



# Marine Management Organisation

Marine Licensing  
Lancaster House  
Hampshire Court  
Newcastle Upon Tyne  
NE4 7YH

T +44 (0)300 123 1032  
F +44 (0)191 376 2681  
[www.gov.uk/mmo](http://www.gov.uk/mmo)

Sheringham and Dudgeon Extension  
Projects Case Team  
Planning Inspectorate  
[sadep@planninginspectorate.gov.uk](mailto:sadep@planninginspectorate.gov.uk)

MMO Reference:  
DCO/2019/00004  
Planning Inspectorate  
Reference: EN010109

**by email only**

10 July 2023

Dear Sir/Madam,

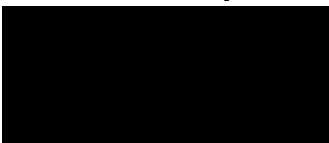
**Planning Act 2008, Proposed Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP).**

## Deadline 7 Submission

This document comprises the Marine Management Organisation's (MMO) Deadline 7 response in respect to the above Development Consent Order (DCO) Application. This is without prejudice to any future representation the MMO may make about the DCO Application throughout the examination process. This is also without prejudice to any decision the MMO may make on any associated application for consent, permission, approval or any other type of authorisation submitted to the MMO either for the works in the marine area or for any other authorisation relevant to the proposed development.

The MMO reserves the right to modify its present advice or opinion in view of any additional matters or information that may come to our attention.

Yours Faithfully



Laura Ashforth  
Marine Licensing Case Officer



[\[redacted\]@marinemanagement.org.uk](mailto: [redacted]@marinemanagement.org.uk)

Copies to:

Nicola Wilkinson (MMO) Case Manager: [\[redacted\]@marinemanagement.org.uk](mailto: [redacted]@marinemanagement.org.uk)

Christie Powell (MMO) – Senior Case Manager:

[\[redacted\]@marinemanagement.org.uk](mailto: [redacted]@marinemanagement.org.uk)



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## 1 General Comments

1.1 The MMO would like to highlight that Deadline 8 is only 1 week after Deadline 7. This will create a short review period for interested parties to provide comments on representations made, especially given that there is usually a delay between the deadline and publication of documentation to the PINS website.

## 2 Comments on any other information and submissions received at Deadline 6

2.1 REP6-002 - Draft Development Consent Order (Revision I)

2.1.1 The MMO are satisfied with the changes made to the dDCO and do not have any further comments to raise.

2.1.2 The MMO have reviewed the applicants updated report 'Appendix 10.2 Underwater Noise Modelling Report'. We can confirm that we are content with the revisions, and that they address our previous concerns. Specifically, the report has been revised to address our comments in relation to:

- The addition of Level vs Range Plots (see section 4.3.3 of the report). Plots have now been included.
- Simultaneous piling. Additional information has been provided on the receptor movement and assumptions (see section 5.3, para 116).

2.1.3 Regarding report 'Appendix 10.2 Underwater Noise Modelling Report' The MMO did request further information regarding the comparison plots (Figure 4-1 and Figure 4-2). Figure 4-1 and Figure 4-2 "*present a small selection of measured impact piling noise data plotted against outputs from INSPIRE covering both SPL<sub>peak</sub> and SEL<sub>ss</sub> data. The plots show data points from measured data (in blue plotted alongside modelled data (in orange) using INSPIRE version 5.1, matching the pile size, blow energy and range from the measured data*". We thank Subacoustech for providing outputs for the single strike SEL as this was requested during the PEIR consultation in June 2021. It would be helpful if additional information could be provided here for context, such as details of the pile size and hammer energy etc. Without this information, these figures are not overly informative.

## 3 Responses to the Examining Authority's Fourth Written Questions (WQ4)

3.1 **Q4.1.4.1** *Statements of Common Ground. Applicant, submit final signed SoCG with electronic signatures at D8. Relevant parties, submit at D8 your confirmation that the final signed SoCG submitted by the Applicant is the version agreed with you. You may do so, by attaching to your submission the copy of the SoCG that is agreed with you.*

The MMO can confirm that we will attach a copy of the agreed signed SoCG to our submission at D8.



3.2 **Q4.3.1.2** Electro-Magnetic Fields. *The MMO [REP5-080] has stated that burial to 1.5m+ should prevent adverse impacts to benthic ecology receptors via electromagnetic field and/or heating. However, the Cable Burial Risk Assessment [APP-293] concludes with a recommendation that there should be a target depth of lowering of 1.0 m, with a proposed minimum of 0.6 m. What would be the consequences to benthic ecology where the depth of buried cable is less than 1m?*

The MMO requested advice on this topic from both benthic ecology specialists and fish biology specialists. The advice varies depending on the topic being discussed.

For benthic ecology and the receptors based in the benthic environment, such as invertebrates the MMO have the following advice:

The potential impacts via electromagnetic fields (EMF) and/or heating of cables on benthic receptors are unlikely to change due to a decrease in cable burial depth from 1.5+ m to 0.6 m. There is limited evidence regarding the impact of EMF on benthic invertebrates. However, that which exists, concludes that, in experimental conditions the suite of taxa exposed to EMF do not adjust their behaviour in response to EMF (Bochert and Zettler 2006).

There may be an impact to benthic ecology receptors because of the decrease in burial depth should the requirement for cable protection increase proportionally. However, this impact of altering of sedimentary habitat to hard structure (that may be readily colonised by a different benthic assemblage), is restricted to a relatively small area where mitigation may be required. Furthermore, it may be reasonably expected that the colonising assemblage will recruit from nearby habitats and therefore does not constitute a wholesale change in the benthic assemblage, rather a change in the mosaic of habitats in the immediate vicinity.

For fish ecology and potential impacts, the MMO have the following advice:

The MMO recommend a cable burial depth of >1.5m (subject to local geology) to reduce the potential effects of electro-magnetic fields (EMF) on electro-sensitive species that rely on benthic habitats e.g., elasmobranchs and European eel. Burial of cables does not reduce the level of energy or alter the frequency of the emitted field, but instead increases the distance between the electrical field (and heat) and the EMF-sensitive receptor. Thus, by increasing the distance between the cable and the electro-sensitive fish through adequate burial, the exposure of the fish to EMF will be lowered and their behaviour/reactions such as attraction or avoidance will be lowered.

There is a relationship between the distance of the EMF emitted and the reactions/behaviour exhibited by electro-sensitive species. For example, a study by Hutchison et al., (2020) found that individuals of the little skate species (*Leucoraja erinacea*) spent a greater amount of time in the 'high' (>52.6  $\mu$ T) EMF zone of the enclosure than the low (<49.7  $\mu$ T) EMF zone, with significant behavioural differences were observed. The study found that skates exposed to EMF also travelled further, but more slowly and for longer periods of time than skate not exposed to EMF, indicating that periods of rest were less frequent. Skates



exposed to EMF generally remained closer to the seabed and exhibited a higher proportion of sharp turns. Hutchison et al. (2020) note that this behaviour collectively indicates increased exploratory and foraging behaviour when exposed to EMF.

Thomsen et al., (2015) also highlighted that the most likely potential effects of EMF relate to attraction towards and avoidance of EMF sources, indicating potential ecological consequences for individuals and wider populations.

In addition, burial of cables has the added benefit of minimising adverse effects of sediment heating on bottom dwelling species such as sandeels, which burrow in the surface sediments and lay their eggs in sticky batches on the seabed. Again, the deeper the cable is buried, the further away the sensitive receptor will be from the source of heat. Herring are also benthic spawners that lay eggs on gravel and coarse gravelly sands substrates. Russel et al. (1976) and Oeberst et al. (2009) showed that egg and larval development in herring are temperature dependent – see Tables 1 & 2. So artificially heated sediments (i.e., emitted from cables) in areas of herring spawning habitat have the potential to speed up the egg hatching and larval development periods resulting in premature hatching times, and potentially premature yolk absorption periods by larvae before they become planktonic.

**Table 1 Herring egg development periods**      **Table 2 Herring yolk absorption periods**

Average temperature	Days	Average temperature	Days
12 - 13° C	7-9	12.8° C	3 & 9
10 - 11° C	10-12	12.0° C	5 & 14
7 - 8° C	14-18	10.7° C	7 & 16
3 -4° C	49	10.3° C	7 & 20

From Russell, 1976.

Whilst there is scientific evidence to confirm the effects of EMF and sediment heating on fish receptors, no significant adverse effects on elasmobranchs (and migratory fish) populations resulting from EMF have been recorded to date. However, conversely, given the limited number of studies of responses to EMF by fish in the wild, there is also considered a lack of robust evidence to the contrary and the overall known effects of EMF on elasmobranchs remain inconclusive.

Sediment heating from cables is expected to result in localised effects within close proximity to the site of the cables, so it is expected that any adverse impacts to fisheries and fish ecology will also be localised to the site of the cables.

The MMO’s recommendation for a minimum cable burial depth of 1.5m is taken from the National Policy for Renewable Energy Infrastructure (Department of Energy and Climate Change (2011)). Adequate cable burial depth not only reduces the risk of snagging such anchors and bottom towed fishing gear, but also reduces the risk of cables being exposed, e.g., through scour, movement of mobile sediments etc. The reburial of exposed cables using burial techniques such as



trenching and jetting causes further disturbance to benthic fish habitats, spawning and nursery grounds.

The MMO are aware that the advice for burial depth varies depending on which receptor is being considered. The MMOs position when making licensing decisions is to take the precautionary approach. The MMO expect to have further clarification for this at deadline 8.

3.3 **Q4.3.1.3** *Outline Benthic Mitigation Plan/Scheme. The Applicant has stated that “Details of the benthic mitigation that applies are provided in Tables 8-3 and 8-4 of the ES [APP-094]. No other forms of mitigation are proposed by the Applicant”.*

a) *For MMO and NE, does the proposed mitigation within these ES tables sufficiently cover the types and form of mitigation that would likely form part of a final mitigation scheme for any benthic habitats, or is there further mitigation that should be incorporated?*

b) *Applicant, explain with reasons what further mitigation might be needed in a final mitigation scheme for any benthic habitats.*

The schemes proposed embedded mitigation, summarised in Table 8-3, and the additional mitigation measures, in Table 8-4 of the ES appear suitable to reduce the potential impacts to sensitive and ecologically important benthic receptors.

3.4 **Q4.3.3.4** *Micro-siting around sand waves and megaripples The ES [APP-092, Table 6-3] states that “Route selection and micro-siting of the cables will be used to avoid areas of sea bed that pose a significant challenge to their installation, including for example areas of sand waves and megaripples. This will minimise the requirement for sea bed preparation (levelling) and the associated sea bed disturbance.”*

a) *Applicant, explain how this is secured through the dDCO?*

b) *NE and MMO, are you satisfied that this mitigation would be secured based on the dDCO?*

The MMO will confirm our position at D8, following the applicant’s explanation of how it will be secured through the dDCO.

3.5 **Q4.3.3.6** *Post-Consent Sampling. The Applicant has committed to further contaminants sampling and analysis is being undertaken post-consent.*

a) *Applicant, how this is secured post-consent?*

b) *MMO, are you satisfied with how this is secured through the dDCO?*

The MMO have reviewed the wording of the condition for post-consent sampling and are satisfied that condition 22 contained within the dDCO (REP6-002) covers all requirements for post-consent sampling.



3.6 **Q4.3.4.2 MEEB and the dDCO.** *The Applicant has submitted the Proposal Without Prejudice DCO Drafting (Revision C) [REP5-008], which at Part 4 includes a section setting out the Measures of Equivalent Environmental Benefit. Consider the wording as set out and respond as to its adequacy if the MEEB is required, particularly with regards to:*

- a) The timings as set out, such as the provision under paragraph 33 that there should be no external cable protection works may be commenced within the Cromer Shoal Chalk Beds MCZ until the MEEB implementation and monitoring plan has been approved by the SoS.*
- b) And, whether it is appropriate that there would be no requirement to implement the MEEB implementation and monitoring plan if no external cable protection works are required within the Cromer Shoal Chalk Beds MCZ?*

The MMO defer to Natural England on whether any external cable protection works may commence within the Cromer Shoal Chalk Beds MCZ until the MEEB implementation and monitoring plan has been approved by the SoS.

Additionally, the MMO defer to Natural England on whether it is appropriate for there to be no requirement to implement the MEEB implantation and monitoring plan if no external cable protection works are required within the Cromer Shoal Chalk Beds MCZ.

3.7 **Q4.11.4.1** *The role of MMO and other drafting edits proposed in the dDCO*

- a) MMO, provide the update as indicated [REP6-026, paragraph 3].*
- b) Applicant and MMO, indicate either in the draft SoCG or here if matters are subsequently agreed with the Applicant, or remain in dispute.*

Please find the MMO's deferred comments regarding the proposed changes to the dDCO within section 4 of this response.

3.8 **Q4.11.8.2** *Post construction monitoring and subsequent remediation.*

- a) Do the dDML post construction monitoring conditions (Schedule 10, Part 2, Condition 20; Schedule 11, Part 2, Condition 20; Schedule 12, Part 2, Condition 19; and Schedule 13, Part 2, Condition 19) [REP6-002] or any other part of the dDCO bind the undertaker to take action should this post construction monitoring highlight any particular impacts that need remediation or further mitigation works?*
- b) Highlight is any further provisions or drafting edits that could be required in the dDCO to ensure remediation or further mitigation works are undertaken on the basis of findings in the post construction monitoring.*

The dDML post construction monitoring conditions do not bind the undertaker to take action should the post construction monitoring highlight any particular impacts that need remediation or further mitigation works. In order for this to be secured in the dDML this would need to be included within the wording of each relevant condition. The MMO will aim to provide suggested wording for the dDML prior to deadline 8.



3.9 **Q4.11.8.3 Deemed Marine Licences and Marine Mammals and Monitoring.** Detail any remaining concerns regarding the dDMLs and the management of marine mammals.

The MMO have no further concerns to raise regarding the dDMLs and management of marine mammals.

3.10 **Q4.11.8.4 Deemed Marine Licences and Benthic Ecology.** Are you satisfied that the mitigation relevant to benthic ecology (including offshore physical processes/ marine geology) are all included with appropriate wording within the dDCO and dDMLs, including through the Requirements and Conditions

The MMO are satisfied that the mitigation relevant to benthic ecology (including offshore physical processes/ marine geology) are all included with appropriate wording within the dDCO and dDMLs, including through the Requirements and Conditions.

3.11 **Q4.12.2.5 Cockles and brown shrimp.** State the final positions of the parties on the issues on cockles and brown shrimp [REP6-026].

The MMO have no further concerns to raise regarding cockles and brown shrimp.

## 4 Responses Deferred from The MMOs Deadline 6 Response (REP6-026)

### 4.1 Responses to the Examining Authority's proposed changes to the draft Development Consent Order (DC1)

4.1.1 **DC1.3.1.1** *The role of MMO - The ExA notes the amendments proposed by the Applicant to Article 5, particularly sub paragraphs 2, 6 and the addition of sub-paragraph 3, to ensure that MMO is consulted by the SoS should the SoS consider a transfer of benefit of a DML, and only the whole of the DML could be transferred, not allowing a transfer of part of a DML. The ExA finds it reasonable that where a transfer of a DML would be proposed, the SoS would be required to look at the proposed transfer in the context of all the provisions of the dDCO, including some Articles and Requirements relating to offshore matters which overlap with the DMLs. In that context, the ExA finds it is reasonable that the SoS would have the ability to approve the transfer of a dDML, in consultation with MMO [RR-053] [REP1-036, Q1.11.3.2] [REP3-112] [REP3-133] [REP4-028] [REP4-037] [REP4-048]. However, the ExA proposes the following edits:*

- A) Applicant, provide edits to Article 5 (or signpost if already included) to ensure that the provision only provides for the transfer of the benefit of the dDML and not a lease.*
- b) Applicant, provide corresponding justification and any other relevant updates in the EM.*
- c) MMO, provide further justification if you find that the provision in Article 5(6) would not enable you to ensure compliance with the provisions of the MACAA2009, when responding to the SoS.*

The MMO note that points (a) and (b) are directed at the applicant.





The MMO are still in discussion regarding the ExA's suggestion. Whilst the MMO was aiming to provide an update for this deadline we have been unable to finalise our response, however, we are confident that a response can be provided for Deadline 8.

- 4.1.2 **DC1.8.2.1** *Activities Authorised under the DMLs. The Marine Management Organisation continue to raise objection to the use of the phrase “materially” within the context of the DMLs [REP2-059, Paragraph 8.9] [REP4-037]. While the ExA awaits further discussion on this matter and resolution on this issue, the following alternative suggestions are proposed. Applicant and MMO to comment:*
- a) *Consider a fuller explanation in the EM which sets out that the undertaker would be restricted to carrying out works that do not give rise to any new or different environmental effects to those assessed in the EIA; or*
  - b) *Consider and adding a provision in the dDML to restrict activities that do not give rise to any new or different environmental effects to those assessed in the EIA.*

The MMO are still in discussion regarding the ExA's suggestion. Whilst the MMO was aiming to provide an update for this deadline we have been unable to finalise our response, however, we are confident that a response can be provided for Deadline 8 .



## References

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