statuses (81 FR 62259, September 8, 2016) pursuant to the ESA. The West Indies DPS, which consists of the whales whose breeding range includes the Atlantic margin of the Antilles from Cuba to northern Venezuela, and whose feeding range primarily includes the Gulf of Maine, eastern Canada, and western Greenland, was delisted. As described in Bettridge *et al.* (2015), the West Indies DPS has a substantial population size (*i.e.*, approximately 10,000; Stevick *et al.*, 2003; Smith *et al.*, 1999; Bettridge *et al.*, 2015), and appears to be experiencing consistent growth.

Humpback whales are the only large cetaceans that are likely to occur in the project area and could be found there at any time of the year. There has been a decline in whale sightings in the peak months since 2016/17; the distribution of whale sightings occur most frequently in the month of January through March (Aschettino *et al*., 2021).

There have been 33 humpback whale strandings recorded in Virginia between 1988 and 2013. Most of these strandings were reported from ocean facing beaches, but 11 were also within the Chesapeake Bay (Barco and Swingle, 2014). Strandings occurred in all seasons, but were most common in the spring. Since January 2016, elevated humpback whale mortalities have occurred along the Atlantic coast from Maine through Florida. The event has been declared an Unusual Mortality Event (UME) with 209 strandings recorded, 7 of which occurred in or near the mouth of the Chesapeake Bay. More detailed information is available at: *https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2023-humpback-whale-unusual-mortality-event-along-atlantic-coast*. Three previous UMEs involving humpback whales have occurred since 2000, in 2003, 2005, and 2006.

Humpback whales use the mid-Atlantic as a migratory pathway to and from the calving/mating grounds, but it may also be an important winter feeding area for juveniles. Since 1989, observations of juvenile humpbacks in the mid-Atlantic have been increasing during the winter months, peaking from January through March. Biologists theorize that non-reproductive animals may be establishing a winter feeding range in the mid-Atlantic since they are not participating in reproductive behavior in the Caribbean (Swingle *et al*., 1993).

Bottlenose Dolphin

The bottlenose dolphin occurs in temperate and tropical oceans throughout the world (Blaylock 1985). In the western Atlantic Ocean there are two distinct morphotypes of bottlenose dolphins, an offshore type that occurs along the edge of the continental shelf as well as an inshore type. The inshore morphotype can be found along the entire United States coast from New York to the Gulf of Mexico, and typically occurs in waters less than 20 m deep (Hayes *et al.,* 2021). Bottlenose dolphins found in Virginia are representative primarily of either the northern migratory coastal stock, southern migratory coastal stock, or the Northern North Carolina Estuarine System Stock (NNCES).

The northern migratory coastal stock is best defined by its distribution during warm water months when the stock occupies coastal waters from the shoreline to approximately the 20 m isobath between Assateague, Virginia, and Long Island, New York (Garrison *et al*., 2017). The stock migrates in late summer and fall and, during cold water months (best described by January and February), occupies coastal waters from approximately Cape Lookout, North Carolina, to the North Carolina/Virginia border. Historically, common bottlenose dolphins have been rarely observed during cold water months in coastal waters north of the North Carolina/Virginia border, and their northern distribution in winter appears to be limited by water temperatures. Overlap with the

southern migratory coastal stock in coastal waters of northern North Carolina and Virginia is possible during spring and fall migratory periods, but the degree of overlap is unknown and it may vary depending on annual water temperature (Garrison *et al*., 2016). When the stock has migrated in cold water months to coastal waters from just north of Cape Hatteras, North Carolina, to just south of Cape Lookout, North Carolina, it overlaps spatially with the NNCES stock (Garrison *et al*., 2017).

The southern migratory coastal stock migrates seasonally along the coast between North Carolina and northern Florida (Garrison *et al*., 2017). During January–March, the southern migratory coastal stock appears to move as far south as northern Florida. During April–June, the stock moves back north past Cape Hatteras, North Carolina, where it overlaps, in coastal waters, with the NNCES stock (in waters ≤1 km from shore). During the warm water months of July–August, the stock is presumed to occupy coastal waters north of Cape Lookout, North Carolina, to Assateague, Virginia, including the Chesapeake Bay.

The NNCES stock is best defined as animals that occupy primarily waters of the Pamlico Sound estuarine system (which also includes Core, Roanoke, and Albemarle sounds, and the Neuse River) during warm water months (July–August). Members of this stock also use coastal waters (≤1 km from shore) of North Carolina from Beaufort north to Virginia Beach, Virginia, including the lower Chesapeake Bay. A community of NNCES dolphins are likely year-round Bay residents (Eric Patterson, pers. communication).

Harbor Porpoise

The harbor porpoise is typically found in colder waters in the northern hemisphere. In the western North Atlantic Ocean, harbor porpoises range from Greenland to as far south as North Carolina (Barco and Swingle, 2014). They are commonly found in bays, estuaries, and harbors less than 200 m deep (Hayes *et al.,* 2022). Harbor

porpoises in the United States are made up of the Gulf of Maine/Bay of Fundy stock. Gulf of Maine/Bay of Fundy stock are concentrated in the Gulf of Maine in the summer, but are widely dispersed from Maine to New Jersey in the winter. South of New Jersey, harbor porpoises occur at lower densities. Migrations to and from the Gulf of Maine do not follow a defined route (Hayes *et al.,* 2022).

Harbor porpoise occur seasonally in the winter and spring in small numbers near the project area. Strandings occur primarily on ocean facing beaches, but they occasionally travel into the Chesapeake Bay to forage and could occur in the project area (Barco and Swingle, 2014). Since 1999, stranding incidents have ranged widely from a high of 40 in 1999 to 2 in 2011, 2012, and 2016 (Barco *et al*., 2017). In most areas, harbor porpoise occur in small groups of just a few individuals.

Harbor Seal

The harbor seal occurs in arctic and temperate coastal waters throughout the northern hemisphere, including on both the east and west coasts of the United States. On the east coast, harbor seals can be found from the Canadian Arctic down to Georgia (Blaylock, 1985). Harbor seals occur year-round in Canada and Maine and seasonally (September-May) from southern New England to New Jersey (Hayes *et al.*, 2022). The range of harbor seals appears to be shifting as they are regularly reported further south than they were historically. In recent years, they have established haulout sites in the Chesapeake Bay including on the portal islands of the CBBT (Rees *et al.,* 2016, Jones *et al*., 2018).

Harbor seals are the most common seal in Virginia (Barco and Swingle, 2014). They can be seen resting on the rocks around the portal islands of the CBBT from December through April. They are primarily concentrated north of the project area at Portal Island No. 3. Over 8 field seasons (2014-2015 through 2021-2022), 79.1 percent of seals were recorded at Portal Island No. 3; 17.4 percent were recorded at Portal Island

No. 4; and 3.5 percent were recorded at Portal Island No. 1 and No. 2 combined (Jones and Rees 2023).

Harbor seals are central-place foragers (Orians and Pearson, 1979) and tend to exhibit strong site fidelity within season and across years, generally forage close to haulout sites, and repeatedly visit specific foraging areas (Suryan and Harvey, 1998; Thompson *et al.,* 1998). Harbor seals tend to forage at night and haul out during the day with a peak in the afternoon between 1 p.m. and 4 p.m. (London *et al.,* 2001).

Gray Seal

The gray seal occurs on both coasts of the Northern Atlantic Ocean and are divided into three major populations The western north Atlantic stock occurs in eastern Canada and the northeastern United States, occasionally as far south as North Carolina. Gray seals inhabit rocky coasts and islands, sandbars, ice shelves and icebergs. In the United States, gray seals congregate in the summer to give birth at four established colonies in Massachusetts and Maine (Hayes *et al.,* 2022). From September through May, they disperse and can be abundant as far south as New Jersey. The range of gray seals appears to be shifting as they are regularly being reported further south than they were historically (Rees *et al.* 2016).

Gray seals are uncommon in Virginia and the Chesapeake Bay. Only 15 gray seal strandings were documented in Virginia from 1988 through 2013 (Barco and Swingle, 2014). They are rarely found resting on the rocks around the portal islands of the CBBT from December through April alongside harbor seals. Seal observation surveys conducted at the CBBT recorded one gray seal in each of the 2014/2015 and 2015/2016 seasons while no gray seals were reported during the 2016/2017 and 2017/2018 seasons (Rees *et al.* 2016, Jones *et al*. 2018).

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007, 2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, *etc.*). Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in table 3.

Table 3 -- Marine Mammal Hearing Groups (NMFS, 2018)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz

***** Represents the generalized hearing range for the entire group as a composite (*i.e.,* all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.* 2007) and PW pinniped (approximation).

The pinniped functional hearing group was modified from Southall *et al*. (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al*., 2006; Kastelein *et al*., 2009; Reichmuth *et al*. 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section provides a discussion of the ways in which components of the specified activity may impact marine mammals and their habitat. The **Estimated Take** section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The **Negligible Impact Analysis and Determination** section considers the content of this section, the **Estimated Take** section, and the **Proposed Mitigation** section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and whether those impacts are reasonably expected to, or reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

Acoustic effects on marine mammals during the specified activity can occur from impact and vibratory pile driving activities. The effects of underwater noise from CTJV's proposed activities have the potential to result in Level A harassment and Level B harassment of marine mammals.

Description of Sound Sources

The marine soundscape is comprised of both ambient and anthropogenic sounds. Ambient sound is defined as the all-encompassing sound in a given place and is usually a composite of sound from many sources both near and far (American National Standards Institute 1995). The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.,* vessels, dredging, aircraft, construction).

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise "ambient" or "background" sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10 to 20 dB from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

Two types of hammers would be used on this project. Impact hammers operate by repeatedly dropping and/or pushing a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak Sound Pressure Levels (SPLs) may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.,* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

The likely or possible impacts of CTJV's proposed activities on marine mammals could be generated from both non-acoustic and acoustic stressors. Potential non-acoustic stressors include the physical presence of the equipment, vessels, and personnel; however, any impacts to marine mammals are expected to primarily be acoustic in nature. Acoustic stressors include effects of heavy equipment operation during pile driving activities.

Acoustic Impacts

The introduction of anthropogenic noise into the aquatic environment from pile driving activities is the primary means by which marine mammals may be harassed from CTJV's specified activities. In general, animals exposed to natural or anthropogenic sound may experience behavioral, physiological, and/or physical effects, ranging in magnitude from none to severe (Southall *et al.,* 2007). Generally, exposure to pile driving activities has the potential to result in behavioral reactions (*e.g.,* avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior) and, in limited cases, auditory threshold shifts. Exposure to anthropogenic noise can also lead to non-

observable physiological responses such as an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions such as communication and predator and prey detection. The effects of pile driving activities on marine mammals are dependent on several factors, including, but not limited to, sound type (*e.g.,* impulsive vs. non-impulsive), the species, age and sex class (*e.g.,* adult male vs. mother with calf), duration of exposure, the distance between the pile and the animal, received levels, behavior at time of exposure, and previous history with exposure (Wartzok *et al.,* 2003; Southall *et al.,* 2007). Here we discuss physical auditory effects (threshold shifts) followed by behavioral effects and potential impacts on habitat.

NMFS defines a noise-induced threshold shift (TS) as a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018). The amount of threshold shift is customarily expressed in dB. A TS can be permanent or temporary. As described in NMFS (2018), there are numerous factors to consider when examining the consequence of TS, including, but not limited to, the signal temporal pattern (*e.g.,* impulsive or non-impulsive), likelihood an individual would be exposed for a long enough duration or to a high enough level to induce a TS, the magnitude of the TS, time to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.,* spectral content), the hearing and vocalization frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.,* how animal uses sound within the frequency band of the signal; *e.g.,* Kastelein *et al.,* 2014), and the overlap between the animal and the source (*e.g.,* spatial, temporal, and spectral).

Permanent Threshold Shift (PTS) —NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018).

Available data from humans and other terrestrial mammals indicate that a 40-dB threshold shift approximates PTS onset (Ward *et al.,* 1958; Ward *et al.,* 1959; Ward, 1960; Kryter *et al.,* 1966; Miller, 1974; Henderson *et al.,* 2008). PTS levels for marine mammals are estimates, because there are limited empirical data measuring PTS in marine mammals (*e.g.,* Kastak *et al.,* 2008), largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS, 2018).

Temporary Threshold Shift (TTS) —A temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018). Based on data from cetacean TTS measurements (Southall *et al.,* 2007), a TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Schlundt *et al.,* 2000; Finneran *et al.,* 2000). As described in Finneran (2016), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level (SEL_{cum}) in an accelerating fashion: At low exposures with lower $SEL_{cum,}$ the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher $SEL_{cum,}$ the growth curves become steeper and approach linear relationships with the noise SEL.

Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in *Auditory Masking,* below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when

communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.,* 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost. Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin, beluga whale (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*) and five species of pinnipeds exposed to a limited number of sound sources (*i.e.,* mostly tones and octave-band noise) in laboratory settings (Finneran, 2015). TTS was not observed in trained spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to impulsive noise at levels matching previous predictions of TTS onset (Reichmuth *et al.,* 2016). In general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran, 2015). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. No data are available on noise-induced hearing loss for mysticetes. For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al.* (2007), Finneran and Jenkins (2012), Finneran (2015), and table 5 in NMFS (2018).

Activities for this project include impact and vibratory pile driving. There would likely be pauses in activities producing the sound during each day. Given these pauses and the fact that many marine mammals are likely moving through the project areas and not remaining for extended periods of time, the potential for threshold shift declines.

Behavioral harassment —Exposure to noise from pile driving activities has the potential to behaviorally disturb marine mammals. Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior

or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007; National Research Council (NRC), 2005).

The following subsections provide examples of behavioral responses that provide an idea of the variability in behavioral responses that would be expected given the differential sensitivities of marine mammal species to sound and the wide range of potential acoustic sources to which a marine mammal may be exposed. Behavioral responses that could occur for a given sound exposure should be determined from the literature that is available for each species, or extrapolated from closely related species when no information exists, along with contextual factors. Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. There are broad categories of potential response, which we describe in greater detail here, that include alteration of dive behavior, alteration of foraging behavior, effects to respiration, interference with or alteration of vocalization, avoidance, and flight.

Pinnipeds may increase their haul out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.,* 2012), and can vary depending on characteristics associated with the sound source (*e.g.,* whether it is moving or stationary, number of sources, distance from the source). In general, pinnipeds seem more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do

cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans.

Alteration of Feeding Behavior —Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.,* bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.,* Croll *et al.,* 2001; Nowacek *et al.,* 2004; Madsen *et al.,* 2006; Yazvenko *et al.,* 2007). In addition, behavioral state of the animal plays a role in the type and severity of a behavioral response, such as disruption to foraging (*e.g.,* Silve *et al.,* 2016; Wensveen *et al.,* 2017). An evaluation of whether foraging disruptions would be likely to incur fitness consequences considers temporal and spatial scale of the activity in the context of the available foraging habitat and, in more severe cases may necessitate consideration of information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal. Goldbogen *et al.* (2013) indicate that disruption of feeding and displacement could impact individual fitness and health. However, for this to be true, we would have to assume that an individual could not compensate for this lost feeding opportunity by either immediately feeding at another location, by feeding shortly after cessation of acoustic exposure, or by feeding at a later time. There is no indication this is the case here, particularly since prey would likely still be available in the environment in most cases following the cessation of acoustic exposure.

Stress responses —An animal's perception of a threat may be sufficient to trigger stress responses consisting of some combination of behavioral responses, autonomic

nervous system responses, neuroendocrine responses, or immune responses (*e.g.,* Seyle, 1950; Moberg, 2000). In many cases, an animal's first and sometimes most economical (in terms of energetic costs) response is behavioral avoidance of the potential stressor. Autonomic nervous system responses to stress typically involve changes in heart rate, blood pressure, and gastrointestinal activity. These responses have a relatively short duration and may or may not have a significant long-term effect on an animal's fitness. Neuroendocrine stress responses often involve the hypothalamus-pituitary-adrenal system. Virtually all neuroendocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction, altered metabolism, reduced immune competence, and behavioral disturbance (*e.g.,* Moberg, 1987; Blecha, 2000). Increases in the circulation of glucocorticoids are also equated with stress (Romano *et al.,* 2004).

The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and "distress" is the cost of the response. During a stress response, an animal uses glycogen stores that can be quickly replenished once the stress is alleviated. In such circumstances, the cost of the stress response would not pose serious fitness consequences. However, when an animal does not have sufficient energy reserves to satisfy the energetic costs of a stress response, energy resources must be diverted from other functions. This state of distress will last until the animal replenishes its energetic reserves sufficient to restore normal function.

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses are well-studied through controlled experiments and for both laboratory and free-ranging animals (*e.g.,* Holberton *et al.,* 1996; Hood *et al.,* 1998; Jessop *et al.,* 2003; Krausman *et al.,* 2004; Lankford *et al.,* 2005). Stress responses due to exposure to anthropogenic sounds or other stressors and their effects on marine mammals

have also been reviewed (Fair and Becker, 2000; Romano *et al.,* 2002b) and, more rarely, studied in wild populations (*e.g.,* Romano *et al.,* 2002a). For example, Rolland *et al.* (2012) found that noise reduction from reduced ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. These and other studies lead to a reasonable expectation that some marine mammals will experience physiological stress responses upon exposure to acoustic stressors and that it is possible that some of these would be classified as "distress." In addition, any animal experiencing TTS would likely also experience stress responses (NRC, 2003), however distress is an unlikely result of these projects based on observations of marine mammals during previous, similar projects.

Auditory Masking —Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.,* 1995). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* pile driving, shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions. Masking of natural sounds can result when human activities produce high levels of background sound at frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.,* on a day with strong wind and high waves), an

anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked. The mouth of the Chesapeake Bay contains active military and commercial shipping, as well as numerous recreational and other commercial vessel and background sound levels in the area are already elevated.

Airborne Acoustic Effects —Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving and removal that have the potential to cause behavioral harassment, depending on their distance from pile driving activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA. Airborne noise would primarily be an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels elevated above the acoustic criteria. We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when looking with their heads above water. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon the area and move further from the source. However, these animals would likely previously have been `taken' because of exposure to underwater sound above the behavioral harassment thresholds, which are generally larger than those associated with airborne sound. Thus, the behavioral harassment of these animals is already accounted for in these estimates of potential take. Therefore, we do not believe that authorization of additional incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further.

Marine Mammal Habitat Effects

CTJV's proposed construction activities could have localized, temporary impacts on marine mammal habitat, including prey, by increasing in-water sound pressure levels

and slightly decreasing water quality. Increased noise levels may affect acoustic habitat (see *Auditory Masking* discussion above) and adversely affect marine mammal prey in the vicinity of the project areas (see discussion below). Elevated levels of underwater noise would ensonify the project areas where both fishes and mammals occur and could affect foraging success. Additionally, marine mammals may avoid the area during construction; however, displacement due to noise is expected to be temporary and is not expected to result in long-term effects to the individuals or populations.

In-water Construction Effects on Potential Prey —Construction activities would produce continuous (*i.e.,* vibratory pile driving) and intermittent (*i.e.,* impact pile driving) sounds. Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* crustaceans, cephalopods, fish, zooplankton). Marine mammal prey varies by species, season, and location. Here, we describe studies regarding the effects of noise on known marine mammal prey.

Fish utilize the soundscape and components of sound in their environment to perform important functions such as foraging, predator avoidance, mating, and spawning (*e.g.,* Zelick and Mann, 1999; Fay, 2009). Depending on their hearing anatomy and peripheral sensory structures, which vary among species, fishes hear sounds using pressure and particle motion sensitivity capabilities and detect the motion of surrounding water (Fay *et al.,* 2008). The potential effects of noise on fishes depends on the overlapping frequency range, distance from the sound source, water depth of exposure, and species-specific hearing sensitivity, anatomy, and physiology. Key impacts to fishes may include behavioral responses, hearing damage, barotrauma (pressure-related injuries), and mortality.

Fish react to sounds that are especially strong and/or intermittent low-frequency sounds, and behavioral responses such as flight or avoidance are the most likely effects. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local

distribution. The reaction of fish to noise depends on the physiological state of the fish, past exposures, motivation (*e.g.,* feeding, spawning, migration), and other environmental factors. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish; several are based on studies in support of large, multiyear bridge construction projects (*e.g.,* Scholik and Yan, 2001; Scholik and Yan, 2002; Popper and Hastings, 2009). Several studies have demonstrated that impulse sounds might affect the distribution and behavior of some fishes, potentially impacting foraging opportunities or increasing energetic costs (*e.g.,* Fewtrell and McCauley, 2012; Pearson *et al.,* 1992; Skalski *et al.,* 1992; Santulli *et al.,* 1999; Paxton *et al.,* 2017). However, some studies have shown no or slight reaction to impulse sounds (*e.g.,* Pena *et al.,* 2013; Wardle *et al.,* 2001; Jorgenson and Gyselman, 2009).

SPLs of sufficient strength have been known to cause injury to fish and fish mortality. However, in most fish species, hair cells in the ear continuously regenerate and loss of auditory function likely is restored when damaged cells are replaced with new cells. Halvorsen *et al.* (2012a) showed that a TTS of 4 to 6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death, and is most likely for fish with swim bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al.,* 2012b; Casper *et al.,* 2013).

The most likely impact to fishes from pile driving activities at the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution, and behavior is anticipated.

Construction activities have the potential to have adverse impacts on forage fish in the project area in the form of increased turbidity. Forage fish form a significant prey base for many marine mammal species that occur in the project area. Turbidity within the water column has the potential to reduce the level of oxygen in the water and irritate the gills of prey fish in the proposed project area. However, fish in the proposed project area would be able to move away from and avoid the areas where increase turbidity may occur. Given the limited area affected and ability of fish to move to other areas, any effects on forage fish are expected to be minor or negligible.

In summary, given the short daily duration of sound associated with individual pile driving events and the relatively small areas being affected, pile driving activities associated with the proposed actions are not likely to have a permanent, adverse effect on any fish habitat, or populations of fish species. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity. Thus, we conclude that impacts of the specified activities are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations.

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through the IHA, which will inform both NMFS' consideration of "small numbers," and the negligible impact determinations.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A

harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would primarily be by Level B harassment, as use of the acoustic sources (*i.e.*, impact and vibratory driving) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for high frequency species and phocids because predicted auditory injury zones are larger than for mid-frequency species. Auditory injury is unlikely to occur for mid-frequency species. The proposed mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable.

As described previously, no serious injury or mortality is anticipated or proposed to be authorized for this activity. Below we describe how the proposed take numbers are estimated.

For acoustic impacts, generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of potential takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimates.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source or exposure context (*e.g.*, frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.*, bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage, depth) and can be difficult to predict (*e.g.*, Southall *et al.,* 2007, 2021, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) for continuous (*e.g.,* vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μPa for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by TTS as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in

changes in behavior patterns that would not otherwise occur. CTJV's proposed activities include the use of continuous (vibratory pile driving) and impulsive (impact pile driving) sources, and therefore the RMS SPL thresholds of 120 and 160 dB re 1 µPa are applicable.

Level A harassment – NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). CTJV's proposed pile driving activities includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving) sources.

These thresholds are provided in table 4 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS' 2018 Technical Guidance, which may be accessed at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*.

Table 4 -- Thresholds Identifying the Onset of Permanent Threshold Shift

	PTS Onset Acoustic Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	*Cell 4* $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	*Cell 6* $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	*Cell 8* $L_{E,PW,24h}$: 201 dB

Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	*Cell 10* $L_{E,OW,24h}$: 219 dB

** Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.*

Note: Peak sound pressure (L_{pk}) has a reference value of 1 µPa, and cumulative sound exposure level (L_E) has a reference value of 1µPa²s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, pile driving).

The project includes vibratory and impact pile driving. Source levels for these activities are based on reviews of measurements of the same or similar types and dimensions of piles available in the literature. Source levels for each pile size and activity are presented in table 5. Source levels for vibratory pile removal and installation of piles of the same diameter are assumed to be the same. Note that CTJV will employ a bubble

curtain during all impact and vibratory driving activities which NMFS assumes will reduce source levels by 5 dB.

Table 5 -- Estimates of Mean Underwater Sound Levels Generated During Vibratory and Impact Pile Driving

Pile Type	Hammer Type	Peak	RMS	SSsel	Source
36-in steel pipe	Impact/(with -5 dB bubble curtain)	210/(205)	193/(188)	183/(178)	Caltrans 2015, 2020
	Vibratory/ (with -5 dB bubble curtain)	180/(175)	170/(165)		Caltrans 2015

Note: CTJV will incorporate bubble curtain with a 5 dB reduction for all pile driving activities

Transmission loss (*TL*) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. *TL* parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater *TL* is:

$$TL = B * \text{Log10}\ (R1/R2), \text{ where}$$

TL = transmission loss in dB

B = transmission loss coefficient

*R*1 = the distance of the modeled SPL from the driven pile, and

*R*2 = the distance from the driven pile of the initial measurement

Absent site-specific acoustical monitoring with differing measured transmission loss, a practical spreading value of 15 is used as the transmission loss coefficient in the above formula. Site-specific transmission loss data for the PTST project area are not available; therefore, the default coefficient of 15 is used to determine the distances to the Level A harassment and Level B harassment thresholds.

The ensonified area associated with Level A harassment is more technically challenging to predict due to the need to account for a duration component. Therefore, NMFS developed an optional User Spreadsheet tool to accompany the Technical Guidance that can be used to relatively simply predict an isopleth distance for use in conjunction with marine mammal density or occurrence to help predict potential takes.

We note that because of some of the assumptions included in the methods underlying this optional tool, we anticipate that the resulting isopleth estimates are typically going to be overestimates of some degree, which may result in an overestimate of potential take by Level A harassment. However, this optional tool offers the best way to estimate isopleth distances when more sophisticated modeling methods are not available or practical. For stationary sources, such as pile driving, the optional User Spreadsheet tool predicts the distance at which, if a marine mammal remained at that distance for the duration of the activity, it would be expected to incur PTS. Inputs used in the optional User Spreadsheet tool are shown in table 6, and the resulting estimated isopleths are shown in table 7, as reported below.

Table 6 -- User Spreadsheet Inputs

	36-inch steel piles	
	Vibratory	Impact
Source Level (SPL)	170 RMS	183 SEL
Transmission Loss Coefficient	15	15
Weighting Factor Adjustment (kHz)	2.5	2
Activity Duration per day (minutes)	30	--
Number of strikes per pile	--	240
Number of piles per day	2	2
Distance of sound pressure level measurement	10	10

Table 7 -- Calculated Level A and Level B Harassment isopleths (Meters)

Scenario	Level A Harassment Zones				Level B Harassment Zones
	LF	MF	HF	Phocid Pinnipeds	

Driving Type	Pile Type	Island 1 & 2	Island 1 & 2	Island 1 & 2	Island 1& 2	Island 1 & 2
36-in Impact (with Bubble Curtain)	36-in. Steel	285	10	338	152	736
36-in Vibratory (with Bubble Curtain)	36-in. Steel	8	1	12	5	10,000

Marine Mammal Occurrence and Take estimation

In this section we provide information about the occurrence of marine mammals, including density or other relevant information which will inform the take calculations as well as how the information provided is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and proposed for authorization. Several approaches were utilized to estimate take for affected species depending on the best data that was available. For some species, survey or observational data was used to estimate take (*e.g.* harbor seal, gray seal). If density data was available, it was employed to develop the take estimate (*i.e.* bottlenose dolphin). In cases where the best available information consisted only of very low density values, NMFS assumed the average group to arrive at an estimate (*i.e*. humpback whale, harbor porpoise).

Humpback whale

Humpback whales are rare in the Chesapeake Bay. Density data for this species within the project vicinity were not available. Habitat-based density models produced by the Duke University Marine Geospatial Ecology Laboratory (Roberts *et al*. 2016) represent the best available information regarding marine mammal densities offshore near the mouth of the Chesapeake Bay. At the closest point to the PTST project area, humpback densities showed a maximum monthly density of 0.107/ 100 km^2 in March. Because humpback whale occurrence is low, as mentioned above, the CTJV estimated,

and NMFS concurred, that there will be a single humpback sighting every two months for the duration of in-water pile driving activities. There are 5 months of planned in-water construction. Using an average group size of two animals Kraus *et al*. (2016) and 5 months of active in-water pile driving work (Jan, Feb, Mar, Apr, Dec) provides an estimate of four takes during the January-April period. NMFS conservatively assumed that there would be an additional sighting of 2 humpback whales in December. Because it is expected that a full shutdown can occur before the mammal can reach the full extent of the Level A harassment zone, no takes by Level A harassment were requested or are expected. Therefore, NMFS proposes to authorize six takes of humpback whale by Level B harassment.

Bottlenose dolphin

There was insufficient monitoring data available from previous PTST IHAs to estimate dolphin take. Therefore, the expected number of bottlenose dolphins was estimated using a 2016 report on the occurrence, distribution, and density of marine mammals near Naval Station Norfolk and Virginia Beach, Virginia (Engelhaupt *et al*. 2016). This report provides seasonal densities of bottlenose dolphins for inshore areas in the vicinity of the project and along the coast of Virginia Beach. Like most wildlife, bottlenose dolphins do not use habitat uniformly. The heterogeneity in available habitat, dietary items and protection likely results in some individuals preferring ocean and others estuary (Ballance 1992; Gannon and Waples 2004). Dolphins clearly have the ability to move between these habitat types. Gannon and Waples (2004) suggest individuals prefer one habitat over the other based on gut contents of dietary items. Therefore, a subset of survey data from Engelhaupt *et al*. (2016) was used to determine seasonal dolphin densities within the project area. A spatially refined approach was used by plotting dolphin sightings within a 12 km radius of the proposed project location. Densities were determined following methodology outlined in Engelhaupt *et al.* 2016 and Miller *et al.*

2019 using the package DISTANCE in R statistical software (R. Core Team 2018). Calculated densities by season are provided in table 8.

Table 8 -- Densities (individual/km^2) of Bottlenose Dolphin from Inshore Areas of Virginia

Season	12 km Distance Around PTST Project Area
Spring	1.00
Winter	0.63

This information was then used to calculate the monthly takes based on the number of pile driving days per month. These were broken out by month as shown in table 9. The Level B harassment area for each pile and driving type was multiplied by the appropriate seasonal density and the anticipated number of days per activity per month to derive the total number of takes for each activity. Given this information, NMFS is proposing to authorize a total of 12,256 Level B harassment exposures for bottlenose dolphins. No take by Level A harassment is proposed by NMFS since the shutdown zone is 30 m and should be readily visible to PSOs.

Table 9 -- Estimated Takes of Bottlenose Dolphin by Level B harassment By Month, Location, and Driving Activity

Month	Jan	Feb	Mar	Apr	Dec	Totals
Dolphin Density (/km^2)	0.63	0.63	1	1	0.63	
Impact: Portal Island 1 Mooring Dolphins (9 Piles)						
Refined Area(/ km^2)	1.38	1.38	1.38	1.38	1.38	
Driving Days	2	3	0	0	0	
Dolphin Harassments	2	3	0	0	0	5
Vibratory: Portal Island 1 Mooring Dolphins (9 Piles)						
Refined Area(/ km^2)	212	212	212	212	212	
Driving Days	2	3	0	0	0	
Dolphin Harassments	268	401	0	0	0	669
Impact: Portal Island 2 Mooring Dolphins (18 Piles)						
Refined Area(/ km^2)	1.32	1.32	1.32	1.32	1.32	

Driving Days	0	0	0	0	9	
Dolphin Harassments	0	0	0	0	8	8
Vibratory: Portal Island 2 Mooring Dolphins (18 Piles)						
Refined Area(/ km^2)	202	202	202	202	202	
Driving Days	0	0	0	0	9	
Dolphin Harassments	0	0	0	0	1146	1146
Impact: Portal Island 1 Trestle/ Dock Removal (97 Piles)						
Refined Area(/ km^2)	1.38	1.38	1.38	1.38	1.38	
Driving Days	13	15	13	8	0	
Dolphin Harassments	12	14	18	12	0	56
Vibratory: Portal Island 1 Trestle/ Dock Removal (97 Piles)						
Refined Area(/ km^2)	212	212	212	212	212	
Driving Days	13	15	13	8	0	
Dolphin Harassments	1737	2004	2756	1696	0	8193
Impact: Portal Island 2 Trestle Removal (34 Piles)						
Refined Area(/ km^2)	1.32	1.32	1.32	1.32	1.32	
Driving Days	0	0	0	0	17	
Dolphin Harassments	0	0	0	0	15	15
Vibratory: Portal Island 2 Trestle Removal (34 Piles)						
Refined Area(/ km^2)	202	202	202	202	202	
Driving Days	0	0	0	0	17	
Dolphin Harassments	0	0	0	0	2164	2164
Total						**12,256**

The total number of bottlenose dolphin Level B harassment events will be split between three bottlenose dolphin stocks: Western North Atlantic Southern Migratory Coastal; Western North Atlantic Northern Migratory Coastal; and NNCES. There is insufficient information to apportion the requested takes precisely to each of these three stocks present in the project area. Given that most of the NNCES stock are found in the Pamlico Sound estuarine system, it is assumed that no greater than 200 of the takes will be from this stock. Since members of the Western North Atlantic Northern Migratory Coastal and Western North Atlantic Southern Migratory Coastal stocks are thought to occur in or near the project area in greater numbers, we conservatively assume that no more than half of the remaining animals will belong to either of these stocks.

Additionally, a subset of these takes would likely be comprised of Chesapeake Bay resident dolphins, although the size of that population is unknown. It is assumed that an animal will be taken once over a 24-hour period; however, the same individual may be taken multiple times over the duration of the project. Therefore, the number of takes for each stock is assumed to overestimate the actual number of individuals that may be affected.

Harbor porpoise

Harbor porpoises are known to occur in the coastal waters near Virginia Beach (Hayes *et al.* 2019), and although they have been reported on rare occasions in the Chesapeake Bay near the project area, they have not been seen by the Protected Species Observers in the PTST project area during the construction. Density data for this species within the project vicinity do not exist or were not calculated because sample sizes were too small to produce reliable estimates of density. Additionally, harbor porpoise sighting data collected by the U.S. Navy near Naval Station Norfolk and Virginia Beach from 2012 to 2015 (Engelhaupt *et al*. 2014, 2015, 2016) did not produce high enough sample sizes to calculate densities.

One group of two harbor porpoises was seen during spring 2015 (Engelhaupt *et al.* 2016). Therefore, it is assumed that there are two harbor porpoises exposed to noise exceeding harassment levels each month during the spring (March–April) for a total of four harbor porpoises (i.e., 1 group of 2 individuals per month x 2 months per year = 4 harbor porpoises). Harbor porpoises are not expected to be present in the summer, fall or winter. Harbor porpoises are members of the high-frequency hearing group which would have Level A harassment isopleths as large as 338 m during impact driving of 36” steel pile, while the Level B harassment zone is 736 m. Given the relatively large Level A harassment zones for HF cetaceans during impact driving and a required shutdown zone of 200 m, NMFS will assume that 30 percent of porpoises are taken by Level A

harassment. Therefore, NMFS proposes to authorize take of three porpoises by Level B harassment and one porpoise by Level A harassment.

Harbor seal

The expected number of harbor seals in the project area was estimated using systematic, land and vessel-based survey data for in-water and hauled-out seals collected by the U.S. Navy at the CBBT rock armor and Portal Islands from November 2014 through April 2022 (Rees *et al*. 2016; Jones *et al*. 2018; Jones and Rees 2020; Jones and Rees 2021; Jones and Rees 2022; Jones and Rees 2023) and shown in table 10. The number of harbor seals sighted by month ranged from 0 to 170 individuals.

Table 10 -- Summary of Historical Harbor Seal Sightings by Month from 2014 to 2022 at the Chesapeake Bay Bridge Tunnel

Month	2014	2015	2016	2017	2018	2019	2020	2021	2022	Monthly Average
January	-	-	33	120	170	7	18	49	34	61.6
February	-	39	80	106	159	21	0	43	14	57.7
March	-	55	61	41	0	18	6	26	37	30.5
April	-	10	1	3	3	4	0	6	1	3.5
December	4	9	24	8	29	0	4	11	11	12.5

Note: Seal counts began in November 2014 and were collected for 9 field seasons (2014/2015, 2015/2016, 2016/2017, 2017/2018, 2018/2019, 2019/2020, 2020/2021, 2021/2022) ending in 2022. In January 2015, no surveys were conducted.

Seal density data are in the format of seal per unit time; therefore, seal take requests were calculated as total number of potential seals per pile driving day (8 hours) multiplied by the number of driving days per month. For example, in December seal density data is reported at 14.3 seals per day * 26 workdays in December, resulting in the potential of 372 instances of take for that month (table 11). The anticipated number of take events were summed across the months during which in-water pile driving is planned. The largest Level A harassment isopleth for phocid species is 153 m which would occur when piles were being removed via impact hammer with a bubble curtain. The smallest Level A harassment zone is 1 m which would occur when piles are removed via vibratory hammer with a bubble curtain. NMFS is proposing to require a shutdown zone for harbor seals of 160 m during impact driving which would theoretically result in

no take by Level A harassment. However, a small number of harbor seals could enter into the shutdown zone unseen by a PSO and remain for sufficient duration to incur PTS. Given that harbor seals are common in the project area, NMFS assumed that a single harbor seal would experience Level A harassment during each in-water work day (80). Therefore, NMFS proposes to authorize the take of 80 harbor seals by Level A harassment and 2,634 harbor seals by Level B harassment for a total of 2,714 takes (table 11).

Table 11 -- Calculation of the Number of Harbor Seal Takes

Month	Estimated Seals per Work Day	Total Pile Driving Days per Month	Total Number of Requested Takes
January 2024	61.6	15	924
February 2024	57.8	18	1,040
March 2024	30.5	13	396.5
April 2024	3.5	8	28
December 2024	12.5	26	325
			2,714

Gray seal

The number of gray seals expected to be present at the PTST project area was estimated using the same methodology as was used for the harbor seal. Survey data collected by the U.S. Navy at the portal islands from 2015 through 2022 was utilized (Rees *et al*. 2016; Jones *et al*. 2018; Jones and Rees 2023). A maximum of 1 gray seal was seen during the months of February 2015, 2016, and 2022. Given this information NMFS assumed that a single gray seal would be taken per work day in February 2024.The anticipated numbers of monthly takes were calculated following the same approach as for harbor seals, and the monthly takes were then summed (table 12). Although the project has not recorded any gray seal sightings to date, NMFS assumed that, over the duration of the project, a single gray seal could enter into the Level A harassment zone unseen by a PSO and remain for sufficient duration to incur PTS.

Therefore, NMFS is proposing to authorize the take of 1 gray seal by Level A harassment and 17 gray seals by Level B harassment for a total of 18 proposed takes.

Table 12 -- Calculation of the Number of Gray Seal Takes

Month	Estimated Seals per Work Day	Total Pile Driving Days per Month	Total Number of Requested Takes
January 2024	0	15	0
February 2024	1	18	18
March 2024	0	13	0
April 2024	0	8	0
December 2024	0	26	0
Total			18

Table 13 shows the take numbers proposed for authorization by NMFS as well as the percentage of each stock affected.

Table 13 -- Proposed Take by Stock and Harassment Type as a Percentage of Stock Abundance

Species	Stock	Level A Harassment	Level B Harassment	Total	Percent of Stock
Humpback Whale	Gulf of Maine	0	6	6	0.4
Harbor Porpoise	Gulf of Maine/ Bay of Fundy	1	3	4	<0.01
Bottlenose Dolphin	WNA Coastal, Northern Migratory	0	6,028	6,028	90.8
	WNA Coastal, Southern Migratory	0	6,028	6,028	160.1
	NNCES	0	200	200	24.3
Harbor Seal	Western North Atlantic	80	2,634	2,714	4.4
Gray Seal	Western North Atlantic	1	17	18	<0.01

The monitoring results from work conducted in 2020 and 2021 are found in table 14. The results demonstrate significantly fewer takes by harassment than were authorized, and it is important to note that estimates in the previous IHAs as well as in

this proposed IHA are based on conservative assumptions, including the size of identified harassment zones and the abundance of marine mammals. However, we note that these assumptions represent the best available information in this case.

Table 14 -- Marine Mammal Monitoring Results from IHAs issued in 2020 and 2021

Species	Stock	Level A Harassments Authorized in 2020 IHA	Level B Harassments Authorized in 2020 IHA	Observations in Level A Harassment Zones Under 2020 IHA	Observations in Level B Harassment Zones Under 2020 IHA	Level A Harassments Authorized in 2021 IHA	Level B Harassments Authorized in 2021 IHA	Observations in Level A Harassment Zones Under 2021 IHA	Observations in Level B Harassment Zones Under 2021 IHA
Humpback Whale	Gulf of Maine	-	12	-	-	-	12	-	-
Harbor Porpoise	Gulf of Maine/ Bay of Fundy	5	7	-	-	5	7	-	-
Bottlenose Dolphin	WNA Coastal, Northern Migratory	142	14,095	-	5	-	43,203	-	394
	WNA Coastal, Southern Migratory	142	14,095	-	-	-	43,203	-	-
	NNCES	2	198	-	-	-	250	-	-
Harbor Seal	Western North Atlantic	1,296	2,124	-	-	1154	1,730	-	-
Gray Seal	Western North Atlantic	1	3	-	-	16	24	-	-

Proposed Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, NMFS considers two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost and impact on operations.

CTJV must conduct training between construction supervisors, crews, marine mammal monitoring team, and relevant CTJV staff prior to the start of all pile driving

activities and when new personnel join the work, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood.

Construction supervisors and crews, PSOs, and relevant CTJV staff must avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 m of such activity, operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions, as necessary to avoid direct physical interaction. If an activity is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone indicated in table 15 or 15 minutes have passed without re-detection of the animal.

Construction activities must be halted upon observation of a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met entering or within the harassment zone.

Shutdown Zones —For all pile driving activities, CTJV would implement shutdowns within designated zones. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones vary based on the activity type and marine mammal hearing group (table 7). In most cases, the shutdown zones are based on the estimated Level A harassment isopleth distances for each hearing group. However, in cases where it would be challenging to detect marine mammals at the Level A harassment isopleth, (*e.g.,* for high frequency cetaceans and phocids during impact driving activities), smaller shutdown zones have been proposed (table 15).

Table 15 -- Shutdown and Monitoring Zones (meters)

Method and Piles	LF Cetaceans	MF Cetaceans	HF Cetaceans	Phocids	Monitoring Zone
36-in Impact (with bubble Curtain)	285	20	200	160	736
36-in Vibratory (with bubble curtain)	10	10	15	10	10,000

Protected Species Observers —The number and placement of PSOs during all construction activities (described in the **Proposed Monitoring and Reporting** section as well as the Marine Mammal Monitoring Plan) would ensure that the entire shutdown zone is visible. A minimum of one PSO must be employed for all driving activities and placed at a location providing, at a minimum, adequate views of the established shutdown zones.

Monitoring for Level B Harassment —PSOs would monitor the shutdown zones and beyond to the extent that PSOs can see. Monitoring beyond the shutdown zones enables observers to be aware of and communicate the presence of marine mammals in the project areas outside the shutdown zones and thus prepare for a potential cessation of activity should the animal enter the shutdown zone. If a marine mammal enters the Level B harassment zone (or Level A harassment zone if larger than the Level B harassment zone), PSOs will document the marine mammal's presence and behavior.

Pre and Post-Activity Monitoring —Prior to the start of daily in-water construction activity, or whenever a break in pile driving of 30 minutes or longer occurs, PSOs will observe the shutdown, Level A harassment, and Level B harassment zones for a period of 30 minutes. Pre-start clearance monitoring must be conducted during periods of visibility sufficient for the lead PSO to determine that the shutdown zones are clear of marine mammals. If the shutdown zone is obscured by fog or poor lighting conditions, in-water construction activity will not be initiated until the entire shutdown zone is visible. Pile driving activities may commence following 30 minutes of observation when the

determination is made that the shutdown zones are clear of marine mammals. If a marine mammal is observed entering or within shutdown zones, pile driving activities must be delayed or halted. If pile driving is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone or 15 minutes have passed for all other species without re-detection of the animal.

Soft Start —The use of soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors would be required to provide an initial set of three strikes from the hammer at reduced energy, with each strike followed by a 30-second waiting period. This procedure would be conducted a total of three times before impact pile driving begins. Soft start would be implemented at the start of each day's impact pile driving activities and at any time following cessation of impact pile driving activities for a period of 30 minutes or longer. Soft start is not required during vibratory pile driving activities.

Bubble Curtain — Use of a bubble curtain during impact and vibratory pile driving in water depths greater than 3 m (10 ft) would be required. It must be operated as necessary to achieve optimal performance, and there can be no reduction in performance attributable to faulty deployment. At a minimum, CTJV must adhere to the following performance standards: The bubble curtain must distribute air bubbles around 100 percent of the piling circumference for the full depth of the water column. The lowest bubble ring must be in contact with the substrate for the full circumference of the ring, and the weights attached to the bottom ring shall ensure 100 percent substrate contact. No parts of the ring or other objects shall prevent full substrate contact. Air flow to the bubblers must be balanced around the circumference of the pile.

Based on our evaluation of the applicant's proposed measures NMFS has preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present while conducting the activities. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the activity; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);

- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and,
- Mitigation and monitoring effectiveness.

Visual Monitoring —Marine mammal monitoring must be conducted in accordance with the Marine Mammal Monitoring and Mitigation Plan. Marine mammal monitoring during pile driving activities must be conducted by NMFS-approved PSOs in a manner consistent with the following:

- PSOs must be independent of the activity contractor (for example, employed by a subcontractor), and have no other assigned tasks during monitoring periods;
- At least one PSO must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization;
- Other PSOs may substitute other relevant experience, education (degree in biological science or related field) or training for experience performing the duties of a PSO during construction activities pursuant to a NMFS-issued incidental take authorization.
- PSOs must be approved by NMFS prior to beginning any activity subject to this IHA.

PSOs should also have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including, but not limited to, the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was note implemented when required); and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

Visual monitoring will be conducted by a minimum of one trained PSO positioned at a suitable vantage point that will allow coverage of the identified harassment zones. The Portal Islands and associated berms would constrain the ensonified area to only one side (*i.e.* east or west) of the bridge tunnel structure. Additionally, CTJV expressed concern that since they will only be using one drill for about two hours per week, it will be difficult to secure multiple observers willing to commit to the PTST project.

Monitoring will be conducted 30 minutes before, during, and 30 minutes after all in water construction activities. In addition, PSOs will record all incidents of marine mammal occurrence, regardless of distance from activity, and will document any behavioral reactions in concert with distance from piles being removed. Pile driving

activities include the time to remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

Reporting

CTJV will submit a draft marine mammal monitoring report to NMFS within 90 days after the completion of pile driving activities, or 60 days prior to a requested date of issuance of any future IHAs for the project, or other projects at the same location, whichever comes first. The marine mammal monitoring report will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report will include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including: (1) The number and type of piles that were removed (*e.g.,* impact, vibratory); and (2) Total duration of driving time for each pile (vibratory) and number of strikes for each pile (impact);
- PSO locations during marine mammal monitoring;
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance;
- Upon observation of a marine mammal, the following information: (1) Name of PSO who sighted the animal(s) and PSO location and activity at time of sighting; (2) Time of sighting; (3) Identification of the animal(s) (*e.g.,* genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species; (4) Distance and location of each observed marine mammal relative to the pile being removed for each sighting; (5) Estimated number of animals (min/max/best

estimate); (6) Estimated number of animals by cohort (adults, juveniles, neonates, group composition, *etc.*); (7) Animal's closest point of approach and estimated time spent within the harassment zone; (8) Description of any marine mammal behavioral observations (*e.g.,* observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.,* no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching);

- Number of marine mammals detected within the harassment zones, by species; and,
- Detailed information about implementation of any mitigation (*e.g.,* shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any.

If no comments are received from NMFS within 30 days, the draft final report would constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments. The Holder must submit all PSO data electronically in a format that can be queried such as a spreadsheet or database (*i.e.,* digital images of data sheets are not sufficient).

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the Holder must report the incident to the Office of Protected Resources (OPR), NMFS (*PR.ITP.MonitoringReports@noaa.gov* and *ITP.pauline@noaa.gov*) and to the Greater Atlantic Regional Stranding Coordinator (978-282-8478) as soon as feasible. If the death or injury was clearly caused by the specified activity, the Holder must immediately cease the activities until NMFS OPR is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of this IHA. The Holder

must not resume their activities until notified by NMFS. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the baseline (*e.g.*, as reflected in the regulatory status of the

species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, the majority of our analysis applies to all the species listed in table 13, given that many of the anticipated effects of this project on different marine mammal stocks are expected to be relatively similar in nature. Where there are meaningful differences between species or stocks, or groups of species, in anticipated individual responses to activities, impact of expected take on the population due to differences in population status, or impacts on habitat, they are described independently in the analysis below

Impact and vibratory pile driving have the potential to disturb or displace marine mammals. Specifically, the project activities may result in take, in the form of Level A and Level B harassment from underwater sounds generated from pile driving.

The takes from Level A and Level B harassment would be due to potential behavioral disturbance, TTS, and PTS. No serious injury or mortality is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. The potential for harassment is minimized through the construction method and the implementation of the planned mitigation measures (see **Proposed Mitigation** section).

We anticipate that harbor porpoises, harbor seals and gray seals may sustain some limited Level A harassment in the form of auditory injury. However, animals in these locations that experience PTS would likely only receive slight PTS, *i.e.,* minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by pile driving, *i.e.,* the low-frequency region below 2 kHz, not severe hearing impairment or impairment in the regions of greatest hearing sensitivity. If hearing impairment occurs, it is most likely that the affected animal would lose a few decibels in its hearing sensitivity, which in most cases is not likely to meaningfully affect

its ability to forage and communicate with conspecifics. Impacts to individual fitness, reproduction, or survival are unlikely. As described above, we expect that marine mammals would be likely to move away from a sound source that represents an aversive stimulus, especially at levels that would be expected to result in PTS, given sufficient notice through use of soft start.

Behavioral responses of marine mammals to pile driving at the project site, if any, are expected to be mild and temporary. Marine mammals within the Level B harassment zone may not show any visual cues they are disturbed by activities or could become alert, avoid the area, leave the area, or display other mild responses that are not observable such as changes in vocalization patterns. Given the short duration of noise-generating activities per day, any harassment would be temporary. There are no other areas or times of known biological importance for any of the affected species.

We acknowledge the existence and concern about the ongoing humpback whale UME. We have no evidence that this project is likely to result in vessel strikes (a major correlate of the UME) and marine construction projects in general involve the use of slow-moving vessels, such as tugs towing or pushing barges, or smaller work boats maneuvering in the vicinity of the construction project. These vessel types are not typically associated with vessel strikes resulting in injury or mortality. More generally, the UME does not yet provide cause for concern regarding population-level impacts for humpback whales. Despite the UME, the West Indies breeding population or DPS, remains healthy.

For all species and stocks, take would occur within a limited, confined area (adjacent to the CBBT) of the stock's range and the amount of take proposed to be authorized is extremely small when compared to stock abundance. In addition, it is unlikely that minor noise effects in a small, localized area of habitat would have any effect on the stocks' ability to recover. In combination, we believe that these factors, as

well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No serious injury or mortality is anticipated or authorized;
- Authorized Level A harassment would be very small amounts and of low degree;
- No important habitat areas have been identified within the project area;
- For all species, the specified project area in Chesapeake Bay is a very small and peripheral part of their range;
- CTJV would implement mitigation measures such as bubble curtains, soft-starts, and shut downs; and
- Monitoring reports from similar work in Chesapeake Bay have documented little to no effect on individuals of the same species impacted by the specified activities.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted previously, only take of small numbers of marine mammals may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is less than one-third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The amount of take NMFS proposes to authorize is below one third of the estimated stock abundance for humpback whale, harbor porpoise, gray seal, and harbor seal (in fact, take is no more than 6 percent of the abundance of the affected stocks, see table 13). This is likely a conservative estimate because they assume all takes are of different individual animals which is likely not the case. Some individuals may return multiple times in a day, but PSOs would count them as separate takes if they cannot be individually identified.

There are three bottlenose dolphin stocks that could occur in the project area. Therefore, the estimated 12,256 dolphin takes by Level B harassment would likely be split among the western North Atlantic northern migratory coastal stock, western North Atlantic southern migratory coastal stock, and NNCES stock. Based on the stocks' respective occurrence in the area, NMFS estimated that there would be no more than 200 takes from the NNCES stock, representing 24.3 percent of that population, with the remaining takes split evenly between the northern and southern migratory coastal stocks. Based on consideration of various factors described below, we have determined the numbers of individuals taken would comprise less than one-third of the best available

population abundance estimate of either coastal migratory stock. Detailed descriptions of the stocks' ranges have been provided in **Description of Marine Mammals in the Area of Specified Activities**.

Both the northern migratory coastal and southern migratory coastal stocks have expansive ranges and they are the only dolphin stocks thought to make broad-scale, seasonal migrations in coastal waters of the western North Atlantic. Given the large ranges associated with these two stocks it is unlikely that large segments of either stock would approach the project area and enter into the Chesapeake Bay. The majority of both stocks are likely to be found widely dispersed across their respective habitat ranges and unlikely to be concentrated in or near the Chesapeake Bay.

Furthermore, the Chesapeake Bay and nearby offshore waters represent the boundaries of the ranges of each of the two coastal stocks during migration. The northern migratory coastal stock is found during warm water months from coastal Virginia, including the Chesapeake Bay and Long Island, New York. The stock migrates south in late summer and fall. During cold water months dolphins may be found in coastal waters from Cape Lookout, North Carolina, to the North Carolina/Virginia. During January–March, the southern migratory coastal stock appears to move as far south as northern Florida. From April to June, the stock moves back north to North Carolina. During the warm water months of July–August, the stock is presumed to occupy coastal waters north of Cape Lookout, North Carolina, to Assateague, Virginia, including the Chesapeake Bay. There is likely some overlap between the northern and southern migratory stocks during spring and fall migrations, but the extent of overlap is unknown.

The Bay and waters offshore of the mouth are located on the periphery of the migratory ranges of both coastal stocks (although during different seasons). Additionally, each of the migratory coastal stocks are likely to be located in the vicinity of the Bay for relatively short timeframes. Given the limited number of animals from each migratory

coastal stock likely to be found at the seasonal migratory boundaries of their respective ranges, in combination with the short time periods (~2 months) animals might remain at these boundaries, it is reasonable to assume that takes are likely to occur only within some small portion of either of the migratory coastal stocks.

Both migratory coastal stocks likely overlap with the NNCES stock at various times during their seasonal migrations. The NNCES stock is defined as animals that primarily occupy waters of the Pamlico Sound estuarine system (which also includes Core, Roanoke, and Albemarle sounds, and the Neuse River) during warm water months (July–August). Members of this stock also use coastal waters (≤1 km from shore) of North Carolina from Beaufort north to Virginia Beach, Virginia, including the lower Chesapeake Bay. Comparison of dolphin photo-identification data confirmed that limited numbers of individual dolphins observed in Roanoke Sound have also been sighted in the Chesapeake Bay (Young, 2018). Like the migratory coastal dolphin stocks, the NNCES stock covers a large range. The spatial extent of most small and resident bottlenose dolphin populations is on the order of 500 km^2, while the NNCES stock occupies over 8,000 km^2 (LeBrecque *et al.,* 2015). Given this large range, it is again unlikely that a preponderance of animals from the NNCES stock would depart the North Carolina estuarine system and travel to the northern extent of the stock's range and enter into the Bay. However, recent evidence suggests that there is likely a small resident community of NNCES dolphins of indeterminate size that inhabits the Chesapeake Bay year-round (Eric Patterson, Personal Communication).

Many of the dolphin observations in the Bay are likely repeated sightings of the same individuals. The Potomac-Chesapeake Dolphin Project has observed over 1,200 unique animals since observations began in 2015. Re-sightings of the same individual can be highly variable. Some dolphins are observed once per year, while others are highly regular with greater than 10 sightings per year (Mann, Personal Communication).

Similarly, using available photo-identification data, Engelhaupt *et al.* (2016) determined that specific individuals were often observed in close proximity to their original sighting locations and were observed multiple times in the same season or same year. Ninety-one percent of re-sighted individuals (100 of 110) in the study area were recorded less than 30 km from the initial sighting location. Multiple sightings of the same individual would considerably reduce the number of individual animals that are taken by harassment. Furthermore, the existence of a resident dolphin population in the Bay would increase the percentage of dolphin takes that are actually re-sightings of the same individuals.

In summary and as described above, the following factors primarily support our preliminary determination regarding the incidental take of small numbers of a species or stock:

- The take of marine mammal stocks authorized for take comprises less than 10 percent of any stock abundance (with the exception of bottlenose dolphin stocks);
- Potential bottlenose dolphin takes in the project area are likely to be allocated among three distinct stocks;
- Bottlenose dolphin stocks in the project area have extensive ranges and it would be unlikely to find a high percentage of any one stock concentrated in a relatively small area such as the project area or the Bay;
- The Bay represents the migratory boundary for each of the specified dolphin stocks and it would be unlikely to find a high percentage of any stock concentrated at such boundaries;
- Many of the takes would be repeats of the same animal and it is likely that a number of individual animals could be taken 10 or more times.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine

mammals, NMFS preliminarily finds that small numbers of marine mammals would be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq*.) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally whenever we propose to authorize take for endangered or threatened species.

No incidental take of ESA-listed species is proposed for authorization or expected to result from this activity. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to CTJV for conducting construction activities as part of the PTST project near Virginia Beach, VA from January through December 2024 provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities*.

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this notice of proposed IHA for the proposed construction activities associated with the PTST project. We also request comment on the potential renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform decisions on the request for this IHA or a subsequent renewal IHA.

On a case-by-case basis, NMFS may issue a one-time, 1-year renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical or nearly identical activities as described in the **Description of Proposed Activity** section of this notice is planned or (2) the activities as described in the **Description of Proposed Activity** section of this notice would not be completed by the time the IHA expires and a renewal would allow for completion of the activities beyond that described in the *Dates and Duration* section of this notice, provided all of the following conditions are met:

- A request for renewal is received no later than 60 days prior to the needed renewal IHA effective date (recognizing that the renewal IHA expiration date cannot extend beyond 1 year from expiration of the initial IHA).
- The request for renewal must include the following:

(1) An explanation that the activities to be conducted under the requested renewal IHA are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.*, reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take).

(2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: December 21, 2023.

Kimberly Damon-Randall,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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