Naval Station Newport Bulkhead LOA Amendment Request

NMFS issued an LOA to Naval Station Newport, in Newport, Rhode Island, in January 2022 for construction activities associated with the bulkhead replacement/repairs at the installation. The LOA is valid from May 15, 2022 through May 14, 2027. The first phase of the project, repairs to the S45 section of bulkhead has recently been awarded and the contractor selected has determined that additional installation methods will be required beyond those included in the application and issued authorization. At this section of bulkhead, the application and authorization included impact driving of steel sheet piles and steel pipe piles and vibratory driving of steel sheet piles and steel H-piles. However, the contractor has determined that vibratory driving of steel pipe piles is also necessary. Additionally, the contractor stated that DTH hammering would be necessary on an as needed basis, if obstructions are encountered that would prevent the use of just impact or vibratory hammers when installing piles.

As such, the Navy is requesting an amendment to the issued authorization to allow vibratory driving of 30-inch steel pipe piles and DTH hammering of 10-inch holes, as needed and to increase allowable take to harbor seal, gray seal, and harp seal.

Acoustic Analysis: The Navy has completed acoustic analysis for the two newly identified construction methods and results are presented below in Tables 1 and 2. Proxy source levels used for these methods are included in Table 3. Figures 1 and 2 show the graphical depiction of these acoustic modeling results.

As shown in Table 1, the distances to the Level A thresholds for each hearing group during vibratory driving steel pipe piles are less than the distances to Level A thresholds for vibratory driving the steel sheet piles included in the authorization. The calculated maximum distance to the Level B threshold is also smaller, due to the use the newly recommended proxy source level from NMFS for this pile type, which is less than the proxy source level used for the sheet piles. Figure 1 depicts the maximum ensonified area based on the acoustic modeling. The fully ensonified area is smaller than the ensonified area for vibratory pile driving steel sheet piles at this bulkhead location (Figure 4, Appendix A of the LOA Application).

Table 2 details the calculated distances to Level A and Level B thresholds associated with the use of the DTH hammer. Use of the DTH hammer will only be on an as-needed basis if obstructions are encountered in the sediments when driving sheet piles, pipe piles, or H-piles. The distances to the Level A thresholds for the hearing groups are less than the maximum distances to marine mammal thresholds associated with impact driving either the steel pipe piles or steel sheet piles included in the authorization. The distance to the Level B threshold as modeled is greater than the maximum Level B distance that would be achieved during vibratory driving the steel sheet piles (see Table 1). However, the maximum distance of 13,594 meters is not likely to be achieved due to the attenuation of sound from intersecting landmasses in Narragansett Bay. Figure 2 depicts the maximum ensonified area based on the acoustic modeling.

Table 1. Calculated Maximum Distances Corresponding to MMPA Thresholds for Underwater Sound from Non-Impulsive Noise (Vibratory Pile Driving)

	Pile Count, Size, and Type	Piles Per Day	Total Production Days	Level A (PTS Onset) Harassment			Level B (Behavioral) Harassment 120 dB RMS Threshold/Area
				Mid-Frequency Cetaceans (Dolphins) 185 dB SEL_{cum} Threshold/Area	High-Frequency Cetaceans (Harbor Porpoise) 155 dB SEL_{cum} Threshold/Area	Phocids (Seals) 185 dB SEL_{cum} Threshold/Area	
NEW ACTIVITY	4, 30-inch steel pipe pile	2	4	0.4 m / 0.000001 km^2	7.4 m / 0.000152 km^2	3.1 m / 0.00003 km^2	3,981 m / 6.741652 km^2
NEW ACTIVITY	8*, 10-inch DTH Hammer	2	8	See Table 2	See Table 2	See Table 2	13,594 m / 7.80374 km^2
COMPARISON TO EXISTING ACTIVITY**	70, 22.5-inch steel sheet piles		23	1.2 m / 0.000004 km^2	19.8 m / 0.0009 km^2	8.1 m / 0.0002 km^2	7,356 m / 9.5 km^2

Notes: *DTH hammer will only be used as needed if obstructions are encountered when driving sheet piles, H-piles, or pipe piles. The project engineers have estimated eight uses of a DTH hammer. **Comparison to existing activity used the worst case impulsive activity for comparison.

Table 2. Calculated Maximum Distances Corresponding to MMPA Thresholds for Underwater Sound from Impulsive Noise (DTH Hammer)

	Pile Count, Size, and Type	Holes Per Day	Total Production Days	Level A (PTS Onset) Harassment			Level B (Behavioral) Harassment 160 dB RMS Threshold/Area
				Mid-Frequency Cetaceans (Dolphins) 185 dB SEL_{cum} Threshold/Area	High-Frequency Cetaceans (Harbor Porpoise) 155 dB SEL_{cum} Threshold/Area	Phocids (Seals) 185 dB SEL_{cum} Threshold/Area	
NEW ACTIVITY	8*, 10-inch DTH Hammer	2	8	3.3 m / 0.000034 km^2	111.6 m / 0.019204 km^2	50.1 m / 0.004657 km^2	See table 1
COMPARISON TO EXISTING ACTIVITY**	70, 22.5-inch steel sheet piles		23	8 m / 0.01 km^2	2,292 m / 3.4 km^2	1,030 m / 1.2 km^2	2,512 m / 3.8 km^2

Notes: *DTH hammer will only be used as needed if obstructions are encountered when driving sheet piles, H-piles, or pipe piles. The project engineers have estimated eight uses of a DTH hammer. **Comparison to existing activity used the worst case impulsive activity for comparison.

Table 3. Proxy Source Levels

Pile Size and Type	Installation Method	Average Peak SPL (dB re 1 µPa)	Average RMS SPL (dB re 1 µPa)	Average SEL (dB re 1 μPa^2 sec)	Source
30-inch steel pipe pile	Vibratory	N/A	159	N/A	NMFS Guidance, unpublished
10-inch DTH mono-hammer (Level A)	DTH	172	N/A	146	Guan and Miner 2020
10-inch DTH mono-hammer (Level B)	DTH	N/A	167	N/A	Heyvaert & Reyff 2021

Table 4. Pile Information

Method of Pile Driving	Number, Size, and Material of Piles	Strikes per Pile (Impact)	Minutes to Drive Pile (Vibratory)	Number of Piles per Day	Number of Pile Driving Days
Vibratory	4, 30-inch pipe piles	N/A	30	2	4*
DTH	~8, 10=inch holes (DTH)	10 per second	240	1 hole/day	8

*Extra days added in the event of construction delays.

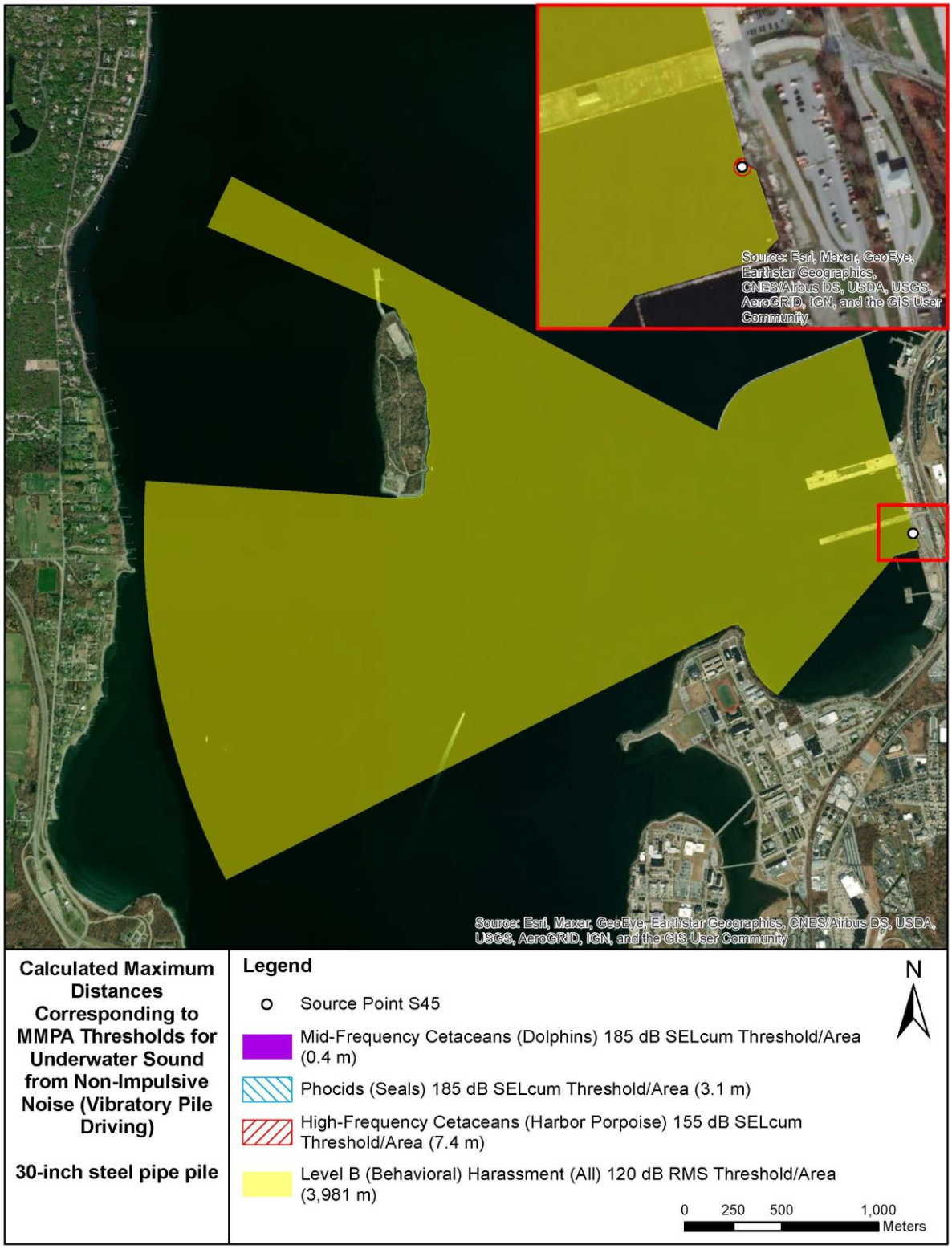

Figure 1. Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones from Vibratory Driving 30-inch Steel Pipe Piles

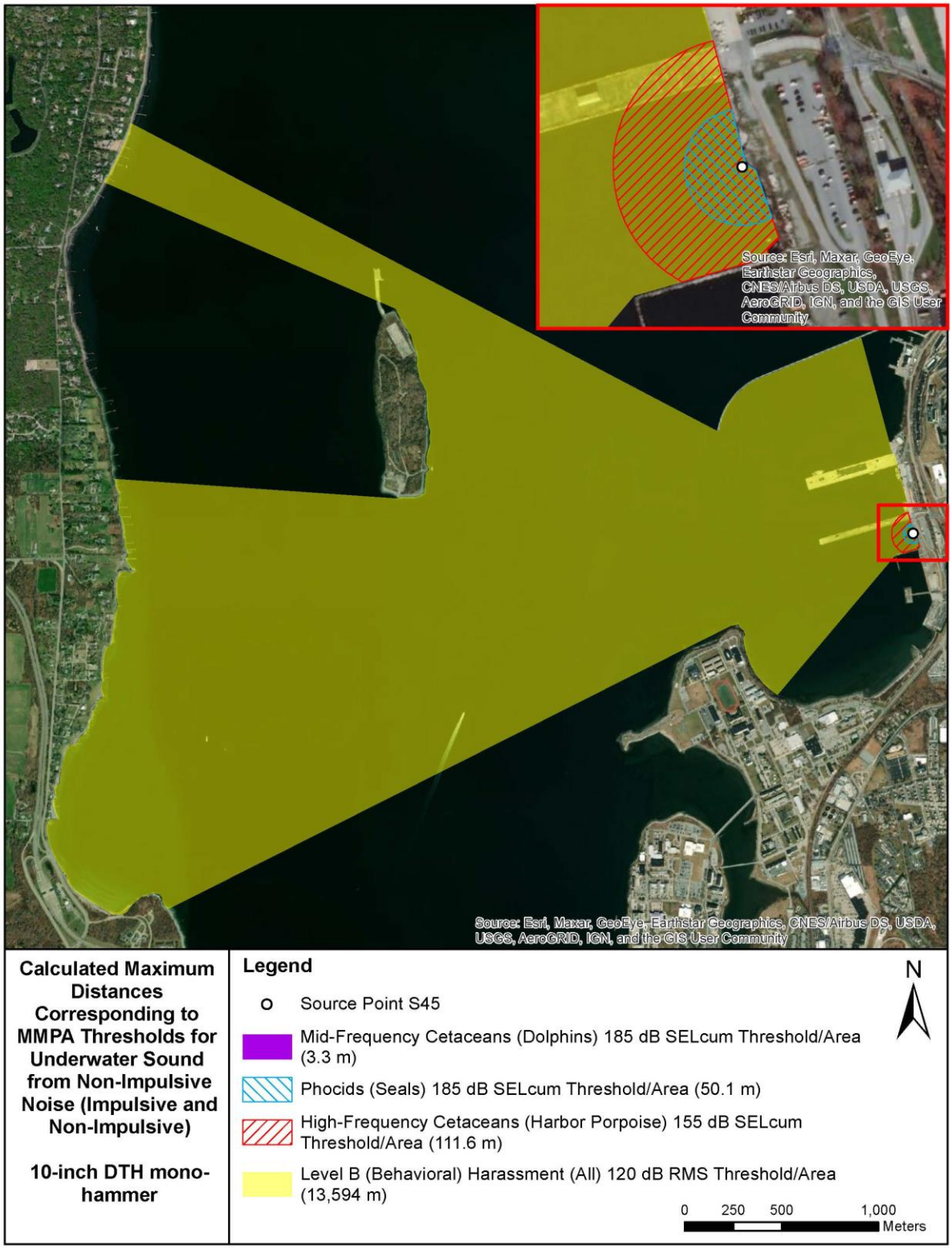

Figure 2. Level A Injury (PTS Onset) and Level B (Behavioral) Harassment Zones from 10-inch DTH Mono-Hammer

Take Analysis: The Navy has completed take analysis for the newly identified construction methods. The resultant activities would require no additional Level A takes for any species in the action area. Additional Level B takes would be necessary for harbor seal (56 total), gray seal (12 total), and harp seal (4 total) (Table 4). However, these increases in requested take are expected to have only a minor effect on individuals and no effect on the population. Use of these methods are not expected to result in any additional impacts to affected species beyond what was previously analyzed in the application and issued authorization.

Table 4. Calculated Take Estimates for Additional Construction Methods

Species	Vibratory Driving 30-inch Pipe Piles		10-inch DTH Hammer		Total
	Level A (PTS Onset)	Level B (Behavioral)	Level A (PTS Onset)	Level B (Behavioral)	
Atlantic white-sided dolphin	0	0	0	0	**0**
Short-beaked common dolphin	0	0	0	0	**0**
Harbor porpoise	0	0	0	0	**0**
Harbor seal	0	17	0	39	**56**
Gray seal	0	4	0	8	**12**
Harp seal	0	1	0	3	**4**
Hooded seal	0	0	0	0	**0**

Monitoring and Mitigation: All monitoring and mitigation requirements discussed in the application and included in the issued authorization will be included in this amendment request.

The maximum shutdown zone included in the authorization is 150 m. This distance is greater than the calculated distance to Level A thresholds for marine mammal species from DTH activities at this project location, which is 111.6 m for harbor porpoise. The Contractor for this project has been selected and brought onboard, and in their draft "Marine Mammal Monitoring and Acoustic Monitoring Plan" they have proposed to implement the same 150 m shutdown distance for cetaceans and pinnipeds when conducting DTH activities (Table 5).

For vibratory driving steel pipe piles, the greatest calculated distance to Level A thresholds for species at this location is 7.4 m, which is less than the standard construction shutdown of 10 m to prevent equipment/mammal interactions. However, for consistency the Contractor has proposed a 30 m shutdown distance for cetaceans and 10 m for pinnipeds from vibratory pile driving steel pipe piles, which is the same as for vibratory driving steel sheet piles in the issued authorization. (Table 5).

Monitoring of the Level B zones for each activity will occur out to the extent of the calculated distance to Level B thresholds, which is 3,981 m for vibratory driving of steel pipe piles and to the extent of the full ROI for DTH activities (Table 5). Locations of protected species observers (PSOs) remain the same as included in the application.

Table 5. Shutdown and Harassment Zones

Pile Type	Installation Method	Pile Diameter	Shutdown Zone for Cetaceans	Shutdown Zone for Pinnipeds	Disturbance Zone
Steel pipe pile	Vibratory	30-inch	30 m	10 m	3,981 m
DTH	DTH	10-inch	150 m	150 m	ROI

Hydroacoustic monitoring for the new activities is also proposed, as detailed below in Table 6.

Table 6. Numbers of Piles to be Measured During Pile Driving

Pile Size and Type	Method of Installation	Number to Monitor
30-inch steel pipe	Vibratory	2
Obstruction drilling	DTH Hammer	10 (maximum)*

*These activities will only occur on an as needed basis