MONA OFFSHORE WIND PROJECT

Annex 3.1 to the Applicant's response to Relevant Representation at the Procedural Deadline

Applicant's Response to Relevant Representation from Natural Resources Wales (NRW) - Impacts on Marine Mammals from Elevated Underwater Sound Due to Vessel Use

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Image of an offshore wind farm

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RPS	**Mona Offshore Wind Ltd.**

Contents

Glossary

Term	Meaning
Applicant	Mona Offshore Wind Limited.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP).
Mona Offshore Wind Project	The Mona Offshore Wind Project is comprised of both the generation assets, offshore and onshore transmission assets, and associated activities.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects.

Acronyms

Acronym	Description
CPODs	Echolocation Click Detectors
CTVs	Crew Transfer Vessels
DCO	Development Consent Order
EWG	Expert Working Group
NRW	Natural Resources Wales
PEIR	Preliminary Environmental Information Report
SPL	Sound Pressure Level

Units

Unit	Description
%	Percentage
dB	Decibel
kHz	Kilohertz
Km	Kilometres
m	Metres
Min	Minutes
SPL_{rms}	Sound Pressure Level (root mean square)

1 Applicant's Response to Relevant Representation from Natural Resources Wales (NRW) - Impacts to Marine Mammals from Elevated Underwater Sound Due to Vessel Use

1.1 Introduction

1.1.1.1 This document has been prepared by the Applicant in response to Section 2.2.2 of Natural Resources Wales (NRW) Relevant Representation (RR-011), which relates to Volume 2, Chapter 4, Marine mammals (APP-056) for the Mona Offshore Wind Project.

1.1.1.2 Except from Section 2.2.2 of the NRW Relevant Representation (RR-011)):

2.2 Injury and disturbance to marine mammals from elevated underwater sound due to vessel use and other (non-piling) sound producing activities.

KEY CONCERN: We acknowledge and welcome the information provided with regard to vessel traffic data (Vol. 2, Chapter 4 Mona ES – Marine Mammals; Figs 4.24 & 4.25) [APP-056], as well as the information provided in Vol. 6, Annex 7.1: Navigational Risk Assessment (NRA) [APP-098] of the ES. However, there is ***inadequate justification for an overall conclusion of low magnitude.*** *We note that the estimated numbers of animals disturbed by vessels and any subsequent conclusions are based on* ***static impact radii.*** *Given the known sensitivity of harbour porpoise, in particular to vessel noise, and the increase in the number of vessels in the area compared to baseline vessel traffic, we advise that the assessment is revised and quantified both for the project alone and in-combination with other projects.*

1.1.1.3 This document has been prepared in response to this Relevant Representation point and serves as the Applicant's response to row RR-011.28 in the Applicant's Comments on Relevant Representations (Document Reference: S_PD_3).

1.2 Response

1.2.1.1 The Applicant notes that the NRW query about static impact radii was not raised in their S42 responses to the statutory consultation on the Preliminary Environmental Information Report (PEIR) or through the Expert Working Group (EWG) Process.

1.2.1.2 The NRW S42 responses agreed it was unrealistic to assess injury and disturbance from vessel use by presenting a sum of the impact ranges of all vessels within each offshore windfarm (page 182 of Consultation Report Appendices - Part 3 (D.25 to F) (APP-040). Following these responses, the Applicant included further evidence and a more detailed approach in the assessment of elevated underwater sound from vessels in the final Environmental Statement (ES) (see Volume 2, Chapter 4, Marine mammals (APP-056)) to justify the conclusion of low magnitude. The Applicant retains their position that summing the impact ranges would not be realistic, as it is highly unlikely that all non-piling construction activities and all vessels would be on site at any one time.

1.2.1.3 In responding to the Relevant Representation point outlined above, the Applicant has drawn further detail from the studies already presented in the marine mammal assessment of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in section 4.9.5 and 4.11.5 of Volume 2, Chapter 4: Marine mammals (APP-056)). However, the Applicant has also drawn on several relevant studies published since the finalisation of the ES assessment, which provide further support for the Applicant's conclusion of low magnitude presented in section 4.9.5 in Volume 2, Chapter 4: Marine mammals (APP-056).

1.2.1.4 Studies presented in Volume 2, Chapter 4: Marine mammals (APP-056) have been based on moving receptors in the field. Empirical data has been gathered from field studies on wild harbour porpoise to determine realistic impact ranges and a quantification of the number of animals potentially affected based on densities of key species has been provided. For example:

- Wisniewska *et al.* (2018) used animal-borne acoustic tags on seven harbour porpoise in coastal waters with high levels of vessel traffic and suggested a maximum reaction distance of 7 km (based on a single vessel pass, for a single harbour porpoise). Vessel Automatic Identification System (AIS) data and the rapid increase and decrease in sound levels suggested this reaction in one harbour porpoise was in response to a fast ferry moving between the island of Zealand and the Jutland Peninsula, with a recorded speed of 33 knots and a closest approach to the harbour porpoise of 140 m. Notably, the speed recorded for the vessel in this study was much faster than speeds of vessels involved in the construction phase at the Mona Offshore Wind Project, which, as detailed in section 4.9.5 and 4.9.6 in Volume 2, Chapter 4: Marine mammals (APP-056), are likely to be travelling at a speed slower than 14 knots and will be adhering to measures to minimise disturbance to marine mammals and rafting birds from transiting vessels (APP-203). Wisniewska *et al.* (2018) showed the harbour porpoise dove away from the surface while fluking vigorously when the 0.5 s 16 kHz third octave levels increased to 100 dB re 1 mPa, but when the noise levels decreased again, the animal resurfaced. Regular foraging behaviour resumed eight minutes later, 15 min after it was first interrupted. A similar reaction was recorded from a different harbour porpoise to a ferry travelling at an estimated speed of 14.5 knots with closest approach distance of 80 m. Although most exposures are at low levels, occasional high-level exposures with rapid onset occur when vessels pass close to animals or at high speeds. The study highlighted that the tagged harbour porpoises did not appear to avoid areas with high levels of vessel traffic such as those deeper channels which allow large ships access to ports or open water, perhaps because these overlapped with important foraging habitats.
- For harbour porpoise, Benhemma-Le Gall *et al.* (2021) demonstrated displacement up to 4 km from construction vessels at Beatrice Offshore Windfarm and Moray East Offshore Windfarm. The study used AIS data integrated with engineering records from construction vessels that were not limited to the more static vessels (e.g. heavy lift jack-up vessels, Cable Laying Vessels) and included guard vessels, Crew Transfer Vessels (CTVs) and high-speed crafts. Harbour porpoise responses were measured using arrays of echolocation click detectors (CPODs) which were deployed in 25 km by 25 km impact and reference blocks throughout the construction period (2017 to 2019). Calibrated noise recorders were deployed at three locations to characterise variation in underwater sound levels. The magnitude of harbour porpoise responses was then quantified in relation to changes in the acoustic environment and vessel activity. Harbour porpoise responses decreased as the mean vessel distance increased (−24% at 3 km) until no apparent response was observed at 4 km (+ 7.2%). Harbour porpoise is a species known to be sensitive to vessel

presence and often shows avoidance behaviour; therefore, it is likely that other cetaceans will be displaced to a similar extent (or less).

- Graham *et al.* (2019) used echolocation detectors and noise recorders to assess harbour porpoise responses to piling, over 10-month foundation installation of a North Sea windfarm. Whilst the focus of the study was on response to piling, AIS detections within 1 km/500 m of each CPOD allowed a control for disturbance by vessel activity. The study indicated higher vessel activity within 1 km was significantly associated with an increased probability of response in harbour porpoise.

1.2.1.5 In a supporting study, Frankish *et al.* (2023) which was published following finalisation of the ES, tracked ten harbour porpoises for 5 to 10 days to determine exposure and behavioural reactions to modelled broadband noise (10 Hz–20 kHz, VHF-weighted) from vessels monitored by AIS. Animals changed behaviour when approached by ships, by moving an average of 3.2 km away (range = 0.2 to 6 km) from 13.6 different ships every day (20% of which were tankers). Animals also dove deep in response to 5.7 ships during the night, for an average of 16.3 mins. Frankish *et al.* (2023) demonstrated highest deterrence probabilities occurred at short distances from ships (<300 m), but also demonstrated individuals occasionally reacted to loud ships located further away, albeit with lower probability (e.g. individuals had a 5 to 9% risk of being deterred by very noisy ships at distances of >2 km).

1.2.1.6 Whilst close proximity to ships has shown behavioural changes in marine mammals, recent studies have demonstrated animals may persist in areas with high levels of vessels and thus elevated underwater sound are part of the baseline.

1.2.1.7 In a supporting study, released after the submission of the Application, Owen *et al.* (2024) studied the long-term presence of harbour porpoises during the rerouting of the major shipping lane through the Kattegat into the Baltic Sea. The study used mean monthly AIS vessel data and modelled underwater sound to monitor vessel traffic and underwater noise over two years and CPODs recorded harbour porpoise presence and foraging behaviour. Despite changes observed in vessel traffic and sound levels, no significant changes were found in monthly presence or foraging behaviour. Presence and foraging behaviour remained the same in areas of increased underwater sound and increased vessel traffic and there was no increase in presence in areas where the vessel traffic/sound levels had decreased, suggesting that the harbour porpoises had not moved to quieter areas. The study suggested harbour porpoise have preferred habitat that they continued to use, even when faced with sudden changes in vessel traffic and noise levels. Owen *et al.* (2024) demonstrated no detected change in monthly presence of foraging behaviour as a result of the shift in shipping lane location.

1.2.1.8 Similarly, Oakley *et al.* (2017) (which was included in paragraphs 4.9.5.22/4.9.5.30 of Volume 2, Chapter 4: Marine mammals (APP-056) studied reactions of harbour porpoise to vessel traffic in the coastal waters of South West Wales, UK. They observed 2,153 vessels from seven land-based sites noting interactions with harbour porpoise. Vessel types included large commercial cargo ships, kayaks, recreational/commercial fishing vessels, rib, jet-ski, speedboat, cruiser and yachts. The study found 74% of interactions were neutral, with harbour porpoise showing no change in directional movement prior to, and after the arrival of the vessel. The mean distance for a neutral reaction to a vessel approach was approximately 250 m (ranging between 10 m to 1 km). At Port Talbot docks, there were five cases of continuing presence of harbour porpoise near large cargo ships, often alongside the ship or within 800 m of it, indicating habituation to the stationary ships, vessel traffic at the site and associated sound. Comparatively, Veneruso *et al.* (2011) recorded 13% negative response behaviour, 6% positive and 82% neutral responses in bottlenose dolphin to vessel interactions in New Quay bay, West Wales. Oakley *et al.* (2017) recorded 10 instances (26%) of negative behaviour in harbour porpoises, with the mean distance from a vessel for a negative reaction circa 25 m.

1.2.1.9 As presented in 4.9.5.39 of Volume 2, Chapter 4: Marine mammals (APP-056), Jones *et al.* (2017) found a large degree of predicted co-occurrence of vessels and grey/harbour seals around the UK, especially within 50 km of the coast near seal haul outs. To the Applicant's knowledge, there is no evidence that relates decreasing seal populations with high levels of co-occurrence between ships and animals (Thomsen *et al.*, 2006). Thomsen *et al.* (2006) estimated that both harbour and grey seals will respond to small (~2 kHz) and large (~0.25 kHz) vessels at approximately 400 m.

1.2.1.10 Importantly, even where disturbance effects have occurred in relation to vessel presence, animals have been shown to quickly return to areas of disturbance.

1.2.1.11 In a supporting study, released after the submission of the Application, Hao *et al.* (2024) used drone video footage to study harbour porpoises reactions to boats approaching at different speeds (10 or 20 knots). Though focused on small vessels, the study found that porpoises generally reacted within proximity (<200 m) and quickly (<50 s) resumed their natural behaviour once the boat had passed. The direct impact of the boat was brief, and behaviour during exposure was similar to behaviour prior to exposure. Similar late responses and quick recovery times have also been observed in other species such as bottlenose dolphin (Lemon *et al.*, 2006, Ribeiro *et al.*, 2005), and is potentially a strategy to reduce unnecessary energy expenditure. As mentioned in paragraph 4.9.5.41 of Volume 2, Chapter 4: Marine mammals (APP-056), Wisniewska *et al.* (2018) showed that despite potential short-term effects on foraging, harbour porpoise recover quickly from vessel traffic and remain in areas of high traffic, even after diving from fast ferries. Therefore, there is evidence from scientific peer-reviewed literature indicating that animals can return quickly to the area. Thus, whilst there might be an initial immediate avoidance behaviour to vessels, animals would be likely to return to the area and vessel presence is therefore unlikely to elicit an effect of ongoing displacement.

1.2.1.12 Therefore, the Applicant considers that assessing the footprint of disturbance for a moving vessel as a continuous area from point A to B along a potential shipping route, based upon a precautionary effect range, would lead to an overestimate of the effect as it would not consider rapid recovery of animals as the vessels pass and therefore would not be an appropriate way of assessing disturbance.

1.2.1.13 Evidence suggests that other characteristics of individual ship encounters in addition to noise and proximity, such as route predictability (steady vs. erratic paths) or speed may be important drivers of negative reactions (Baş *et al.*, 2015, Oakley *et al.*, 2017). Harbour porpoises may become accustomed to regular and predictable transits, such as those routes to and from the Mona Array Area. As discussed in 4.9.5.22 of Volume 2, Chapter 4: Marine mammals (APP-056), vessel type and speed (rather than presence) were relevant factors in reactions of harbour porpoise to vessels. Of the negative reactions recorded, 75% were in response to high-speed or planing-hulled vessels (e.g. speed boats). In terms of vessel speed, of the negative reactions, 60% were in response to steady speeds and 40% to fast speeds. Cargo, recreational fishing and speedboats were the main vessel types accounting for negative reactions.

1.2.1.14 Supplementary evidence from Hao *et al.* (2024) found harbour porpoise responses were linked to the speed of the approaching boat (and therefore the rate of change in sound level), rather than to sound intensity (as the received sound level did not vary with boat speed). Harbour porpoise were more likely to move further away from the boat path when approached at slower speeds (10 knots) than at faster speeds (20 knots). Conversely, they swam faster when approached at faster speeds (20 knots) and slowed down again once the boat has passed (<50s after) than when approached at slower speeds (10 knots). Hao *et al.* (2024) suggested the direct impact of the boat was brief, and the behaviour of harbour porpoise during exposure was similar to the behaviour prior to exposure. Therefore, for slower-moving vessels, such as those involved in the construction and operations and maintenance phase of the Mona Offshore Wind Project, animals may move away when vessels travel through rather than remain in the vicinity of the vessel and then resume activity once boats have passed.

1.2.1.15 Therefore, the use of existing shipping routes, where possible, and measures adopted as part of the Mona Offshore Wind Project (as set out in section 4.8 of Volume 2, Chapter 4: Marine mammals (APP-056)) will aid in reducing the potential for negative behavioural reactions. In particular, the Applicant has committed to the development of and adherence to an Offshore EMP, including Measures to minimise disturbance to marine mammals and rafting birds from transiting vessels (APP-203). These measures require vessels to not deliberately approach marine mammals as a minimum and avoid abrupt changes in course or speed should marine mammals approach the vessel to bow-ride, where appropriate and possible considering all technical considerations. APP-203 secures a commitment that the site induction processes will incorporate the principles of the Wildlife Safe (WiSe) Scheme to ensure that key personnel are aware of the need to follow the WiSe Code of Conduct. The WiSe Scheme is a UK national training scheme for minimising disturbance to marine life. The approval of an Offshore EMP and Measures to minimise disturbance to marine mammals and rafting birds from transiting vessels by the licencing authority are secured under Schedule 14, Condition 18(1)(e) of the Draft Development Consent Order (DCO) (APP-023) and in the Marine Licence Principles Document (APP-195).

1.2.1.16 Furthermore, the Applicant considers the assessment to be a robust and precautionary assessment of the potential disturbance from vessels, particularly because modelling does not take into account background ambient noise, meaning ranges are likely to be over-precautionary. It is likely that sound pressure levels (SPL) in the local environment will already be as high as the continuous behavioural disturbance threshold of 120 dB re 1 μPa (SPL_{rms}) for marine mammals much of the time (Xodus, 2014). As detailed in 4.9.5.17 and 4.9.8.10 in Volume 2, Chapter 4: Marine mammals (APP-056), background noise levels in the sea of 130 dB re 1 μPa for UK coastal waters are not uncommon (Farcas *et al.*, 2020, Nedwell *et al.*, 2007).

1.2.1.17 It is also difficult to quantifiably assess the direct responses of animals to vessel noise, as effects are only measurable when there are step changes in the noise level above the gradually increasing baseline levels (Tournadre, 2014), such as those directly owing to changes in vessel speed or routing. Wisniewska *et al.* (2018) highlighted in their study that there is a lack of baseline ‘sound-free’ periods for which to compare against and suggested that demonstrating behavioural responses to noise under natural conditions convincingly is notoriously difficult, particularly because the history of the animal's exposure to vessel noise is rarely known.

1.2.1.18 The range of distances from empirical studies (1 to 7 km) used in Volume 2, Chapter 4: Marine mammals (APP-056) as an effective impact range exceed those from the underwater sound modelling (~4 km), and as a result, the numbers of animals predicted to be disturbed are highly precautionary. Therefore, the potential number of harbour porpoise predicted to be disturbed per vessel (of 0.07% of the Management Unit (MU)) represents an absolute worst case scenario. Using the maximum vessel impact range of 4 km from the underwater sound modelling (see Volume 3, Annex 1: Underwater Sound Technical Report (APP-079)) the potential number of harbour porpoise predicted to be disturbed per vessel would be 0.02% of the harbour porpoise MU. In reality, the number of animals likely to be affected will be considerably less (particularly given this is a simplistic model that does not account for prior exposure, baseline sound levels or any dose response).

1.2.1.19 Therefore, the Applicant defends the overall conclusion of **low** magnitude presented in Volume 2, Chapter 4: Marine mammals (APP-056), which is based upon a robust scientific assessment which is appropriate to the impact of underwater sound from vessels. The Applicant has based the potential numbers of animals (and, as such, the assessment of magnitude) on peer-reviewed scientific studies of responses from harbour porpoise in the field, in addition to presenting the radii from underwater sound modelling of vessels to be utilised at Mona Offshore Wind Project. This is a highly precautionary approach given the ranges used from the literature are further than those from the underwater sound modelling (Volume 3, Annex 1: Underwater Sound Technical Report (APP-079)).

1.2.1.20 The Mona Offshore Wind Project lies in an area which already experiences high levels of vessel traffic (see paragraph 4.9.5.7/4.9.5.39 of Volume 2, Chapter 4: Marine mammals (APP-056)) and animals may already experience levels of tolerance or habituation to vessel sound and have adapted to existing shipping routes, given they are regularly seen in the marine mammal study area. Furthermore, the underwater sound modelling is precautionary as it does not incorporate any baseline levels of underwater sound in the Irish and Celtic Sea, and in reality, animals already experience baseline levels of vessel noise over the study area. The assessment is based upon a worst-case scenario (i.e. the maximum design scenario) both for the Mona Offshore Wind Project alone and all other projects in-combination, and all projects are expected to adopt measures to reduce any significant injury and/or disturbance from vessel noise (such as the Offshore EMP including measures to minimise disturbance to marine mammals and rafting birds from transiting vessels for the Mona Offshore Wind Project). Therefore, there are multiple levels of precaution already built into the assessment, and the Applicant considers there is adequate justification provided for the assessment of the Mona Offshore Wind Project alone or in-combination with other projects and for the determination of **low** magnitude effects.

1.3 References

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