



# 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)

## (Email only)

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

02 May 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 3 Submission**

This document comprises the Marine Management Organisation's (MMO) Deadline 3 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

Nicola Wilkinson  
Marine Licensing Case Officer

D [REDACTED]  
E [REDACTED] [@marinemanagement.org.uk](mailto:[REDACTED]@marinemanagement.org.uk)

Copies to:

Christie Powell (MMO) – Case Manager: [REDACTED] [@marinemanagement.org.uk](mailto:[REDACTED]@marinemanagement.org.uk)

Paul Stephenson (MMO) – Senior Case Manager:  
[REDACTED] [@marinemanagement.org.uk](mailto:[REDACTED]@marinemanagement.org.uk)



## Contents

1	General Comments.....	3
2	Written summaries of Oral Submissions to ISH 5.....	3
3	Written summaries of Oral Submissions to ISH 6.....	7
4	Responses to the Examining Authority's Second Written Questions (WQ2) .....	9
5	Responses Deferred from The MMOs Deadline 2 Response (REP2-059) .....	19
6	References .....	20
7	Annex 1 .....	21



## 1 General Comments

- 1.1 The MMO have review the applicants Statement of Common Ground (SoCG) and continue to work with them on this document. There are a couple points within this where the outcome is “Not Agreed – no material impact”. These are points that the MMO still consider important in the examination process but understand the applicant’s decision to not consider them further. These issues were discussed at the Issue Specific Hearings (ISH) 5 &6 and are detailed below in the MMOs written summary of submissions made.

## 2 Written summaries of Oral Submissions to ISH 5

### **Session 3, Agenda Item 6**

#### *6. The extent, scope and security of mitigation for marine mammals*

- i. Is there agreement on the content, scope and level of mitigation secured in the Marine Mammal Management Protocol [REP1- 014]? If not, what amendments are perceived to be required in order for agreement to be reached?*

- 2.1 The MMO were largely content with the mitigation measures proposed, which are in keeping with other offshore wind developments. However, there were some reservations regarding the breaks in piling:
- 2.2 The MMO have previously cited the Joint Nature Conservation Committee’s (JNCC) (2010) guidance following concerns with the applicants comment that “any breaks in piling of more than 10 minutes and less than 2 hours, piling can recommence, with 5 to 6 blows at low energy (300kilojoules (kJ) or 320kJ lowest possible hammer energy), followed by piling at full energy”. JNCC guidance recommends that if there is a pause in piling operations for a period of greater than 10 minutes, then the pre-piling search and soft-start procedure should be repeated before piling recommences. If a watch has been kept during the piling operation, the Marine Mammal Observers (MMObs) or Passive Acoustic Monitoring Operators (PAM-Ops) should be able to confirm the presence or absence of marine mammals, and it may be possible to commence the soft-start immediately. The guidance recommends that the soft-start duration should be a period of not less than 20 minutes. Any requested variation from a 20-minute soft-start should be agreed with the relevant agency and regulator. The MMO previously recommend that this guidance is adhered to, and the full soft start of 20 minutes is implemented (not 5 to 6 blows at low energy as is proposed in the MMMP).



2.3 The MMO have reviewed the revised MMMP and it appears to have sufficiently addressed previous reservations. The revised MMMP proposes that for any breaks in piling of more than 10 minutes, the full mitigation procedure is required, including 30-minute monitoring of the Monitoring Area (MA) by MMObs and / or Passive Acoustic Monitoring, Acoustic Deterrent Device deployment and activation for the required time, followed by the soft-start and ramp-up procedure (for a minimum of 20 minutes). Monitoring of the MA during any breaks in piling will be conducted by MMObs during daylight hours and suitable visibility or by PAM-Ops during poor visibility or at night. If monitoring was conducted during piling prior to any breaks and the MA has been confirmed as having no marine mammals, then it may be possible to commence the soft start immediately. The soft-start and ramp-up procedure would be for a minimum of 20 minutes as outlined in the JNCC guidance. The MMO believe that this approach is in keeping with best practice guidance.

ii. *Does Natural England and the Marine Management Organisation consider that there are any fundamental issues remaining, on either an Environmental Impact Assessment or Habitats Regulation Assessment basis, in respect of marine mammals that warrant further work to be done? Explain with reasons.*

2.4 The MMO have no major outstanding concerns with the Habitats Regulation Assessment (HRA) but largely defer to Natural England on this.

2.5 There are still some remaining reservations regarding the Environmental Impact Assessment, we think still require addressing

#### *Comments on Chapter 10 – Marine Mammal Ecology:*

2.6 The Cumulative Impact Assessment (CIA) screening identified that there is the potential for cumulative impacts on marine mammals as a result of disturbance from underwater noise during piling and other construction activities, including vessels at SEP and DEP. Other potential impacts, including Permanent Threshold Shift (PTS) from underwater noise and Temporary Threshold Shift (TTS) from underwater noise, were screened out of the CIA. All operational impacts have also been screened out of assessment. There does not appear to be a justification for scoping out PTS and TTS from underwater noise or operational impacts, unless this is included in the CIA screening.

2.7 Paragraph 309 and 709 of Chapter 10: *“The approach to the assessment for cumulative disturbance from underwater noise for harbour porpoise has been based on the approach for the assessment of disturbance in Section 10.6.1.2, including the current advice from the SNCBs (JNCC et al., 2020) on the assessment of impacts on the SNS SAC. The potential disturbance from underwater noise during piling for other marine mammal species has been assessed based on the worst-case maximum area modelled for SEP and DEP for each species, using TTS / fleeing response as a proxy for disturbance, where no further information of potential disturbance impact ranges are available”*. The MMO have previously noted that is not considered appropriate to use the TTS-onset thresholds as a proxy for disturbance. TTS occurs at much higher sound exposures, and so will underestimate the risk of disturbance. The MMO are aware that justification for this has been provided and will review for deadline 4



- 2.8 Paragraph 308 of Chapter 10: “*There are currently no agreed thresholds or criteria for the behavioural response and disturbance of marine mammals, therefore it is not possible to conduct underwater noise modelling to predict impact ranges*”. The MMO agree that there are currently no agreed behavioural thresholds for marine mammals. One approach is to use species-specific dose-response curves to assess disturbance from piling. Dose response curves should be based on current, appropriate, peer-reviewed literature. Generally, noise contours at 5 dB intervals are generated by noise modelling and overlaid on species density surfaces to predict the number of animals potentially disturbed.
- 2.9 Paragraph 399 (and elsewhere in the chapter): “*The results of the underwater noise modelling (Table 10-60) indicate that any marine mammal would have to be less than 100m (precautionary maximum range) from the continuous noise source for 24 hours, to be exposed to noise levels that could induce PTS or TTS, with the exception of harbour porpoise and the predicted impact ranges for TTS of 1km for rock placement and 0.2km for dredging, based on the Southall et al. (2019) non-impulsive thresholds and criteria for SELcum*”. Please note that as the noise modelling incorporated a fleeing animal receptor, the results indicate that any marine mammal would be at risk of PTS or TTS if they were less than 100m from the continuous noise at the start of the activity (and not necessarily at 100m for 24 hours as the report suggests).

*Comments on Appendix 10.2 Underwater Noise Modelling Report:*

- 2.10 The predictions of the simultaneous piling are provided in section 5.3 of the Underwater Noise Modelling Report. Contour plots and summary tables of results are provided for each scenario. This modelling is based on a fleeing receptor for marine mammals (and both a stationary and fleeing receptor for fish). However, apart from the flee speeds, the report does not provide any detail on the fleeing assumptions or receptor movements. The MMO note would be helpful if the report could include an explanation as to how the simultaneous piling assessment was conducted. For example, the model used to simulate fleeing behaviour should be clearly described, including the following parameters, which all affect the amount of noise an animal may be estimated to be exposed to: the time (e.g. onset of activity) or noise level at which animals are assumed to begin responding; the direction in which they flee (especially in the case of scenarios assuming multiple location/simultaneous piling when the assumptions might be less obvious); whether there is a maximum distance or minimum sound level at which animals will cease to respond; whether animals are assumed to continue fleeing, remain stationary, or return toward the noise source/s during temporary cessations in noise-generating activity.
- 2.11 It will be important to verify the predictions made in the Environmental Statement through construction noise monitoring. To aid comparison of predicted versus measured data, the noise modelling report should include a plot showing the predicted received levels versus range for both monopiles and pin piles, for representative hammer strikes.



2.12 The Examiner asked during the hearing whether further underwater noise monitoring will be required during the examination period to satisfy the MMO. The MMO can confirm that no further underwater noise monitoring is required during examination, and that the standard monitoring secured post consent is sufficient.

#### **Session 4, Agenda Item 7**

*iii. The Marine Management Organisation continue to raise objection to the use of the phrase “materially” within the context of the draft Development Consent Order and Deemed Marine Licences [REP2-059, paragraph 8.9]. The ExA notes the argument of precedence raised by the Applicant. Can the MMO explain why, if that phrase has been accepted by the SoS in other consented DCOs, it is inappropriate for that phrase to be used in this instance?*

2.13 The MMO strongly considers that the activities authorised under the DCO and DML should be limited to those that are assessed within the Environmental Impact Assessment (EIA), and the statement that activities will be limited to those that ‘do not give rise to any materially new or materially different environmental effects’ should be updated to clarify this. The MMOs position was that wording should be updated to ‘do not give rise to any new or different environmental effects to those assessed in the environmental information’.

2.14 The MMO have previously raised concerns with the term ‘materially’ in examinations for projects including Sizewell C, Hornsea 4, and Boston Alternative energy facility. This is based on our experience in working under the made DMLs of past projects. One of the issues with the Nationally Significant Infrastructure Projects (NSIP) process is the delay between a decision being made on an application, and then the construction and operation of these projects. These delays mean that we become aware of issues with the drafting of the DMLs in terms of enforceability, years after project decisions have been made. As a licensing case team as a whole we now have a wealth of experience in post consent work under Deemed Marine Licences, and we intend to use that experience to continually improve the advice we provide to the Secretary of State (SoS) for NSIP projects, using the best available evidence we have.

2.15 In this DCO and the DML, the applicant wants flexibility in terms of the design details. Where those design details are not finalised at the application stage, the applicant is wanting to retain some flexibility and is proposing that the works that can be carried out should be restricted to those which do not give rise to materially new or materially different environmental effects to those assessed in the EIA.



- 2.16 The concern with this is that the inclusion of the word materially here would allow the undertaker to carry out works whose effects are outside of the likely significant effects assessed in the EIA, providing they do not do so materially, i.e. in any significant way, greatly, or considerably. This is not what the purpose of the EIA process is, and it runs contrary to the purpose of EIA. The other issue with this is that whilst the undertaker is responsible for producing the environmental information and statement on which the EIA decision is based, the appropriate authority is responsible for the EIA consent decision, the inclusion of the word materially essentially means that the undertaker makes the decision as to what is and what is not material. Under EIA it is for the appropriate authority to determine what the likely significant effects will be and how those should be mitigated.
- 2.17 This was the reasoning for the MMO to not consider it appropriate to use the word material in these circumstances. If the applicant wants the flexibility of not being prescriptive about the design from the start, the Order and the DML granted through it should restrict works which can be carried out to those which do not give rise to any new or different environmental effects to those assessed in the EIA.

### 3 Written summaries of Oral Submissions to ISH 6

#### **Session 4, Agenda Item 8**

##### *8. Draft Development Consent Order*

- i. Regarding the comments from the Marine Management Organisation for Deadline 2 [REP2-059], whether Part 2, Article 5 of the draft Development Consent Order (Benefit of Order) allows for the transfer or temporary lease of the benefits of the draft Marine Licences in a way which would be a significant departure from the current statutory framework set out by Marine and Coastal Access Act 2009?*

*Also, whether there would be sufficient involvement in such circumstances by the Marine Management Organisation in considering a proposed transfer or lease of development order benefits?*

- 3.1 The MMO wish to highlight that within the Marine and Coastal Access Act 2009 (MCAA), it states the following:

*Section 72, sub section*

*(7) On an application made by a licensee, the licensing authority which granted the licence—*

- (a) may transfer the licence from the licensee to another person, and  
(b) if it does so, must vary the licence accordingly.*

*(8) A licence may not be transferred except in accordance with subsection (7).*



- 3.2 At the point of a DCO being made, the DML falls away from the DCO and comes under the MMOs jurisdiction. It therefore falls under MCCA for enactment and enforcement. Under MCCA it is only the licensing authority who have the power to vary a licence. At the point of the DCO being made the SoS has no power to alter or transfer the DML to another holder and does not have the power to allow the applicant to transfer the DML to another holder. The applicant will still require to come to the MMO for a variation of the DML to allow the transfer. While the applicant stated that the DMLs should be treated separate to a standard marine licence, the MMO wish to highlight that the DMLs are still subject to the same regulations as standard marine licences, and therefore the process for both is comparable.
- 3.3 In considering the proposed provisions of Article 5 DCO, Article 5(2), being read with Article 5(4) introduces a process involving the Secretary of State providing consent to the transfer in certain circumstances, rather than the MMO as the regulatory authority for marine licences considering the merits of any application for a transfer.
- 3.4 As the process proposed by the applicant is a significant departure from the current statutory framework in relation to marine licences, it has not been tested, it may therefore be the case that the applicant/undertaker will face unnecessary delays following it's application as it is not clear that the Secretary of State will have a process in place to deal with requests of this nature and it is not clear what any consultation period with the MMO would be.
- 3.5 It is noted that the Secretary of State "must consult" the MMO (Article 5(5)) – however the obligation goes no further than this, the Secretary of State is not obligated to take into account the views of the MMO in providing its consent and there is no obligation for the MMO to be informed of the decision of the Secretary of State – only by the undertaker under Article 5(8). This provision merely states that the notification must be 'prior' to any transfer or grant and does not indicate any time scale.
- 3.6 Despite the proposed changes to the process of transferring a marine licence it remains that neither the licence holder/undertaker nor the Secretary of State has any power to actually vary any terms of a marine licence and it will still therefore be necessary for the MMO to take steps to vary a marine licence to reflect that it has been transferred to another entity. To our mind the proposed mechanism for transfer of a marine licence does not actually work and in fact does little more than complicate the process.
- 3.7 There are also very real practical concerns as to how the proposed process would work in practice. The transfer of the licence would happen first, and then the marine licence would need to be varied. After the transfer of the licence, the new license holder/undertaker would have a marine licence which would still be in the name of the license holder/undertaker who had transferred the licence. The new license holder/undertaker would have no authorisation to carry out any acts until the variation had taken place and until the variation had been affected the original licence holder/ original undertaker would remain liable for any actions undertaken. The procedure under section 72 MCAA avoids this issue entirely.





- 3.8 At the request of the Examiner, the MMO reviewed previous DCOs made, and does understand that this wording is included in other DCOs and understands the precedence the applicant is referring to. However, the MMO also have experience in applying transfer of benefit on constructed projects, and all have to come to the MMO for a variation to the DML to allow the transfer to be made. Whether they have approval from the SoS or not, the transfer is still required to go through the DML variation process with the MMO.
- 3.9 The licence holder, or undertaker as commonly referenced in DCO/DMLs, must submit a request to vary a DML in writing to MMO. All variation requests should be screened in accordance with The Marine Works (EIA) Regulations 2007 (as amended) (MWRs), under provision 88.

*88. Any change to or extension of development of a description listed in Schedule A1 (other than a change or extension falling within paragraph 31 of that Schedule) where that development is already authorised, executed or in the process of being executed.*

At this point the MMO would notify the Planning Inspectorate (PINS) and the relevant government department of the proposal to amend the DML. The continued engagement with the relevant departments depends on the level of change requested, so for example an admin change such as a change in licence holder, would only require a notification from the MMO.

- 3.10 It is essential as the regulatory authority in the marine environment that the MMO is always fully aware who has the benefit of marine licence in order that it can carry out its regulatory function and where necessary take enforcement action. The mechanism the applicant is currently proposing for the transfer of a marine licence departs from this established process without clear justification as to why such a departure is necessary or appropriate in the circumstances.

### **Leasing of a DML, or Transferring in part**

- 3.11 The MMO highlighted that within MCAA there is no provision to lease a marine licence, or to transfer in part. The MMO note that the applicant has agreed to amend this wording under Article 5 and welcome this change. The MMO have no further concerns regarding the leasing or transferring in part of the DMLs.

## **4 Responses to the Examining Authority's Second Written Questions (WQ2)**

- 4.1 **Q2.3.1.4** *Electromagnetic Field impacts. Even if cables were buried or covered with cable protection, would this be sufficient mitigation to prevent adverse impacts to benthic ecology by reason of electromagnetic fields or through sediment heating?*

The MMO recommended a cable burial depth of >1.5m (subject to local geology) to reduce the potential effects of electro-magnetic field (EMF) on electro-sensitive species that rely on benthic habitats e.g., elasmobranchs. This is in line with the most recent scientific evidence (Hutchison et al., 2020a; 2020b; 2021) and is in



accordance with the recommended burial depth given in the National Policy Statement for Renewable Energy Infrastructure (EN-3) (Dept. of Energy & Climate Change, 2011). The >1.5m burial depth is generally applied to reduce EMF effects, however, it will have the de facto effect of minimising adverse effects of sediment heating on sensitive bottom dwelling species, e.g., sandeels. It should be recognised that 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 receptor.

Notwithstanding the above, for this locality in particular, the MMO recognise that burial of cables may impact the designated features within the Cromer Shoal Chalk Beds Marine Conservation Zone (CSCB MCZ), such as causing direct damage to the chalk reef, for example. Therefore, the MMO defer to Natural England, as the lead statutory consultee for the CSCB MCZ, to comment further on the appropriateness of buried cables in relation to any impacts on MCZ features. Furthermore, cable burial may not be possible in some instances where other man-made infrastructure such as cables and pipelines are present, or when the underlying geology makes cable burial impractical.

The MMO consider that given the above, burial to 1.5m+ should prevent adverse impacts to benthic ecology receptors via electromagnetic field and/or heating.

- 4.2 **Q2.3.1.6 UXO in Benthic Communities.** *The Applicants' document 'Assessment of Sea Bed Disturbance Impacts from Unexploded Ordnance Clearance' [APP-080] states, regarding the recovery of benthic communities following a detonation, that "Recovery of these communities will take place rapidly with full recovery expected within two years in many areas based on the resilience of most biotopes. Recovery may take longer in some coarse and mixed sediment areas but based on DOW post-construction monitoring of cable installation activities, full recovery is expected in less than four years". Do you agree with the conclusions on this matter? Explain with reasons. Provide details if you consider further evidence or mitigation is necessary? See related questions in the sections on Habitats and Ecology Offshore and the section on Historic Environment and Cultural Heritage.*

The MMO note that some background to the theoretical sensitivity and recovery times of the potential habitats likely to be in the vicinity of the Unexploded Ordnance (UXO) have been provided, and these are based on the widely-used (Marine Evidence based Sensitivity Assessment) MarESA approach. This approach indicates that, at worst (depending on the sediment habitat type), recovery from the impacts from unexploded ordnance clearance is likely to take 2-10 years. In the absence of directly comparable empirical data for these habitats from this type of impact, this seems defensible. However, the proposition from the applicant that full recovery is likely to be less than four years is not based on evidence following impacts from an unexploded ordnance clearance but from a different pressure, i.e., cable installation activities. As the type and spatial extent of this pressure is different to that of an unexploded ordnance impact, the MMO do not unequivocally support nor refute this assertion.



4.3 **Q2.3.4.5** *Historic oyster bed evidence. The Applicant has stated [REP2-020] that there were oyster beds historically in this area, when providing support for their MEEB preference. Can you provide any evidence of historic oyster beds in this part of the southern North Sea?*

The MMO currently hold no evidence of the historic oyster beds in this area, and hold no evidence of why the oyster beds no longer exist.

4.4 **Q2.5.1.2** *Concurrent versus sequential scenarios. Depending on the construction scenario, the offshore construction period may either be 2 years in the concurrent scenario or 4 years in the sequential scenario, with a potential maximum 2 years break in between [APP-314]. The concurrent scenario would result in a greater intensity of activity, but over a shorter time frame whereas the sequential scenario would seek a lesser intensity of activity but over a longer period of time. Whilst much of the focus for offshore ornithology, marine mammals and benthic ecology has been on the operational effects, comment on:*

- a) *From EIA and HRA perspectives, which construction scenario is considered better and would be preferred by the Applicant and why?*
- b) *Would the concurrent scenario, by limiting the amount of construction time within the Greater Wash SPA, be more beneficial for red-throated divers than the sequential scenario?*
- c) *Is there any evidence to suggest that the on and off effect of construction in the sequential scenario would have a dissuading effect that birds may not return to the location?*

The MMO note that point (a) is directed at the applicant and defer to Natural England regarding points (b) and (c) regarding disturbance to red-throated divers and long term-disturbance to birds.

4.5 **Q2.11.3.1** *Article 5 – Benefit of Order. The Applicant and MMO are to continue discussions on changes to Article 5 of the dDCO. This should include the consideration of the role of MMO in sub-paragraph 5, particularly whether requirement to consult the MMO before giving consent to the transfer or grant to another person of the benefit of the provisions of the dDMLs is sufficient involvement for the MMO. MMO to also research other DCOs and whether there have been similar issues of transfer of benefits of orders and marine licences using DCO provisions, and possible duplication of processes that may have occurred.*

The MMO maintains its position with regard to Article 5, as set out in our Deadline 2 response (REP2-059) and during ISH 5 on 30 March 2023. The MMO have reiterated their position in points (section 4) of this response.



At the request of the Examiner, the MMO reviewed previous DCOs made, and does understand that this wording is included in other DCOs and understands the precedence the applicant is referring to. However, the MMO have experience in applying transfer of benefit on constructed projects, and have come to the MMO direct for a variation to the DML to allow the transfer to be made. Whether they have approval from the Secretary of State (SoS) or not, the transfer has still undergone the DML variation process with the MMO.

4.6 **Q2.11.3.2 Collaboration conditions.** *For both parties to continue discussions as to the wording for a collaboration condition for the dDCO.*

The MMO can confirm that discussion with the applicant regarding wording for the collaboration has progressed since Deadline 2. Since Deadline 2 the MMO and the Applicant have agreed wording on the condition which has been updated in the SoCG between the MMO and the Applicant and provided here for reference:

*(1) Prior to submission of plans and documentation required to be submitted to the MMO for approval in accordance with conditions [13 and 14], the undertaker must provide a copy of the relevant plans and documentation to [SEL/DEL] to enable [SEL/DEL] to provide any comments on the plans and documentation to the undertaker.*

*(2) The plans and documentation submitted to the MMO for approval in accordance with conditions [13 and 14] must be accompanied by any comments received by the undertaker from [SEL/DEL] in accordance with subparagraph (1) or a statement from the undertaker confirming that no such comments were received.*

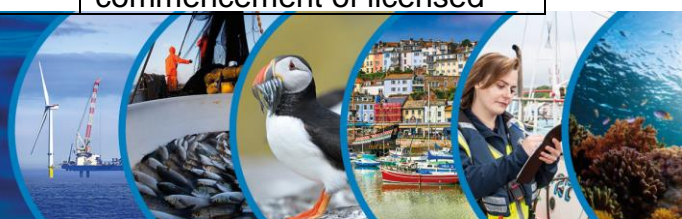
4.7 **Q2.11.5.3 Requirement 20.** *In the interests of protecting sensitive seabird or marine mammal species and any activities they may do in the hours of darkness, should construction hours be imposed in respect of offshore works?*

The MMO defer to Natural England for potential restrictions in construction hours as a form of mitigation against adverse impacts to sensitive seabirds. The MMO do not consider restrictions for marine mammals are required

4.8 **Q2.11.6.1 Timeframes for determinations.** *The MMO and Applicant, provide a joint statement setting out your positions and corresponding rationales for the appropriate lead-in period (4 months or 6 months) for review and decisions from the MMO on detailed submissions from the Applicant.*

The MMO has agreed the following timeframes with the Applicant:

Reference	Document	Timeline as drafted in the DCO
Schedule 10, Part 2, Paragraph 13(1)(a)	Project details and plans	At least four months prior to commencement of licensed



		activities
Schedule 10, Part 2, Paragraph 13(1)(b)	Construction Programme and monitoring plan (save for where specified otherwise)	At least six months prior to commencement of licensed activities
Schedule 10, Part 2, Paragraph 13(1)(b)(iii)(aa)	Details of pre-construction surveys, baseline report format and content, construction monitoring, post construction surveys and monitoring and related reporting	At least four months prior to the first survey, details of pre-construction surveys and proposed pre-construction monitoring At least four months prior to construction, detail on construction monitoring At least four months prior to commissioning, detail on post construction monitoring
Schedule 10, Part 2, Paragraph 13(1)(c)	Construction method statement	At least four months prior to commencement of licensed activities
Schedule 10, Part 2, Paragraph 13(1)(d)	Project environmental management plan	At least four months prior to commencement of licensed activities
Schedule 10, Part 2, Paragraph 13(1)(e)	Archaeological written scheme of investigation in relation to the offshore order limits	At least four months prior to commencement of licensed activities
Schedule 10, Part 2, Paragraph 13(1)(f)	An offshore operations and maintenance plan	At least six months prior to commencement of operation of the licensed activities
Schedule 10, Part 2, Paragraph 13(1)(g)	Aids to navigation and management plan	At least four months prior to commencement of licensed activities
Schedule 10, Part 2, Paragraph 13(1)(h)	Where driven or part-driven pile foundations are proposed a marine mammal mitigation protocol	At least six months prior to commencement of licensed activities
Schedule 10, Part 2, Paragraph 13(1)(i)	Mitigation scheme for Benthic habitats of conservation, ecological and/or economic importance constituting annex 1 reef habitats	At least four months prior to commencement of licensed activities
Schedule 10, Part 2, Paragraph 13(1)(j)	An ornithological monitoring plan	At least six months prior to commencement of licensed activities
Schedule 10, Part 2, Paragraph 14(3)	SIP for the SNS SAC	No later than six months prior to commencement of piling activities



- 4.9 **Q2.11.6.2** *Outline Offshore Operation and Maintenance Plan. The ExA is concerned regarding the 'amber' items highlighted within the Relevant Representation [RR-053], particularly that additional licences may be required "if proposed works exceed those assessed within the ES or described within the DCO." What is the likelihood of the works falling outside of the scope of the dDCO or causing greater effects than assessed as the worst-case scenario in the ES?*

The MMO defer to the applicant on the likelihood of effects exceeding what has been assessed within the ES.

The MMO would like to reiterate our comments from ISH 5 regarding comments relating to the use of the word "material" under normal planning or consenting acts the MMO works under the MCAA which has different definitions, which is relevant to the MMO under the DML, which falls to the MMO as a regulator as soon as the DML has been made, rather than the MMO being able to make the decision on the DML itself. Because of this the MMO during examination have less power over its inclusion within the DML. Please refer to the MMO's comments in paragraph 3.14 of this response.

If works fall outside of what is assessed within the ES, and they fall under one of the licensable activities as prescribed by MCAA, then further marine licences for the project may be required. This is standard practice across consented and built windfarm projects.

- 4.10 **Q2.12.2.1** *Confidence in the Southern North Sea Special Area of Conservation Site Integrity Plan [APP-290]. Do you have confidence that site integrity plans for relevant projects in the Southern North Sea SAC would provide sufficient control over the timing and nature of noisy activities to ensure that the relevant in-combination disturbance impact thresholds for marine mammals would not be breached? Explain with reasons.*

Site Integrity Plans became a requirement following an Assessment to determine whether consented offshore windfarms within the North Sea would adversely affect the integrity of the Southern North Sea Special Area of Conservation (SNS SAC). This review concluded that in order to manage noise, and therefore impact, to the SNS SAC Site Integrity Plans (SIPs) were required. The purpose of the SIP is to demonstrate that, with applied mitigation if necessary, the SNS SAC conservation objectives can be maintained without resulting in Adverse Effect on Site Integrity. The aim of the SIP is to ensure that noise within the SNS SAC is managed and aligned with guidance from the Joint Nature Conservation Committee, which advises that noise must not exclude harbour porpoise from more than 20% of the relevant area of the site in any given day, or an average of 10% of the relevant area of the site over a season.

The MMO are therefore satisfied that the SIP is currently provides sufficient control over the timing and nature of noisy activities to ensure that the relevant in-combination disturbance impact thresholds for marine mammals would not be breached.



4.11 **Q2.12.2.4 Underwater Noise Modelling.** *Are you content, at this stage, that sufficient underwater noise modelling has been satisfactorily undertaken? Explain with reasons.*

The MMO are satisfied that further underwater noise modelling is not required, this is on the following basis; (1) Provided that there are no changes at a later date to the original design parameters that have informed the current noise modelling; (2) provided that construction noise monitoring of the first four (representative) piled foundations is undertaken. This is a standard requirement for offshore wind projects. However, the MMO consider it is important to verify the predictions made in the ES through construction noise monitoring. To aid comparison of predicted versus measured data, the noise modelling report should include a plot showing the predicted received levels versus range for both monopiles and pin piles, for representative hammer strikes.

While the MMO consider further underwater noise modelling noise is not required the MMO still request amendments to the current underwater noise modelling that has been carried out. The MMO has summarised our points below:

- The noise modelling report should include a plot showing the predicted received levels versus range for both monopiles and pin piles, for representative hammer strikes.
- Further explanation as to how the simultaneous piling assessment was conducted (i.e., the model used to simulate fleeing behaviour should be clearly described, including the following parameters, which all affect the amount of noise an animal may be estimated to be exposed to: the time (e.g. onset of activity) or noise level at which animals are assumed to begin responding; the direction in which they flee (especially in the case of scenarios assuming multiple location/simultaneous piling when the assumptions might be less obvious); whether there is a maximum distance or minimum sound level at which animals will cease to respond; whether animals are assumed to continue fleeing, remain stationary, or return toward the noise source/s during temporary cessations in noise-generating activity.
- For the 'other (non-continuous) noise sources, The MMO request that the Applicant/Subacoustech confirm that that the equation is  $N \log R - \alpha R$  (and not  $N \log R + \alpha R$ )?
- Figure 6-1 in Appendix 10.2 shows the 1/3 octave frequency bands used as a basis for the Southall et al. (2019) weightings used in the simple modelling. The MMO understand that propagation loss is a function of the environment and request the Applicant/Subacoustech explain why the propagation loss varies quite significantly between the different sources, particularly when the source spectra (as per Figure 6-1) are not that different?
- Figure 4-1 and Figure 4-2 in Appendix 10.2 “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". 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.

For assessing potential disturbance and behavioural responses of marine mammals, it was recognised that there are no currently agreed behavioural thresholds. It was advised that one approach would be to use species-specific dose-response curves to assess disturbance from piling. Dose response curves should be based on current, appropriate, peer-reviewed literature. Generally, noise contours at regular intervals (e.g., 1 dB – 5 dB) are generated by noise modelling and overlaid on species density surfaces to predict the number of animals potentially disturbed. The applicant has suggested the possibility of including further plots of single-strike maximum and minimum energies at fixed dB intervals can be investigated. The approach of using dose response curves to assess disturbance would be in keeping with other offshore windfarm developments, and it is therefore recommended.

4.12 **Q2.12.2.5** *PTS and TTS reasoning. Review document APP-193 wherein the Applicant states to have provided justification for screening out PTS and TTS from the cumulative impact assessment. Provide comments if you believe the justification and reasoning to be robust or if there remains a disagreement and why*

The MMO notes that section 10.3.2.1 of the CIA Screening (APP-193) states the following: "PTS could occur as a result of pile driving during offshore wind farm installation, pile driving during oil and gas platform installation, underwater explosives (used occasionally during the removal of underwater structures and UXO clearance) and seismic surveys (JNCC, 2010a, 2010b). However, if there is the potential for any PTS, from any project, suitable mitigation would be put in place to reduce any risk to marine mammals. Other activities such as dredging, drilling, rock placement, vessel activity, operational windfarms, oil and gas installations or wave and tidal sites will emit broadband noise in lower frequencies and PTS from these activities is very unlikely. Therefore, the potential risk of PTS in marine mammals from cumulative impacts has been screened out from further consideration in the CIA".

The MMO do not believe that the justification presented by the applicant is sufficient to scope out PTS from the cumulative impact assessment. Mitigation can be put in place to reduce the risk of potential impact, but PTS will still need to be assessed. Furthermore, the justification that other activities such as dredging, drilling, rock placement, vessel activity, operational windfarms, oil and gas installations or wave and tidal sites will "emit broadband noise in lower frequencies and PTS from these activities is very unlikely", is not valid. The risk of PTS depends on several factors such as the noise levels emitted, the duration of the activity and exposure of the animal. Ultimately, cumulative effects are very difficult to assess, and EIA-based cumulative effects assessments (CEAs) led by developers of individual projects have clear shortcomings (when compared to CEAs led by government agencies on a regional and strategic level) (Willstead et al., 2017).





Regarding TTS, section 10.3.2.2 and 10.3.2.3 of the CIA Screening states: “Where there is little information on the potential disturbance ranges for marine mammals, TTS has been used to indicate possible fleeing response (Section 10.6.1.4 of Chapter 10 Marine Mammal Ecology APP-096). It is acknowledged that disturbance is likely to have greater impact ranges than for TTS. The risk of TTS will be within disturbance ranges for marine mammals. The effects of TTS in marine mammals are temporary. TTS / fleeing response has been screened in to the CIA, where there is a lack of further relevant information for disturbance. The potential for the disturbance to marine mammals from underwater noise has been screened in to the CIA”.

The MMO agree with section 10.3.2.2 that the risk of TTS will be within disturbance ranges for marine mammals. However, it is important to note that TTS and disturbance/displacement are not the same thing, and TTS should not be used to indicate possible fleeing responses. TTS is a temporary hearing impairment and should be considered in addition to disturbance.

4.13 **Q2.12.2.6** *Barrier, Disturbance and Displacement Effects. Has the Applicant adequately mitigated for potential barrier, disturbance and displacement effects to marine mammals [APP-096, REP1-014]? If not, what would you expect or require from the Applicant to give reassurances on this matter?*

The MMO has reviewed the most recent draft MMMP (REP1-014) and note that the changes mostly address the MMO’s concerns regarding the breaks in piling.

The revised MMMP proposes that for any breaks in piling of more than 10 minutes, the full mitigation procedure is required, including 30-minute monitoring of the MA by MMObs and / or Passive Acoustic Monitoring, Acoustic Deterrent Device deployment and activation for the required time, followed by the soft-start and ramp-up procedure (for a minimum of 20 minutes). Monitoring of the MA during any breaks in piling will be conducted by MMObs during daylight hours and suitable visibility or by PAM-Ops during poor visibility or at night. If monitoring was conducted during piling prior to any breaks and the MA has been confirmed as having no marine mammals, then it may be possible to commence the soft start immediately. The soft-start and ramp-up procedure would be for a minimum of 20 minutes as outlined in the JNCC guidance. As noted in paragraph 2.13 of this response, the MMO consider that this approach is in keeping with best practice guidance.

The MMO defer to Natural England for comments on potential barrier effects. The primary purpose of the MMMP is to reduce the risk of potential impact in terms of auditory injury (i.e., PTS). Some of the mitigation measures proposed, such as low order disposal techniques for UXO clearance, and noise abatement measures (such as bubble curtains), will likely reduce the distance at which marine mammals are disturbed / displaced. The use of ADDs however, are specifically designed to deter animals from the area, in order to reduce the risk of physical / auditory injury. Overall, Cefas recommend the use of noise abatement measures to reduce the risk



of potential impact (in terms of auditory injury and disturbance) on sensitive receptors.

4.14 **Q2.12.2.8 UXO clearance.** *Are the UXO clearance mitigations listed in the MMMP [REP1-014, paragraphs 34, 35 and 38] scientifically verified and approved by the MMO and CEFAS, ensuring that a Permanent Threshold Shift impact would be avoided? See related questions in the sections on Benthic ecology, Intertidal, Subtidal and Coastal effects and the section on Historic Environment and Cultural Heritage.*

4.15 The MMO would like to highlight that there is no certainty with the UXO clearance mitigation measures that PTS will be avoided. The mitigation measures should help to reduce the risk of potential impact. Of relevance, it is worth noting that separate MMMPs for piling and UXO clearance will be developed for SEP and DEP at the pre-construction stage. These final MMMPs will take account of the most suitable mitigation measures and up to date scientific understanding at the time of construction. These measures will be consulted upon with the Marine Management Organisation (MMO), Statutory Nature Conservation Bodies (SNCBs) and The Wildlife Trusts (TWT). I believe that this approach is reasonable.

4.16 Paragraph 35 of REP1-014 highlights some of the mitigation measures that could be included, such as low-order disposal techniques, the use of bubble curtains if high-order UXO detonation is required, the activation of ADDs, all UXO clearance to take place in daylight and when possible, in favourable conditions with good visibility, and the establishment of a Monitoring Area (with MMObs and Passive Acoustic Monitoring). These are the standard measures that the MMO would expect to see for UXO clearance applications. For any low order disposal techniques proposed, there must be sufficient evidence to demonstrate the effectiveness of such measure/s.

4.17 Paragraph 47 of the MMMP states the scenarios under which a bubble curtain can be deployed for UXO detonation, specifically:

- When UXO is larger than 50kg charge weight;
- Water depths are between approximately 5m and 40m;
- Significant wave heights are less than 1m;
- Maximum wind speed is less than 8m/s; and
- Current speeds are less than 1.5 knots

4.18 The MMO consider that the contractor should be able to confirm the specific parameters under which a bubble curtain can be deployed. In the unlikely event that low-order disposal (such as deflagration) is not possible, then the MMO recommend that bubble curtains are deployed for all high-order detonations and not just those larger than 50 kg charge weight.



- 4.19 **Q2.14.1.5** *Timetable for Delivery. The Applicant's compensatory measures documents [APP-069, APP-072] set out the time periods (breeding seasons etc) for implementation of the compensatory measures before the Proposed Development becomes operational. Are these time periods sufficient in length and sufficiently secured in the dDCO?*

The MMO defer to Natural England regarding compensatory measures for both sandwich terns and kittiwakes.

- 4.20 **Q2.15.1.5** *Unexploded Ordnance. Do you accept that it is unnecessary for the Applicant to adopt the revised/ additional wording proposed by HE in its WR [REP1-112, Paragraphs 17.4, 17.5 and 17.8]. See related questions in the sections on Habitats and Ecology Offshore and the section on Benthic ecology, Intertidal, Subtidal and Coastal effects.*

The MMO understands that the clearance of UXOs is to be covered by further marine licence applications, outside of the DCO. This is standard practice for multiple consented and under construction projects. This allows the MMO to assess the potential impacts of UXO clearance at the time of requirement Therefore the requirement for UXO clearance to be included within Schedule 10 and 11 of the DMLs is not required. The DMLs do not permit any UXO clearance therefore the inclusions requested within the provisions are not relevant. The MMO will consult Historic England on any UXO clearance licence applicant they receive and therefore can consider advice supplied at the time.

## 5 Responses Deferred from The MMOs Deadline 2 Response (REP2-059)

### ExAs First Written Questions

- 5.1 **Q1.12.2.5** *Recreational Activity. It is known that recreational boat trips take place from Blakeney to view seals along the North Norfolk Coast. What would the impacts be on recreational boat trips from the Proposed Development? Would there be a cumulative effect upon seals arising from construction/ maintenance vessels for the Proposed Development and the continued recreational tourist boat trips?*

At deadline 2 The MMO noted the applicants response to this question, and deferred response to this deadline. The MMO have reviewed the applicants response and are satisfied with this.

### Deadline 1 Submission - 13.6 Marine Plan Policy Review (REP1-060)

- 5.2 The MMO has met with the applicant to discuss previous comments raised on the Marine Plan Policy Review (REP1-060) and is aware an updated version is to be submitted to examination. The MMO will provide further comment on this document at the deadline following this submission.



## 6 References

Department of Energy and Climate Change. (2011). National Policy for Renewable Energy Infrastructure (EN-3). [Online] Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/37048/1940-nps-renewable-energy-en3.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/37048/1940-nps-renewable-energy-en3.pdf)

Hutchison, Z. L., Gill, A. B., Sigray, P., He, H., & King, J. W. (2021). A modelling evaluation of electromagnetic fields emitted by buried subsea power cables and encountered by marine animals: Considerations for marine renewable energy development. *Renewable Energy*, 177, 72-81.

Hutchison, Z. L., Gill, A. B., Sigray, P., He, H., & King, J. W. (2020a). Anthropogenic electromagnetic fields (EMF) influence the behaviour of bottom-dwelling marine species. *Scientific reports*, 10(1), 1-15.

Hutchison, Z. L., Secor, D. H., & Gill, A. B. (2020b). The interaction between resource species and electromagnetic fields associated with electricity production by offshore wind farms. *Oceanography*, 33(4), 96-107.

Willstead, E., Gill, A. B., Birchenough, S. N. R., & Jude, S. (2017). Assessing the cumulative environmental effects of marine renewable energy developments: Establishing common ground. *Science of the Total Environment*, 577, 19–32.



## 7 Annex 1

Activity	Quantity of Sediment to be Disposed (m <sup>3</sup> )
Sea bed preparation – wind turbines (m <sup>3</sup> )	729,477
Sea bed preparation – OSPs (m <sup>3</sup> )	0
Sand wave levelling (pre-sweeping) (m <sup>3</sup> )*	376,400
Drilling – wind turbines (m <sup>3</sup> )	23,892
Drilling – OSPs (m <sup>3</sup> )	850
HDD exit point	700
<b>Total</b>	<b>1,131,319</b>

\* Note that for a SEP in isolation scenario no sand wave levelling would be required

Summary of the worst-case sediment disposal quantities at SEP and DEP (extracted from Disposal Site Characterisation Report, Table 9).

