THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

Rampion Two Offshore Wind Farm

Appendix E5 to the Natural England Deadline 5 Submission

Natural England's Advice on Fish and Shellfish

For:

The construction and operation of the Rampion 2 Offshore Windfarm located approximately 13km off the Sussex coast in the English Channel.

Planning Inspectorate Reference EN010117

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09 July 2024

Natural England's Advice on Fish and Shellfish

In formulating these comments, the following documents have been considered:

- [REP4-053 & REP4-054] - 7.17 In Principle Sensitive Features Mitigation Plan Rev D (clean & tracked)
- [REP4-055 & REP4-056] - 7.18 Offshore In Principle Monitoring Plan Rev B (clean & tracked)
- [REP4-057 & REP4-058] - 7.22 Commitments Register Rev D (clean & tracked)
- [REP4-061 & REP4-062] - 8.25.1 Applicant's Post Hearing Submission – ISH 1 Appendix 9 - Further information for Action Points 38 and 39 – Underwater Noise Rev B (clean & tracked)
- [REP4-067] - 8.40 8.40 ITAP - Information to support efficacy of noise mitigation abatement techniques with respect to site conditions at Rampion 2 Offshore Windfarm
- [REP4-071] - 8.67 Without Prejudice Stage 2 Marine Conservation Zone (MCZ) Assessment Rev A
- [REP4-078] - 8.74 Without Prejudice Measures of Equivalent Environmental Benefit Review Rev A

We note that the Applicant has provided [REP4-081] - 8.80 Schedule 18 - Measures of Equivalent Environmental Benefit (on a without prejudice basis) Rev A. This will be considered for deadline 6 alongside our advice on the other aspects of the DCO.

1. Summary of Key Issues

Natural England highlight that the key issues raised in this Appendix relate to long standing issues we have raised through pre-application, in our relevant representations and throughout the Examination. Whilst we welcome the further information provided by the Applicant at this late stage in the Examination, it should be acknowledged that many of the concerns raised within our Relevant Representations remain unresolved.

Underwater Noise Modelling of the Worst-Case Scenario

Natural England have outstanding questions regarding the worst-case modelling scenario. We advise that a clear explanation of whether sequential or simultaneous piling has been modelled as the worst case in each situation still needs to be provided and each figure needs to be clearly labelled with which scenario it is demonstrating. Additionally, as raised in our Relevant Representations (Appendix E, Point 27), where piling is conducted simultaneously at two locations we question what the closest distance between locations is likely to be, and how this is considered in terms of impacts on the MCZ's.

Natural England understands that, based on the explanation provided by the Applicant, the north-west modelling location does not represent the worst-case piling scenario in the absence of mitigation in relation to Kingmere MCZ. Additionally, we seek clarity on whether the south-west modelling location represents the worst-case scenario for Selsey Bill and the Hounds MCZ. Without modelling of the worse-case scenario, the extent of impacts from underwater noise cannot be fully understood.

Black seabream – Kingmere MCZ

Based on our comments above regarding modelling of the worst-case scenario, we cannot rule out impacts from mortality and mortal injury on black seabream within Kingmere MCZ. We also cannot fully understand the extent of the potential impacts for recoverable injury within

the site. Based on the current information, it appears that recoverable injury, temporary threshold shift (TTS) and behavioural impact could all affect black seabream within Kingmere MCZ during a highly-sensitive lifecycle stage and would lead to the conservation objectives of the site being hindered. As such, we do not agree that the magnitude of these impacts is negligible.

Natural England, as the Statutory Nature Conservation Body, whose remit specifically relates to designated sites, advise that it is not possible to establish a threshold for black seabream below which behavioural impacts that could hinder the conservation objectives of the site would not occur. Our advice remains consistent; that the only measure that will prevent the conservation objectives being hindered is a full seasonal piling restriction from 01 March to 31 July inclusive.

Short-snouted seahorse - Beachy Head West, Beachy Head East, Selsey Bill and the Hounds MCZ, and Bembridge MCZ

Natural England notes that based on the modelling provided there is potential for the following impacts to occur on short-snouted seahorses due to underwater noise generated from piling activities in an unmitigated scenario:

- Beachy Head West MCZ – TTS and behavioural impacts
- Selsey Bill and the Hounds MCZ – behavioural impacts, with confirmation of the modelling location representing the worst-case scenario required to rule out TTS impacts

Natural England advises that to conclude that these impacts will not hinder the conservation objectives of these sites, mitigation is required. Natural England advises that short-snouted seahorses are protected year-round within the MCZs, however they are particularly sensitive to impacts/disturbance from underwater noise during the breeding season (April to October). We advise that if the Applicant committed to the full seasonal restriction we have advised for black seabream (March to July inclusive), this would also cover a proportion (approximately half) of the key breeding time for seahorses.

In relation to the rest of the year, provided that the Applicant were able to field-test and evidence that a reduction in the region of 15dB is deliverable during the 'worst-case' environmental conditions at the site, we would be in a position to conclude that the conservation objectives of the four seahorse MCZs will not be hindered due to TTS and behavioural impacts from underwater noise generated from piling. Therefore, we advise that the Applicant submits proposals for testing double bubble curtains (DBBC) outside of the sensitive seasons of other species (namely black seabream and herring) into the Examination. Natural England advises that alternative Noise Abatement Systems (NAS) should remain under consideration in the event DBBCs do not demonstrate the efficacy required.

Herring and Sandeel

Natural England defers to the advice of MMO/Cefas with regards to underwater noise impacts on herring and sandeel. We have been in regular contact with MMO/Cefas to ensure our advice into the Examination is aligned.

Noise Abatement Systems

Natural England welcomes the provision of the Information to support efficacy of noise mitigation abatement techniques with respect to site conditions at Rampion 2 Offshore Windfarm document [REP4-067] and the updated In Principle Sensitive Features Mitigation Plan Rev D [REP4-053 & REP4-054]. Having reviewed these documents, our advice is that

significant uncertainty remains over the efficacy of the measures proposed in the environmental conditions at the Rampion 2 site. Natural England has provided a detailed position on each of the NAS presented in 'Section 2 – Detailed Comments' below.

Stage 2 MCZ Assessment

Natural England welcomes the submission of a Stage 2 MCZ Assessment, given we continue to advise that in the absence of a seasonal restriction, the conservation objectives of the Kingmere MCZ will be hindered by the proposed development. We advise that there appears to be another means of proceeding (no piling from March to July inclusive) that would prevent the site Conservation Objectives from being hindered and that this should be considered within the *'Alternative ways of Proceeding'* section of the decision-maker's assessment. We note the evidence base/justifications used within the assessment reflect many of our outstanding comments/disagreements with the position presented by the Applicant, therefore we have not repeated these points in this response.

Measures of Equivalent Environmental Benefit (MEEB)

We welcome the submission of 'Without Prejudice Measures of Equivalent Environmental Benefit' [REP4-078] for consideration. Natural England's advice is that the measures as presented do not provide Equivalent Environmental Benefit.

Monitoring

Natural England supports the collection of underwater noise monitoring data to understand how noise propagates over distance from the source in the specific environmental conditions at the Rampion 2 site. Given the complex and variable environmental conditions at the site and the uncertainties of the efficacy of NAS in these conditions, we advise that the first eight piles (or eight of the first 12 piles), of each foundation type are monitored across a representative range of conditions. We advise this monitoring should be designed to consider if the noise levels are in line with the predictions made in the Environmental Statement and also if the NAS achieved a noise reduction in the region of 15dB. We have included more detailed comments on this in the sections relating to seahorses and monitoring below. We advise that an updated In Principle Monitoring Plan (IPMP) is submitted into the Examination to reflect this advice.

Natural England notes that the Applicant has stated that noise monitoring requirements expected to be published in the Defra marine noise policy paper may supersede part or all the measures in the IPMP. Natural England advises that based on the potential for the conservation objectives of MCZs to be hindered, site specific monitoring through the IPMP is still likely to be required.

2. Detailed Comments

2.1 Black seabream (*Spondyliosoma cantharus*) – Kingmere MCZ

Modelling of noise contours – North-West modelling location in relation to Kingmere MCZ

Natural England notes that the information provided by the Applicant in [REP4-074] states that *'alteration of the modelled location along the inshore boundary of the proposed DCO Order Limits could marginally reduce the distance between the proposed DCO Order limits and the MCZ boundary'.* The Applicant suggests that because this area is in the piling exclusion zone defined in the Applicant's mitigation plan, it is in fact in excess of the worst-case scenario. Natural England advises that the worst-case scenario in terms of the MCZ should be modelled to allow a full understanding of the extent of potential impacts before mitigation measures are considered. This is particularly key as the mitigation measures in this case may change based on the final decision made by the Secretary of State on the seasonal restriction and/or the final design information and mitigation plan, which will be developed post consent. Therefore, we advise that the Applicant's modelling location should be amended to represent the worst-case scenario.

We also advise that any modelling of NAS using the current modelling location may appear to show misleading results, as they are not based on the worst-case scenario. This further highlights the importance of modelling the worst-case location.

Underwater Noise Impacts

Mortality and Mortal Injury

We advise that to date none of the modelling presented has shown noise contours for this impact overlapping with the boundary of Kingmere MCZ. However, based on the information provided by the Applicant at Deadline 4 regarding the north-west modelling location not being the worst-case unmitigated scenario in relation to Kingmere MCZ, we can no longer advise that these impacts would not occur in the MCZ in an unmitigated scenario.

Recoverable Injury

We note from Figure 6.2 [REP4-062], that the unmitigated recoverable injury contour for multileg foundations overlaps with the southern boundary of Kingmere MCZ and that the same contour for monopiles is close to overlapping. Noting our point above regarding the north-west modelling location and taking into account the inevitable uncertainties around underwater noise modelling, it appears visually that moving the location to the closest point to the MCZ would create a more significant overlap for multileg foundation and initiate an overlap for monopile foundations with the MCZ. Therefore, noise levels that could create recoverable injury would be experienced by black seabream over more of the site and in relation to both foundation types. Based on the absence of modelling of the worst-case scenario, Natural England advises that the unmitigated impacts from recoverable injury relating to both monopile and multileg foundations have the potential to hinder the conservation objectives of Kingmere MCZ.

Temporary Threshold Shift (TTS)

Natural England notes that based on the modelling presented in the ES in an unmitigated scenario, noise levels that could result in TTS will occur within Kingmere MCZ. We advise that this impact has the potential to hinder the conservation objectives of the MCZ.

Behavioural Threshold

Natural England does not support the use of a 141dB or indeed a 135dB threshold in relation to behavioural impacts on the black seabream feature of Kingmere MCZ. Natural England's position is that there is not sufficient species-specific evidence in relation to the breeding behaviours of bream protected through the conservation objectives of Kingmere MCZ to robustly establish a suitable threshold. This impact has the potential to hinder the conservation objectives of the MCZ. Therefore, given the substantial increases in noise levels that are likely to arise due to impact piling, Natural England continues to advise that a full piling restriction from 01 March to 31 July inclusive is the only measure that would prevent the conservation objectives of Kingmere MCZ being hindered.

We note that the selected modelling locations impact the amount of overlap of the noise contours with designated sites. Whilst we do not support the use of the 135dB behavioural threshold in relation to black seabream, we have the following observations to make based on Figure 5.16 and Figure 5.17 of the In Principle Sensitive Features Monitoring Plan (IPSFMP) [REP4-054]. We highlight that Figure 5.16 (monopiles) shows that even with a 15dB reduction, there is overlap of the 135dB contour with Kingmere MCZ in relation to the western modelling location and a slight overlap from the eastern location. Figure 5.17 (multileg) shows a similar overlap at the western location. We advise that it appears likely that modelling the piling location at the closest point to Kingmere MCZ would result in a greater overlap than is currently modelled, leading to these noise levels occurring over a greater proportion of the MCZ. We advise that this further calls into question the viability of the Applicants proposed mitigation plan.

Underwater Noise Study

As raised by Natural England at Deadline 4, the information in the IPSFMP has not been amended to include updated information presented in [PEPD-023] 6.4.8.4 - Environmental Statement - Volume 4- Appendix 8.4: Black Seabream Underwater Noise Technical Note and Survey Results - Revision A. Natural England provided a response to this report in Appendix E1 to our Deadline 1 Submission.

2.2 Short-snouted seahorse (*Hippocampus hippocampus*) - Beachy Head West MCZ, Beachy Head East MCZ, Selsey Bill and the Hounds MCZ, and Bembridge MCZ, also Wildlife and Countryside Act 1981

Natural England highlights that the Beachy Head West MCZ, Beachy Head East MCZ, Selsey Bill and the Hounds MCZ, and Bembridge MCZ represent the only 4 MCZs designated for short-snouted seahorses nationally, and they therefore represent the entire national MCZ designated population. The conservation objective across all four sites for short-snouted seahorses is to 'maintain' the feature in favourable condition (as opposed to black seabream which have a restore objective). This means maintaining the quality and quantity of their habitats and the number, age and sex ratio of the population. The supplementary conservation advice does mention breeding through maintaining the reproductive and recruitment capability of the species, maintaining the presence and spatial distribution of the species, and their ability to undertake key life cycle stages and behaviours.

Seahorses are known to be sensitive to underwater noise (Anderson et al. 2011, Palma et al. 2019). They are a spatially restricted species and are unable to move away from their home ranges easily due to limited swimming capacity. As stated in the supplementary conservation advice for the MCZ's, if disturbed individuals do move away from their territories this puts them at risk of increased predation and causes a disruption to their feeding. During the breeding season (April to October) seahorses form pair bonds within which they remain largely

monogamous. For this time, it is understood that individuals will hold home ranges of less than 20 m². There is a small overlap between a pairs range, and it is in this overlap that the pair will meet daily to reinforce their pair bonding (Masonjones and Lewis, 1996). Therefore, disturbance, in this case due to underwater noise, could disrupt seahorse social structures by disturbing pairs before they are established (Foster and Vincent, 2004) and ultimately may result in failure to reproduce. Removal or death of a member of a monogamous pair could decrease short-term reproductive output, and may reduce the size of later broods, if familiarity enhances brood success (Vincent, 1994).

Underwater Noise Impacts

Mortality and Mortal Injury, and Recoverable Injury

Natural England advises that based on the modelling provided, mortality/mortal injury and recoverable injury impacts from underwater noise on short-snouted seahorses will not be realised within the seahorse MCZs.

Temporary Threshold Shift (TTS)

Bembridge MCZ and Beachy Head East MCZ

Natural England advises that based on the modelling provided in Figures 5.1 and 5.2 [REP4-062], temporary threshold shift impacts from underwater noise on short-snouted seahorses will not be realised within Bembridge MCZ or Beachy Head East MCZ.

Beachy Head West MCZ

We understand based on the further information presented in [REP4-074] that whilst the modelling location does not appear to represent the worst-case scenario location, because of the fixed windfarm separation zone, where no piling activities will take place at any point, this is the closest area to the Beachy Head West MCZ piling could ever occur. We are therefore content that this currently represents the worst-case scenario, but it should be recognised that should there be any future changes to this zone our advice may change.

Based on the modelling undertaken (Figures 5.1 and 5.2 [REP4-062]) in an unmitigated scenario noise levels that could result in TTS impacts from underwater noise on short-snouted seahorses will occur within Beachy Head West MCZ from multileg piling, as the contour appears to overlap with the southern boundary of the western section of the site.

Selsey Bill and the Hounds MCZ

Based on the modelling undertaken (Figures 5.1 and 5.2 [REP4-062]) in an unmitigated scenario, the contour relating to TTS does not appear to overlap with Selsey Bill and the Hounds MCZ. However, we require clarification that the modelling location is the worst-case scenario for this MCZ. We note that from discussions with the Applicant they have suggested that as with the north-west modelling location, the piling exclusion zone means that the worst-case location that piling will take place is the south-west modelling location. In addition to our concerns raised above regarding this justification, we also highlight that this exclusion zone will not be in place all year, so piling outside of March to July could result in a greater worst-case for the MCZ seahorses than is currently presented. We advise that the Applicant needs to provide clear justification why the modelling location represents the worst-case for Selsey Bill and the Hounds MCZ year-round.

Behavioural

Natural England advises that there is not sufficient species-specific literature to draw robust conclusions on an appropriate threshold in relation to behavioural impacts to short-snouted seahorses from underwater noise. It is however apparent from Natural England's supplementary conservation advice that seahorse breeding behaviours are sensitive to disturbance from underwater noise and that this has the potential to negatively affect breeding success. Based their sensitivity, Natural England do not consider that 141dB (using seabass as a proxy species as reported in Kastelein *et al*., (2017)) is an appropriately precautionary threshold.

Unlike black seabream, the conservation objectives for short-snouted seahorse do not have a seasonal component and are not related to the disturbance of specific breeding behaviours or locations at the site. As such, whilst there is no evidence available to confirm if a threshold of 135dB (using sprat as a proxy species as reported in Hawkins *et al*. (2014)) is appropriate for seahorses, we advise that on balance its use represents an adequately precautionary approach in the absence of evidence.

We note that in Figure 5.5 and Figure 5.6 [REP4-062] the Applicant has modelled a threshold of 135dB. The 135dB contour modelled extends into both Beachy Head West MCZ and Selsey Bill & the Hounds MCZ for monopiles and multileg foundations. We advise that the extent of the overlap with Selsey Bill & the Hounds MCZ, needs to be validated by confirming the modelling location is the worst case (as above). The 135dB contour also falls in close proximity to the far eastern extent of Beachy Head East MCZ. We note Bembridge MCZ is avoided by the contour in both scenarios.

Mitigation in relation to Beachy Head West MCZ and Selsey Bill and the Hounds MCZ

Based on modelling that has been conducted there is a potential for impacts to occur on seahorses within Beachy Head West MCZ (TTS and behavioural) and Selsey Bill and the Hounds MCZ (behavioural). We therefore advise that mitigation is required year-round to ensure the conservation objectives are not hindered.

We note that the Applicant has modelled a 15dB noise reduction based on their commitment to use double bubble curtains year-round in Figure 5.5 and Figure 5.6 [REP4-062]. Natural England advise that if the Applicant committed to the seasonal restriction that we have advised for black seabream (March to July inclusive), this would cover a proportion of the key breeding time for seahorses. In relation to the rest of the year, provided that the Applicant were able to field test and evidence that a reduction in the region of 15dB is deliverable during the worst-case environmental conditions at the site, we would be in a position to conclude that the conservation objectives of the four seahorse MCZ's will not be hindered due to behavioural impacts of from underwater noise generated from piling. Therefore, we advise that the Applicant submits proposals for testing double bubble curtains, outside of the sensitive seasons of other species (namely black seabream and herring) into the Examination within an updated IPMPPlease refer to our more detailed advice on this matter in the section on monitoring below.

Wildlife and Countryside Act 1981

As stated in our Relevant Representations both species of UK seahorses - spiny (*Hippocampus guttulatus*) and short-snouted (*Hippocampus hippocampus*) are protected under Section 9 of the Wildlife and Countryside Act 1981 in any location. We advise that there is a possibility of seahorses being killed, injured or disturbed, or for damage or destruction to their place of shelter or protection, all of which are offences under Section 9. We advise that

there is a risk that such impacts could be realised as part of all phases of the Rampion 2 development, and that underwater noise impacts from piling is one of the key pathways/mechanisms by which such impacts could be realised. We advise the Applicant engages in early discussions with the MMO regarding any requirement for a European Protected Species Licence.

2.3 Noise Abatement Systems (NAS)

General Points

Natural England welcomes the provision of the Information to support efficacy of noise mitigation abatement techniques with respect to site conditions at Rampion 2 Offshore Windfarm document [REP4-067] and the updated In Principle Sensitive Features Mitigation Plan (IPSMFP) Rev D [REP4-053 & REP4-054]. Having reviewed these documents our advice is that significant uncertainty remains over the efficacy of the measures proposed in some of the conditions at the Rampion 2 site.

Natural England understands from the Applicant's Deadline 3 submission [REP3-051 Annex I] that the environmental conditions at the Rampion 2 include water depths in the array area ranging from 13 m to 65 m below Lowest Astronomical Tide (LAT). We note that the report on the efficacy of noise mitigation [REP4-067] does not include any evidence for depths of over 50m and that many of the measures only have measured data for depths of less than 40m. Furthermore, [REP4-067] draws the conclusion that the *'application of noise abatement systems'* at the Rampion 2 site *'might be challenging due to soil conditions and bathymetry for some of the foundation locations'.* It is noted in [REP4-067] that limited evidence exists of NAS used in such varying/complex bathymetry and soil conditions that exist at the Rampion 2 site. Documents [REP3-051] and [REP4-052] suggest that the spring current speeds within the coastal processes study area range from 0.75 and 1.1m/s in the offshore array areas, reducing gradually from 0.9 m/s at the offshore end of the export cable corridor to 0.5 m/s at the landfall. We note that this differs to the information in [REP4-067] which uses a mean current value of 0.48 to 0.76m/s. Natural England advises that the maximum current speed of 1.1m/s, as opposed to a mean current speed (0.48 to 0.76m/s) should be considered in the report, as this is the worst-case scenario.

Additionally, we note that current empirical data only exists for up to 10m pile diameters, and therefore there is no data in relation to the 13.5m pile diameter proposed for the project. There is also no pile driving analysis available for the hammer energies (of up to 4,400kJ for monopiles) that it is proposed could be needed to install the piles in worst-case scenario for Rampion 2. We advise this adds to the uncertainty that exists around the efficacy of noise abatement measures at this site.

Natural England notes that the environmental information provided in the Draft Piling Marine Mammal Mitigation Proposal [REP4-052] is not consistent with the information above, for example in relation to water depths. The document has also not been updated in line with the information on the efficacy of mitigation measures presented in [REP4-067]. We advise that such documents are updated and aligned for consistency and clarity of understanding.

We note that the evidence base and technology in relation to NAS is constantly evolving, and that by the time of construction it is possible that measures that achieve greater levels of attenuation may be available. However, this cannot be relied upon at this time. We advise that the Applicant conducts an updated review of available NAS technology for the site as part of the final pre-construction IPSFMP to ensure that measures that can most reliably achieve the greatest level of noise reduction (alone or in combination) at the time of construction are utilised.

Key uncertainties relating to specific NAS

Double big bubble curtain (DBBC)

Natural England notes that the principal mitigation measure currently proposed is a DBBC.

Based on the information supplied the following uncertainties remain in relation to the use of this measure:

- The noise reductions proposed are only valid for currents of up to 0.75 m/s. Based on the information above we advise that the currents at Rampion 2 exceeds this figure in parts of the array and that this needs to be acknowledged. We advise that the worst-case in terms of current speed is considered.
- The noise reduction of 15dB stated is only relevant to depths of up to 40m. We note that at depths below 40 m there is no empirical evidence of achievable noise reduction by any Big Bubble Curtain (BBC) system. It is suggested that there is a potential decrease of 1db (unlikely 2db) in 50m water depth. We note that based on the information above, the depths in the array area are between 13 m-65 m. As such, we advise that the evidence provided does not give sufficient assurance that this measure will be able to achieve the 15dB reduction proposed in all piling locations within the array. We advise that uncertainty exists in waters deeper than 40 m and no consideration of waters deeper than 50 m has been provided. Therefore, Natural England do not advise that a reduction of 15dB in the source level is a precautionary assumption.
- As stated in [REP4-067], the enhanced Big Bubble Curtain (eBBC) is under development and has not yet been tested offshore. It is noted that it is unlikely to be applicable for the next few years as a state-of-the-art measure.

General hammer noise mitigation

We note that the IPSFMP suggests the *'procedural measures such as "HiLo" can be implemented to reduce noise emissions. This procedure uses a high frequency low energy blow method and has been proven to have good noise control capabilities'* however it is noted that these measures are potentially *'not suitable for all ground conditions due to the lower energies utilised'.* We advise that this is an important consideration given the known challenging and variable ground conditions at Rampion 2.

Hydro Sound Damper (HSD)

Based on the information supplied, the following uncertainties remain in relation to the use of this measure:

- We note that it has been stated that this measure could achieve a 10dB reduction in sound levels, but that this could be affected by 'tunnelling' effects due to the complex nature of the soil conditions in the area, which could lead to a reduction in the levels of abatement achieved.
- It is suggested that observations on other projects have noted that with increasing pile diameter the pile-driving frequency spectrum might be shifted toward lower frequencies. We understand from the information presented that evidence does not exist in relation to 13.5m diameter piles, but that this could reduce the noise reduction achieved by 1dB- 2dB.
- We highlighted that document [REP3-051], Appendix I outlines that the practicability and efficiency at >40 m remains to be proven (whereas [REP4-067] suggests this is unlikely to be an issue). Document [REP3-051] also suggested this measure could

only be used on piles with a diameter of 9-13 m and that it had not been tested on jacket foundations. We advise that these limitations should be clarified based on the worst-case scenario of 13.5 m piles and that fact that jacket piles form an option within the Rochdale envelope.

Based on the limitations above, we advise that it should not be assumed that this measure can reliably deliver noise mitigation of 10dB.

IQIP PULSE hammer

The IPSFMP [REP4-054] suggests '*modelled estimates based on the largest hammer available from this company, have calculated a noise reduction capability of 6 to 10dB'* and that therefore a '*precautionary approach'* is an '*assumption of 6dB reduction in piling noise*'. However, it is noted that these *'predictions are made with limited data and should be considered indicative for the equipment and conditions at Rampion 2'*. We advise that this is not supported by [REP4-067], which suggests reductions of 2dB or 3 dB, or possibly lower. Additionally, it is expected that pile driving noise will be shifted to lower frequencies, which may affect overall noise reduction in a way that is not statistically quantifiable and could also result in seabed vibrations below 10Hz. We advise that the potential impacts of this shift of noise to lower frequencies on the relevant fish receptors also needs to be considered.' It is suggested in [REP4-067] that it is also unclear what influence changes in piling procedure and soil conditions may have. Based on the current uncertainties in the evidence, we advise this measure is not currently one that should be under consideration within [REP4-054].

MENCK Noise Reduction Unit (MNRU) hammer

The IPSFMP [REP4-054] suggests a *'modelled estimated Sound Exposure Level (SEL) reduction of 9dB and peak reduction of 12dB'* and that therefore a *'precautionary approach'* is an *'assumption of 9dB reduction in piling noise'*. However, (as with the PULSE hammer) it is noted that these "*predictions are made with limited data and should be considered indicative for the equipment and conditions at Rampion 2*". We note that [REP4-067] reports that for the MNRU there are *'no empirical measurements with and without MNRU systems under real offshore conditions available, thus a reliable evaluation regarding the achievable overall noise reduction is not yet possible'* and that a shift to lower frequencies will likely affect the noise reduction. Therefore, we advise that without empirical evidence, this measure is not currently one that should be under consideration within the IPSFMP.

IHC Noise Mitigation Screen

This measure is not proposed to be used for Rampion 2 in [REP4-054]. We understand from [REP4-067] that it is unlikely to be suitable for use in the varying bathymetric conditions at the Rampion 2 site and on the pile diameters that might be required (13.5 m). This means that overall noise reduction of up 22dB proposed is not currently possible, as it appears it would require use of this measure. Clarification on this matter would be welcomed.

Combined Measures

The only combination of measures that currently appear to be potentially feasible is a combination of DBBC with HSD. We note that [REP4-067] suggest that this combination could result in an overall reduction of about 18-19dB (below 40m). Based on this we advise that there is not sufficient evidence to support the 20dB reduction that is stated in the IPSFMP (and presented in some of the supporting figures). We advise that further clarity is also required regarding how additive figures have been calculated. Furthermore, we advise that the evidence presented does not suggest that such figures are achievable in deeper waters.

2.4 MEEB

Natural England advises that the measures proposed for black seabream are not sufficient to provide benefits of equivalent (or greater) value to offset the underwater noise impacts from piling at the Rampion 2 site. Please see our commentary below on each of the MEEB presented.

Natural England considers that MEEB should wherever possible be targeted at the designated habitats or species of the MCZ which would be adversely affected by the project and should be informed by the site's conservation objectives, the nature and the extent of the impacts and the contribution of the site to the coherence of the MPA network for the affected habitats and/or species. We highlight that Kingmere MCZ is one of only four sites in the MPA network for black bream, the other three being in Dorset.

We advise that any MEEB taken forward should be implemented and effective before the impacts take place to provide the ecological functions that they are intended to compensate for. Where this is not fully achievable, compensatory packages should consider increased or additional measures for the interim where this would serve a sound ecological compensatory function.

Reduction in disturbance from watercraft within the Kingmere MCZ

This measure has been proposed through a voluntary seasonal speed limit and/or a voluntary no anchor zone.

Natural England do not support these measures as MEEB for underwater noise impacts from piling on black seabream because:

- No evidence has been provided on the distribution or intensity of any current impacts on the site Conservation Objectives from engine noise/anchoring within the MCZ. This information should be presented to demonstrate there is a significant pressure that the measure could potentially ameliorate and therefore be suitable as MEEB.
- Sussex Inshore Fisheries and Conservation Authority (IFCA) (Sussex IFCA, 2024) already have an existing voluntary code of conduct in relation to bream nesting which is to *"use methods that minimise damage to sensitive areas, consider drifting (i.e., no anchor) where practicable or if necessary, use a lower impact anchor".* Therefore, it is unclear how this would provide additional benefit to existing management measures. We have recommended that the Applicant contact Sussex IFCA to seek feedback on the likely relevance and effectiveness of the measure.
- It has not been demonstrated or quantified that the reduction of disturbance from watercraft (engine noise/physical disturbance/habitat damage) via a voluntary measure would provide an equivalent benefit to the underwater noise impact from pile driving.
- No evidence has been provided to establish a 'common currency' between the impacts of impulsive noise from pile driving and continuous/transient noise from vessels so that the measure can be scaled.
- The fact that these are voluntary measures and therefore in no way enforceable introduces considerable uncertainty regarding the uptake and spatial/temporal extent of measures, and in turn whether sufficient MEEB can be generated. No evidence of stakeholder engagement has been presented.
- It is unclear how the proposed monitoring (e.g., vessel speed, number, type, and duration) within the MCZ would accurately quantify the underwater noise reduction and subsequent level of benefit on black seabream.

- The adaptive management suggested is additional workshops or engagement with stakeholders, which may not result in greater uptake. Sufficient evidence has not been provided to assume that voluntary no anchor zones would result in reduced levels of angling and alleviate impacts of angling on black seabream.

Removal of marine litter including awareness and engagement

We acknowledge that the measures proposed would be targeted at drifting or surface litter, particularly plastics, as opposed to removal of litter directly from the seabed. We understand that the anticipated outcome is improvements to benthic habitat quality (i.e. black seabream spawning grounds) as well as food chain benefits. Natural England advises that we are not supportive of marine litter removal and/or awareness campaigns as a compensatory measure for benthic habitats unless there is specific evidence that marine litter is impacting the conservation objectives of a site.

Natural England do not support the measure as MEEB for underwater noise impacts from piling on black seabream at the Rampion 2 site because:

- There is currently no evidence to demonstrate that marine litter is hindering the conservation objectives of the designated site or supporting habitats for breeding black seabream.
- There is currently no evidence that there is a significant amount of litter within Kingmere MCZ.
- It is unclear how it will be demonstrated that the removal of litter is effectively providing MEEB for underwater noise impacts.
- We do not believe that 'one off' litter removal campaigns will make a positive or discernible difference to the management of features of MCZs, and therefore cannot be considered an appropriate compensation measure for MEEB (Natural England et al., 2023).
- It is unclear how the awareness and engagement campaign will effectively compensate for underwater noise impacts. This includes uncertainty on uptake, how quantitative uptake of measures could be used to infer the volume of debris that would have otherwise been discarded into the marine environment, and how that could offset underwater noise impacts.
- There is no on-going monitoring proposed, nor adaptive management to change the approach if it is demonstrated that it is not delivering.

We draw the ExA's attention to Natural England and JNCCs advice to the Secretary of State (as the relevant competent authority) on Ørsted's Hornsea Project Three (HOW03) Sandbank Implementation Plan (SBIP) and associated documents (Natural England & JNCC, 2022). We advised DESNZ that the proposed Marine Debris Removal Campaign and Marine Debris Awareness Campaign would not provide sufficient compensation in relation to the long-lasting loss of designated habitat. We have also provided the same advice to DESNZ for the Norfolk Vanguard and Boreas OWF projects which similarly proposed marine litter removal to offset benthic impacts (Natural England, 2024; Natural England *et al*. 2023). Further, the UK Statutory Nature Conservation Bodies (SNCBs) have produced a position statement confirming that marine litter is not appropriate as benthic compensation (SNCBs, 2023). As the Applicant's proposed litter clearance targets the supporting benthic habitat used by nesting bream, and given Defra's best practice advice considers that the approach to MEEB should be the same as for European sites (Defra, 2021), the above advice also applies in this case. Finally, we highlight that Marine Debris Removal has not been included in Defra's Library of Strategic Compensation Measures, indicating a broad consensus that it is not suited to compensating for impacts.

Monitoring and research of black seabream movements within the Kingmere MCZ and surrounding areas

Whilst it may have merit in its own right, Natural England's position is that research and development cannot be considered as compensation or MEEB. This is because there is no guarantee that the research will deliver any outputs or management measures, or if it does, that these would be sufficient to offset and provide benefit of equivalent value to the maximum extent of the proposed development's effect on black seabream.

Natural England would welcome any discussions with the Applicant on opportunities to help improve the black seabream evidence base in and around Kingmere MCZ outside of MEEB requirements.

Marine Recovery Fund (MRF)

The applicant has outlined an option to rely on the Marine Recovery Fund where the SoS grants permission for this as an alternative to reliance on the project alone measures outlined above. Natural England advise that the MRF is unlikely to be suitable in a relevant timescale, given the species-specific nature of the conservation objectives at Kingmere MCZ. The MRF measures are currently more focused around impacts to ornithological and benthic receptors.

2.5 Monitoring

Underwater Noise

Natural England advise that key objectives of the monitoring should be to validate the predictions made in the Environmental Statement, including showing that the noise level predictions made are appropriate, that the significance of predicted impacts are justified, and to validate the efficacy of the noise abatement measures.

Natural England supports the collection of underwater noise monitoring data to understand how noise propagates over distance from the source in the specific environmental conditions at the Rampion 2 site. Given the complex and variable environmental conditions at the site, we advise that the first eight piles (or eight of the first 12 piles), of each foundation type are monitored across a representative range of conditions. We advise this includes worst-case environmental conditions within the design envelope e.g., depths, current speeds, and ground conditions as well as hammer energy.

In light of the uncertainties regarding the efficacy of NAS in the environmental conditions at the Rampion 2 site, the monitoring of the first eight piles (or eight of the first 12 piles), should include monitoring of the efficacy of the final noise abatement system selected. We advise that to conclude that the conservation objectives of Beachy Head West MCZ and Selsey Bill and the Hounds MCZ will not be hindered, the Applicant must test and evidence a reduction in the region of 15dB from the proposed use of double bubble curtains (or another comparable noise abatement system). We advise that the Applicant submits an updated In Principle Monitoring Plan to include such testing/monitoring of noise abatement systems outside of the sensitive seasons of other species (namely black seabream and herring). We advise that this should include a commitment to provide initial outputs from the monitoring within 2 weeks of it concluding, highlighting any obvious deviations from what was assessed and whether the levels of noise abatement proposed have been achieved. We advise that the final reporting should follow this as soon as possible. The timeframe for this is for the MMO to advise on, but we advise that a 4-week timeframe is considered to ensure noise levels are not significantly higher than those predicted in good time.

In relation to the distances of monitoring stations from the pile, we note that the Applicant has suggested some distances within the In Principle Monitoring Plan. We advise that consideration should be given to the National Physics Laboratory Guidance note 133 - Underwater noise measurement when determining the final monitoring protocol. We advise that the final distance for the monitoring will need to be discussed and agreed with MMO/Cefas post consent as part of the consultation on the Final In Principle Monitoring Plan. We advise that the final proposals/hypothesis selected needs to demonstrate how they are fit for monitoring underwater noise levels generated by piling and the levels of noise reduction achieved by the NAS.

In relation to the hypotheses set out in the In Principle Monitoring Plan (IPMP) we do not support the phrasing of hypothesis 1 where it states: *'The installation of piled foundations for Rampion 2 offshore wind farm results in under water noise levels that do not* ***significantly exceed*** *those predicted from the modelling undertaken to inform the EIA'*. We advise that the noise levels should not exceed the worst-case scenario predicted in the environmental statement. In relation to hypothesis 2, we advise that this should relate to the levels of noise reduction achieved by the NAS measures being in the region of 15dB.

Natural England highlights that we do not support the zoned approach to piling proposed or it being possible to draw an appropriate behavioural threshold for black seabream from the literature, so we have not provided advice on the monitoring proposed in hypothesis 3, which specifically relates to Kingmere MCZ. However, should the full seasonal restriction we have advised not be implemented, it should be noted that Natural England would have concerns regarding the robustness and adequacy of what has been proposed.

Monitoring of black bream nesting habitat in the cable corridor

We note that point 5.2.14 [REP4-054] states that black seabream nesting sites in the cable corridor will be informed by *'pre-construction data that will be collected post-consent'* alongside other available data sources. We highlight point E12 within our risk and issues log has not been addressed within the documents submitted. This point advises that:

'The post consent survey, undertaken as part of a suite of pre-construction surveys, will allow a determination to be made as to the extent of the nesting area, and specifically the key nesting areas, in order to identify the best cable route, minimising interaction with key sensitive features where practical, prior to offshore export cable installation'. Natural England advise that due to both seasonal variation and interannual variation with regards to nesting locations a single pre-construction survey should not be presumed as definitively and absolutely defining nesting locations. We advise that the focus should be on ensuring that that survey identifies potentially suitable habitat for nesting and avoids this. We advise that an appropriate methodology for pre-construction surveys has yet to be agreed and that this should be agreed with the MMO in consultation with Natural England. Whilst we understand that the final details of this are likely to be agreed post-consent, we advise that an outline plan should be included in the In Principle Monitoring Plan. The micro-siting should focus on avoiding the areas identified in these surveys and also known nesting locations'.

Natural England also stated within our Deadline 1 Fish and Shellfish IPMP response, that in addition to underwater noise monitoring, post-construction monitoring that tests whether areas identified as being potentially suitable for black seabream nesting are still suitable for nesting post-construction is presented. We advise that this is important to demonstrate that mitigation measures have achieved the levels presented in the application and to evidence recovery post-construction. We advise this matter remains unaddressed in both the IPMP and Table 7.1 of the IPSMP. These plans also fail to recognise how habitat potentially suitable for black seabream nesting will be identified to inform micrositing and how it will be monitored post construction.

2.6 Commitments Register

Below is a summary of the individual commitments made by the Applicant to mitigate against impacts from piling and export cable construction activities on black seabream from the development, along with Natural England's advice on each. We advise that it is essential that the commitments register and the IPSFMP fully reflect each other.

Natural England will be providing our advice on benthic ecology matters at Deadline 6. Therefore, we may have further comments to make relating to impacts on underlying benthic habitats suitable for black seabream at that stage.

Commitment	Natural England's Advice
C-265	We support the commitment to using noise abatement on each foundation installation, however there is uncertainty regarding the level of attenuation achievable using DBBC in the environmental conditions at the Rampion 2 site. To ensure the conservation objectives of MCZs designated for short- snouted seahorses are not hindered, we advise that testing is required to evidence attenuation efficacy to the level asserted as achievable by the Applicant (i.e. in the region of 15dB) prior to the works taking place. Please see our monitoring and seahorse advice above for further information. We advise this needs to be a clear commitment within all the relevant plans and documents. We advise that this commitment should relate to any kind of hammer that could be used.
C-269 & C-270	Natural England reiterate our advice provided in our Relevant Representations (Point 51 and line E50 of our risks and issues log) regarding commitment C-269 and C-270. We advise that an appropriate methodology for pre-construction surveys has yet to be agreed and that this should be agreed with the MMO in consultation with Natural England. Whilst we understand that the final details of this are likely to be agreed post-consent, we advise that an outline plan should be included in the In Principle Monitoring Plan. We advise that the buffer distance being committed to needs to be included in this commitment. We also advise that the Applicant will need to provide clear evidence to demonstrate why they cannot avoid any sensitive features as part their pre-construction survey data.
C-271 & C-272	Natural England reiterate our advice provided in our Relevant Representations (Point 54 and line E53 of our risk and issues log) regarding commitment C-271 and C-272. Natural England previously advised that a Cable Burial Risk Assessment (CBRA), which contains site specific geotechnical information should be provided. We understand that the Applicant is considering submitting a CBRA into the examination at Deadline 5. We advise that 'where required' is removed, as this is required.
C-273.	Natural England reiterate our advice provided in our Relevant Representations (point 50 and line E49) that we support this measure but advise that this includes all aspects of export cable installation, including but not limited to seabed preparation works, cable protection work and UXO works. We advise that should any activities not be included we would have concerns regarding the impacts of these. We understand that UXO works will form part of a separate licence, but it should be noted our advice is that all UXO clearance works should be undertaken outside of the sensitive season for black seabream. We also advise that a definition of emergency work is included within the dML interpretation section, which Natural England will then advise on.
C274	Natural England continue to advise against the zoned approach to piling proposed by the Applicant (see Appendix E of our Relevant Representations). We do not agree with basing such an approach on a threshold of 141dB and do not believe a suitable threshold can be robustly established based on the literature. We also advise that the accuracy of modelling is not sufficient to establish clear spatial zones and we highlight issues raised above regarding the modelling showing overlap with Kingmere MCZ at 135dB, even with mitigation implemented. Additionally, once the locations furthest from

	the MCZ are completed, the remaining uncompleted piling locations will be closer to the MCZ. This is particularly problematic when considering piling over multiple years.
C-280	Natural England advises that we cannot agree to appropriate piling exclusion zones based on the lack of a suitable behavioural threshold to which noise levels should be mitigated to.
C- 281	Whilst we support no piling occurring within the western part of the array from March to June, we advise that the seasonality within the conservation advice includes July and therefore this month should be treated in the same way as March to June. Natural England advises we cannot agree to a sequenced piling plan in the absence of a suitable behavioural threshold to mitigate noise levels down to. We note that it appears that some piling locations in the western array even with NAS measures are likely to result in an overlap of the 135dB contour.

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