



MEMORANDUM

TO: Jessica Taylor, Office of Protected Resources, NOAA Fisheries

DATE: September 6, 2023

FROM: US Wind, TRC Environmental, Marine Acoustics, Inc.

TRC PROJECT NO.: 016310

SUBJECT: NMFS RFI Responses – Maryland Offshore Wind Project LOA

On behalf of US Wind, TRC submits this memo in response to the Requests for Information (RFI) provided in August 2023 by NMFS for the Maryland Offshore Wind Project. It provides a description of the proposed methodology to produce updated species-specific requested takes for seals and pilot whales (note that updated seal and pilot whale exposures and requested takes are currently presented by guild per NMFS request, see below). Additionally, activity-specific take requests are provided below in several updated tables originally included in the LOA application. Finally, information is presented in response to the RFI provided by NMFS on 8/16.

Take Estimates for Seals and Pilot Whales

US Wind understands that the “scaling by abundance” approach for calculating species-specific takes of seals and pilot whales is no longer supported, as overall population sizes (from the stock assessment reports) do not necessarily correlate to the abundance of these species within the Project area.

Occurrence records for these four marine mammal species are sparse in the mid-Atlantic region of the US Wind Project area. However, US Wind has sought to identify species-specific and Project area-specific information that could be used to determine the percentage of takes that should be allocated to each species, as described below.

Pilot Whales

Both species of pilot whales occur in waters along the continental shelf break from Florida to Nova Scotia. The distributional ranges of the long-finned and short-finned pilot whales overlap in the Project area offshore of Maryland.

Site-specific information about pilot whale presence in the US Wind Project area is not available. No confirmed pilot whale detections or sightings were reported during multi-year studies of the Lease area and surrounding waters (Barco et al. 2015, Williams et al. 2015), and no pilot whales were observed by PSOs during any of US Wind’s marine surveys conducted from 2021 through 2022 (RPS 2023).

Lacking site-specific information, US Wind evaluated larger-scale studies and data sources for information about pilot whale presence. Obtaining such data was complicated by the fact that short-finned and long-finned pilot whales are difficult to differentiate at sea, and identification often requires high-quality photographs (Rone and Pace 2012) or analysis of biopsied tissue (Garrison and Rosel 2017). Therefore, species-level pilot whale identifications are not assigned during most surveys (sightings are generally classified as generic “pilot whales”). Even when pilot whales strand, species identification is often not possible. However, some studies have assigned post-hoc species-level classification of pilot whale sightings using habitat-based models, as described below.

A habitat-based model, taking into account latitude, time of year, and sea surface temperature, was developed based upon an analysis of pilot whale biopsies collected from South Carolina to George’s Bank

between 1998 and 2007 (Garrison and Rosel 2017). This model indicated that pilot whale individuals observed in waters warmer than 25°C have a near 100% probability of being short-finned pilot whales (Garrison and Rosel 2017). In contrast, pilot whales observed in waters colder than 22°C have a near 100% probability of being long-finned pilot whales (Garrison and Rosel 2017). Figure 1 presents sea surface temperatures for the North Atlantic.

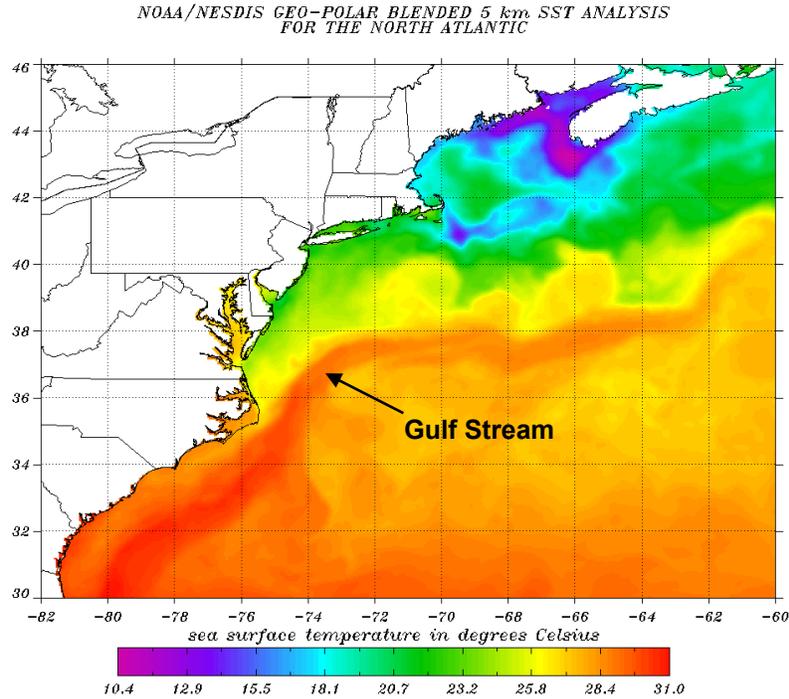


Figure 1. Sea surface temperature for the North Atlantic.
(<https://www.ospo.noaa.gov/data/sst/contour/natlanti.cf.gif>).

Based upon the model described above, pilot whale sightings documented during the AMAPPs FY15-FY19 (Palka et al. 2021) survey efforts were partitioned between the two species. Inferred pilot whale distribution data indicates that most pilot whale sightings south of Cape Hatteras are short-finned pilot whales, and most sightings north of ~42°N are long-finned pilot whales (Hayes et al. 2022 and Palka et al. 2021). Additionally, all pilot whales observed in offshore waters near the Gulf Stream are most likely short-finned pilot whales and all shipboard sightings from Florida to New Jersey were predicted to consist entirely of short-finned pilot whales (Hayes et al. 2022 and Palka et al. 2021). The Project area is located between Cape Hatteras and 42°N and is situated to the west of the Gulf Stream. Therefore, pilot whale sightings were not classified to species in the region of the Project area (Hayes et al. 2022 and Palka et al. 2021, Figure 1).

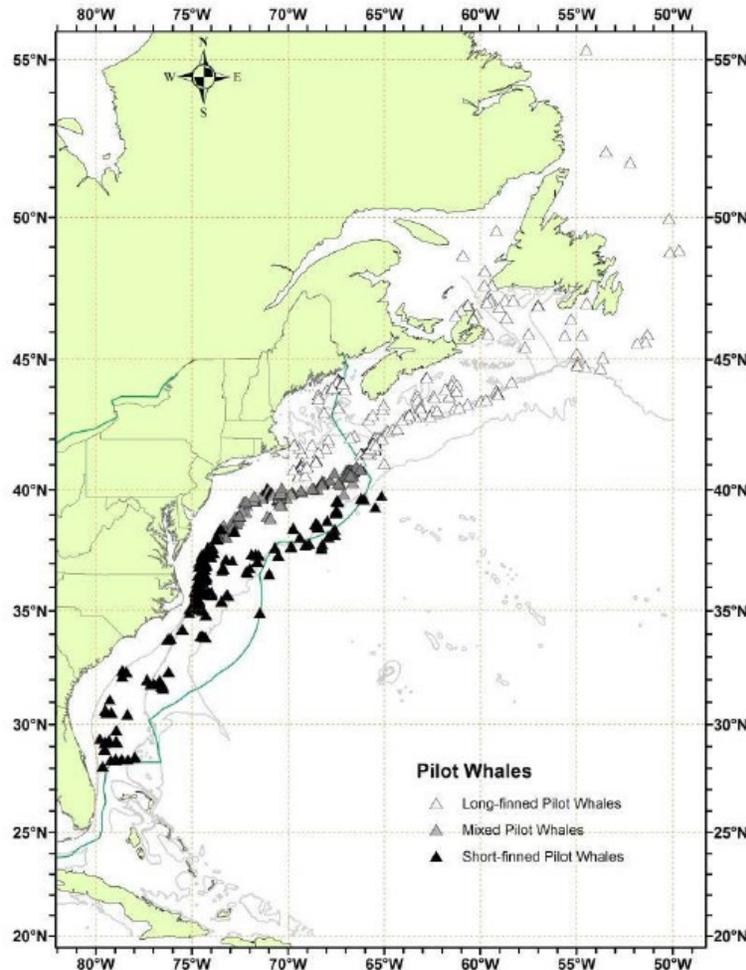


Figure 1. Map of the Atlantic Ocean showing the distribution of long-finned (open symbols), short-finned (black symbols), and both species (grey symbols) during shipboard and aerial surveys. The inferred distribution is valid for June-August only. From Hayes et al. (2022) and Palka et al. (2021) (See Hayes et al. (2022) and Palka et al. (2021) for a complete discussion.

As species-specific occurrence information could not be obtained from survey data, US Wind evaluated pilot whale strandings records for Delaware, Maryland, and surrounding states. Maryland marine mammal stranding records indicate that since 1900, both long-finned and short-finned pilot whales were reported to have stranded along Maryland shores (Maryland Marine Mammal Stranding Program, 2023). No pilot whale stranding information is available for Delaware. Strandings data presented in Hayes et al. 2022 indicate that no long-finned pilot whales were reported stranded south of Massachusetts from 2015-2019 (Hayes et al. 2022). One short-finned pilot whale stranded in Maryland in 2019 (no pilot whale strandings were reported in Delaware during the time period of 2015-2019, Hayes et al. 2022). Short-finned pilot whale strandings were also reported from New York (4 individuals in 2018) and Massachusetts (3 individuals in

2019) during this time period. Though historic records indicate that both species of pilot whale have stranded in Maryland in the past, all recent pilot whale strandings south of Massachusetts have been short-finned pilot whales.

Seals

Distributional records have shown that since the abolishment of bounty hunting and the advent of the Marine Mammal Protection Act, the western North Atlantic populations of gray and harbor seals have rebounded significantly, such that the distributional ranges of both species have been expanded into mid-Atlantic waters seasonally. Harbor seals occur as far south as Virginia from late September through May, while gray seals typically occur south to New Jersey but have been recorded as far south as North Carolina (Hayes et al. 2022). Thus, seasonally (late September through May), both seal species may occur in the waters of the US Wind Project area. Although gray seals were not thought to give birth south of Massachusetts, gray seal pup strandings have recently been reported in Delaware (National Aquarium 2023). These observations suggest the establishment of a rookery off the coast of Cape Henlopen, Delaware, north of the Project area, and are indicative of a more stable seasonal population in the area (National Aquarium 2023).

No seal sightings were reported during multi-year studies of the Lease area and surrounding waters (Barco et al. 2015, Williams et al. 2015). Additionally, no harbor seals were observed by the PSOs during US Wind's marine surveys conducted from 2021 to 2022 (RPS 2023). However, one gray seal was observed by US Wind PSOs during this time period (RPS 2023).

Both gray and harbor seals strand in Maryland and Delaware seasonally, typically from late winter to early spring. Strandings of both species have been reported along the Maryland coast since the 1900s (Maryland Marine Mammal Stranding Program, 2023). In Maryland, most gray and harbor seal strandings occur on Assateague Island (National Aquarium 2023). From 2015 to 2019, eight strandings of harbor seals were reported in Delaware while seven harbor seals stranded in Maryland, for an average of three harbor seal stranding annually (Hayes et al. 2022). For this same period, 10 gray seals stranded in Delaware while only one gray seal stranded in Maryland, for an average of 2.2 gray seals stranding in this region annually (Hayes et al. 2022).

Seals and Pilot Whales Conclusions

Neither sighting nor stranding data for the US Wind Project area are sufficient to ascertain the percentage of each seal (harbor or gray) or pilot whale (short-finned or long-finned) population that occur in these waters. Seals typically are not observed during sighting surveys, but stranding records indicate that both species of seals strand annually at about the same rate (an average of 2 to 3 individuals per year). US Wind proposed a conservative 50-50 split between harbor and gray seal based on stranding data, given the lack of available sighting information.

The US Wind Project area is located in a region where both long-finned and short-finned pilot whales may be present, and where species-specific occurrence data is not available. Stranding records for pilot whales in the region of the Project area are sparse, with only one short-finned pilot whale stranding reported over five years. Due to the warmer water temperatures found in the Project area (Figure 2), there is a potentially higher likelihood of occurrence of short-finned pilot whales than long-finned pilot whales. None of the available data provide conclusive evidence of the percentage of each stock of pilot whales that occurs in the Project area. Therefore, US Wind conservatively proposed to partition total pilot whale takes based upon the assumption that 60% of impacted individuals will be short-finned pilot whales and 40% of impacted individuals will be long-finned pilot whales.

Guidance provided by NMFS on August 30, 2023, indicated that the strandings data described above may not be representative of actual species abundance in the area and NMFS requested that US Wind present exposure estimates for each guild (pilot whales and seals) without any scaling applied (see below). US Wind has provided exposure estimates and requested takes by guild below and anticipates that these figures will be updated if additional site-specific datasets become available.

Updated Tables 6-1 and 6-13 below present guild densities for pilot whales and seals (MGEL 2022), which were used for the calculation of updated activity-based exposure and take estimates.

Table 6-1. Mean Monthly (or in Some Cases, Annual) Densities of Potentially Affected Marine Mammals in the Buffered (5.25 km) Lease Area that were Used in the Marine Mammal Take Estimation of Noise Impacts Associated with Impact Pile Driving and micro-siting HRG Survey Sound Sources.

Marine Mammal Species	Model Group ^a	Mean Monthly Densities (animals/km ²) ^b											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Atlantic spotted dolphin	<i>Stenella</i>	0.00003	0.00001	0.00002	0.00013	0.00046	0.0009	0.00396	0.01505	0.00475	0.00335	0.00243	0.00032
Blainville's beaked whale	Small BW	0.00001											
Common Bottlenose dolphin ^c		0.03855	0.01316	0.01659	0.05668	0.15225	0.1592	0.18323	0.20608	0.1647	0.14689	0.1713	0.11705
Common dolphin		0.04298	0.01869	0.01972	0.03268	0.03289	0.01471	0.01301	0.00501	0.00044	0.00765	0.05746	0.07939
Common minke whale		0.00069	0.00089	0.00114	0.00687	0.0075	0.00155	0.0005	0.0002	0.0001	0.00055	0.00025	0.00064
Cuvier's beaked whale	Small BW	0											
Dwarf sperm whale	<i>Kogia spp.</i>	0											
Fin whale		0.00214	0.00184	0.00154	0.00135	0.00094	0.00111	0.00041	0.00028	0.0004	0.00037	0.00045	0.00151
Gervais' beaked whale	Small BW	0.00001											
Gray seal and Harbor seal ⁴	Seals	0.16993	0.12084	0.07569	0.11879	0.09843	0.01087	0.00408	0.00236	0.00405	0.02158	0.03222	0.15741
Harbor porpoise		0.03653	0.03336	0.02586	0.03191	0.00615	0.00002	0.00001	0.00001	0	0	0.00002	0.02025
Humpback whale		0.00091	0.00062	0.00083	0.00187	0.00142	0.00102	0.0002	0.00011	0.00027	0.00112	0.00143	0.00088
Killer whale		0.00002											
Long-finned and short-finned pilot whales ^d	Pilot Whales	0.00039											
North Atlantic right whale		0.00075	0.00076	0.00063	0.00045	0.00008	0.00003	0.00001	0.00001	0.00002	0.00004	0.00011	0.00036

Table 6-1. Mean Monthly (or in Some Cases, Annual) Densities of Potentially Affected Marine Mammals in the Buffered (5.25 km) Lease Area that were Used in the Marine Mammal Take Estimation of Noise Impacts Associated with Impact Pile Driving and micro-siting HRG Survey Sound Sources.

Marine Mammal Species	Model Group ^a	Mean Monthly Densities (animals/km ²) ^b											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pantropical spotted dolphin	<i>Stenella</i>	0.00004											
Pygmy sperm whale	<i>Kogia</i> spp.	0											
Risso's dolphin		0.00045	0.00006	0.00006	0.00056	0.00051	0.00018	0.00017	0.00018	0.0001	0.00023	0.00092	0.00169
Rough-toothed dolphin		0.00002											
Sei whale		0.00029	0.00021	0.00034	0.00061	0.0002	0.00005	0.00001	0	0.00001	0.00006	0.00017	0.00046
Sperm whale		0.00004	0.00001	0.00001	0.00004	0.00006	0.00002	0.00002	0	0	0	0.00001	0.00003
Striped dolphin	<i>Stenella</i>	0.00004											
True's beaked whale	Small BW	0.00001											

Source: Marine Geospatial Ecology Laboratory 2022

^a Model group indicates those species that were modeled as a representative group rather than as individual species. BW= beaked whale

^b Annual densities are shown for species with insufficient sightings to derive density estimates by month.

^c Two stocks of common bottlenose dolphin (the Western North Atlantic migratory coastal stock and the Western North Atlantic offshore stock) may occur in the Project area. Both stocks are presented here.

^d Densities are only available for the combined seal and pilot whale groups in the MGEL 2022 dataset

Table 6-13. Marine Mammal Species Densities Used for Micro-Siting HRG Survey Take Calculations*

Hearing Group	Common Name	Mean Monthly Densities (animals/km ²)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
LF Cetaceans	North Atlantic right whale	0.00075	0.00076	0.00063	0.00045	0.00008	0.00003	0.00001	0.00001	0.00002	0.00004	0.00011	0.00036
	Fin whale	0.00214	0.00184	0.00154	0.00135	0.00094	0.00111	0.00041	0.00028	0.0004	0.00037	0.00045	0.00151
	Humpback whale	0.00091	0.00062	0.00083	0.00187	0.00142	0.00102	0.0002	0.00011	0.00027	0.00112	0.00143	0.00088
	Common minke whale	0.00069	0.00089	0.00114	0.00687	0.0075	0.00155	0.0005	0.0002	0.0001	0.00055	0.00025	0.00064
	Sei whale	0.00029	0.00021	0.00034	0.00061	0.0002	0.00005	0.00001	0	0.00001	0.00006	0.00017	0.00046
MF Cetaceans	Atlantic spotted dolphin	0.00003	0.00001	0.00002	0.00013	0.00046	0.0009	0.00396	0.01505	0.00475	0.00335	0.00243	0.00032
	Bottlenose dolphin	0.03855	0.01316	0.01659	0.05668	0.15225	0.1592	0.18323	0.20608	0.1647	0.14689	0.1713	0.11705
	Long-finned and Short-finned pilot whale	0.00039											
	Pantropical spotted dolphin	0.00004											
	Risso's dolphin	0.00045	0.00006	0.00006	0.00056	0.00051	0.00018	0.00017	0.00018	0.0001	0.00023	0.00092	0.00169
	Short-beaked common dolphin	0.04298	0.01869	0.01972	0.03268	0.03289	0.01471	0.01301	0.00501	0.00044	0.00765	0.05746	0.07939
	Blainville's beaked whale	0.00001											
	Cuvier's beaked whale	0											
	Gervais' beaked whale	0.00001											
	True's beaked whale	0.00001											
HF Cetaceans	Harbor porpoise	0.03653	0.03336	0.02586	0.03191	0.00615	0.00002	0.00001	0.00001	0	0	0.00002	0.02025
	Kogia sp.	0											
Pinnepeds	Harbor and Gray seal	0.16993	0.12084	0.07569	0.11879	0.09843	0.01087	0.00408	0.00236	0.00405	0.02158	0.03222	0.15741

*Month of maximum density is shown in bold and shaded grey, if applicable. These values were used for the micro-siting HRG calculations

Requested Take by Activity Type

In response to an RFI issued by NMFS on 8/23, US Wind has provided requested take numbers for each marine mammal species for each of the specified activities. See updated Tables 6-10, 6-11, 6-12, 6-15, 6-16, 6-18, and 6-20 below. Highlighted text indicates new columns.

Table 6-10. Maximum Annual Injury (PTS; Cumulative Sound Exposure Levels [SEL] and Peak) and Behavior (Sound Pressure Level [SPL]) Acoustic Exposure and MMPA Level A and Level B Requested Takes of Potentially Affected Marine Mammals in the Buffered Lease Area Associated with the Mitigated (10 dB Sound Reduction Level) Sound Level for Pile Driving of 11-m Monopiles During the Three Years of Construction Planned for the Project; Only Sound Level Attenuation (10 dB) Mitigation Applied.

Marine Mammal Hearing Group	Marine Mammal Species	PTS Cumulative Injury SEL Acoustic Exposures			PTS Peak Injury Acoustic Exposures			Behavioral SPL Acoustic Exposures			Level A Requested Takes			Level B Requested Takes		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Low Frequency Cetaceans (LFC)	Fin whale	0.39	1.16	0.68	0.00	0.00	0.00	3.94	11.57	6.83	2	2	2	4	12	7
	Common minke whale	0.49	5.55	1.11	0.00	0.00	0.00	2.96	33.31	6.66	1	6	2	3	34	7
	Humpback whale	0.42	1.55	0.67	0.00	0.00	0.00	2.52	9.29	4.05	2	2	2	3	10	5
	North Atlantic right whale	0.01	0.05	0.02	0.00	0.00	0.00	0.06	0.24	0.08	0 ^a	0 ^a	0 ^a	2	2	2
	Sei whale	0.01	0.12	0.02	0.00	0.00	0.00	0.11	0.83	0.17	1	1	1	1	1	1
Mid-frequency Cetaceans (MFC)	Atlantic spotted dolphin	0.00	0.00	0.00	0.00	0.00	0.00	14.07	38.86	50.75	0	0	0	24 ^b	54 ^b	54 ^b
	Blainville's beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Common bottlenose dolphin ¹	0.00	0.00	0.00	0.00	0.00	0.00	846.85	2320.67	1711.04	0	0	0	847	2,321	1,712
	Cuvier's beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Gervais' beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Killer whale	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.22	0.15	0	0	0	0 ^c	0 ^c	0 ^c
	Long-finned and short-finned pilot whales ^d	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	26 ^e	26 ^e	26 ^e
	Pantropical spotted dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.45	0.31	0	0	0	5	5	5
	Risso's dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.79	4.33	1.94	0	0	0	9	9	9

Table 6-10. Maximum Annual Injury (PTS; Cumulative Sound Exposure Levels [SEL] and Peak) and Behavior (Sound Pressure Level [SPL]) Acoustic Exposure and MMPA Level A and Level B Requested Takes of Potentially Affected Marine Mammals in the Buffered Lease Area Associated with the Mitigated (10 dB Sound Reduction Level) Sound Level for Pile Driving of 11-m Monopiles During the Three Years of Construction Planned for the Project; Only Sound Level Attenuation (10 dB) Mitigation Applied.

Marine Mammal Hearing Group	Marine Mammal Species	PTS Cumulative Injury SEL Acoustic Exposures			PTS Peak Injury Acoustic Exposures			Behavioral SPL Acoustic Exposures			Level A Requested Takes			Level B Requested Takes		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
	Rough toothed dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.08	0	0	0	0 ^c	0 ^c	0 ^c
	Short-beaked common dolphin	0.00	0.00	0.00	0.00	0.00	0.00	28.63	233.12	96.48	0	0	0	29	234	97
	Sperm whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Striped dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.45	0.31	0	0	0	0 ^c	0 ^c	0 ^c
	True's beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	High Frequency Cetaceans (HFC)	Harbor porpoise	0.00	0.00	0.00	0.00	1.19	0.01	0.03	15.83	0.08	0	3	3	3	16
	Dwarf sperm whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Pygmy sperm whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Phocid Pinnipeds Underwater (PW)	Harbor and Gray seals ^d	0.00	0.00	0.00	0.00	0.00	0.00	17.87	234.31	30.02	0	0	0	18	235	31

¹Two stocks of common bottlenose dolphin (the Western North Atlantic migratory coastal stock and the Western North Atlantic offshore stock) may occur in the Project area. Both stocks are presented together here.

^a Given the efficacy of the planned mitigation, no takes by MMPA Level A are requested for the North Atlantic right whale

^b Requested takes for Atlantic spotted dolphins for 11-m monopile driving activities are based upon the assumption that 4 groups will be observed during year 1, and 9 groups will be observed during years 2 and 3.

^c No takes are being requested for killer whales, rough-toothed dolphins, and striped dolphins due to their limited occurrence within the Project area.

^d Exposure estimates and requested takes presented for pilot whale and seal guilds, as requested by NMFS

^e Requested take for pilot whales for 11-m monopile driving activities are based upon the assumption that one group would be observed during each year.

Table 6-11. Maximum Injury (PTS; Cumulative Sound Exposure Levels [SEL] and Peak) and Behavior (Sound Pressure Level [SPL]) Acoustic Exposure and MMPA Level A and Level B Requested Takes of Potentially Affected Marine Mammals in the Buffered Lease Area Associated with the Mitigated (10 dB Sound Level Reduction) Sound Level for Pile Driving of 3-m Skirt Piles During the Three Years of Construction for the Project; Only Sound Level Attenuation (10 dB) Mitigation Applied.

Marine Mammal Hearing Group	Marine Mammal Species	Cumulative Injury SEL Acoustic Exposures			Peak Injury Acoustic Exposures			Behavioral SPL Acoustic Exposures			Level A Requested Takes			Level B Requested Takes		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Low Frequency Cetaceans (LFC)	Fin whale	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.06	0.03	0	0	0	2	2	2
	Common minke whale	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.08	0.04	0	0	0	1	1	1
	Humpback whale	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0	0	0	2	2	2
	North Atlantic right whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Sei whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
MF Cetaceans (MFC)	Atlantic spotted dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.35	0.17	0	0	0	6	6	6
	Blainville's beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Common bottlenose dolphin ¹	0.00	0.00	0.00	0.00	0.00	0.00	9.53	19.06	9.53	0	0	0	12	20	12
	Cuvier's beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Gervais' beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Killer whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Long-finned and short-finned pilot whales ^a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Pantropical spotted dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Risso's dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.01	0	0	0	9	9	9
	Rough toothed dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Short-beaked common dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.57	1.14	0.57	0	0	0	7	7	7
	Sperm whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Striped dolphin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
True's beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	

Table 6-11. Maximum Injury (PTS; Cumulative Sound Exposure Levels [SEL] and Peak) and Behavior (Sound Pressure Level [SPL]) Acoustic Exposure and MMPA Level A and Level B Requested Takes of Potentially Affected Marine Mammals in the Buffered Lease Area Associated with the Mitigated (10 dB Sound Level Reduction) Sound Level for Pile Driving of 3-m Skirt Piles During the Three Years of Construction for the Project; Only Sound Level Attenuation (10 dB) Mitigation Applied.

Marine Mammal Hearing Group	Marine Mammal Species	Cumulative Injury SEL Acoustic Exposures			Peak Injury Acoustic Exposures			Behavioral SPL Acoustic Exposures			Level A Requested Takes			Level B Requested Takes		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
HFC	Harbor porpoise	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
High Frequency Cetaceans (HFC)	Dwarf sperm whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Pygmy sperm whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Phocid Pinnipeds Underwater (PW)	Harbor and Gray seal ^a	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.16	0.08	0	0	0	1	1	1

^a Exposure estimates and requested takes presented for pilot whale and seal guilds, as requested by NMFS

Table 6-12. Maximum Injury (PTS; Cumulative Sound Exposure Levels [SEL] and Peak) and Behavior (Sound Pressure Level [SPL]) Acoustic Exposure and MMPA Level A and Level B Requested Takes of Potentially Affected Marine Mammals in the Buffered Lease Area Associated with the Mitigated (10 dB Sound Level Reduction) Sound Level for Pile Driving of 1.8-m Pin Piles During the Three Years of Construction for the Project. The 1.8-m Pin Piles for the Met Tower are only being installed in Year 2; no 1.8-m Pin Pile Installation will Occur in any Other Year; Only Sound Attenuation (10 dB) Level Mitigation Applied.

Marine Mammal Hearing Group	Marine Mammal Species	Cumulative Injury SEL Acoustic Exposures			Peak Injury Acoustic Exposures			Behavioral SPL Acoustic Exposures			Level A Requested Takes			Level B Requested Takes		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Low Frequency Cetaceans (LFC)	Fin whale		0.00			0.00			0.01			0			2	
	Common minke whale		0.00			0.00			0.01			0			1	
	Humpback whale		0.00			0.00			0.01			0			2	
	North Atlantic right whale		0.00			0.00			0.00			0			0	
	Sei whale		0.00			0.00			0.00			0			0	
Mid-frequency Cetaceans (MFC)	Atlantic spotted dolphin		0.00			0.00			0.00			0			0	
	Blainville's beaked whale		0.00			0.00			0.00			0			0	
	Common bottlenose dolphin ¹		0.00			0.00			1.91			0			12	
Mid-frequency Cetaceans (MFC)	Cuvier's beaked whale		0.00			0.00			0.00			0			0	
	Gervais' beaked whale		0.00			0.00			0.00			0			0	
	Killer whale		0.00			0.00			0.00			0			0	
	Long-finned and short-finned pilot whale ^a		0.00			0.00			0.00			0			0	
	Pantropical spotted dolphin		0.00			0.00			0.00			0			0	
	Risso's dolphin		0.00			0.00			0.00			0			0	
	Rough toothed dolphin		0.00			0.00			0.00			0			0	
	Short-beaked common dolphin		0.00			0.00			0.18			0			7	
	Sperm whale		0.00			0.00			0.00			0			0	
	Striped dolphin		0.00			0.00			0.00			0			0	

Table 6-12. Maximum Injury (PTS; Cumulative Sound Exposure Levels [SEL] and Peak) and Behavior (Sound Pressure Level [SPL]) Acoustic Exposure and MMPA Level A and Level B Requested Takes of Potentially Affected Marine Mammals in the Buffered Lease Area Associated with the Mitigated (10 dB Sound Level Reduction) Sound Level for Pile Driving of 1.8-m Pin Piles During the Three Years of Construction for the Project. The 1.8-m Pin Piles for the Met Tower are only being installed in Year 2; no 1.8-m Pin Pile Installation will Occur in any Other Year; Only Sound Attenuation (10 dB) Level Mitigation Applied.

Marine Mammal Hearing Group	Marine Mammal Species	Cumulative Injury SEL Acoustic Exposures			Peak Injury Acoustic Exposures			Behavioral SPL Acoustic Exposures			Level A Requested Takes			Level B Requested Takes		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
	True's beaked whale		0.00			0.00			0.00			0			0	
High Frequency Cetaceans (HFC)	Harbor porpoise		0.00			0.00			0.00			0			0	
	Dwarf sperm whale		0.00			0.00			0.00			0			0	
	Pygmy sperm whale		0.00			0.00			0.00			0			0	
Phocid Pinnipeds Underwater (PW)	Harbor and Gray seal ^a		0.00			0.00			0.09			0			1	

¹Two stocks of common bottlenose dolphin (the Western North Atlantic migratory coastal stock and the Western North Atlantic offshore stock) may occur in the Project area. Both stocks are presented together here.

^a Exposure estimates and requested takes presented for pilot whale and seal guilds, as requested by NMFS

Table 6-15. Calculated Level B Takes of Marine Mammals by Acoustic Harassment due to MicroSiting HRG Survey Activities, Second Construction Campaign, Daylight-only Operations.

Hearing Group	Common Name	Best Abundance Estimate of Stock	Month of Max Density	Calculated Level B Exposures	Max Percentage of Stock Impacted ^a	Level B Requested Takes
LF Cetaceans	North Atlantic right whale	338	Feb	0.1	0.035	0 ^b
	Fin whale	6,802	Jan	0.3	0.005	0 ^b
	Humpback whale	1,393	Apr	0.3	0.021	0 ^b
	Minke whale	21,968	May	1.2	0.005	2
	Sei whale	6,292	Apr	0.1	0.002	0 ^b
MF Cetaceans	Atlantic spotted dolphin ^c	39,921	Aug	2.3	0.0059	6
	Bottlenose dolphin	69,490	Aug	32.1	0.046	33
	Killer whale	UNK	N/A	0.0	UNK	0
	Long-finned and short-finned pilot whale ^d	68,139	N/A	0.02	0.000	0 ^b
	Pantropical spotted dolphin	6,593	N/A	0.0	0.000	0
	Risso's dolphin	35,215	Dec	0.3	0.0007	0 ^b
	Rough toothed dolphin	136	N/A	0.0	0.002	0
	Short-beaked common dolphin	172,974	Dec	12.4	0.007	7
	Striped dolphin	67,036	N/A	0.0	0.000	0
	Sperm Whale	4,349	May	0.0	0.000	0
	Blainville's beaked whale	10,107	N/A	0.0	0.000	0
	Cuvier's beaked whale	5,744	N/A	0.0	0.000	0
	Gervais' beaked whale	10,107	N/A	0.0	0.000	0
	True's beaked whale	10,107	N/A	0.0	0.000	0
HF Cetaceans	Harbor porpoise	95,543	Jan	5.7	0.006	6
	Kogia sp.	UNK	N/A	0.0	UNK	0
Pinnepeds	Harbor and Gray seal ^d	88,636	Jan	26.4	0.030	27

UNK: no stock abundance estimate available

N/A: only annual density data available

^a Based upon calculated Level B Exposures

^b No MMPA Level B takes are requested during HRG survey activities due to the efficacy of planned mitigation and the short duration of these activities.

^c Two stocks of common bottlenose dolphin (the Western North Atlantic migratory coastal stock and the Western North Atlantic offshore stock) may occur in the Project area. Both stocks are presented together here.

^d Exposure estimates and requested takes presented for pilot whale and seal guilds, as requested by NMFS

Table 6-16. Calculated Level B Takes of Marine Mammals by Acoustic Harassment due to MicroSiting HRG Survey Activities, Third Construction Campaign, Daylight-only Operations.

Hearing Group	Common Name	Best Abundance Estimate of Stock	Month of Max Density	Calculated Level B Exposures	Max Percentage of Stock Impacted ^a	Level B Requested Takes
LF Cetaceans	North Atlantic right whale	338	Feb	0.1	0.035	0 ^b
	Fin whale	6,802	Jan	0.3	0.005	0 ^b
	Humpback whale	1,393	Apr	0.3	0.021	0 ^b
	Minke whale	21,968	May	1.2	0.005	2
	Sei whale	6,292	Apr	0.1	0.002	0 ^b
MF Cetaceans	Atlantic spotted dolphin ^c	39,921	Aug	2.3	0.0059	6
	Bottlenose dolphin	69,490	Aug	32.1	0.046	33
	Killer whale	UNK	N/A	0.0	UNK	0
	Long-finned and short-finned pilot whale ^d	68,139	N/A	0.02	0.000	0 ^b
	Pantropical spotted dolphin	6,593	N/A	0.0	0.000	0
	Risso's dolphin	35,215	Dec	0.3	0.0007	0 ^b
	Rough toothed dolphin	136	N/A	0.0	0.002	0
	Short-beaked common dolphin	172,974	Dec	12.4	0.007	7
	Striped dolphin	67,036	N/A	0.0	0.000	0
	Sperm Whale	4,349	May	0.0	0.000	0
	Blainville's beaked whale	10,107	N/A	0.0	0.000	0
	Cuvier's beaked whale	5,744	N/A	0.0	0.000	0
	Gervais' beaked whale	10,107	N/A	0.0	0.000	0
	True's beaked whale	10,107	N/A	0.0	0.000	0
HF Cetaceans	Harbor porpoise	95,543	Jan	5.7	0.006	6
	Kogia sp.	UNK	N/A	0.0	UNK	0
Pinnepeds	Harbor and Gray seal ^d	88,636	Jan	26.4	0.030	27

UNK: no stock abundance estimate available

N/A: only annual density data available

^a Based upon calculated Level B Exposures

^b No MMPA Level B takes are requested during HRG survey activities due to the efficacy of planned mitigation and the short duration of these activities.

^c Two stocks of common bottlenose dolphin (the Western North Atlantic migratory coastal stock and the Western North Atlantic offshore stock) may occur in the Project area. Both stocks are presented together here.

^d Exposure estimates and requested takes presented for pilot whale and seal guilds, as requested by NMFS

Table 6-18. Maximum Annual MMPA Level A and Level B Acoustic Exposure and MMPA Level A and Level B Requested Takes of Potentially Affected Marine Mammals in the Buffered Lease Area Resulting from Acoustic Exposure During Mitigated (10 dB Sound Reduction Level) Impact Pile Driving (Monopile, Skirt Pile, and Pin Pile) and Micro-Siting HRG Survey Activities During Each Year of the Planned Construction and Survey Activities for the Project.

Marine Mammal Hearing Group	Marine Mammal Species	Injury SEL					Behavior SPL					Level A Requested Takes					Level B Requested Takes				
		Year 1		Year 2		Year 3	Year 1		Year 2		Year 3	Year 1		Year 2		Year 3	Year 1		Year 2		Year 3
		Pile Driving	Pile Driving	HRG Surveys	Pile Driving	HRG Surveys	Pile Driving	Pile Driving	HRG Surveys	Pile Driving	HRG Surveys	Pile Driving	Pile Driving	HRG Surveys	Pile Driving	HRG Surveys	Pile Driving	HRG Surveys	Pile Driving	Pile Driving	HRG Surveys
Low Frequency Cetaceans	Fin whale	0.39	1.16	0.00	0.68	0.00	3.97	11.65	0.3	6.86	0.3	2	2	0	2	0	6	16	0 ^a	9	0 ^a
	Common Minke whale	0.49	5.55	0.00	1.11	0.00	3.00	33.39	1.2	6.70	1.2	1	6	0	2	0	4	36	2	8	2
	Humpback whale	0.42	1.55	0.00	0.67	0.00	2.54	9.33	0.3	4.06	0.3	2	2	0	2	0	5	14	0 ^a	7	0 ^a
	North Atlantic right whale	0.01	0.05	0.00	0.02	0.00	0.06	0.24	0.1	0.08	0.1	0 ^b	0 ^b	0	0 ^b	0	2	2	0 ^a	2	0 ^a
	Sei whale	0.01	0.12	0.00	0.02	0.00	0.11	0.83	0.1	0.17	0.1	1	1	0	1	0	1	1	0 ^a	1	0 ^a
Mid-Frequency Cetaceans	Atlantic spotted dolphin	0.00	0.00	0.00	0.00	0.00	14.24	39.21	2.3	50.92	2.3	0	0	0	0	0	30 ^c	60 ^c	6	60 ^c	6
	Blainville's beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
	Common Bottlenose dolphin ^d	0.00	0.00	0.00	0.00	0.00	856.38	2341.64	32.10	1720.57	32.10	0	0	0	0	0	859	2353	33	1724	33
	Cuvier's beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
	Gervais' beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
	Killer whale	0.00	0.00	0.00	0.00	0.00	0.08	0.22	0.00	0.15	0.00	0	0	0	0	0	0 ^e	0 ^e	0	0 ^e	0
	Long-finned and short-finned pilot whale ^f	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0	0	0	0	0	26 ^g	26 ^g	0	26 ^g	0
	Pantropical spotted dolphin	0.00	0.00	0.00	0.00	0.00	0.17	0.45	0.00	0.31	0.00	0	0	0	0	0	5	5	0	5	0
	Risso's dolphin	0.00	0.00	0.00	0.00	0.00	0.80	4.36	0.3	1.95	0.3	0	0	0	0	0	18	18	0 ^a	18	0 ^a
	Rough toothed dolphin	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.00	0.08	0.00	0	0	0	0	0	0 ^e	0 ^e	0	0 ^e	0
	Short-beaked common dolphin	0.00	0.00	0.00	0.00	0.00	29.20	234.44	12.4	97.06	12.4	0	0	0	0	0	36	248	7	104	7

Table 6-18. Maximum Annual MMPA Level A and Level B Acoustic Exposure and MMPA Level A and Level B Requested Takes of Potentially Affected Marine Mammals in the Buffered Lease Area Resulting from Acoustic Exposure During Mitigated (10 dB Sound Reduction Level) Impact Pile Driving (Monopile, Skirt Pile, and Pin Pile) and Micro-Siting HRG Survey Activities During Each Year of the Planned Construction and Survey Activities for the Project.

Marine Mammal Hearing Group	Marine Mammal Species	Injury SEL					Behavior SPL					Level A Requested Takes					Level B Requested Takes				
		Year 1		Year 2		Year 3	Year 1		Year 2		Year 3	Year 1		Year 2		Year 3	Year 1		Year 2		Year 3
		Pile Driving	Pile Driving	HRG Surveys	Pile Driving	HRG Surveys	Pile Driving	Pile Driving	HRG Surveys	Pile Driving	HRG Surveys	Pile Driving	Pile Driving	HRG Surveys	Pile Driving	HRG Surveys	Pile Driving	Pile Driving	HRG Surveys	Pile Driving	HRG Surveys
Mid-Frequency Cetaceans	Sperm whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
	Striped dolphin	0.00	0.00	0.00	0.00	0.00	0.17	0.45	0.00	0.31	0.00	0	0	0	0	0	0 ^e	0 ^e	0	0 ^e	0
	True's beaked whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
High Frequency Cetaceans	Harbor porpoise	0.00	1.19	0.00	0.01	0.00	0.03	15.83	5.7	0.09	5.7	0	3	0	3	0	3	16	6	3	6
	Dwarf sperm whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
	Pygmy sperm whale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0
Pinnipeds in Water	Harbor and Gray seal ^e	0.00	0.00	0.00	0.00	0.00	17.95	234.56	26.4	30.1	26.4	0	0	0	0	0	19	237	27	32	27

^a No MMPA Level B takes of fin whale, humpback whale, NARW, sei whale, or Risso's dolphin are requested during HRG survey activities, due to the efficacy of the planned mitigation and the short duration of these activities.

^b Given the efficacy of the planned mitigation, no takes by MMPA Level A are requested for the North Atlantic right whale.

^c Requested MMPA Level B takes for Atlantic spotted dolphins for pile driving activities are based upon the assumption that a total of 5 groups will be observed during year 1, and a total of 10 groups will be observed during each of years 2 and 3.

^d Two stocks of common bottlenose dolphin (the Western North Atlantic migratory coastal stock and the Western North Atlantic offshore stock) may occur in the Project area. Both stocks are presented together here.

^e No takes are being requested for killer whales, rough-toothed dolphins, and striped dolphins due to their limited occurrence within the Project area.

^f Exposure estimates and requested takes presented for pilot whale and seal guilds, as requested by NMFS

^g Requested take for pilot whales for 11-m monopile driving activities are based upon the assumption that one group would be observed during each year.

Table 6-20. Total Requested MMPA Level A (PTS Cumulative and Peak) and Level B (Behavior) Harassment Takes Associated with Acoustic Exposure During Mitigated (10 dB Sound Reduction Level) Impact Pile Driving (Monopile, Skirt Pile, and Pin Pile) and Micro-Siting HRG Survey Activities for the Full Duration of the Construction and Survey Periods for the Project; Harassment Takes Rounded Upwards to Nearest Whole Integer.

Marine Mammal Hearing Group	Marine Mammal Species	Abundance ¹	MMPA Level A Harassment Requested	Percent of Stock Affected	MMPA Level B (Behavior) Harassment Requested	Percent of Stock Affected
Low Frequency Cetaceans	Fin whale	6,802	6	0.088	31	0.456
	Common minke whale	21,968	9	0.041	52	0.237
	Humpback whale	1,396	6	0.430	26	1.862
	North Atlantic right whale	338	0	0.000	6	1.775
	Sei whale	6,292	3	0.048	3	0.048
Mid-Frequency Cetaceans (MFC)	Atlantic spotted dolphin	39,921	0	0.000	162	0.406
	Common Bottlenose dolphin ²	69,490	0	0.000	5002	7.198
	Pantropical spotted dolphin	6,593	0	0.000	15	0.228
	Risso's dolphin	35,215	0	0.000	78	0.221
	Short-beaked common dolphin	172,974	0	0.000	402	0.232
	Long-finned and short-finned pilot whales	68,139 ^a	0	0.000	52	0.076
High Frequency Cetaceans	Harbor porpoise	95,543	6	0.006	34	0.036
Pinnipeds in Water	Harbor and Gray seal	88,636 ^b	0	0.000	342	0.386

¹Hayes et al. 2022, 2021, 2020, 2019; Waring et al. 2015; UNK=unknown

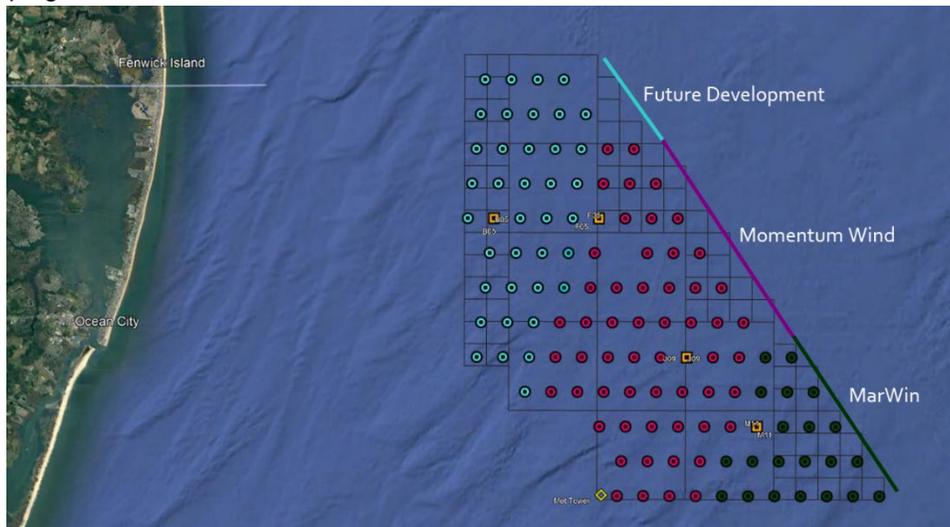
²Two stocks of common bottlenose dolphin (the Western North Atlantic migratory coastal stock and the Western North Atlantic offshore stock) may occur in the Project area. Both stocks are presented together here.

^aSum of long-finned pilot whale and short-finned pilot whale abundances.

^bSum of harbor seal and gray seal abundances.

Project Information provided in response to RFI issued 8/17/2023

- What are the target penetration depths for installing OSS pin piles and Met tower pin piles?
 - ⊘ OSS skirt piles: 50-60 meters (164-196 feet), subject to final design
 - ⊘ Met Tower pin piles: 51-53 meters (166-175 feet), subject to final design
- What are the approximate sizes/areas of the MarWin, Momentum Wind, and Future Area campaigns?



- ⊘ MarWin – approximately 18 square miles
 - ⊘ Momentum Wind – approximately 55 square miles
 - ⊘ Future Development – approximately 31 square miles
- What is the expected timing (time of year) and duration (how many days) of the following activities (see table below)? Also, please clarify the timing and durations for WTG, OSS, and Met tower foundation installation, HRG surveys, and inter-array cable and export cable installation are accurate.

Project Activity	Expected Timing ^a	Expected Duration (approximate)
Scour Protection Pre-Installation	Q2 through Q3 of Year 1	21 days
	Q2 through Q3 of Year 2	55 days
	Q2 through Q3 of Year 3	38 days
WTG Foundation Installation	Q2 through Q3 of Year 1	21 days
	Q2 through Q3 of Year 2	55 days

Project Activity	Expected Timing ^a	Expected Duration (approximate)
	Q2 through Q3 of Year 3	38 days
Scour Protection Post-Installation	Q2 through Q3 of Year 1	42 days
	Q2 through Q3 of Year 2	110 days
	Q2 through Q3 of Year 3	76 days
OSS Foundation Installation	Q2 of Year 1	1 day
	Q2 of Year 2	2 days
	Q2 of Year 3	1 day
Met Tower Installation	Q2 of Year 2	1 day
HRG Surveys ^d	Q2 through Q3 of Year 2	14 days
	Q2 through Q3 of Year 3	14 days
Site Preparation	Not anticipated	
Inter-array Cable Installation	Q2 through Q4 Year 1	42 days
	Q2 through Q4 Year 2	110 days
	Q2 through Q4 Year 3	76 days
Export Cable Installation	Q1 through Q4 Year 1	60 days
	Q1 through Q4 Year 2	120 days (2 cable)
	Q1 through Q4 Year 3	60 days
Fishery Monitoring Surveys	Q2 through Q4 2025-2029	16 days/year commercial pot surveys
		12 days/year recreational surveys

Project Activity	Expected Timing ^a	Expected Duration (approximate)
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^a Installation timing will depend on vessel availability, contractor selection, weather, and more. Year 1 is anticipated to be 2025, Year 2 to be 2026, and Year 3 to be 2027, although these are subject to change per the factors identified. Note: "Q1, Q2, Q3, and Q4" each refer to a quarter of the year, starting in January and comprising 3 months each. Therefore, Q1 represents January through March, Q2 represents April through June, Q3 represents July through September, and Q4 represents October through December.

- What are the depths along the export cable routes? Please send sea surface temperature and depth-average temperature ranges for the Project Area.
 - Depths range from -10 to -45 m (-33 to -148 ft) (see COP Volume II Section 3.1.2).
 - See COP Volume II, Table 2-1 below for monthly air and sea surface temperature data from NOAA buoy 44009 (located approximately 6 km northeast of the Lease area at the terminus of the south-bound Traffic Separation Scheme from Delaware Bay).
 - See COP Volume II, Table 4-1 below for CTD temperature and salinity data from the lease area and surrounding waters.

Table 2-1. Monthly Air and Sea Surface Temperature Statistics, NOAA Buoy 44009 (1997–2021)

	Month	Air Temp. at 3.8 m MSL			Sea Surface Temp. at -2 m MSL		
		Mean [°C]	Min [°C]	Max [°C]	Mean [°C]	Min [°C]	Max [°C]
1	Jan	3.91	-10.90	14.90	6.97	2.10	12.30
2	Feb	4.02	-13.00	18.30	5.56	0.40	21.10
3	Mar	6.01	-6.50	15.60	6.04	0.70	14.30
4	Apr	9.72	0.70	23.20	8.96	4.40	29.30
5	May	14.45	4.50	23.50	13.79	8.50	22.80
6	Jun	20.22	11.50	29.80	19.78	11.20	28.40
7	Jul	23.55	16.30	29.50	23.47	15.80	29.10
8	Aug	24.01	18.90	30.20	24.33	19.30	29.90
9	Sep	21.59	13.10	27.80	22.55	19.10	29.30
10	Oct	16.98	6.30	25.30	18.89	15.10	24.80
11	Nov	11.82	-1.50	20.50	14.44	10.10	19.00
12	Dec	7.12	-7.40	17.70	10.40	4.00	14.60
	Annual	13.70	-13.00	30.20	14.56	0.40	29.90

Source: (NOAA 2021a)

Table 4-1. Five years (2014 – 2018) of CTD data from the Lease Area and Adjacent Waters Summarized by Season

Season	Depth (m)	Temperature (°C)			Salinity (PSU)		
		Min	Max	Mean	Min	Max	Mean
Spring	1	1.92	17.80	9.03	29.51	36.11	32.39
	20	4.14	12.86	8.33	31.31	35.63	33.25
	30	4.44	11.93	8.25	31.98	35.53	33.69
Summer	1	22.49	27.27	25.10	30.24	32.00	31.60
	20	10.00	18.62	14.04	32.09	33.16	32.46
	30	8.09	10.47	9.52	32.59	33.19	32.78
Fall	1	13.19	27.84	21.71	29.65	33.58	31.99
	20	10.97	26.11	18.02	31.01	35.46	33.02
	30	9.91	21.18	16.15	32.19	35.10	33.39

Source: World Ocean Database 2021

- What are the maximum numbers of each type of construction related vessel in the table below?
Also, what are the expected annual numbers of vessel trips for each type of vessel?

Vessel availability, contractor selection, weather, and other factors would affect the number and type of vessels, including the number of round trips per installation campaign (i.e., Year 1, 2 and 3). Information provided is an estimate only.

Project Period	Vessel Types	Max Number of Vessels	Expected Maximum Annual Number of Vessel Trips ^a
Foundation Installation	Transport, Installation, and Support	5	10
	Crew Transfer	1	26
	Environmental Monitoring and Mitigation	4	52
WTG Installation	Transport, Installation, and Support	4	26

Project Period	Vessel Types	Max Number of Vessels	Expected Maximum Annual Number of Vessel Trips ^a
	Crew Transfer Vessel	0	0
Inter-array Cable Installation	Transport, Installation, and Support	4	5
	Crew Transfer Vessel	2	136
OSS Installation	Transport, Installation, and Support	9	16
	Crew Transfer Vessel	0	0
Offshore Export Cable Installation	Transport, Installation, and Support	6	25
	Crew Transfer Vessel	0	0
All Other Construction Activities	Crew Transfer Vessel	NA	NA
	Transport, Survey, and Support	NA	NA

^a Vessels and trips provided represent maximum number of Year 2 trips for each vessel category for each activity from US Wind's OCS air permit application, Appendix A.

- What areas (outside of the Project Area) would US Wind vessels be transiting during any time of the project?
 - US Wind vessels will be transiting to and from numerous port facilities during the construction and operation of the Project. These port facilities could include the following:
 - Baltimore, MD (construction, primary)
 - Hampton Roads, VA (construction, alternate)
 - Ocean City, MD (construction/operation, primary)
 - Port Norris, NJ (construction, alternate)
 - Lewes, DE (construction, alternate)
 - Cape Charles, VA (construction, alternate)

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