

Note

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Water & Maritime

To: Jack Thompson (NRW)
From: Royal HaskoningDHV
Date: 07 April 2025
Copy: Arndt Hermann (MHPA)
Our reference: PC1477-RHD-ZZ-ZZ-FN-EV-0003
Classification: Project related
Checked by: Gregor McNiven

Subject: Milford Haven Port Authority Jetty Improvements (Application Number: CML2484): Further Information Request Response

Dear Jack,

Please find below our response to the Further Information Request issued by Natural Resources Wales (NRW) on 10th March 2025 regarding the marine licence application for Milford Haven Port Authority Jetty Improvements (application number: CLM2482).

1 Water Quality

1.1 Increase in water turbidity

NRW clarification point

Further evidence in support of the turbidity evaluation is required. The Zone of Influence (ZoI) should either be precautionary or determined by quantitative evaluation of the turbidity plume extent.

Applicant response

As set out in the ER, the proposed works will require the installation of up to 32 piles using a combination of methods to install and then seat the piles. Some sediment may be disturbed during installation, however this would be limited to the immediate area around each pile and would not be disturbed to the extent that sediment would be suspended into the water column, but would remain close to bed level. As such the 'ZoI' would be limited to the seabed immediately adjacent to each pile. Similarly, should a jack up barge be used, the sediment that could be disturbed by the jack up legs being positioned on the seabed is minimal. Therefore, as outlined in the supporting assessments provided, the proposed works would not disturb significant volumes of sediment and any localised increases in turbidity would be temporary and small-scale in nature. Additionally, maintenance dredging is regularly carried out in the wider area under the MHPA 10-year maintenance dredging marine licence (DML2166). In comparison to these operations, any increases in turbidity as a result of the proposed works would be minimal.

Based on the assessment provided in **Section 4** of the Environmental Report and in **Table 4.1** in the HRA, as well as the clarification provided above, it is considered that no further assessment is required on this matter.

1.2 Accidental pollution

NRW clarification point

Accidental pollution associated with the proposal (both the construction works and during operation) should be included for assessment of the impact on water quality.

Applicant response

MPHA maintain and exercise an Oil Spill Contingency Plan which is monitored and approved by the Maritime and Coastguard Agency. As the jetty is operated by MHPA, the Oil Spill Contingency Plan would be adhered to throughout construction and during operation, following the proposed improvement works. A quick deployment containment boom is currently located on the jetty platform to prevent oil from spreading in the event of a large-scale accidental oil spill. This equipment will remain in a suitable location during construction and on the jetty or pontoons once installed.

As such, while there is potential for accidental pollution during construction and operation, existing protocols put in place by MPHA would ensure that any pollution events (both small and large scale), should they occur, would be managed appropriately such that environmental effects are minimised as far as possible.

1.3 Levels of sediment bound contaminants

NRW clarification point

The baseline environmental conditions (levels of sediment bound contaminants) need to be established in support of any evaluation of effects and assessment of impacts on designated protected features (and sub-features).

Applicant response

As dredging is not required as part of the proposed works, and only minimal sediment will be disturbed temporarily during the construction phase, it is not a requirement to characterise sediment contaminant concentrations as it is considered there is no pathway for significant effect on designated protected features and sub-features.

However, for context, whilst regular maintenance dredging is not required at the Port Authority Jetty, maintenance dredging is regularly carried out in the wider area under the MHPA 10-year maintenance dredging marine licence (DML2166) including at Milford Shelf and the approach to Milford Haven, which at its nearest point is located approximately 500m from the jetty. Marine licence DML2166 also permits disposal of up to 250,000m³ material at licensed offshore disposal sites (LU168 and LU169). To support the marine licence application, sediment samples from each dredge area were collected in 2021 and analysed for heavy metals and polycyclic aromatic hydrocarbons. The WFD Compliance Assessment concluded the sediment throughout Milford Haven contains low concentrations of contaminants and that maintenance dredging will not have a non-temporary effect on water quality or cause the deterioration of the Milford Haven Outer and Inner water bodies.

Therefore, given proposed works would not disturb significant volumes of sediment (both spatially or temporally), and particularly in comparison to existing maintenance dredging operations, effects on water quality, and therefore designated protected features and sub features, through the release of sediment-bound contaminants are not predicted.

2 Benthic Ecology

2.1 Impacts of accidental pollution

NRW clarification point

Evaluation of accidental pollution is needed. This should consider the totality of the project, from the shore-side diesel storage facility, to pollution from vessels and plant associated with the works. Any

habitats or species at risk of impact in the event of the spillage or release of contaminants should be included for evaluation. Consideration of the subfeatures of the designated features of the SACs on the evaluation is required, in particular where these sub-features are listed as sensitive (seagrass, maerl etc.).

Applicant response

As outlined in **Section 1.2** of this document, there is potential for accidental pollution during construction and operation. However, existing protocols adopted by MPHA would ensure that any pollution events (both small and large scale), should they occur, would be managed appropriately during construction and operation. During construction there is limited potential for impacts associated with accidental pollution given the best practice measures in place to minimise risks. For example, bunding, storage facilities and spill kits will be employed to contain and prevent the release of fuel, oils and chemicals associated with the plant, refuelling and construction equipment into the marine environment.

Further information and an assessment of potential impacts to subfeatures of the Pembrokeshire Marine SAC, seagrass and maerl, is provided in **Section 2.3** of this note.

2.2 Best practice

NRW clarification point

The WFD assessment mentions mitigation through best practice. Further detail of these mitigation measures is required.

Applicant response

As referenced in the supporting documents provided, works will be undertaken in line with standard industry practice, such as NRW's 'Guidance for Pollution Prevention for work or maintenance in or near the water'. The following measures would be implemented (for reference the relevant sections of the guidance have been provided):

- *Section 5.1 Pollutant containment* – a secondary containment system such as bunding will be employed to contain and prevent the release of fuel, oils and chemicals associated with the plant, refuelling and construction equipment into the marine environment.
- *Section 5.4 Painting* – Coatings and treatments will be suitable for use in the marine environment.
- *Section 7 Invasive Non-Native Species* – All equipment, materials, machinery and PPE used will be in a clean condition prior to their arrival on site, and upon removal from site, to minimise risk of introducing non-native species into the marine environment.

2.3 Benthic ecology and potential effects

NRW clarification point

*The environmental report should include a specific section on benthic ecology and potential effects given that the works are located within the SAC. A baseline characterisation survey of the benthic environment under the footprint of the proposed works is needed, primarily in the areas of the new piling works, but also in adjacent areas to understand potential secondary impact pathways. It should be ascertained whether seagrass (*Zostera marina*) and maerl are in close proximity to the proposed works and whether they are likely to be impacted either directly or indirectly by the proposed piling works. Further mitigation measures may be required if sensitive habitats are located in or close to the impact zone. This baseline should then be used to inform the benthic ecology assessment of the environmental report.*

Applicant response

Further information and an assessment of potential impacts to subfeatures of the Pembrokeshire Marine SAC, seagrass and maerl, is provided below.

Published in 2014, a Recreational Users Voluntary Agreement for the Pembrokeshire Marine SAC¹ outlines a “sensitive habitat zone” which was designed to protect seagrass and maerl habitats within the SAC. The boundary of the Gelliswick to Lindsaway Bay sensitive habitat zone is located approximately 300m west of the jetty, which is the nearest evidence for the presence of seagrass and maerl habitat to the jetty. As such, as no seagrass or maerl habitat is present within the works area, there is no potential for direct impacts such as loss or damage.

There is potential for small-scale sediment disturbance as a result of the piling and use of a jack up rig which may result in smothering or reduction in water quality.

MarLIN's sensitivity assessments suggest that seagrass populations are likely to survive short-term increases in turbidity and are tolerant to light (up to 5cm of fine material) smothering and siltation². Maerl beds are considered to have medium sensitivity to increases in suspended solids due to the reduction in light availability for photosynthesis³. Smothering and siltation may also lead to a reduction in water flow through maerl beds and reducing the habitat complexity. However, there is very limited potential for indirect impacts to seagrass and maerl habitats given that the proposed works would not disturb significant volumes of sediment and any increases in suspended sediment and/or turbidity would be temporary and small-scale in nature. As set out in Section 1.1 the ‘Zol’ for turbidity (and therefore deposition) is considered to be limited to the area immediately adjacent to each pile and therefore does not extend past the existing footprint of the jetty. Therefore, no indirect effects on the subfeatures of the Pembrokeshire Marine SAC are predicted to occur.

2.4 Biosecurity risk assessment

NRW clarification point

It is expected that a biosecurity risk assessment is undertaken to ensure that any marine invasive non-native species present are dealt with and disposed of in an appropriate manner as the Milford Haven waterway is a known hotspot for marine invasive non-native species.

Applicant response

As Statutory Harbour Authority MHPA typically require a Biosecurity Risk Assessment to be undertaken prior to works being undertaken and is likely to be included as a marine licence condition. Therefore, a Biosecurity Risk Assessment will be undertaken to fulfil the MHPA requirements.

3 Fish

3.1 Piling noise impacts

NRW clarification point

Fish species of significant conservation value migrate through or spawn in the area. Further information is required on the proposed piling activities to understand the risk to spawning and migrating fish species.

¹ [Jun-2014-Final-Annex-to-Vol-Agreement.pdf](#)

² [Zostera \(Zosterella\) noltei beds in littoral muddy sand - MarLIN - The Marine Life Information Network](#)

³ [Maerl beds - MarLIN - The Marine Life Information Network](#)

A more detailed assessment of piling noise impacts to fish is required. Not enough information has been provided regarding the proposed piling activities (e.g., piling hours, number of piles, etc). This should be considered and noise modelling for the different piling types produced to understand the zone of impact of different noise impact thresholds. Timing restrictions may be needed for piling activities depending on the results of the noise modelling and assessment, and the duration and intensity of the piling activities.

Applicant response

Further information and an assessment of the piling noise impacts to spawning and migratory fish species is provided below.

Migratory fish species

In line with the methodology outlined, the majority of piling will be undertaken using a vibrating hammer or drilling method and the use of percussive piling would be minimal as it is only required to fully secure the piles once piling depth has been achieved using either drilling or vibratory piling. Nedwell et al (2006)⁴ carried out a study on the effects of underwater piling noise on salmonids. The study found no startle response was seen for any of the piles driven by vibropiling. The study also observed that for the two minutes prior to piling and for the first two minutes during piling activity levels remained the same suggesting vibropiling is unlikely to cause significant impacts to migratory salmonids.

With a pile diameter of up to 600mm, it is expected that minimal percussive piling will be required to fully secure the piles. However, an assessment of the worst-case scenario is provided here. Each pile is expected to require a day to install, which includes piling (vibratory, drilling and percussive) as well as any mobilisation and demobilisation of equipment. As such the percussive element for each pile will be limited to less than 1 hour per day. As piling works would be limited to daylight hours this leaves a large window of time (minimum of 12 hours) where no substantial noise will occur during the programmed piling works. Keefer et al (2012)⁵ determined sustained (e.g. over >1 hour) swim speeds for river and sea lamprey of between 0.35 and 0.7 m/s, which would allow individuals to travel between 15.12 and 30.24 km over a 12-hour period. Therefore, during the night, when lamprey typically migrate, the 12-hour period would allow lamprey (and any other migratory fish species) to pass through the majority of the Milford Haven Waterway when piling is not being undertaken.

It should also be noted that this conclusion is based on the worst-case scenario by which percussive piling noise would completely block fish migratory routes. However, given the width of the Milford Haven Waterway is over 1km at the PAJ location (calculated at the closest point to the Terminal located to the South), the zone of impact is not expected to extend into the main channel, which is over 550m away, and certainly not expected to extend the full width of the channel. Therefore, even whilst the proposed piling works are being undertaken, and in the unlikely event that migration is occurring during the day, part of the channel would be available for migratory fish to pass through.

Spawning fish species

Herring spawn on gravel and similar habitats such as coarse sand or maerl beds. Milford Haven is one of many areas in the UK supporting herring populations, and spawning is known to occur at the entrance to the estuary (Ellis et al., 2012)⁶. Whilst herring spawning may occur in Milford Haven, as it is in regular

⁴ Nedwell, J., Turnpenny, A., Lovell, J. M. and Edwards, B. (2006). An investigation into the effects of underwater piling noise on salmonids. The Journal of the Acoustical Society of America 120: 2550-4.

⁵ Keefer, M. L., Clabough, T. C., Jepson, M. A, Johnson, E. L., Boggs, C. T. and Caudill, C. C. (2012). Adult Pacific Lamprey Passage: Data Synthesis and Fishway Improvement Prioritization Tools.

⁶ Ellis, J.R., Milligan, S.P., Readdy, L., Taylor, N. and Brown, M.J. (2012). Spawning and nursery grounds of selected fish species in UK waters. Science Series Technical Report no. 147, Cefas [Online] Available at: <https://www.cefas.co.uk/publications/techrep/techrep147.pdf>.

use the PAJ area is considered unlikely to provide a suitable spawning ground, therefore no pathway for direct impacts has been identified. There is potential for indirect impacts as a result of piling noise, however, given the limited requirement for percussive piling, proposed works would not impact spawning grounds in the wider Milford Haven Waterway and thus no significant impacts on spawning fish species are anticipated.

Though percussive piling is considered unlikely to have a significant effect on migratory or spawning fish species due to the short-term and temporary nature of the impact, to further reduce the potential for adverse effects all percussive piling will be undertaken using soft-start procedures. This will be undertaken in-line with JNCC guidance, to minimise the potential for impacts to migratory fish that may be present in the vicinity of the works. The soft-start duration to ensure incremental increases in pile power over a set time period until full operational power is achieved will be a period of no less than 20 minutes. Should piling cease for a period greater than 10 minutes, then the soft start procedure will be repeated.

Based on the existing assessment provided in the HRA, as well as the further information provided above, it is considered that no additional assessment is required on this matter.

4 Marine Mammals

4.1 Underwater noise impacts

NRW clarification point

No assessment has been completed to quantify the impact and severity of impact from underwater noise to marine mammals. To fully assess the impact on marine mammals, additional information is required in relation to disturbance and injury from underwater noise.

Applicant response

An assessment of underwater noise impacts to marine mammals was included in the HRA, in which this topic was carried forward to the Appropriate Assessment stage. Further information, considering disturbance and injury as separate impact pathways is included below.

Disturbance

Noise can lead to the disturbance of marine mammals when at haul-outs, causing them to flee and resulting in excessive energy use. The closest grey seal haul-out sites are on Skomer Island, approximately 12 km from the proposed works. Given the distance from the proposed works, there is no pathway for disturbance impacts to grey seals at this site associated with underwater noise.

Injury

There is potential for grey seals, harbour porpoise and bottlenose dolphin to be present within the Milford Haven Waterway and underwater noise associated with percussive piling activities could cause permanent or temporary auditory injury. As marine mammals rely on hearing to communicate, navigate and hunt, any underwater noise disturbance can impact their ability to carry out these functions.

Guidance from Southall et al. (2019) categorises marine mammals by their hearing sensitivity, see Table 1.

Table 1 Marine mammal hearing groups from Southall et al., 2019

Hearing group	Generalised hearing range	Example species
Low-frequency cetaceans	7 Hz to 35 kHz	Baleen whales
High-frequency cetaceans	150 Hz to 160 kHz	Dolphins, toothed whales, beaked whales, bottlenose whales (including bottlenose dolphin)
Very high-frequency cetaceans	275 Hz to 160 kHz	True porpoises (including harbour porpoise)
Phocid carnivores in water	50 Hz to 86 kHz	True seals (including harbour seals)

Southall et al. (2019) presents noise impact thresholds for these hearing groups based on the nature of the sound (impulsive or non-impulsive) and the auditory injury of concern described as:

- Permanent Threshold Shift (PTS) which is unrecoverable reduction in hearing sensitivity, considered the higher severity impact; and
- Temporary Threshold Shift (TTS) which is short term reduction in hearing sensitivity, considered the lower severity impact.

Assessment

In line with the methodology outlined, the majority of piling will be undertaken using a vibrating hammer or drilling method and with a pile diameter of up to 600mm, it is expected that minimal percussive piling will be required to fully secure the piles. Therefore, considering the worst-case use of percussive piling, the criteria set out by Southall et al. (2019) for PTS and TTS in marine mammals in response to impulsive noise sources have been assessed, see Table 2. Potential instantaneous effects based on the single-strike metric peak sound pressure level (SPL), $L_{p,pk}$, are considered as a worst-case scenario.

Table 2 Peak SPL ($L_{p,pk}$) criteria for PTS and TTS in marine mammals (Southall et al., 2019)

	Peak SPL ($L_{p,pk}$) (dB re 1 $\mu\text{Pa}^2\text{s}$)	
	Impulsive	
	PTS	TTS
Low-frequency cetaceans	219	213
High-frequency cetaceans	230	224
Very high-frequency cetaceans	202	196
Phocid carnivores in water	218	212

Noise levels generated from percussive piling activities vary considerably based on a number of factors including pile diameter, hammer energy and the surrounding environment (i.e. water depth and obstructions). For example, Nedwell et al. (2002)⁷ indicated piling of 700 mm diameter piles in the River Arun as generating a SPL of 191 dB re 1 $\mu\text{Pa}^2\text{s}$ at 1m from the source. Similarly, underwater noise measurements of piling undertaken at the Red Funnel Terminal in Southampton, for piles between 508 and 914 mm diameter, show the SPL as approximately 194 dB re 1 $\mu\text{Pa}^2\text{s}$ at source (Nedwell et al., 2003a)⁸. Whereas measurements taken during the construction of offshore windfarms in the UK indicate

⁷ Nedwell, J. R., Turnpenny, A. W. H., and Edwards, B. (2002). Piling on the River Arun; implications for salmon migration.

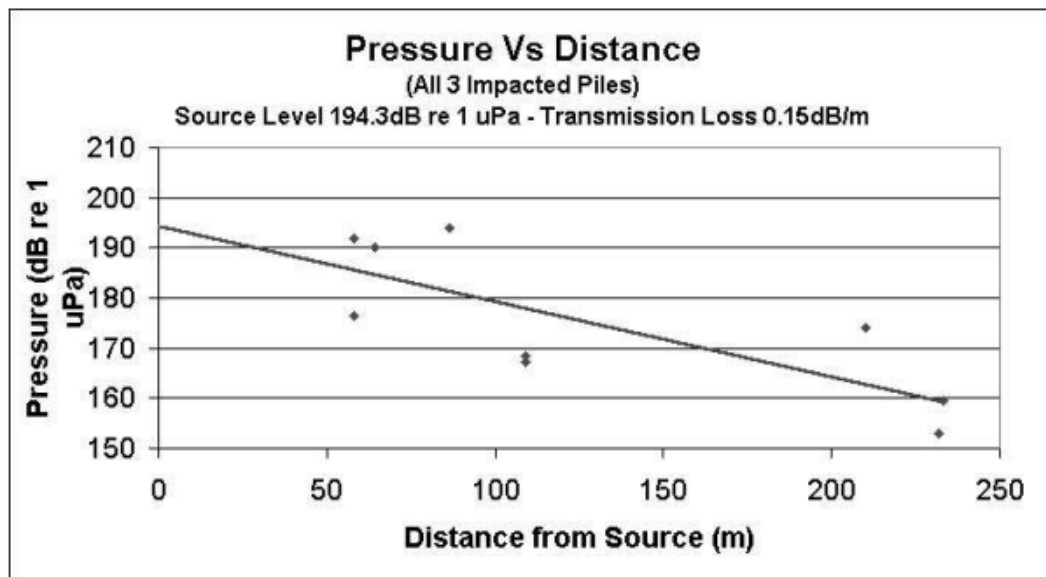
⁸ Nedwell, J. R., Turnpenny, A. W. H., Langworthy, J., and Edwards, B. (2003a). Measurements of underwater noise during piling at the Red Funnel Terminal, Southampton, and observations of its effect on caged fish. Subacoustech Report No. 558 R 0207.

SPL of 260 dB re 1 μ Pa²s (1m from source) associated with piling of 4,300 mm diameter piles (Nedwell et al., 2003b)⁹.

As outlined in the ER, pile diameter is anticipated to be up to 600 mm for the proposed works and given the relatively shallow water depths at the Port Authority Jetty, the noise measurements from the River Arun and Southampton Terminal are considered most likely to reflect those potentially generated as part of the proposed works. As such, the SPLs indicated in both cases remain below the PTS and TTS thresholds set by Southall et al. (2019) suggesting limited potential for auditory injury to marine mammals of all hearing groups.

Additionally, sound generated is expected to reduce with distance from the piling. As part of the study for the Red Funnel Terminal in Southampton, Nedwell et al. (2003a) identified a 0.15 dB reduction in SPL per metre from the source (see Figure 1). While other factors may affect this, a similar reduction is anticipated at Port Authority Jetty, reducing the potential for disturbance impacts to marine mammals that could be present within the vicinity of piling works.

Figure 1 Relationship between SPL (dB re 1 μ Pa²s) and distance for impact piling (Nedwell et al., 2003b)



Whilst estimated noise levels are not expected to cause permanent or temporary auditory injury to marine mammals from percussive piling, the following mitigation measures were proposed to reduce the risk of disturbance (see Section 5: Appropriate Assessment in the HRA submitted as part of the application):

- All percussive piling will be undertaken in line with Joint Nature Conservation Committee (JNCC) guidance (JNCC, 2010)¹⁰.
- All percussive piling will be undertaken using soft-start procedures to ensure incremental increase in pile power over a set time period until full operational power is achieved. The soft-start duration should be a period of no less than 20 minutes. Should piling cease for a period greater than 10 minutes, then the soft start procedure must be repeated.

⁹ Nedwell, J. R., Langworthy, J., and Howell, D. (2003b). Assessment of sub-sea acoustic noise and vibration from offshore wind turbines and its impact on marine wildlife; initial measurements of underwater noise during construction of offshore windfarms, and comparison with background noise. Subacoustech Report No. 544 R 0424.

¹⁰ JNCC, 2010. Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise

It should be noted that the further assessment provided above considers the worst-case noise levels, based on the use of percussive piling methods. However, in line with the methodology provided, the majority of piling will be undertaken using a vibrating hammer or drilling method and the use of percussive piling would be minimal (approx. 1 hour per day), and would only be used in combination with other methodologies to fully secure piles where required. No further mitigation measures, over and above those proposed, are therefore considered necessary.