Marine
Management
Organisation

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

T +44 (0)300 123 1032
www.gov.uk/mmo

Dogger Bank South Case Team
Planning Inspectorate
DoggerBankSouth@planninginspectorate.gov.uk

(Email only)

MMO Reference: DCO/2022/00007
Planning Inspectorate Reference: EN010125
Identification Number: 20050160

03 July 2025

Dear Sir or Madam,

Planning Act 2008, RWE Renewables UK Dogger Bank South (West) Ltd and RWE Renewables UK Dogger Bank South (East) Ltd Proposed Dogger Bank South Offshore Wind Farms Order

Deadline 8 Submission

On 10 July 2024, the Marine Management Organisation (the MMO) received notice under section 56 of the Planning Act 2008 (the PA 2008) that the Planning Inspectorate (PINS) had accepted an application made by RWE Renewables UK Dogger Bank South (West) Ltd and RWE Renewables UK Dogger Bank South (East) Ltd (the Applicants) for determination of a development consent order for the construction, maintenance and operation of the proposed Dogger Bank South Offshore Wind Farms (the DCO Application) (MMO ref: DCO/2022/00007; PINS ref: EN010125).

The DCO Application seeks authorisation for the construction, operation and maintenance of Dogger Bank South (DBS) Offshore Wind Farm (OWF), comprising of up to 100 wind turbine generators in DBS East and up to 100 wind turbine generators in DBS West together with associated onshore and offshore infrastructure and all associated development (the Project).

The DCO Application includes a draft development consent order (the DCO) and an Environmental Statement (the ES). The draft DCO includes, Marine Licence 1 (Schedule 10), Marine Licence 2 (Schedule 11), Marine Licence 3 (Schedule 12), Marine Licence 4 (Schedule 13) and Marine Licence 5 (Schedule 14) which are draft Deemed Consent (DML) under Part 4 (Marine Licensing) of Marine and Coastal Access Act 2009 (MCAA 2009).

This document comprises of the MMO's Deadline 8 response.

This written representation is submitted without prejudice to any future representation the MMO may make about the DCO Application throughout the examination process. This representation is also submitted 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.

Yours Sincerely,

[redacted]

[redacted]
Marine Licencing Case Officer

D +44 ([redacted]
E [redacted]marinemanagement.org.uk

Contents

1. Closing Statement

1.1 General comments

1.1.1 The MMO would like to highlight to the Examining Authority (ExA) and Secretary of State (SoS) that requests for information from the Applicants were made during the pre-application process, specifically in relation to noise.

1.1.2 The MMO understands that disagreements are reviewed, and recommendations are made to the SoS by the ExA, so the SoS can make a decision. However, the MMO would highlight that with the Applicants leaving some of the major issues for examination it has increased resource requirements during this process and some high priority issues remain unresolved, undermining the development consent order process. In addition to this, major decisions that should be a matter for the SoS are being included as conditions to resolve at the post consent stage. This causes additional work for all parties, increases/duplicates resources and occasionally can put the MMO in a difficult position. For example, if we require more information (at a cost to the Applicant), such as surveys which impacts the Applicants timeline and funding.

1.1.3 The MMO would highlight a specific example where the Applicants have had nearly a year (based on the environmental statement being submitted on the 8 August 2024), to carry out a back-calculation to temporally refine the recommended restrictions (cable works and piling) during the herring spawning season. These restrictions were recommended following the review of the ES. Noting that the back-calculation approach to refining the herring spawning season to the 'peak of spawning activity' is a complex process which requires accurate data-interpretation and repeat consultations between the Applicant, the MMO and Cefas, it is incredibly disappointing that the Applicant has chosen to delay resolving this issue until half way through examination and only providing the back calculation document weeks before the final examination deadline.

The issue of temporally (through back-calculations) and spatially (through examining sediment and larval data) refining the cable works restriction, as well as the issues surrounding UWN impact ranges, the use of noise abatement and UWN management strategies could have been dealt with and agreed well in advance of the final examination deadlines.

1.1.4 The MMO would state that this is a trend among developers and causing significant issues especially when multiple Examinations are taking place that require a similar level of information/technical review. The MMO is raising this higher with PINS and recommend that clear guidance which outlines the expectations of the ExA that significant points of disagreement (i.e., around restrictions on activities) should be dealt with a priority and not left to the final stages of examination, is needed to rectify this issue. Especially if these have been identified in the pre-application stage.

1.1.5 The MMO would highlight that the Applicants have engaged on other matters with the MMO throughout the process with the aim to agree as much as possible.

1.1.6 A summary of the remaining not agreed issues can be found in Section 2 of this document.

1.1.7 The MMO may provide further points in a closing statement at Deadline 9.

1.1.8 The MMO would also highlight that there are some strategic and wider positions on several of the DML conditions being discussed internally. For example, Transfer of Benefit, the MMO will be providing further information in the North Falls Examination,

but this will be after the deadline closes for this project. The MMO may also be submitting something to DESNZ as a wider topic and should the Secretary of State require this information we would be able to provide this for review if requested, however we would prefer to not have additional deadline submission during the decision so that the decision is not delayed.

2. Comments on The Applicants responses to Deadline 6 documents (REP7-131), the Draft Development Consent Order (REP7-012) and Updated Documents

2.1 Coastal processes – REP5-040 – Assessment of Coastal Processes at the Dogger Bank South Landfall

2.1.1 The MMO is content that the evidence presented via modelling work is adequate to address the physical process changes arising from the emplacement of scour protection around the landfall exit pit in the nearshore. In addition, the applicant presents a more discursive conceptual model (discussed on page 114, paragraph 6).

2.1.2 The MMO is not familiar with the Litdrift' model used to examine longshore transport changes, but it is described by the applicant as a 1-Dimensional sediment transport model. Both wave and sediment transport modelling highlight the approximate (minor, local) scale of impacts (changes in wave height and sediment transport of a few percent).

2.1.3 The impact assessment of the landfall changes raises only minor additional queries. Where the modelling gives numerical estimates of impacts on processes, it does not allow for a long-term view of morphological outcomes i.e., the models are not updating, systems models that directly address the impacts of (potential) concern i.e., incremental morphological changes over longer periods in response to the physical impacts. In this respect the conceptual model approach is welcome.

2.1.4 The conceptual model (of sediment build-up around the exit structure) is described consequent upon the numerical modelling but does not go further and address the subsequent impact of the sediment feature that develops i.e., the modelling only assesses the impact of the initial structure, not the eventual sediment ramp. There appears to be no data regarding the longer-term feedback between the initial physical and sediment transport impacts and the wider morphological forcing. The conceptual model does not assess this local morphological change within the context of the wider-scale forcing. The MMO believes that this would be a necessary final step.

2.1.5 The MMO is confident that the Applicant's estimate of the scale of impacts is reasonable i.e., that the local structure (cable protection at the exit point of the cables, several hundred metres offshore) will directly affect the physical processes only in the immediate vicinity. However, it should be noted that changes of a few percent can affect systems which are at or near 'points of inflexion' i.e., where small changes might be sufficient to alter patterns. This would often be revealed by historical patterns of volatility i.e., rapidly reversing to cyclical changes in short periods. The MMO does not expect this to be the case at this site since the wave climate is very strongly biased toward a dominant direction, while the alignment of the combined Spurn Head and Smitihic Bank are likely to dominate the geomorphic response of the wider area. However, it would be of value to obtain a final, illustrated statement of the Applicant's conceptual model of nearshore impact that discusses the present-day forcing of the shoreline e.g., the

longshore transport rates north and south of the affected region, the historical trends of shoreline change, to highlight the susceptibility of the local system to minor localised interventions.

2.1.6 As per comment 1.1.5, it would be valuable to understand whether there are, at this location, strong or weak alongshore gradients (in wave forcing, or in resultant sediment transport rates, potentially visible as changes in shoreline change trends in short distances alongshore). Where gradients are weaker, or are rapidly changing, a minor intervention in the nearshore could have a potentially larger impact on shoreline change. The location of the landfall, at the southern tip of a large offshore bank feature, may be subject to such a transition, but it appears more likely that the wave shadow of the bank extends over the likely range of impact of a small-scale feature like the exit pit. However, the MMO would like to see a confirmation of this perspective presented as the basis for the assessment, rather than a simple percentage-based numerical comparison of modelled data.

2.1.7 The MMO understands that the Applicants have committed to defining the pre-construction baseline for sediment transport regimes within 8.23 In Principle Monitoring Plan [REP7-116], which will consolidate all available survey, modelling and observational evidence, including undertaking monitoring of nearshore cable protection measures in water depths of less than 10m. The MMO is content with this approach and believes this will be resolved post consent.

2.2 Disposal Sites and Disposal Site Characterisation Report (REP7-114)

2.2.1 The MMO welcomes the Applicants comments in Section 1.6 of their response and the updates to Disposal Site Characterisation Report (REP7-114). and points them to our Deadline 7 response (REP7-148).

2.2.2 In addition to the comments raised in our Deadline 7 response (REP7-148), the MMO does need further information in relation to the use of HU225 disposal site where the cable corridor overlaps Hornsea 4 Offshore Wind Farm cable corridor. Two disposal sites cannot overlap so the assessment needs to be updated to show the impact of Dogger Bank South Disposal within this disposal site.

2.2.3 Due to the stage of examination, the MMO does not believe that this can be done prior to examination closes. The MMO believes that the risk is low and this can take place post consent. This requires 2 actions by the Applicant to give confirmation that the DML allows for disposal in other locations and so we are confident the assessment will be submitted post consent at the earliest opportunity so there are no delays at the pre-construction stage. .

2.2.4 The DML needs amended to allow disposal in other sites with approval from MMO, as the disposal sites references are included the DML needs allow additions to this without a variation to enable efficiency. This can be done by the inclusion of 'and any other MMO approved disposal sites' or 'unless otherwise agreed in writing with the MMO' in the areas where disposal and disposal sites are referenced.

2.2.5 In addition to this the MMO requests a commitment is added to the commitment register to assess use within the HU225 post consent and submit this to the MMO. This does not have to be a condition.

2.2.6 The MMO has shared this with the Applicant but the updates may not have been possible for Deadline 8 and the MMO will continue to engage with the Applicant for

Deadline 9 as these updates do not impact other interested parties as no parameters are changing.

2.3 Noise

2.3.1 The MMO welcomes the changes made to condition 15(g) and has no further comments.

2.3.2 The MMO notes the inclusion of Condition 28 (Export Cable restriction) on DMLs 3 and 4 are only on a without prejudice basis. The MMO has major concerns if these are not included in the final DML. The MMO agrees with the wording and requires further post consent commitment in relation to the document to be certified within this condition. Please see further comments in Section 3 of this document.

2.3.3 The MMO notes the inclusion of Condition 30 (Noise restriction) on DMLs 1-4 are only on a without prejudice basis. The MMO has major concerns if these are not included in the final DML. The MMO agrees with the wording and requires further post consent commitment in relation to the document to be certified within this condition. Please see further comments in Section 3 of this document.

2.4 In Principle Monitoring Plan (REP7-115)

2.4.1 The MMO has no concerns regarding Invasive nonnative species within the latest revision of the In Principe Monitoring Plan.

2.5 Topics which the MMO and the Applicant have an agree to disagree position and these will not be resolved by the end of examination:

2.5.1 Transfer of Benefit – Article 5 – The MMO still maintains that reference to the DML's Article 5 should be removed. Please see Section 1.2 of REP2-061 for more information and note Section 1.8 above.

2.5.2 Force Majeure - The MMO notes this is likely to be not agreed by the end of Examination. The MMO's position is detailed in section 1.3 of REP2-061.

2.5.3 Determination dates - Please see section 1.7 in REP7-148.

2.5.4 Fisheries back calculations & herring Spawning restriction plan (Export cable corridor and piling restrictions – Please see section 3 in relation to this. However, with potential minor amendments to the conditions will be content to continue this discussion post consent should the SoS include Conditions 27 and 28.

2.6 Topics which the MMO hopes will be resolved before the end of examination

2.6.1 The MMO welcome the addition of the disposal site references to the relevant DML sections - Please see section 1.3 in REP7-148 for further information on the Hornsea 4 Export Cable Corridor disposal site (HU225) as well as section 2.2 above.

2.6.2 Coastal processes issues as per Section 2.1 above.

2.7 Documents still being reviewed:

2.7.1 All updated Environmental Statement Chapters

2.7.2 These will be reviewed and a response provided at Deadline 9.

3. Fisheries comments

3.1 Back-calculation of the Peak Atlantic Herring Spawning Period - REP6-014

3.1.1 The MMO welcomes the discussion on the without prejudice condition wording for UWN and piling impacts mitigation and note that the Applicants have now included a noise restriction condition (DML's1-4) as well as export cable works restriction condition (DMLs 3 and 4).

3.1.2 Please note that the back-calculations provided within this document (REP6-014) relate entirely to the data associated with the areas of the herring spawning ground which overlie the DBS OWF's export cable corridor (ECC). Therefore, the back-calculations relate to the temporal period related to the restriction on cable installation and seabed-interacting works **only** (DMLs 3 and 4). Due to the analyses being constrained to the ECC area only, this back-calculation is not applicable to the recommended temporal restriction on piling activities.

3.1.3 The MMO does not agree with the back-calculations presented in the document and have detailed the specific areas of issue below, including that several of the Applicant's back-calculation input parameters are incorrect.

3.2 Back-calculation input parameters

3.2.1 With regards to the input parameter that "*Maximum 0-ringer larval length = 9 mm"*, in principle, the MMO supports the use of a 9 millimetre (mm) larval length for the purpose of calculating a conservative estimate of the **start** of peak spawning, noting that smaller larvae within the survey data will have been spawned later than the calculated start date. However, for the Banks herring stock, ICES classify newly hatched larvae as those <10mm, so taking a precautionary approach, it is also necessary to consider factoring in catches of larvae >9mm as these represent older larvae collected during the sampling period, which would indicate that some eggs are being laid in the first half of August.

3.2.2 In Section 3.1, the Applicants state that "For the purposes of the back-calculation, the Offshore Export Cable Corridor is characterised by average temperatures>12.8°C". The near-seabed temperature data shows variation in near-bed temperatures for the International Herring Larvae Survey (IHLS) survey point within the ECC as being between 12°Celcuis (C) and >13°C, and the MMO does not believe that basing the back-calculation on average temperatures >12.8°C is appropriate as the data show periods where nearbed water temperatures have been lower than this, for example, temperatures of 12.01 - 12.30ºC were recorded in 2012 and 2023.

To ensure that the Applicant's calculations are sufficiently conservative, the back-calculations should be based on near-bed water temperatures of between 12°C – 12.3°C as these are the lowest near-bed temperatures provided by the time series.

3.2.3 The timing of the Central North Sea (CNS) IHLS is already clearly targeted to the 'peak' of when the herring larvae will be most abundant. The CNS IHLS survey was originally comprised of three separate surveys which covered the full spawning period but has since been reduced; the full survey extent was originally 1 – 15 September (discontinued from 1999), 16 – 30 September (ongoing) and 1 – 15 October (discontinued from 2004). The survey has been reduced in duration not because the 'peak' period of spawning activity has reduced, but due to temporal and budgetary constraints. The statement by the Applicants in Section 3.2, paragraph 18 that "*Due to a change in survey method and other limiting factors (e.g. weather and COVID-19), the*

abundance data for post-2017 monitoring is limited and does not reflect the magnitude of previous spawning activity," is incorrect.

3.2.4 There was no change to the survey methodology for the CNS IHLS surveys in 2017 which affects the quality or representation of larval abundance data post-2017. In fact, the Applicants have used IHLS data for the years 2019, 2022 and 2023 in their temperature and larval abundance maps, so clearly the data are available and suitable for incorporation into the assessment. The Applicants should refer to Kyle-Henney et al. (2024) for further information on the years of IHLS data which should be incorporated into assessments relating to the CNS/Banks Herring spawning stock. Specifically, Sections 2.3.5.1 and Appendix D which outline the changes to the IHLS survey extent for the Downs Herring Spawning stock in the Southern North Sea and clearly state that "For the Banks herring spawning stock the IHLS surveys in which these data were collected have not changed". Further, the ICES Herring Working Group reports for the years 2018-2022 detail that CNS IHLS surveys were carried out as standard.

3.2.5 The Applicants should therefore be incorporating the full series of data available – including the most recently available data i.e., up to 2023 – into their calculations. As per point 3.2.1, the Applicant should also be including larvae ≤ 10mm in length in their analyses.

3.2.6 The temperature dependent egg development periods defined by Kotthaus (1939) in Russell (1976), replicated in Table 3.1 of the document, denote an average temperature of 12.3°C equating to an egg development period of between 7-9 days. The Applicant's chosen egg development period of < 7 days is based on their chosen near-bed temperature of 12.8°C. As per point 3.2.2, the MMO does not consider that this temperature is sufficiently conservative based on the IHLS data presented. In the context of determining the egg development period, using the average near-bed temperature of 12.3°C is appropriate. Where the Applicants have chosen the lower of the two quoted values (7 days) for egg development based on a chosen higher near-bed temperature, the MMO requests that the higher of the two quoted values (9 days) is applied based on the Applicant's IHLS near-bed temperature data showing recorded near-bed temperatures as low as 12°C (see point 3.2.2).

Therefore, the egg development period used by the Applicants is not conservative enough and should be set at 9 days.

3.2.7 With regards to the Applicant's discussion of Yolk Absorption, and Yolk Sac Absorption Periods in Sections 3.3 and 4 of the REP6-014, there are several points the MMO disagrees with. The first is that the Yolk Sac Absorption Period can be discounted from the analyses and that the back-calculation use the periods which relate to the External Disappearance (absorption) of the Yolk Sac. Kotthaus (1939), who provided the experiments for which the Russel (1976) herring egg and larval development period tables are based on, describes the critical point for herring larval survival as being the complete reabsorption of the yolk, not just the external disappearance of the yolk but the full reabsorption of the nutrients contained within the yolk into the body of the larvae.

3.2.8 The original text by Kotthaus (1939), summarises the temperature-dependent development periods in herring eggs based on their observations during their larval hatching experiments. The original text by Kotthaus (1939), also provides the development period of larvae based on *"the time from hatching to the external disappearance of the yolk sac on the one hand, and to the complete resorption of the yolk on the other hand".* Although very similar-sounding, these terms represent different things and should be thought of as:

i. External Disappearance of the Yolk Sac Period = The time from hatching to the external disappearance of the yolk sac from the outside of the body of the larvae only (critically this does not include the continued absorption of the yolk internally within the larvae).

ii. Yolk Sac Absorption Period = The time from hatching to the complete absorption of the yolk (i.e., the full reabsorption of the nutrients contained within the yolk into the body of the larvae both externally and internally).

3.2.9 The Applicants position that the back-calculation should incorporate the period for the external disappearance of the yolk only (i.e., the shorter of the two defined periods), is not conservative enough and does not account for the continued reabsorption of the nutrients contained within the yolk into the body of the larvae. It is *this* period of continued internal absorption of nutrients from the yolk which allows for continued larval development and increases the larvae's buoyancy (Dickey-Collas *et al.,* 2009).

The Applicants should therefore be using the full yolk sac absorption periods for the appropriate near-bed temperatures. For near-bed temperatures of 12.0°C (noting that using a near-bed temperature of 12.8°C is not conservative enough based on the IHLS data provided, see point 3.2.2), the full Yolk Sac Absorption Period is 14 days.

3.2.10 In response to the Applicants statements that the full yolk sac absorption period can be discounted based on the assumption that larvae become positively buoyant as the yolk sac is absorbed, the MMO acknowledges that there is validity in this statement but that the data resolution to shorten the full yolk sac absorption period based on this is lacking. For instance, it is true that at some point during the later stages of larval development, larvae gain sufficient positive buoyancy to lift them away from the seabed. Noting that the IHLS survey sampling method catches larvae which are >10 mm in length (caught within 5 metres (m) of the seabed and certainly within range of disturbance from cable laying activities), it cannot be assumed when exactly larvae float off without quantitative evidence. However, the MMO does not believe the evidence exists, at present, to determine at what specific point during their yolk sac absorption period the larvae become buoyant enough to be considered as dissociated from the seabed. Noting that we cannot pinpoint the stage or the number of days into their development at which the larvae become buoyant, it is not appropriate to factor this into the back-calculation in attempt to shorten the restricted period.

Given that the data resolution does not exist, the Applicants must use the full yolk sac absorption period of 14 days based on near-bed temperatures of 12.0°C.

3.3 Larval Growth Rates and growth days

3.3.1 In response to the Applicant's statement in paragraph 32 that "*In effect, the MMO's example back-calculation double-counts the growth period*", by allocating the maximum number of days for both the full yolk sac absorption period and the period of time the larvae need to grow from a hatch length of 5mm to reach 10mm in length, the MMO believes there is some validity to this. The Applicants are correct that larvae will be undergoing growth during the yolk sac absorption period and so the MMO proposes the following way forward:

i. The full yolk sac absorption period should be **14 days** (points 3.2.2, 3.2.5 and 3.2.6).

ii. The number of days needed for a larva with a hatch length of 5 mm to grow to 10 mm in length is **20 days**, based on a growth rate of 0.25 mm per day (Heath, 1993).

3.3.2 The example provided does not necessarily double count the entire growth period, however the MMO recognises that the larvae would grow 3.5 mm in the 14-day yolk sac absorption period (reaching a length of 8.5 mm). This means that an additional 1.5 mm of growth is needed, which at a growth rate of 0.25 mm per day would take an **additional 6 days** for a 5 mm larva to reach 10 mm in length. The Applicants may argue that including any time after the 14-day yolk sac absorption period is inappropriate based on larvae attaining buoyancy during this period, but the fact remains that we do not have the resolution of data needed to determine at what point larvae attain buoyancy in this assessment. For the Banks herring stock, ICES classify newly hatched larvae as those <10mm, and that the IHLS survey sampling method catches larvae which are 10 mm in length within 5 m of the seabed during the survey period of 16 – 30 September. Therefore, additional time must be included in the analyses to account for additional growing time during the larvaes' development.

3.3.3 As such, the MMO requests that an additional 6 days of growth be included in the back-calculation, instead of the originally requested 16 days of growth. This, alongside the issues outlined in points 3.2.2-3.2.7, means that the input parameters for the back-calculation must be amended to the following to determine the start date for the 'peak' of spawning:

Start of 'peak' spawning period = start date of the peak of high larval abundance – (growth days + no. of days for yolk-sac absorption + no. of days for egg development)

i. Start date of the peak of high larval abundance = start of CNS IHLS Survey (already scheduled to target the peak of spawning) = 16 September.

ii. Growth days = 6 days.

iii. Number of days for egg development = 9 days based on nearbed temperature of 12.3°C (12.3°C and 9 days are the more conservative of the values provided, see points 3.2.2 and 3.2.4).

iv. Number of days for yolk-sac absorption = 14 days based on nearbed average temperatures of 12.0°C (12.0°C and 14 days are the more conservative of the values provided, see points 3.2.2, 3.2.5 and 3.2.6).

⇨ Therefore the 'peak' of spawning (inclusive of egg and larval development time)

= **16 September – (6 + 14 + 9) = 18 August.**

3.3.4 With regards to determining the end of the peak spawning period equalling the end of peak larval abundance comment in the previous advice (REP5-049), this does not mean the 'end of the peak spawning period', but the end of the larval vulnerability period. To expand on this, the end of the peak larval abundance, in IHLS terms, is when the survey ends because the CNS IHLS survey targets the peak of larval abundance. Hence, if the peak of larval abundance ends on 30 September, then it should be accepted that from 1 October onwards the majority of larvae will have fully absorbed their yolk-sacs and drifted away from the spawning ground. Thus, the last day of the peak sensitive period for herring larvae is 30 September.

3.3.5 The Applicants should note that time should be allocated prior to the peak of spawning in order to allow disturbances to the area to dissipate, i.e., for sediments to settle and for suspended sediment concentrations to drop, to allow adult herring to move into the area and for aggregation and spawning to occur. This period of post-work settlement and herring aggregation has been set at **8 days** for other projects where the back-calculation option has been used.

3.3.6 In this sense, the back-calculation carried out in this advice using input parameters more appropriate to the environmental conditions and developmental processes of the larvae, determines that the 'peak' of spawning occurs between the 18 August and 30 September, inclusive. **When including an 8 day post-works settlement period, this refines the period of the restriction on cable works to being from the 10 August - 30 September, inclusive.** This represents a significant, but sufficiently well-evidenced, refinement of the originally requested restriction on cable works for the period 1 August – 30 October.

3.3.7 Therefore, the MMO requests that Condition 28 (Export cable restriction) of DML 3 and 4 is updated to include the following:

*"restricted period" means **10 August to 30 September** inclusive or such other period indicated by the Back Calculation Technical Report as the period when herring are most likely to have spawned and where eggs and newly hatched larvae should be undisturbed to avoid any adverse impacts to those eggs or larvae and any such alternative period must be agreed with the MMO in writing.*

3.3.8 The MMO notes that the current Back Calculation Technical Report does not have this information in. Noting the stage of the examination it is unlikely that this document can be updated. As this document can't be updated the MMO requests a commitment to be added to the commitment register to ensure that the comments within this advice are taken into any updates to this document post consent should further evidence be provided to refine the restriction further.

3.3.9 The MMO believes this is a suitable refinement but with the inclusion of the condition this allows for additional refinement should more evidence become available.

3.3.10 The MMO notes that the Applicant has references EGL2 marine licence and that this included 31 days restriction. There are a number of differences between EGL2 and this project and the MMO believes the 10 August to 30 September is an appropriate refinement. Given the difference in location of the projects, and the differing pressures exerted on the spawning grounds from the Project, the MMO strongly believes this restriction is proportionate to, and reflective of, the scale of the impacts from the

licensable activities.

3.4 'Without Prejudice' Herring Spawning Plan – REP7-135

3.4.1 The MMO does not agree with the area of this map which indicates the "*Herring Spawning Noise Restriction Boundary (restricted area shorewards of this boundary)".* This boundary was defined with respect to cable laying works and the spatial refinement of the recommended restriction on cable installation and seabed-interacting works within the DBS OWF ECC under the without prejudice condition, based on sediment and larval abundance data only. The data was not examined in terms of the wider risk to herring spawning from Underwater Noise (UWN) disturbance as a result of unmitigated piling, and as outlined below, the Applicants have made no commitment to noise reduction levels thus far other than included condition 15(1)(g) to ensure that the use of mitigation is included in the MMMP. It is not appropriate to apply the spatially refined ECC cable works restriction boundary to UWN related impacts because the UWN pressures are far more dispersive and, in defining this boundary, the Applicants have constrained their data consideration to the area of spawning ground within the vicinity of the ECC.

3.4.2 As was outlined in REP7-148 the updated UWN noise modelling which show the potential impact range decrease when a 10 decibel (dB) noise reduction is applied is encouraging. However, the modelling presented does not represent **a clear and binding commitment by the Applicant** to implement measures which achieve a 10 dB noise reduction. The MMO notes that the ExA (PD-028) added the recommendation to a reduction of 10dB to Condition 15(1)(g). The MMO questioned what would happen if this was included and not achieved. The MMO also noted the Applicant did not take this recommendation on board.

3.4.3 As outlined in previous advice, the requested temporal restriction on piling activity during the herring spawning season must be maintained until an appropriate commitment to achieving a 10 dB noise reduction is made by the Applicants.

3.4.4 The MMO notes the Applicants have included an agreed without prejudice Noise Restriction Condition 27 within the DMLs, however as the herring spawning piling restriction plan is not agreed Condition 27(1) is being reviewed and the MMO will discuss amendments with the Applicants to be submitted at Deadline 9 (if required). Therefore until the Applicants can provide a confirmative commitment to using noise abatement systems which achieve a 10 dB noise reduction the restriction is required across the whole area.

3.5 Summary

3.5.1 The MMO is not satisfied that the Applicant's back-calculation is sufficiently precautionary and have highlighted in points 3.2.2-3.2.7, that inappropriate input parameters for the environmental conditions and developmental processes of the larvae have been used throughout. Based on the points made by the Applicants in their documentation, the MMO has amended the number of recommended growth days to be factored into the calculation to avoid double counting and have repeated the calculation in points 3.3.2 – 3.3.6.

3.5.2 The MMO considers that the evidence provided has the potential to allow the restriction on cable installation and seabed-interacting works within the DBS OWF ECC to be refined from the originally recommended period of the 1 August – 30 October, inclusive,

to being the **10 August - 30 September, inclusive.**

3.5.3 The MMO notes that the back-calculations provided within this document relate entirely to the data associated with the areas of the herring spawning ground which overlie the DBS OWFs export cable corridor (ECC). **Therefore, the calculations relate to the temporal period related to the restriction on cable installation and seabed-interacting works only.** Due to the analyses being constrained to the ECC area only, this back calculation is not applicable to the recommended restriction on piling activities.

3.5.4 Outstanding issues in relation to the Herring Spawning Plan remain.

4. Response to the Examining Authority's Written Questions (ExQ2) – PD-022

Fish and Shellfish ecology

4.1 FSE 2.9

Export cable proposed through the Flamborough Head herring spawning ground: The ExA is aware of the questions and responses between the applicants and the MMO regarding herring larval abundance mapping and presentation of the density data.

4.2 a) Can you confirm if this issue has now been resolved and if it is satisfied with the quality and presentation of the data regarding herring larval abundance and density submitted into the examination by the applicants at DL4 [REP4-098]. If not, please explain why not?

4.2.1 Please see the comments in Section 3.4 above. There is agreement in relation to a spatial restriction for cable works (KP20-40) and agreement on a refined seasonal restriction for cable works. There is not agreement on the spatial requirement for underwater noise impacts from piling. The without prejudice conditions are largely agreed but discussion continues based on the references to the documents that are not agreed as set out above. The MMO largely believes this will be agreed to be resolved post consent if the conditions are within the DML. However, notes should the SoS provide any changes to this the MMO would like to review the final wording to understand how this will work in practice post consent.

4.3 b) If so, what is your position on potential impacts of the construction and installation of the export cable corridor on spawning herring?

4.3.1 There are two main ways in which the construction and installation of the DBS export cable poses a significant concern in relation to the Banks herring spawning population which uses the Flamborough Head herring spawning ground. The first of these is that if construction and installation of the export cable occurs during the spawning season, this will cause immediate and direct disturbance to the herring spawning habitat itself as well as causing direct disturbance to adult herring engaged in spawning and possible mortality of eggs and larvae developing on the seabed as the plough passes along the Export Cable Corridor (ECC) route.

4.3.2 The second impact pathway relates to the more long-term potential for sediment composition change which would affect the extent and distribution of areas of seabed with sufficient integrity and composition to provide herring spawning habitat. The act of ploughing a trench in which to lay the export cable will bring subsurface sediments to the seabed surface, which may not have the same composition as the current surface sediments (for example, ploughed up sediments may have a sandier composition than

the current more gravelly surface sediments). It is also possible that fine sediments may become suspended in the water column and resettle over the seabed on either side of the ploughed trench, introducing a higher content of mud and silt into areas of suitable spawning habitat (adult herring prefer sediments with a clean gravelly composition, and increasing the mud or silt content of an area to greater than 4% of the total sediment composition can render the sediments unsuitable as herring spawning habitat. Both processes have the potential to affect the sediment composition of the seabed, potentially reducing the suitability of the area to provide potential spawning habitat.

4.3.3 However, there are ways to mitigate these risks. Prohibiting cable installation activities during the herring spawning season in areas where the seabed has the highest potential to provide herring spawning habitat, eliminates the risk of adult herring being disturbed during the spawning season, as well as protecting herring eggs and larvae from damage or smothering as a result of ploughing. Through the suite of evidence provided by the Applicant, the subsequent spatial refinement, and all-party-agreement of the requested restriction on cable works between kilometre points 20 – 40 of the DBS ECC route during the herring spawning season, the MMO is content that this risk has been appropriately managed.

4.3.4 With regards to the more long-term risks posed by cable laying activities in the herring spawning ground, the MMO is generally content that the impacts from the DBS ECC specifically have been appropriately mitigated, however the MMO would highlight that DBS is not the only project with proposed works within the herring spawning ground at Flamborough Head. Disturbance of the Flamborough Head herring spawning ground by multiple projects arguably goes beyond the remit of individual project developers who, despite carrying out suitably detailed in-combination assessments as required to complete their applications, are often limited to using publicly available data and may not have sight of the specific design parameters being proposed by other developments. Individual project developers may also not have full access to projects which are in their conceptual or scoping stages and the lack of detailed assessments available for these projects (due to them being in the early stages of development) which also means that cumulative impacts cannot be fully assessed.

4.3.5 It makes much more sense for cumulative assessments for areas of sensitivity (for example, the Flamborough Head herring spawning ground) to be carried out by a more centralised competent authority which has oversight of the multiple projects (inclusive of export cables, telecommunications cables for example) happening in the area of sensitivity. Such an approach would help to standardise the specific restrictions applied to each project and create an opportunity for a harmonized monitoring programme to ensure that the integrity of the spawning ground is not being eroded by subsequent projects which are individually mitigated, but the residual impacts of which may be cumulatively degrading the spawning ground. However, the MMO notes this is unlikely to be in place for a decision.

4.4 c) What is your opinion on whether the applicants have fully adhered to the mitigation hierarchy on this issue?

4.4.1 Broadly the principles of the mitigation hierarchy dictate that significant impacts to sensitive features should first be avoided, and where avoidance is not possible these impacts should be minimised by project design or construction strategy. Where significant impacts to sensitive features cannot be avoided or minimised, then mitigation options must be explored.

4.4.2 In the context of the DBS OWFs export cable, the environmental statement highlighted that the export cable infrastructure had to pass through the herring spawning ground at Flamborough Head in order to reach the prescribed National Grid connection point. In the context of the export cable, the MMO believes that the Applicants have generally adhered appropriately to the principles of the mitigation hierarchy. The MMO would note that when reviewing the ES**Error! Bookmark not defined.**, the MMO was in strong disagreement with the Applicant's conclusion that "*the low magnitude of impact for both Projects together (DBS East and DBS West), combined with the medium sensitivity of effect for the demersal fish, pelagic fish, and shellfish receptor groups, results in the assessment that temporary habitat disturbance and direct damage has a minor adverse effect, and is therefore not significant in EIA terms. No additional mitigation measures are considered to be required*". This assessment encompassed the effects of direct habitat disturbance for both herring and sandeel. It was clear in the ES that the export cable could not avoid passing through the herring spawning ground given the location of the DBS OWFs arrays and the connection point, and the extent of the herring spawning ground, and that the nature of cable installation works meant that the risk of disturbance to both adult herring engaged in spawning and areas of important herring spawning habitat was significant.

4.4.3 At this point, the MMO requested that seabed-interacting works within the ECC be prohibited during the Banks herring spawning season. The Applicants then explored how spawning habitat disturbance could be minimised. The MMO provided clear guidance on the evidence needed to both spatially and temporally refine the requested restriction on export cable installation works during the herring spawning season. The Applicants have provided the requested evidence, in an appropriate format and accompanied by a suitable considerate discussion of the evidence and this has allowed us, collectively, to spatially refine the restriction on export cable installation works. This ensures that works which disturb the seabed remain prohibited in the areas of the ECC which overlap sediments with high potential to provide spawning habitat and where spawning has actively taken place in the past, whilst allowing works to be carried out in areas of the ECC closest to the array and where sediments have low or no potential to provide herring spawning habitat.

4.4.4 The MMO is generally content that, despite the initial disagreement on the severity of the impacts posed to the herring spawning ground by the export cable installation, the Applicants have followed the appropriate steps to provide an evidence base which allows for the impacts to adult spawning herring and the herring spawning ground to be successfully minimised.

4.5 d) Are the applicants' proposed mitigations sufficient and are you satisfied with the way they are secured in the DMLs?

4.5.1 In the context of this question, which asks specifically about the **export cable proposed through the Flamborough Head herring spawning ground** and its associated installation works, the MMO considers that the now-agreed, spatially-refined, temporal restriction on works which interact with the seabed along the DBS ECC route (including seabed preparatory works, cable trenching etc) is sufficient to ensure that areas of seabed with sufficient integrity and composition to support herring spawning are adequately protected during the herring spawning period.

4.5.2 The draft wording of the spatially refined and now-agreed export cable works restriction to be included on the DML is sufficient and that the requirement that works which interact with the seabed between kilometre points 20 – 40 of the DBS ECC route be

prohibited during the herring spawning season, is appropriately captured in DML 3 & 4 in Condition 28, noting minor ongoing discussions relating to the wording due to the disagreement over the documents mentioned in the condition.

4.6 7 FSE 2.10

Please provide your position on the applicants' statements in paragraph 10 on page 8 of the applicants' Fish and Shellfish Response to the MMO [REP4-098] and [paragraph 39 page 26 of the Heat Mapping Report: Atlantic Herring and Sandeel [AS-105]. Please state whether you are in agreement or not with these statements and what impact the export cable construction and installation could have on drifting, developing herring larvae.

4.6.1 With respect to the comment in paragraph 10 on page 8 of the Applicants' 14.13 Fish and Shellfish Response to the MMO [REP4-098].

The MMO's position has previously been outlined in REP6-014 and REP7-148. It should be understood that once fertilised, herring eggs undergo a period of development in which emerging larvae remain close to the seabed but gradually become more buoyant as they complete the yolk sack absorption stage of their development. This means that in the later stages of their initial development, herring larvae attain some buoyancy through absorbing their yolk-sacs, but do not become positively buoyant enough to fully join the pelagic ichthyoplankton. In this short period of their development, it is possible for herring larvae to drift short distances from the spawning beds they originated from.

4.6.2 Regarding the Applicant's statement, the annual herring larvae abundance maps presented in REP4-098, the Applicant's Fish and Shellfish Response did show data for herring larval presence at the IHLS sampling point which was located between KP 50 – 60 of the ECC. However, it should be noted that the IHLS survey collects herring larval data from fixed sampling stations at set locations across the survey grid, and the DBS OWFs ECC just so happens to overlap with some of these sampling stations (between KP 20-30 and KP 50-60). In the context of the larval abundance data point located between KP 50-60, I agree with the Applicant's statement, and this was outlined in my response to the Examining Authority's (ExA) Question 1.6 FSE.2.9 a) which is provided in Section 4.2 above. The MMO recognises that the PSA analyses for the ECC shows that almost all the sample stations between ST 161 (located after KP 40) and the DBS OWF array areas are mostly sandy sediments and are therefore unsuitable as potential herring spawning habitat.

4.6.3 The Particle Size Analysis (PSA) data provided by the Applicant showed that the sediment composition between KP 50-60 was outside of the 'preferred' and 'marginal' compositions for herring spawning as defined by Reach *et al*., (2013). In comparison, for the area of seabed between KP 20-40, the herring larval data and PSA data provided by the Applicant showed that this area of the ECC represented an area of importance as herring spawning habitat as the data showed high larval abundances consistently in this location throughout the timeseries used and the PSA data indicated the sediments had sufficient composition to be considered as 'preferred' and 'marginal' for herring spawning as defined by Reach *et al.,* (2013). This was not the case for the area of seabed between KP 50 – 60 of the ECC.

4.6.4 With respect to the comment in paragraph 39 on page 26 of the Heat Mapping Report: Atlantic Herring and Sandeel [AS-105], the Applicant made the statement below:

"It is important to note at this stage that the IHLS does not sample larvae on the seabed, but rather at approximately 5m above the seabed, in the water column. As such, larvae

caught by the IHLS are likely to be mobilised by nearbed currents, and are not directly associated with the seabed at point of capture and therefore not considered to be at risk of potential impacts associated with the installation of cables (Kyle-Henney et al., 2024; EGL2, 2024). Considering the high energy environment off Flamborough Head and the proximity of suitable sediments either side of the Offshore Export Cable Corridor (based on EMODnet data and not site-specific ground-truthing surveys), it is likely that the majority of larvae caught at the IHLS sampling station between ST163 and ST164 hatched from spawning beds outside of the Offshore Export Cable Corridor."

4.6.5 The MMO is generally in agreement with the statements that herring larvae can be mobilised to some degree by nearbed currents when in the later stages of their initial yolk-sac absorption developmental stage (as outlined in point 21 above). However, the MMO does not agree with the statement that *because* the larvae are slightly mobilised, this means there is *no risk* of potential impacts associated with the installation of cables. As the Applicants have noted in their response, the IHLS Gulf Plankton Sampling method collects samples within 5m of the seabed. This ensures that herring larvae in the earliest developmental stages can be sampled in the closest possible proximity to their origin point and provides the closest possible measurement of spawning activity.

4.6.6 The MMO considers the implication in the Applicant's statement that the slight mobilisation of herring larvae means there is "*no risk"* of potential impacts associated with the installation of cables to be inaccurate. The works associated with ploughing a trench deep enough and wide enough to accommodate the DBS OWF export cable infrastructure represents a significant source of seabed disturbance, causes sediment suspension and potential smothering effects. The small amount of mobility that herring larvae have in the later stages of their initial yolk-sac absorption developmental stage does not equate to complete immunity to disturbance and harm. As a point of best practice for future impact assessments, when discussing potential impacts to herring eggs and larvae as a result of offshore development activities, herring eggs and larvae must be treated as a stationary receptor due to the very, very limited mobility that eggs and larvae have in these early stages of development.

4.7 FSE 2.14:

Seasonal restrictions for piling in the array areas in relation to potential impacts on herring and sandeel. Natural England (NE) has maintained its advice at DL4 that as the behavioural threshold of 135dB single strike sound exposure level (SELss) overlaps a significant area of the high and very high spawning habitat potential sites when piling in the array areas a seasonal restriction on piling may be required and defers to the Centre for Environment, Fisheries and Aquaculture Science (Cefas) for advice on timing on any such restriction. The MMO's DL4 submission states on page 15 that it agrees with NE's conclusions and agrees that a seasonal restriction is needed to reduce population impacts on the Banks Herring population.

a) What is Cefas's advice on the timing of a potential seasonal restriction for piling in the array areas to reduce the potential impacts on herring and sandeel?

4.7.1 Seasonal restrictions for piling in the DBS OWFs array areas are not applicable with respect to sandeel as sandeels lack the specialised hearing apparatus (i.e., they do not have a gas bladder attached to their hearing structures) which makes them sensitive to Underwater Noise (UWN).

4.7.2 With respect to herring in the context of this question, the MMO has highlighted multiple times that the range of impact for behavioural responses overlaps a significant area of

herring spawning ground. The MMO original requested a restriction on piling activities during the herring spawning season was made to cover the *whole* of the herring spawning period, which is widely published as being 1 August – 31 October, inclusive (Coull *et al.,* 1998; Ellis *et al.,* 2012). On the basis of the evidence provided in the ES, it was requested for this whole herring spawning period to be covered by the piling restriction as this allows time for herring to migrate into and gather over the spawning ground, spawn and then disperse, accounting for herring which arrive and spawn both earlier and later than the 'peak' of spawning.

4.7.3 Although the Applicant provided a back-calculation for the 'peak' of herring spawning in Section 3 above, it should be noted that the calculations provided related *entirely* to the data associated with the areas of the herring spawning ground which overlie the DBS OWFs ECC. Due to the analyses being constrained to the ECC area only, this back calculation is not applicable to the recommended restriction on piling activities. The Applicants have not yet provided a back-calculation for the 'peak' of herring spawning in the context of piling activities as this would require the Applicants to consider data for a wider area of the herring spawning grounds rather than the area only underlying the ECC.

4.7.4 The MMO understands that the outstanding issues relating to UWN impacts to herring from piling activities within the DBS OWF array areas has now been paused, to be resolved in the post-consent period due to the lack of time remaining to fully resolve this. It was outlined that the draft DML will carry a licence condition prohibiting piling activities across the whole of the DBS OWF array areas for the duration of the herring spawning period (defined as 1 August – 31 October, inclusive). This is reflected in condition 27, however as set out in Section 3 above there may be some minor amendments to this condition based on disagreements with the documents mentioned within this condition.

b) Please update the examination on the latest discussions with the applicants regarding any seasonal piling restrictions if discussions have taken place since ISH5 and DL4 submissions.

4.7.5 The MMO notes that the Applicants provided further evidence in REP7-148 which included additional modelling for alternative piling locations at DBS East: south location (no change) and DBS West: south-west location (remodelled location). In addition, the revised modelling also presented the predicted impact ranges for piling at the alternative locations when using noise abatement systems (NAS) which equate to a 10 dB noise reduction.

4.7.6 In short, the modelling presented was positive and the Applicant has provided a figure (Figure 3.1) which presented the UWN impact range noise contours associated with monopiling at the DBS West north location, and the DBS East south location, with and without a 10 dB reduction. Figure 3.1 showed the UWN impact ranges for all physiological effects (Temporary Threshold Shifts (TTS), recoverable injury, mortality) to be greatly reduced when a 10 dB noise reduction was applied, as well as showing the impact range for behavioural effects to be similarly reduced with a 10 dB noise reduction. The UWN contour depicting the range of behavioural effects based on the 135 dB SEL single strike (ss) threshold, when modelled with a 10 dB noise reduction, showed that the noise contour no longer overlapped with areas of the herring spawning ground which have the highest confidence scores, however there is still some overlap with areas of the herring spawning ground which have a confidence score of 0.04 – 0.8,

which the MMO considers still represents medium-high confidence for potential herring spawning habitat. Nonetheless, this modelling was encouraging.

4.7.7 The Applicants have not explicitly made a formal commitment to implement mitigation measures to achieve a 10 dB noise reduction. Therefore, this modelling can only be considered an indication of what noise reduction *might* be possible and is not sufficient to remove the recommended temporal restriction on piling and Unexploded Ordnance (UXO) detonation activities. If the Applicants make a clear and definite commitment to implement mitigation measures which achieve a minimum 10 dB noise reduction, then there is potential (based on the modelling assessed in REP7-148 which illustrates a 10 dB noise reduction) that a temporal restriction on piling activities may not be required. However, the Applicants should be clear on their choice of noise abatement systems and what the minimum achievable noise reduction level is for each system based on the site-specific conditions of the DBS OWFs project site. The MMO notes this may not be possible util post consent.

4.7.8 Until such a commitment is made and the required supporting evidence is provided, I must maintain that it is necessary to request a temporal restriction on all piling and UXO clearance activities during the Banks herring spawning season (1 August – 31 October inclusive). This is reflected in condition 27, however as set out in Section 3 above there may be some minor amendments to this condition based on disagreements with the documents mentioned within this condition.

c) During ISH5 the ExA suggested [EV10-006] the applicant, the MMO and the Applicant have reviewed this condition and the Applicants proposed a general restriction condition that could be refined post consent. Condition 27 has largely been agreed apart from minor amendments potentially being required which will be agreed for Deadline 9.

4.7.9 The ExA should note that the context of the Rampion 2 project application is considerably different to the current DBS OWF project. In the later stages of the examination process, the Rampion 2 project began exploring a piling zoning plan in order to spatially refine the restrictions placed on piling works with respect to nesting black seabream within the Kingmere Marine Conservation Zone.

4.7.10 Nonetheless, *if* the Applicants wishes to explore the possibility of implementing a zoning plan in order to spatially refine the restriction on DBS piling activities, then this is something which could be supported. However, both the ExA and the Applicants should understand that this is a resource-heavy approach which requires the Applicants to know their finalised project parameters, provide multiple rounds of additional modelling based on different zoning proposals, and incorporate noise abatement and noise mitigation plans. This is not possible with the time remaining in the Examination for the DBS OWFs and if this is something which the Applicants choose to pursue then it should be done post-consent and with early engagement from the MMO, Cefas Fisheries Advisors and Natural England.

4.8 FSE 2.12 Potential effects on sandeel and herring populations

The ExA would welcome a brief, high level summary of the MMO's, NE's and the applicants' latest positions on the following issues including positions on whether proposed mitigation from the applicants is adequate. Cross references to other documentation submitted into the examination which give the detail would also be helpful.

a) Potential impacts on fish from underwater noise from piling in the array areas for: i) Herring ii) Sandeel

i) Herring

4.8.1 Herring has a swim bladder that is involved in hearing, i.e. they have a functional physical connection between the swim bladder and the inner ear. They detect sound through sound pressure and particle motion and their hearing capabilities are greater than other fishes that either do not possess a swim bladder or have a swim bladder that is not involved in hearing. This makes herring (and other clupeids) particularly vulnerable to the impacts of underwater noise (UWN), especially impulsive noise (i.e. percussive piling) and explosions, such as clearance of unexploded ordnance (UXO). Herring are also benthic spawners which rely on gravel and coarse sediment substates on which to lay their eggs. This makes them particularly vulnerable to habitat disturbance during their spawning season (Banks herring spawning season = August to October, inclusive).

4.8.2 The nearest herring spawning ground is to the east of the DBS arrays off Flamborough Head. UWN modelling for piling at the DBS arrays shows that the range of impact for temporary threshold shift (TTS) (an auditory injury) overlaps the area of the herring spawning ground off Flamborough Head in areas of 'high' to 'medium' spawning potential habitat. The range of impact for behavioural responses in herring is shown in the modelling to overlap a much larger portion of the herring spawning ground covering areas of 'high' and 'high' to 'medium' spawning potential habitat.

4.8.3 In summary, herring will be vulnerable to TTS in a small portion of the spawning ground, and vulnerable to behavioural responses across a large area of the spawning ground (see Figure 1). Given that herring are substrate-specific spawners we have concerns that UWN from piling may cause behavioural disturbance which may cause fish to avoid their spawning ground due to noise disturbance. Given their reliance on specific seabed substrates, if herring react to the noise disturbance caused by piling by moving away from the spawning ground, then there is potential for spawning failure to occur.

4.8.4 There is also a further risk, that piling noise may disturb herring migrating through the North Sea from north to south to reach their spawning grounds. Within Figure 1, the Applicant has also presented modelled noise contours based on the use noise abatement systems (NAS) such as hammer cushions and bubble curtains. However, the Applicants have not made a commitment to using NAS, and thus the risk to herring at the spawning ground remains and the MMO maintains that a restriction on piling should be conditioned on the DML from 1 August to 31 October, inclusive).

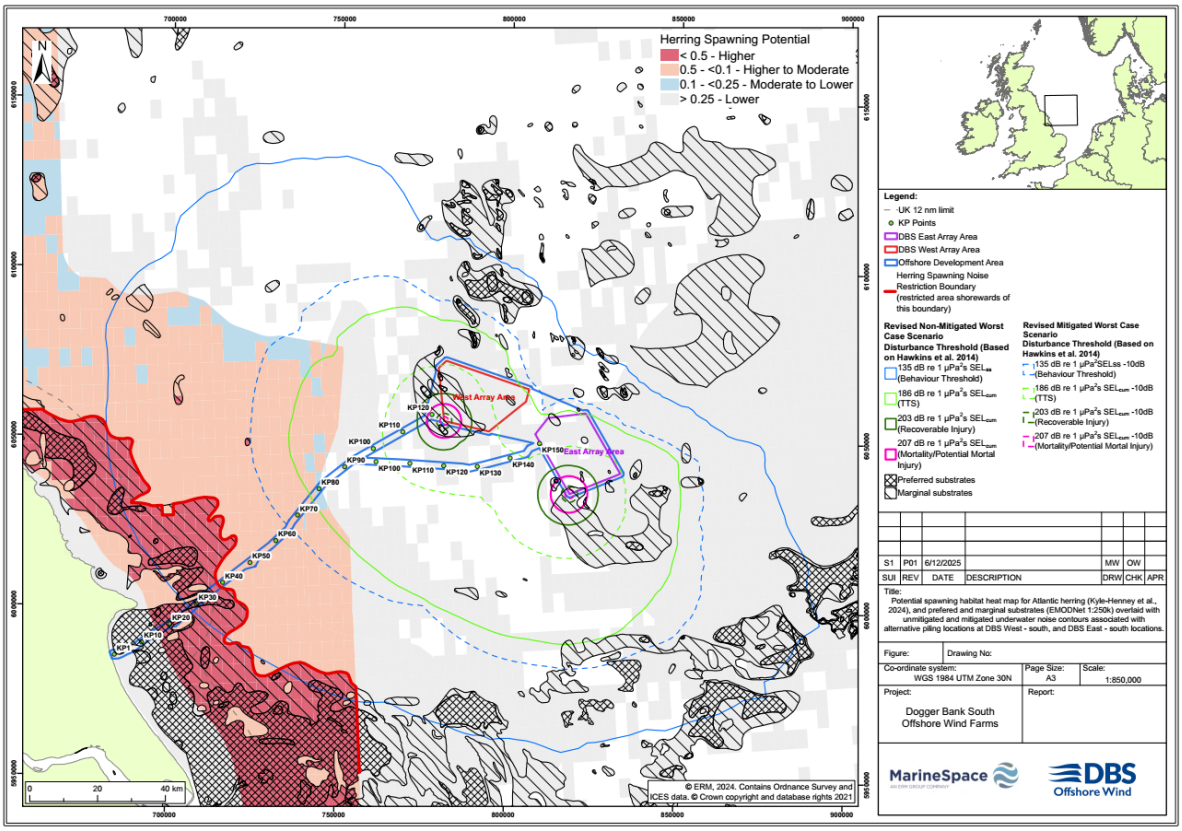

Figure 1: UWN modelling in relation to the herring spawning ground off Flamborough Head. Showing unmitigated and mitigated noise contours (ERM 2024).

ii) Sandeel

4.8.5 Sandeel do not possess a swim bladder, so detect sound through particle motion. They are less considered less vulnerable to barotrauma, although some barotrauma can result from exposure to sound pressure. Sandeel have high site fidelity, and a close affiliation with the seabed. Their preferred habitat consists of sand and slightly gravelly sand substrates. They burrow into the substrate and undertake a hibernation period between November and February (inclusive), during which they also spawn laying batches of eggs which are attached to the seabed. Given the specific sediment preferences of sandeel, and their close affinity with the seabed throughout their lifecycle, sandeel are vulnerable to disturbance arising from offshore construction activities such as dredging and piling which cause physical disturbance to their sandeel habitat.

4.8.6 The UWN modelling presented in the Applicant's Heat Mapping Report: Atlantic Herring and Sandeel (RWE Nov 2024) shows the noise contours for the range of effect for mortality and potential mortal injury, recoverable injury and TTS in sandeel (see Figure 2). As can be seen from Figure 2, the ranges of effect for mortality and potential mortal injury, recoverable injury are small in the context of the wider available habitat. However, it should be recognised that the UWN modelling represents one modelled pile in each array area, whereas in reality, these impact ranges will occur at all sites where piling of foundations takes place, across each array. The heat map of sandeel habitat suitability in Figure 2 indicates that pockets of the array areas have 'very high' levels of confidence as sandeel habitat (denoted by orange colours), with the wider area being 'high' and 'medium' confidence as sandeel habitat. The impact range for TTS encompasses a much wider area of the sandeel habitat, so extends across the 'very high', 'high', 'medium' and 'low' confidence areas.

4.8.7 Given that much of the DBS array areas is considered to an important sandeel habitat, it cannot be discounted that we can expect to see mortality and potential mortal injury and recoverable injury across the array areas at sites where piling is taking place, hence we can expect the impacts to be localised. The wider reaching effects of TTS occurring across the site are also off concern, and whilst not discounting the vulnerability of sandeel to UWN (and habitat) disturbance during construction of the windfarms, especially during their hibernation and spawning periods, we do not have major concerns that significant impacts to sandeel will occur at a population level as a result of UWN from piling. This is, in part, due to the wider availability of suitable sandeel habitat, and takes into the soft-start procedures on commencement of piling that will allow sandeel to move away from the sound disturbance and avoid auditory injury.

4.8.8 However, the MMO welcomes that the Applicants will be undertaking post-construction monitoring of sandeel habitat suitability, to determine whether the seabed within the array areas remains suitable for recolonisation. It should be recognised that monitoring of sandeel habitat suitability is just that, i.e. it only considers whether sediments are suitable for sandeel to inhabit but does not actually gather any data on presence/absence or abundance of sandeel.

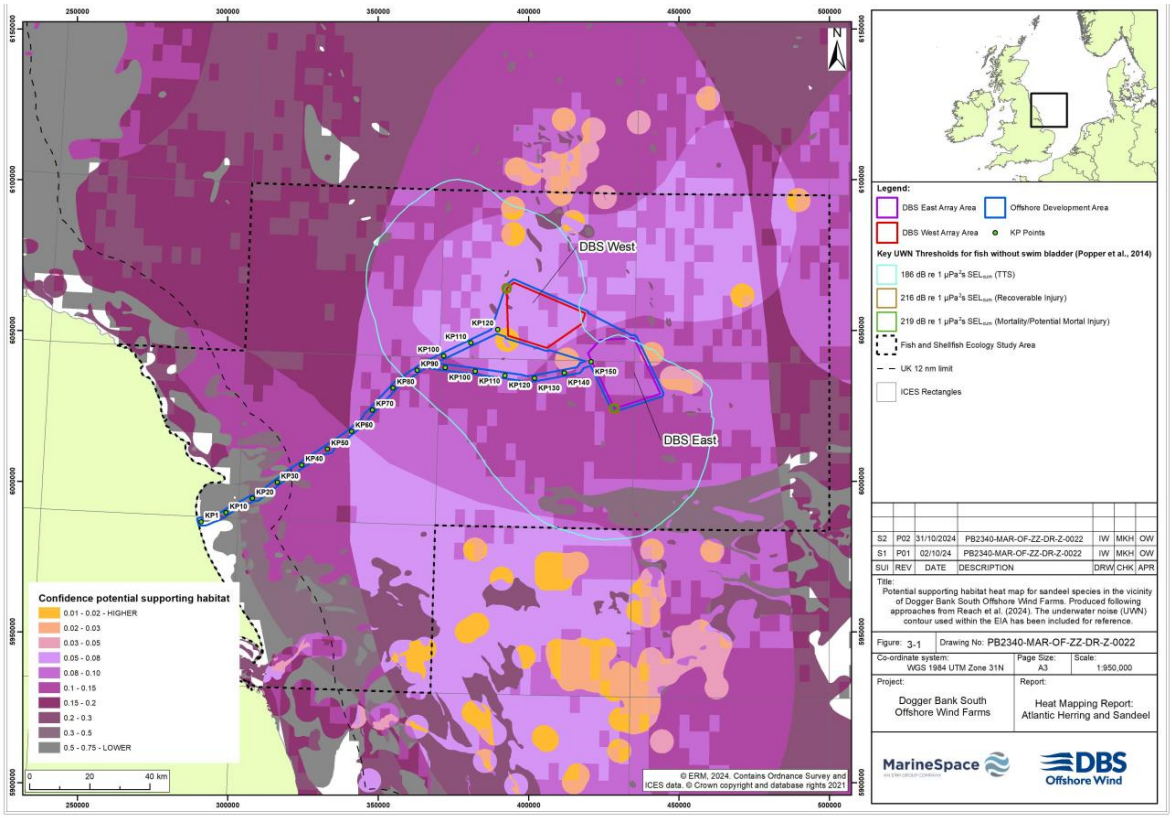

Figure 2. UWN modelling in relation to sandeel habitat and spawning ground and UWN modelling (RWE, November 2024).

b) Potential impacts on fish from construction activity along the export cable corridor through the Flamborough Head spawning ground for: i) Herring ii) Sandeel

<u>i) Herring</u>

4.8.9 As discussed above, herring are reliant on gravel and coarse sediment substrates on which to lay their eggs. This makes herring vulnerable to habitat disturbance during their spawning season (August to October, inclusive) caused by construction activities

associated with cable laying activities, including UXO clearance, sandwave clearance, dredging and disposal of sediments. Disturbance and removal of substrate can affect spawning success in the following ways;

- An absence of suitable spawning habitat on which gravid female herring can lay eggs.
- Removal of eggs attached to the gravel and larvae developing close to the seabed.
- Smothering of developing eggs and larvae from the deposition of suspended sediments caused by disturbance to seabed during construction.

4.8.10 Given their reliance on specific seabed substrates, if the herring spawning habitat off Flamborough Head is disturbed or removed during construction, then there is potential for spawning failure to occur in the area of impact. Whilst this could be considered as a small area of impact, relative to the whole of the spawning ground off Flamborough Head, we have raised concerns that there are multiple cable routes in the planning, consented or construction phases that have cable routes or construction activities which overlap the spawning ground off Flamborough Head e.g. EGL2 (L/2023/00211/1), EGL 3 and EGL 4 (DCO/2024/00009), Hornsea Project Four OWF export cable (DCO/2018/00014) and Dogger Bank A and B (Creyke Beck) OWF export cable (DCO/2013/00010) to name a few. These projects have all been identified as having potential to cause disturbance to herring spawning habitat, (i.e. through sea-bed levelling, cable laying etc), unless they are managed through suitable mitigation measures or appropriate scheduling of works outside the Banks herring spawning season. Hence it is important to look at the cumulative impact of all construction activities affecting the spawning ground as a whole, rather than considering DBS in isolation.

4.8.11 For this reason, we have recommended a temporal piling restriction on all cable laying activities for the DBS export cable corridor (ECC) during the Banks herring spawning season. We have agreed with the Applicant that the restriction can be spatially refined to the area between kilometre points (KP) KP20 – KP40 where coarse gravel sediments, which are suitable for herring spawning are found. The Applicants also wish to reduce the duration of the temporal element of this restriction to the 'peak' of spawning activity (as opposed to the full spawning season of August to October, inclusive), however, the MMO does not agree with the evidence to support this refinement, and have asked for changes to be made to some of the parameters used by the Applicant in their back-calculation method. For the time being we maintain that the restriction on construction activities between KP20 – KP40 is conditioned on the DML from 1 August to 31 October, inclusive). Further consideration of the back-calculation method and refinement of the temporal condition will be reviewed post-consent.

<u>ii) Sandeel</u>

4.8.12 As discussed above, sandeel are highly vulnerable to habitat disturbance due to their close affiliation with the seabed. This is especially the case when habitat removal and disturbance occur during their winter hibernation and spawning months when the sandeel are burrowed in the sediment, and the eggs are on adhered to the sediment. Figure 2 shows the 'heat' map of sandeel habitat suitability for the DBS arrays and the ECC. The 'heat' map indicates that inshore areas of the ECC between KP1 – KP30 are of low confidence as spawning habitat. From KP30 to KP120 (at DBS West array) and KP150 (DBS East array) the 'heat' map confidence scores are a mix of 'medium', 'high' and 'very high', indicating that much of the ECC is suitable as sandeel habitat. However, as can be seen in the 'heat' map, areas of 'medium', 'high' and 'very high' are available across the wider Central North Sea.

4.8.13 The MMO would therefore have to assume that disturbed sandeel may seek alternative habitat available nearby, and that where mortality or injury occurred, there remains a population of sandeel across the wider available habitat. Therefore, the MMO does not have any major concerns that impacts to sandeel at a population level will occur as a result of construction along the ECC.

c) Potential impacts on fish from underwater noise from UXO clearance in the array areas and along the export cable corridor through the Flamborough Head spawning ground for: i) Herring ii) Sandeel

4.8.14 In Chapter 5 of the ES (Project Description) for DBS it states that "A Marine Licence application would be applied for post-consent to allow for the investigation and clearance of any UXO to ensure appropriate". For this reason, the primary focus of our advice so far has been to consider the impacts of all other construction activities in relation to fisheries and fish ecology e.g. UWN from piling, habitat disturbance etc. However, the MMO notes that some UWN modelling to predict the range of effect from UXO in fish was presented in the ES Underwater Noise Modelling Report (Appendix 11-3) which have been presented in Table 1 below.

Table 1. Noise impact ranges for fish from UXO detonations

of various charge weights Popper *et al.* (2014) Unweighted SPLRMS	**Mortality and potential mortal injury**	
	234 dB	**229 dB**
Low yield	130 m	210 m
Low order (0.25 kg)	40 m	65 m
25 kg + donor	170 m	290 m
55 kg + donor	230 m	380 m
120 kg + donor	300 m	490 m
240 kg + donor	370 m	620 m
525 kg + donor	490 m	810 m
698 kg + donor	530 m	890 m

4.8.15 Please note that in addition to the above impact ranges for mortality and potential mortal injury, we can expect recoverable injury, TTS and behavioural responses to occur over greater distances. The Popper *et al.* (2014) 'guidelines' for injury thresholds in fish from explosions only provides a quantitative threshold for mortality and potential mortal injury of 229 - 234 dB peak, whereas for the effects of recoverable injury, TTS and behavioural responses, qualitative thresholds are given whereby the relative risk (high, moderate, low) is given for fish at three distances from the source defined in relative terms as near (N) (ten of metres), intermediate (I) (hundreds of metres), and far (F) (thousands of metres). See Table 2 below:

Table 2. Qualitative thresholds for effects in fish from explosions (adapted from Popper *et al*. 2014)

Type of Animal	Impairment		
	Recoverable injury	**TTS**	**Behaviour**
Fish: no swim bladder (particle motion detection)	(N) High (I) Low (F) Low	(N) High (I) Moderate (L) Low	(N) High (I) Moderate (F) Low
Fish where swim bladder is not involved in hearing (particle motion detection)	(N) High (I) High (F) Low	(N) High (I) Moderate (F) Low	(N) High (I) High (F) Low
Fish where swim bladder is involved in hearing (primarily pressure detection)	(N) High (I) High (F) Low	(N) High (I) High (F) Low	(N) High (I) High (F) Low
Eggs and larvae	(N) High (I) Low (F) Low	(N) High (I) Low (F) Low	(N) High (I) Low (F) Low

4.8.16 Please note that the modelled impact ranges have not been mapped over fish habitats or spawning grounds, so the MMO is unable to comment on the extent of impact to sensitive fish receptors. However, noting that a separate marine licence will be applied for to allow for the investigation and clearance of any UXO, the MMO recognises that the locations of potential UXOs are not yet known, and therefore it is not possible to model site-specific UXO clearance activities in relation to fish habitats. With this in mind, it is not appropriate to request any mitigation or licence conditions pertaining to UXO clearance activities as they are not relevant to the DML in question and suitable site-specific UWN modelling has been presented for review.

d) Potential effects on fish spawning areas from benthic ecological halo effects associated with above ground structures including cable protection installed on the seabed for: i) Herring ii) Sandeel

<u>i & ii Herring / Sandeel</u>

4.8.17 Benthic ecological halos caused by habitat modification can result in changes to the existing / baseline seabed habitat such as changes in the composition of benthic infauna/epifauna communities and changes to sediment characteristics. When a habitat is modified it may either become more suitable for certain benthic infaunal and/or epifaunal species, creating an attraction around the modified area, or it could make the area less suited to the species, causing them to move elsewhere to more favourable habitat. Changes in benthic communities which provide prey species for fish can therefore influence the suitability of the affected area for fish communities, again either through attraction to the prey or through avoidance by seeking prey elsewhere.

4.8.18 The MMO can also assume that changes to both benthic and fish communities may result in either an increase or decrease in the predation of fish eggs or larvae, in areas where benthic ecological halos occur in demersal spawning grounds, depending on the species that move in/out of the affected area. Given that sandeel are entirely demersal and have a close affiliation with the seabed, we might expect that they will come under increased pressure, either from predation, depending on how the community changes, or from changes to the species it preys upon. Herring are primarily a pelagic species,

so only require gravel and coarse sediment substrates during their spawning seasons, thus, assuming that the sediment remains suitable for herring to spawn on, the primary concerns regarding changes to benthic and fish communities as a result of a halo effect would be the predation of eggs and larvae.

4.8.19 Changes in sediment characteristics can be caused by changes to the component sediment fractions, removal of the sediments, scouring of sediment, or placement of objects (e.g. cable protection, turbine foundations etc). Such changes can make the seabed sediments become more or less suitable as habitat / spawning habitat for demersal species such as sandeel and herring. In the context of herring, if the sediments become too fine, e.g. too sandy/silty/muddy, then the habitat will not be suitable to lay eggs on. In the context of sandeel, if the sediments become too coarse (e.g. gravel) or too fine (e.g. silt/mud) then they will become unsuitable as sandeel habitat and unsuitable for spawning. The placement of infrastructure on the seabed such as turbine foundations and cable protection results in long-term habitat loss, or permanent habitat loss, if the infrastructure is not removed at the end of the project's lifetime. Placement of infrastructure in areas of herring spawning habitat and sandeel habitat results in areas of habitat becoming unavailable, the scale of impact for a particular species will depend upon the total area of the habitat that is affected compared to the wider available habitat that is suitable.

4.8.20 Ideally, modification of seabed habitat for species such a herring and sandeel that rely on specific substrates for part or all of their life stages should be minimised as much as possible through appropriate design measures such as; limiting the footprint of wind turbine foundations and offshore platforms (where possible), the burial of cables wherever possible (subject to local geology and crossing of existing infrastructure), where cable protection is required (e.g. at crossing with other assets), the footprint of cable protection placed on the seabed should be minimised as far as is practicable and safe. The MMO has not requested any mitigation measures pertaining to benthic halo effects on sandeel or herring but expect the Applicants to follow best-practice measures in minimising the footprint of the OWF's infrastructure.

e) Potential effects on fish spawning areas from EMF effects and the localised heating of sediment within the array areas and along the export cable corridor for: i) Herring ii) Sandeel

4.8.21 It should be noted that the sensitivity of marine fish larvae to magnetic fields varies with species. As juveniles and adults, sandeels live in association with specific areas of the sea bottom, where they spend most of their time buried in the sediment (Wright *et al*., 2000), occasionally forming schools that rise up into the water column to feed (Johnsen *et al*., 2017) or spawn (Bergstad *et al*., 2001; Gauld and Hutcheon, 1990). With respect to electromagnetic fields (EMF) produced by OWF export cables, it is difficult to replicate the exact conditions produced by either active HVDC or HVAC cable infrastructure without carrying out field investigations. However, recent laboratory investigations which exposed sandeel larvae to EMFs produced by direct currents suggested that sandeel larvae would not be attracted to or repelled from HVDC subsea cables associated with OWFs as the EMFs did not affect the spatial distribution or the swimming behaviour of sandeel larvae (Cresci *et al.,* 2022).

4.8.22 In addition, current scientific understanding generally accepts that adult sandeel do not possess the type of specialised sensory organ which would create a sensitivity to EMF emissions. For example, elasmobranchs are considered the most sensitive fish receptor group to EMF effects, because they possess electrosensitive sensory organs,

such as the Ampullae of Lorenzini, used for navigation and prey species detection. While adult sandeel are not believed to possess such sensory structures within their physical anatomy, it is possible that EMF emissions have potential to influence other aspects of sandeel ecology, for example behavioural responses to external stimuli which increases the risk of predation or effects on the motility of spermatozoa which may have consequences for sandeel egg fertilisation (Formicki et al., 2019). However, quantitative studies of impacts to sandeel specifically in the context of EMF are lacking and therefore no definitive impact pathway can be concluded.

4.8.23 With respect to the effects of sediment heating due to the presence of export cables beneath the sediment, sandeel species burrow to depths of between 20cm to of 50cm depending on sediment type (Holland *et al.*, 2005 and Rowley, 2008), so there is potential for sandeels to be exposed to the effects of thermal heating in the sediment layers they inhabit. This question can only really be answered broadly as the effect on sandeel from sediment heating will be dependent on the temperatures associated with the cable infrastructure. For example, small fluctuations in sediment temperature may be within the sandeels tolerable range, however greater sediment temperature fluctuations may potentially warm the near-seabed water and reduce oxygen availability for respiration (Behrens et al., 2009). Again, this highlights a gap in our understanding of the possible likelihood and significance of sediment heating as an impact pathway for sandeel.

4.8.24 Herring are a pelagic species and so it is considered that adult herring will generally exist outside of the range of impact of possible EMF emissions (i.e.., they will spend the majority of their lives in the water column rather than on the sediment). In this sense, the impacts of EMF and sediment heating on herring are more relevant to the eggs and larvae which are demersal. There is limited research which indicates that increased water temperatures may affect the mitochondrial function of embryos, as well as the proportion of eggs able to hatch, the size of larvae at the point of hatching and the subsequent survivability of the larvae (Leo *et al*., 2018). Observed effects have indicated that temperature plays a role in shaping embryonic mitochondrial respiration, with subsequent effects on embryonic respiration and body length at hatching (Peck *et al*., 2012).

4.8.25 That being said, it should be noted that these studies have been conducted primarily to investigate herring eggs and larval development under different climate change-related scenarios and so the effects observed must be considered with caution. In the context of impacts associated with OWF export cables, the key impact pathways with respect to herring eggs and larvae remain the risk of direct damage, smothering and prevention of oxygenation, all pathway which have the potential to result in herring egg and larvae mortality.

4.8.26 Although significant gaps in our understanding of the effects of EMF and sediment heating on both the egg and larval and adult life stages of herring and sandeel specifically remain, the MMO does not consider that herring or sandeel are notably receptive or sensitive to EMF emissions or sediment heating effects. The MMO would not consider the presence of EMFs to be a significant cause of concern for herring and sandeel spawning areas.

f) Potential cumulative effects from the proposed development in combination with other planned projects on: i) Herring ii) Sandeel

4.8.27 It is somewhat unclear what information the ExA is seeking to obtain through this question. The importance of examining impacts to herring and sandeel habitat suitability has been outlined throughout the consultation and examination process, as well as being touched within this representation.

g) Potential long term or permanent effects if cable protection was not removed from the export cable corridor post decommissioning within areas of high - very high potential spawning habitat for: i) Herring ii) Sandeel

4.8.28 The initial thoughts on this are that cable protection should not be being laid through areas of high – very high potential herring spawning habitat as the key aspect of protecting herring spawning habitat is ensuring that the quality, integrity and distribution of available spawning habitat is maintained. This is something which should be being managed above the individual project level as individual project impact assessments cannot fully capture the extent of damaging being done to the spawning ground across the multiple projects from the various industries being permitted to carry out activities within the spawning ground (i.e., OWF development, but also aggregate extraction, other cable laying works, commercial bottom trawl fisheries etc.,).

4.8.29 With respect to the issues posed by cable protection being left permanently in situ post-decommissioning, this is dependent upon the type of cable protection as the type of cable protection will affect the residual impacts. For example, boulder protection (i.e., piles of rock boulders laid along the cable length to prevent cable exposure or snagging) structurally changes and fragments the available habitat. The presence of a large rock wall prevents the free movement of species from one area of the array to the other. This has ramifications for species migrations (through the presence of new obstacles), feeding opportunities (through fish community change) and potentially reproductive success (physical loss of spawning habitat). In comparison, mattress-form cable protection also has the potential to change habitat through changing sediment deposition characteristics, whereby larger or smaller fractions of sediment being transported by natural processes will become caught in the mattress. This may result in benthic community change which may influence feeding opportunities for fish, which could in turn change the assemblage of the fish community present in the area. There are some excellent published literatures reviews which examine the range of effects associated with habitat changes due to OWF (Bat *et al*., 2013; Van Hal *et al.,* 2017; Hogan *et al.,* 2023, for example).

4.8.30 With consideration to herring and sandeel and maintaining suitable habitat through the industrialisation of the seabed specifically, then changes to sediment composition, because of changing sediment transport and deposition dynamics, present the greatest source of concern. Changes to sediment transport and deposition dynamics as a result of abandoned cable protection devices has the potential to cause increased deposition of silt or muddy sediments which will render areas of preferred or marginal habitat unusable. This presents a risk that the quality, distribution and total extent of herring spawning habitat and sandeel habitat available could be permanently changed.

4.8.31 Whilst the MMO is fortunate to have a standardised methodology for determining areas of seabed with the greatest value to herring and sandeel as spawning habitat during the impact assessment process (Kyle-Henny *et al.,* 2024, Reach *et al*., 2024), there is no standardised pre- or post-construction monitoring scheme in place to allow

for wide scale, harmonized monitoring of effects from OWF on the herring spawning grounds and areas of sandeel habitat. It is therefore difficult to use the current sporadically implemented pre- and post-construction monitoring carried out by individual OWF projects to really quantify what effect OWF expansion is having on herring spawning habitat and sandeel habitat quality and availability over an ecologically meaningful scale (i.e., at the regional or national level). This information is necessary in monitoring changes to herring spawning habitat and sandeel habitat in a wider and more long-term context and is essential inbuilding our collective understanding of what the impact from OWF developments is and what the actual recoverability of spawning habitat is. This is for a wider discussion within regulators and industries and does not believe this can be answered within this Examination.

5. Comments on the on the Applicants comments on the Examining Authority's Proposed Schedule of Changes to the draft Development Consent Order (REP7-130)

5.1.1 The MMO has reviewed this document and NE's document REP7-151 and although NE's comments aren't within this document has provided comments in some rows on both the Applicant and NE's response where required.

Reference	Text as set out in the draft DCO	ExA's recommended amendment/ insertion	Reasons and notes	Applicants Comments	MMO Comments
ARTICLES					
2	"undertaker" means, subject to article 5 (benefit of Order),— (a) for the purposes of constructing, maintaining and operating the DBS East works and any related ancillary works, DBSEL; (b) for the purposes of constructing, maintaining and operating the DBS West works and any related ancillary works, DBSWL; and (c) in any other case, DBSEL and DBSWL;	**"undertaker" means, subject to article 5 (benefit of Order),— (a) for the purposes of constructing, maintaining, and operating and decommissioning the DBS East works and any related ancillary works, DBSEL; (b) for the purposes of constructing, maintaining, and operating and decommissioning the DBS West works and any related ancillary works, DBSWL; and (c) in any other case, DBSEL and DBSWL;**	To provide clarity and ensure consistency where definition is used within the requirements in relation to decommissioning	The Applicants have made this change in the Draft Development Consent Order (DCO) (Revision 10) [document reference 3.1]	The MMO has no concerns with the updated wording.
Schedule 2 – Requirements (R)					
Requirement 1	1.—(1) The DBS East Project must commence no later than the expiration of seven years beginning	1.—(1) The DBS East Project must commence no later than the expiration of five ~~seven~~ years beginning with the date this Order comes into force. (2)	Considering the case presented by the applicants with regard to the importance of the	As stated in The Applicants' Responses to January 2025 Action Points [AS-155] (Action Point 11): "The Applicants recognise the critical need for low carbon infrastructure and intend to	The MMO would be content with either option and will leave it to the SoS to decide.

	with the date this Order comes into force. (2) The DBS West Project must commence no later than the expiration of seven years beginning with the	The DBS West Project must commence no later than the expiration of five ~~seven~~ years beginning with the date this Order comes into force	proposed development to the delivery of identified government targets, the ExA considers that the seven-year commencement period proposed by the applicants to be excessive. Moreover, the ExA sees no reason why either or both projects cannot reasonable be commenced within a shorter timeframe	begin construction of the Projects as soon as possible following the grant of consent. However, it can take a large amount of time for a project of this scale and complexity to move into the construction phase following grant of consent, as there are several matters that need to be in place before construction can begin. The Applicants may need to secure a Contract for Difference (CfD) for each Project, and the Applicants are not able to guarantee the timing for this process. The Applicants note that changes have been made to the timings of the CfD auction rounds over recent years, moving from biannual to annual and also moving the auction application windows to different months of the year. Any future changes to the process and its timing by Government are entirely outside of the Applicants' control and so contingency must be allowed for in the implementation period for the Projects to reflect this. Additionally, it is well known that there can be long lead in times for the manufacture and supply of major parts of the Projects' key infrastructure, such as wind turbine generators and cabling, due to the current high global demand for such services. The specialist vessels used in the offshore construction are also in particularly high demand at present.	

				Whilst the Applicants intend to seek to commission these services as early as possible, supply chain availability is another factor that could potentially delay the implementation of the Projects. The Applicants therefore consider that, whilst it is the intention to commence construction of the Projects as soon as practicable, a seven year time limit for implementation is proportionate and justified. This approach has been accepted by the Secretary of State on other recent offshore wind farm developments of similar scale and complexity, including the Sheringham Shoal and Dudgeon Extensions DCO, the Hornsea Four DCO and the Hornsea Three DCO." Since this response, the Secretary of State approved a seven year commencement period for Rampion 2, continuing recent precedent. In addition to the above, the Projects could be subject to legal challenge. It has become increasingly common for large infrastructure schemes to be subject to legal challenge by way of judicial review and, whilst the majority of these challenges have been unsuccessful, they have caused long and unforeseen delays to the implementation of projects. This would particularly be the case if any legal challenge were taken all the way through to the Supreme	

				Court, which could take much longer than 12 months. For example, the judicial review of the Norfolk Vanguard project resulted in a more than 12 months delay to the reapproval of the DCO (noting that Vanguard was also subject to delays by the Secretary of State in reaching a decision of an additional 7 months). A stark example of offshore wind projects being put on hold due to reasons not dissimilar to those set out above (for example, supply chain issues), has recently occurred with the discontinuance (in its current form) of Hornsea Four. The ability to rely on the seven year implementation period within the DCO for that project could enable it to be resurrected at a later date and enable its valuable contribution to the Government's clean energy targets to be realised. There remains the possibility that several of the factors outlined above could combine in unexpected ways, with the result that the start of construction of either one or both Projects is delayed such that the full 7-year implementation period is required. This is particularly the case due to there being two separate Nationally Significant Infrastructure Projects (NSIPs) within the Draft DCO, both of which will require CfD and to go through key milestones such as	

				Financial Investment Decision, bringing a further element of uncertainty. Given the recent precedent for other offshore wind farms of seven year implementation periods, the Applicants submit that any reduction in this period would introduce uncertainty and inconsistency in the consenting regime, undermining investor confidence and increasing risk premiums across the industry. Given the Government's clear commitment to scaling offshore wind development, stability and predictability in DCO consenting terms is essential. The Applicants therefore maintain that, whilst they will seek to implement both Projects as soon as possible, there may be factors, or a combination of factors, outside of their control that could cause unforeseen delays, which supports the position that a seven year implementation period is required.	
Requirement 4	4.—(2) The dimensions of any offshore converter platform (excluding helidecks, lightning protection, towers, masts and cranes) must not exceed:— (a) 125 metres in length; (b) 100 metres in width; or (c) 105 metres in height above LAT.	2) The dimensions of any offshore converter platform and offshore accommodation platform (excluding helidecks, lightning protection, towers, masts and cranes) must not exceed:— (a) 125 metres in length; (b) 100 metres in width; or (c) 105 metres in height above LAT.	For clarity and to ensure that full details are provided.	The Applicants have made this change in the Draft DCO (Revision 10) [document reference 3.1]	The MMO welcome the changes made by the Applicants.

Requirement 5	5.—(1) Offshore converter platforms and offshore accommodation platform foundations must be of one or more of the following foundation options: piled monopile, or piled jacket	5.—(1) Offshore converter platforms and offshore accommodation platform foundations must be of one or more of the following foundation options: piled monopile, and/or piled jacket	For clarity and consistency with other requirements.	The Applicants have made this change in the Draft DCO (Revision 10) [document reference 3.1]	The MMO welcome the changes made by the Applicants.
Schedule 10 – Deemed Marine licence (DML) 1					
	(g) Cable protection replenishment;	(g) Cable protection replenishment outside European marine designated sites with benthic habitats as qualifying features for a maximum period of ten years post construction; (h) Cable repairs and replacement; (i) Access ladder and boat landing replacement; (j) Wind turbine generator and offshore accommodation platform anode replacement; and (k) J-tube repair/replacement	NE's standard advice is that cable protection should only be deployed for a maximum period of 10 years from the commencement of operations outside of designated sites. The ExA is currently persuaded that	The Applicants note that the proposed amendments could not be applied to Schedule 10 DML1, Schedule 11 DML 2 and Schedule 14 DML 5 - Part 2 as these DMLs do not cover areas that extend outside European marine designated sites with benthic habitats as qualifying features. The ExA's suggested DCO changes in the row below relates to matters concerning the use of replenishment protection within European marine designated sites with benthic habitats as qualifying features As regards the suggestion of the inclusion of the proposed wording within Schedule 12 DML 3 - Part 2, 5(2)(g) and Schedule 13 DML 4 - Part 2, 2(5)(g), the Applicants are of the opinion that this amendment is unnecessary and do not propose to make this change. The Applicants believe requiring further licencing for replenishment of cable protection	The MMO believes this is a matter for the SoS to decide. The MMO believes that if this is included within the DML and the consent then the HRA as part of the decision would need to consider the full amount of cable protection that could be placed within the Dogger Bank SAC throughout the project and that consideration of compensation should be undertaken and

				already consented beyond 10 operational years serves only to increase bureaucracy without providing any additional environmental benefits. There are no environmental harms associated with the installation of replenishment protection up to the limits established by the Draft DCO that would not have already been assessed, mitigated and managed through the main project consents. The Applicants direct the ExA to the response provided to Natural England in The Applicants' Responses to Deadline 2 Documents [REP3-028] (REP2-065:6), presented below for ease: 'The Applicants' position remains that replenishment of cable and scour protection up to the limits set out within the DMLs could be deposited within the footprints of deposition established at the construction stage. These footprints would be established through the discharge of the Reporting of Scour and Cable Protection conditions in each DML (for example, see Condition 23 in DML 1 (Schedule 10) within the Draft DCO (Revision 6) [document reference 3.1]) with the volumes of deposition also managed through these conditions. The effects of protection introduced through this mechanism will be compensated for as part of the DBS benthic SAC compensation proposals. The effects of	included within a compensation schedule for the Dogger Bank SAC. However, the MMO understands that NE's position is that the amount of cable protection assessed is consented is for construction only, once they've placed it in position and discharged the relevant conditions that consented figure cannot be utilised as this has been reduced as part of the project design.

				such protection will have been comprehensively assessed as a permanent effect compensated for through the DBS DCO consenting process. The Applicants maintain that further assessment and compensation discussions relating to project activities that have been previously assessed, licenced and compensated for would be neither proportionate or necessary'	
Schedules 10 to 14 – Deemed Marine Licence (DML) 1-5					
Schedule 10 DML1 - Part 2, 7(7)(8) Schedule 11 DML2 - Part 2, 7(7)(8) Schedule 12 DML3 - Part 2, 5(7)(8) Schedule 13 DML4 - Part 2, 5(7)(8) Schedule 14 DML5 - Part 2, 3(7)(8)	N/a	—(7) No cable protection can be replenished within European marine designated sites with benthic habitats as qualifying features unless otherwise agreed in writing by the MMO in consultation with the relevant statutory nature conservation body and the Maritime and Coastguard Agency. (8) The undertaker is not required to comply with sub-paragraph (7) in a case of emergency."	NE's Risk and issue log at deadline 6, point A15/A19 [REP6-077] continues to state a significant disagreement on the issue of cable protection replenishment within designated sites for benthic features. Within any designated sites for benthic features, such as the Dogger Bank SAC, NE states the condition should stipulate that there should be no deployment of	The Applicants are of the opinion that this amendment is unnecessary and do not propose to make this change. The Applicants submit that requiring control of the deposit of replenishment cable protection already consented serves only to increase bureaucracy without providing any additional environmental benefits. There are no environmental harms associated with the installation of replenishment protection up to the limits established by the Draft DCO that would not have already been assessed, mitigated, managed and compensated for through the main project consents. Such a condition would therefore be unreasonable and unnecessary. The Applicants also highlight the reasons that replenishment protection is required include reducing risks to other sea users which might be caused through exposed cables lying on the seabed, and also to reduce the risk of	The MMO's position remains unchanged that no new cable protection will be placed within Marine Protected Areas (MPAs) with benthic features after construction. The MMO understands that this condition would allow cable protection to be replenished within the operation phase. The MMO further understands that this replenishment could only be within the footprint and

			cable protection after the completion of construction. The ExA therefore considers the revised wording would allow the relevant statutory nature conservation body to have the necessary degree of oversight of any cable protection replenishment required within designated sites from a safety perspective and has therefore included the need for the Maritime and Coastguard Agency to be consulted	reductions in operational time or output (potentially denying the transmission of up to 3 GW of clean power to the UK grid) should exposed cables become damaged whist waiting for approvals to make protection deposits. Both of these risks increase in proportion with delays to the deposits of replenishment protection which might arise as a result of the suggested process. The Applicants direct the ExA to the response provided to Natural England in The Applicants' Responses to Deadline 2 Documents [REP3-028] (REP2-065:6), presented below for ease: 'The Applicants' position remains that replenishment of cable and scour protection up to the limits set out within the DMLs could be deposited within the footprints of deposition established at the construction stage. These footprints would be established through the discharge of the Reporting of Scour and Cable Protection conditions in each DML (for example, see Condition 23 in DML 1 (Schedule 10) within the Draft DCO (Revision 6) [document reference 3.1]) with the volumes of deposition also managed through these conditions. The effects of protection introduced through this mechanism will be compensated for as part of the DBS benthic SAC compensation proposals. The effects of such protection will have been	volume of what was placed at the time of construction.

				comprehensively assessed as a permanent effect compensated for through the DBS DCO consenting process. The Applicants maintain that further assessment and compensation discussions relating to project activities that have been previously assessed, licenced and compensated for would be neither proportionate or necessary'	
Schedule 10 DML1 - Part 2, 15(1) Schedule 11 DML2 - Part 2, 15(1) Schedule 12 DML3 - Part 2, 13(1) Schedule 13 DML4 - Part 2, 13(1) Schedule 14 DML5 - Part 2, 11(1)	(c) a construction method statement (in accordance with the cable statement), including details of— (i) cable burial, specification, installation and monitoring to include— … (vii) associated ancillary works; and (viii) guard vessels to be employed	(c) a construction method statement (in accordance with the cable statement), including details of— (i) cable burial, specification, installation and monitoring to include— … (vii) associated ancillary works; and (viii) guard vessels to be employed; and (ix) arrangements for crossing and proximity agreements to be put in place with existing subsea pipelines and cable operators, and gas block (UKCS Block) operators;	Crossing and proximity agreements are proposed as the main form of mitigation to reduce the significance of effects to other offshore users and should be captured by the dDCO to ensure that the proposed development would not result in greater effects than those set out in the ES.	The need to obtain consent from the owners of existing infrastructure (usually obtained through entry into of crossing and proximity agreements) with which the Projects will interact is a requirement of the Agreement for Lease for the Projects with The Crown Estate and therefore is already secured through that means, as is the standard approach for offshore wind farm consenting. Furthermore, it is recognised (for example in the Government Guidance on Use of planning conditions, July 2019) that a positively worded condition that requires the applicant to enter into an agreement is unlikely to pass the test of enforceability. It is also not necessary and almost entirely unprecedented to impose such a condition, when there is already a separate obligation on the Applicants to enter into such agreements.	The MMO has no concerns if this is not included.

Schedule 10 DML1 - Part 2, 15(1)(c)(i) Schedule 11 DML2 - Part 2, 15(1)(c)(i) Schedule 12 DML3 - Part 2, 13(1)(c)(i) Schedule 13 DML4 - Part 2, 13(1)(c)(i) Schedule 14 DML5 - Part 2, 11(1)(c)(i)	bb) a detailed cable laying plan for the authorised scheme, incorporating a detailed burial risk assessment encompassing the identification of any cable protection that exceeds 5 percent of navigable depth referenced to Chart Datum and, in the event that any area of cable protection exceeding 5 percent of navigable depth is identified, details of any steps (to be determined following consultation with the MCA and Trinity House) to be taken to ensure existing and future safe navigation is not compromised or similar such assessment to ascertain suitable burial depths and cable laying techniques, including cable protection; and	(bb) a detailed cable laying plan for the authorised scheme, incorporating a detailed burial risk assessment encompassing the identification of any cable protection that exceeds 5 percent of navigable depth referenced to Chart Datum and, in the event that any area of cable protection exceeding 5 percent of navigable depth is identified, details of any steps (to be determined following consultation with the MCA, and Trinity House and the MMO in consultation with the statutory nature conservation body) to be taken to ensure existing and future safe navigation is not compromised or similar such assessment to ascertain suitable burial depths and cable laying techniqe	The wording has been added in response to NE's deadline 6 response [REP6-072] advising that if cable protection would be required at greater heights, that this should also be agreed with the MMO in consultation with the SNBC	The Applicants are of the opinion that this amendment is unnecessary and do not propose to make this change, noting that control of the reduction of water depths to levels exceeding 5 percent of navigable depths is already secured via the Applicants' commitment to comply with MGN654, contained in the 'Offshore Safety Management' conditions included within each Deemed Marine Licence presented in the Draft DCO (Revision 10) [REP6-004] (e.g. Condition 18 of Schedule 10 DML). Further, the Applicants note that Natural England's interest in this issue only applies within the 10m depth contour and not beyond. As such, if applied, this recommendation would only be applicable to Schedule 11 DML2 and Schedule 12 DML3 and should be restricted to water depths within the 10m depth contour closest to shore only. Requesting this requirement beyond the 10m depth contour will likely further increase Natural England's known and stated resourcing problems for no discernible benefit, which may also then lead to further delays in necessary approvals. Finally, it is not necessary for the MMO to consult itself on the discharge of DML conditions.	The MMO made comments regarding this in REP7-148 which was detailed. The MMO will wait on the Applicants response to those comments.
Schedule 10 DML1 - Part 2, 15(1)(g)	g) in the event that driven or part-driven pile foundations are	g) in the event that driven or part-driven pile foundations are proposed to be used, a marine	The ExA is currently persuaded by the	The Applicants have amended the condition wording regarding noise reduction to the following at Deadline 7:	The MMO previously highlighted in

Schedule 11 DML2 - Part 2, 15(1)(g) Schedule 12 DML3 - Part 2, 13(1)(g) Schedule 13 DML4 - Part 2, 13(1)(g)	proposed to be used, a marine mammal mitigation protocol (in accordance with the outline marine mammal mitigation protocol), the intention of which is to prevent injury to marine mammals, following current best practice as advised by the relevant statutory nature conservation bodies and which must include consideration of noise reduction methods and/or, deployment of noise mitigation systems or noise abatement systems that will be utilised to manage sounds from those piling activities and such protocol must include full details and justification for the mitigation chosen or excluded for deployment;	mammal mitigation protocol (in accordance with the outline marine mammal mitigation protocol), the intention of which is to prevent injury to marine mammals, following current best practice as advised by the relevant statutory nature conservation bodies and which must include consideration the use of noise reduction methods and/or, deployment of noise mitigation systems or noise abatement systems that will be utilised to manage sounds from those piling activities and such protocol must include full details and justification for the mitigation chosen or excluded for deployment; the noise reduction methods employed must achieve at least a 10dB reduction in underwater noise at a frequency band approved by the MMO in consultation with the relevant statutory nature conservation body and verified by the monitoring set out in the final MMMP informed by the outline MMMP;	preferred condition wording as advised by the MMO [REP6-069] and NE [REP6-075] which is to replace 'consideration of' with 'the use of'. MMO and NE consider that the phrasing 'consideration of' leaves ambiguity at the post consent stage that could mean no mitigation is applied post consent when this will be required. Due to the outstanding concerns by NE at deadline 6 of AEoI for marine mammal species at the North Norfolk Coast and Wash SAC, Southern North Sea SAC and	(g) in the event that driven or part-driven pile foundations are proposed to be used, a marine mammal mitigation protocol (in accordance with the outline marine mammal mitigation protocol), the intention of which is to prevent injury to marine mammals, following current best practice as advised by the relevant statutory nature conservation bodies and which must include details of noise reduction methods through project design (primary measures) and/or, deployment of noise mitigation systems or noise abatement systems (secondary measures) that will be utilised to manage sounds from those piling activities and such protocol must include full details and justification for the mitigation chosen or excluded for deployment. The Applicants have agreed this wording with Natural England by email on 20th June 2025 and the MMO by email on 24th June 2025 in order to enable Natural England to confirm there is no Adverse Effect on Integrity (AEoI) on the SACs from the Projects. The Applicants understand confirmation of this will be provided in Natural England's Deadline 7 submissions and in the final SoCG with Natural England to be submitted at Deadline 8. As previously noted by the Applicants in the response to MM.1.2 of The Applicants' Responses to ExQ1	REP7-148 section 1.10 that the MMO, NE and the Applicant has agreed condition wording, other than the fisheries comments above that could be managed through the inclusion of the herring spawning restriction condition and agree with the Applicants comments.

			Humber Estuary SAC, but confirmation by NE that AEoI would be ruled out if the applicants confirmed the use of noise reduction methods to deliver at least a 10dB reduction in underwater noise [REP6-075], the ExA currently considers it appropriate and reasonable to add further to the condition that at least a 10dB reduction must be achieved by the use of noise reduction systems, verified by the monitoring set out in the final MMMP informed by the outline MMMP.	[REP3-027] following the first issued of the Marine Noise Package released by Defra and the JNCC et al. (2025) 1 , the Applicants believe that they have already demonstrated sufficient commitment to reducing underwater noise. The Applicants maintain that there would be no potential for Adverse Effect on Integrity on North Norfolk Coast and Wash SAC, Southern North Sea SAC and Humber Estuary SAC even in the absence of the revised wording agreed with Natural England detailed above.	

Schedule 10 DML1 - Part 2,15(1)(k) Schedule 11 DML2 - Part 2,15(1)(k) Schedule 12 DML3 - Part 2,13(1)(k) Schedule 13 DML4 - Part 2,13(1)(k) Schedule 14 DML5 - Part 2,11(1)(j)	N/a	k) Impacts of unexploded ordnance (UXO) clearance with and without additional mitigation measures will be presented in the final UXO clearance MMMP and UXO clearance Marine Licence Application	k) Impacts of unexploded ordnance (UXO) clearance with and without additional mitigation measures will be presented in the final UXO clearance MMMP and UXO clearance Marine Licence Application;	The Applicants do not think that this condition is necessary or appropriate, nor is it enforceable or reasonable. It has not been requested by Natural England or MMO for such a condition to be imposed and it is not appropriate to impose a condition in the DCO for a Marine Licence that will be applied for and approved entirely outwith the DCO. The Applicants are not aware of any precedent for such an approach and it would be pre-determinative and potentially undermine the role of the MMO as the consenting authority to prescribe what any separate marine licence application must include. The Applicants fully intend to provide all information required by the MMO as part of the separate marine licence process for Unexploded Ordnance (UXO) clearance. Therefore, the Applicants do not propose to	The MMO previously highlighted in REP7-148 section 1.11 and 1.12 that the MMO, NE and the Applicant has agreed condition wording and are in agreement with the Applicants comments.
Schedule 10 DML1 - Part 2, 15(1)(l) Schedule 11 DML2 - Part 2, 15(1)(l) Schedule 12 DML3 - Part 2, 13(1)(l)) Schedule 13 DML4 - Part 2, 13(1)(l)	N/a	l) No construction activities that interact with the seabed associated with the authorised development may be undertaken between 1 August to 31 October inclusive between Kilometre Point 20 to Kilometre Point 60, unless otherwise agreed in writing by the MMO in consultation with the relevant statutory nature conservation body.	The ExA is currently persuaded by advice from the MMO [REP-069] that a three month seasonal restriction is required during the Banks herring season to construction	The Applicants highlight that they do not consider there to be sufficient evidence for such a restriction given that the impact is not predicted to be significant in Environment Impact Assessment (EIA) terms. Notwithstanding the above, the Applicants are presently engaging with Natural England and MMO in relation to this matter on a without prejudice basis and do not propose to include the ExA's suggested wording in the Draft DCO. The Applicants have	The MMO previously highlighted in REP7-148 section 1.11 and 1.12 that the MMO, NE and the Applicant has agreed condition wording and are in agreement with the Applicants comments.

Schedule 14 DML5 - Part 2, 11(1)(k)			activities that interact with the seabed through the spawning ground between 1 August to 31 October inclusive so that the risk of disturbance to gravid herring engaged in spawning is negated [REP6-049]. The MMO has advised [REP-069] this restriction should apply between Kilometre Point 20 to Kilometre Point 60.	agreed alternative wording for a restriction in relation to this matter with MMO and Natural England, with this wording included in the updated Draft DCO (Revision 10) [document reference 3.1] submitted at Deadline 7. The Applicants note that detail relating to this restriction should not be included in Schedule 10 DML1 - Part 2, 15(1)(l), Schedule 11 DML2 - Part 2, 15(1)(l) or Schedule 14 DML5 - Part 2, 11(1)(k) as these DMLs do not relate to the Offshore Export Cable Corridor upon which this restriction is focussed	
Schedule 11 DML2 - Part 2,15(1)(m) Schedule 12 DML3 - Part 2,13(1)(m) Schedule 13 DML4 - Part 2,13(1)(m) Schedule 14 DML5 - Part 2,11(1)(m)	N/a	(m) No piling or construction activity interacting with the seabed associated with the proposed development can commence until a spawning herring construction restriction plan has been submitted to and approved by the MMO. The spawning herring construction restriction plan must include details of verified noise mitigation measures to be employed to achieve a 10dB	The ExA considers it pragmatic to follow the example of the Rampion 2 made DCO for which a condition was made for an outline spawning herring piling restriction plan upon which a	The Applicants highlight that they do not consider there to be sufficient evidence for such a restriction given that the relevant impact is not predicted to be significant in EIA terms and the scientific basis for the restriction does not seem supported by the evidence available. Notwithstanding the above, the Applicants are presently engaging with Natural England and MMO in relation to this matter on a without prejudice basis and do not propose to include the ExA's suggested wording in	The MMO previously highlighted in REP7-148 section 1.11 and 1.12 that the MMO, NE and the Applicant has agreed condition wording and if included (not withstanding final comments on documents

		reduction at a frequency band approved by the MMO in consultation with the relevant statutory nature conservation body and any necessary details to ensure adherence to the seasonal restriction of construction activities that interact with the seabed specified in condition 2,15(1)(l).	final spawning herring piling restriction plan should be based. For this proposed development there are two potential aspects to potential seasonal restrictions i) related to construction activities that interact with the seabed and ii) related to underwater noise associated with piling construction activities. Therefore, the ExA considers it sensible for there to be a condition within the DMLs for an outline spawning herring construction restriction plan to address the potential effects	the Draft DCO. The Applicants have agreed alternative wording for a restriction in relation to this matter with MMO and Natural England, with this wording presented in the document Summary of Herring Noise Impact Discussions During Examination submitted into Examination at Deadline 7 on a without prejudice basis. It has also been included on a without prejudice basis (in square brackets) in the Draft DCO (Revision 10) [document reference 3.1]. The Applicants note that any piling restrictions should not be imposed Schedule 14 DML5 - Part 2,11(1)(m) as this DML does not include any activities requiring piling.	referenced in the condition discussed in Section 3) are in agreement with the Applicants comments.

			from both these pathways		
Schedule 10 DML1 - Part 2,16(2)(3) Schedule 11 DML2 - Part 2,16(2)(3) Schedule 12 DML3 - Part 2,14(2)(3) Schedule 13 DML4 - Part 2,14(2)(3)	2) The SIP submitted for approval must contain a description of the conservation objectives for the Southern North Sea Special Area of Conservation ("SNS SAC") as well as any relevant management measures and it must set out the key statutory nature conservation body advice on activities within the SNS SAC relating to piling as set out within the JNCC Guidance and how this has been considered in the context of the authorised scheme. (3) The SIP must be submitted in writing to the MMO no later than six months prior to the commencement of piling activities.	2) The SIP submitted for approval must contain a description of the conservation objectives for the Southern North Sea Special Area of Conservation ("SNS SAC"), North Norfolk Coast and Wash Special Area of Conservation ("NNCW SAC") and the Humber Estuary SAC as well as any relevant management measures and it must set out the key statutory nature conservation body advice on activities within the SNS SAC, NNCW SAC and the Humber Estuary SAC relating to piling as set out within the JNCC Guidance and how this has been considered in the context of the authorised scheme. (3) The SIP must be submitted in writing to the MMO no later than six months prior and no sooner than 9 months prior to the commencement of piling activities.	Given the outstanding concerns from NE at this stage of the examination, specifically that NE cannot at this stage rule out AEoI for harbour seal at the NNCW SAC or for grey seal at the Humber Estuary SAC, the ExA considers it prudent to expand the coverage of the SIP to include these designated areas. The ExA is currently persuaded by suggested amendments to subparagraph (3) to the timing of the submission for the SIP based on continued	(2) The Applicants have amended the condition wording regarding noise reduction to the following at Deadline 7: (g) in the event that driven or part-driven pile foundations are proposed to be used, a marine mammal mitigation protocol (in accordance with the outline marine mammal mitigation protocol), the intention of which is to prevent injury to marine mammals, following current best practice as advised by the relevant statutory nature conservation bodies and which must include details of noise reduction methods through project design (primary measures) and/or, deployment of noise mitigation systems or noise abatement systems (secondary measures) that will be utilised to manage sounds from those piling activities and such protocol must include full details and justification for the mitigation chosen or excluded for deployment. The Applicants have agreed this wording with Natural England by email on 20th June 2025 and the MMO by email on 24th June 2025 in order to enable Natural England to confirm there is no AEoI on the SACs from the Projects. To ensure these measures are also appropriate to reduce potential effects for the updated assessment on the Wash and North	The MMO previously highlighted in REP7-148 section 1.10 that the MMO, NE and the Applicant has agreed condition wording and the inclusion of Norfolk Coast and Wash Special Area of Conservation ("NNCW SAC") and the Humber Estuary SAC is not required..

			advice from NE [REP6-077].	Norfolk Coast (WNNC) SAC, updates have been made to illustrate the mitigated impact ranges in Illustrative Underwater Noise Technical Note (Revision 3) [document reference 14.9] submitted at Deadline 7. Natural England confirmed via email on 20th June 2025 that they anticipate this matter to be resolved at Deadline 8 and no AEoI for WNNC SAC to be concluded	
Schedule 10 DML1 - Part 2, 20(4)(a) Schedule 11 DML2 - Part 2, 20(4)(a) Schedule 12 DML3 - Part 2, 18(4)(a Schedule 13 DML4 - Part 2, 18(4)(a) Schedule 14 DML5 - Part 2, 14(4)(a)	(4) The pre-construction surveys referred to in sub-paragraph (1) must, unless otherwise agreed in writing with the MMO, include, but not be limited to, the need to undertake— (a) a survey to determine the location, extent and composition of any habitats of principal importance, Annex 1 subtidal habitat, habitat with suitability for sandeel or surficial deposits of glacial till in the parts of the Order limits in which it is proposed to carry out construction works;	(4) The pre-construction surveys referred to in subparagraph (1) must, unless otherwise agreed in writing with the MMO, include, but not be limited to, the need to undertake— (a) a survey to determine the location, extent and composition of any habitats of principal importance, Annex 1 subtidal habitat, habitat with suitability for sandeel or surficial deposits of glacial till in the parts of the Order limits in which it is proposed to carry out construction works; where cable protection is proposed within habitats of principal importance, Annex 1 subtidal habitat, habitat with suitability for sandeel or superficial deposits of glacial till, a survey report must be submitted to the MMO following completion of the relevant	The ExA is currently persuaded by responses in NE's deadline 6 recommendation in section ii) page 2 of Appendix C6 advice on benthic and intertidal ecology [REP6-073] and has therefore added the suggested wording to sub-paragraph (a)	The Applicants highlight that in the Draft DCO (Revision 10) [document reference 3.1] they have already committed to providing the details of exclusion zones or micro-siting requirements for any habitats of principal importance, Annex I subtidal habitat or surficial deposits of glacial till through conditions such as condition 15(1)(v) in Schedule 10 DML1 - Part 2, 20(4)(a). Further, the Cable Statement (Revision 5) [REP6-043] contains provisions for the minimisation of the use of cable protection. The Applicants note that their assessments have assumed that the full footprint of development in the array areas has been assumed to be suitable for sandeel and no significant impacts have been identified. As a result of the above, the Applicants believe that the Draft DCO as presently drafted, and the controls it contains, already provides	The MMO notes that NE welcome the requirement of a survey report where cable protection is proposed within such habitats. The MMO believes this is for the SoS to decide on at this stage and not post consent. Noting our comments in REP7-148.

		survey to justify with evidence the need for the proposed locations and extent of any cable protection in those locations, demonstrating how the extent of cable protection has been kept to a minimum for each;		sufficient protections, where they are justified, in relation to the receptors of the impacts of cable protection identified by the ExA. The Applicants do not propose to include the suggested wording in the Draft DCO due to its impractical nature. The Applicants note that habitats of principal importance, Annex 1 subtidal habitat, habitat with suitability for sandeel or superficial deposits of glacial till cooccur across the Offshore Development Area and also occur in close proximity to one another. As a result, in many cases it will not be possible to avoid cable protection on one receptor, without impacting another, adjacent receptor that the restriction is seeking to avoid, potentially to a greater degree. This becomes clear, by way of an example, when it is considered that all of the array areas lie within the Annex I sandbank habitat where areas of high sandeel potential also occur. It is unclear, in this example, how one might strike a balance between avoidance of potential sandeel habitat when so doing might involve greater levels of cabling construction activity and the deposit of cable protection in areas of Annex I habitat which might also support habitats of principle importance. As drafted, there is no way to prioritise these trade offs and there is a high risk	

				that reaching agreement in relation to these issues would be highly time consuming, and potentially impossible.	
Schedule 10 DML1 - Part 2, 20(4)(e) Schedule 11 DML2 - Part 2, 20(4)(e) Schedule 12 DML3 - Part 2, 18(4)(e) Schedule 13 DML4 - Part 2, 18(4)(e)	N/a	e) a survey of seabird densities and distributions in the study area to identify areas where impacts are likely to be particularly high. The report must include an explanation of how this additional post-consent ornithological mapping has influenced the array, size or layout to mitigate impacts as much as possible.	The ExA currently considers that the further surveys of seabird densities and distributions in the study area advocated by NE may help to identify areas where impacts are particularly high, and that might be suitable for changes to array size or layout to mitigate impacts	The Applicants do not believe that Natural England is requesting more surveys. As stated in their response to the ExQ2 (REP5-062: OR.2.3) they confirmed that they were happy with the digital aerial surveys undertaken by the Applicants for the marine ornithology assessment. The Applicants also highlight that, in line with the mitigation hierarchy, they have sought to mitigate potential impacts on ornithological receptors through the refinement of the Array Areas conducted post-PEIR submission and the increase of the air gap from the statutory minimum of 22m above Mean High Water Springs (MHWS) (equivalent to 24m above Mean Sea Level (MSL) to 34m above MSL (as detailed in response to OR.2.4 of The Applicants' Responses to ExAQ2 [REP5-036]). Fundamentally in response to the ExA's suggestions: • Changes to layout are unlikely to significantly reduce collisions as this is a function of the number of turbines and rotor swept area (not the size of the Array Area) (see below for explanation of variation in distribution trends). The only way to further reduce impact is to reduce turbines and therefore the capacity of the Projects (see Table 4-5	The MMO notes the Applicant's comments and defers to NE in relation to the technicality. The MMO understands NE has also questioned this condition and the location of such condition. The MMO notes NE raise a number of issues in relation to the processing of this condition post consent and echo these concerns..

				and section 4.5.1 of Habitats Regulations Derogation: Provision of Evidence (Revision 4) [document reference 6.2] for further information). • The Array Areas are directly related to displacement, however any reduction would potentially reduce the capacity of the site. The Applicants reiterate that density mapping data based on the sitespecific aerial survey data was collated and examined (preapplication) to indicate areas within The Crown Estate lease options that showed higher and lower densities of birds, with one higher density area related to birds used in the boundary refinement (this was presented as part of the minutes from the ornithology Expert Topic Group (ETG) meeting 06/02/2024 (see Consultation Report, Appendix F - Non-statutory consultation and engagement [APP043]). The Applicants have provided examples of this previous work in Appendix A - Offshore Ornithology Year 1 and 2 Combined Spatial Plots [document reference 17.10] which shows that the Applicants have already taken all reasonable steps to reduce the Array Areas to avoid areas of higher species density. Generally, the Applicants consider that hotspot modelling is an unreliable basis on which to conduct any boundary changes or micrositing since seabird	

				distributions are notoriously variable daily, seasonally, inter-annually and across longer timeframes, and the snapshots collected for the impact assessment, while considered a reliable guide in terms of population estimates generally, are not considered to represent static and consistent locations. In addition, from a practical perspective • Construction timescales for delivery to meet the Government's 2030 target are already tight, given requirements for geophysical and geotechnical survey prior to foundation design, then procurement, fabrication and installation of foundations – all of which would have to happen after the proposed additional ornithological surveys • If further survey was undertaken this would require a lot of time (procurement and contracting; 24 months of survey; 6 months of data QA, analysis and reporting; consultation), this would result in lengthy and costly programme delay to construction • Hotspots within the Array Areas are only relevant to collision risk, displacement is based upon the full boundary plus a buffer so minor layout changes (within the Array Areas) are not relevant. • The site specific data show no consistent patterns of distribution from season to season, year to year or species to species. So further	

				survey is likely to just add to the variation already seen. Further to the above, the Applicants do not believe that Schedule 12 DML3 and Schedule 13 DML4 should be considered for this change as the key concern related to this matter is the footprint of the array areas, which is dealt with by Schedule 10 DML1 and Schedule 11 DML2	
Schedule 10 DML1 - Part 2, 21(2) Schedule 11 DML2 - Part 2, 21(2) Schedule 12 DML3 - Part 2, 19(2) Schedule 13 DML4 - Part 2, 19(2	(2) In the event that driven or part-driven pile foundations are proposed, such monitoring must include measurements of noise generated by the installation of the first four piled foundations of each piled foundation type to be installed unless the MMO otherwise agrees in writing	(2) In the event that driven or part-driven pile foundations are proposed, such monitoring must include measurements of noise generated by the installation of the first four piled foundations of each piled foundation type to be installed unless the MMO otherwise agrees in writing. As part of the piling monitoring planned and undertaken, if the worst-case piles are not included in the first four piles to be monitored, then two of the worst-case piles must be monitored in addition to the first four piles and results analysed and shared with the MMO and statutory nature conservation body for validation purposes	The ExA is currently persuaded by the MMO's current position [REP6-049] that there should be a commitment that two of the worst-case piles would be monitored, which may be after the first four piles, which would allow the predictions to be validated	In the MMO's Deadline 5 submission (row 89, Table 1) [REP5-049], the MMO commented that: 'The MMO discussed this point further with the Applicant on 13 May 2025 and advised that there was no update with the SNCBs. The MMO requested if it could not be updated within the condition on this occasion the MMO could accept a commitment to discuss the monitoring requirements post consent – specifically which piles to monitor once the design is finalised.' The Applicants provided the following response at Deadline 6 in [REP6-052]: 'The Applicants discussed this point with the MMO at a meeting on 13th May 2025. At that meeting the MMO confirmed that they would be content that this monitoring was agreed post-consent and the Applicants agreed to update the Commitments Register (Revision 2) [REP2-025] (which will be re-submitted at Deadline 7) to add a commitment to having these future discussions.' The Applicants consider	The MMO welcomes the Applicants comments and considers the matter agreed.

				that a resolution with the MMO has been agreed and have updated the Commitments Register (Revision 3) [document reference: 8.6] at Deadline 7 (see C191). Therefore, the Applicants do not propose to update the Draft DCO (Revision 10) [document reference 3.1]	
Schedule 10 DML1; Part 2, 22(3)(e) Schedule 11 DML2 - Part 2, 22(3)(e) Schedule 12 DML3 - Part 2, 20(3)(e Schedule 13 DML4 - Part 2, 20(3)(e)	(d) undertake post-construction vessel traffic monitoring in accordance with the outline vessel traffic monitoring plan by automatic identification system for a duration of three consecutive years following the completion of construction of the authorised project, unless otherwise agreed in writing by the MMO, with provision for a report to be submitted annually to the MMO, Trinity House and the MCA; and (e) undertake any marine mammal monitoring referred to in the marine mammal mitigation protocol submitted in	(d) undertake post-construction vessel traffic monitoring in accordance with the outline vessel traffic monitoring plan by automatic identification system for a duration of three consecutive years following the completion of construction of the authorised project, unless otherwise agreed in writing by the MMO, with provision for a report to be submitted annually to the MMO, Trinity House and the MCA; and (e) undertake any marine mammal monitoring referred to in the marine mammal mitigation protocol submitted in accordance with condition 15(1)(g), including monitoring of operational underwater noise levels along with a verification process to check they remain within those predicted within the environmental statement;	The ExA understands there is a significant gap in knowledge of the operational underwater noise levels of wind turbine generators of size proposed by the proposed development and that that the turbine sizes used to inform operational noise modelling are considerably smaller Appendix F5 [REP-057]As NE raised a concern around the adequacy of the proposed monitoring of marine mammals	The Applicants do not propose to update the Draft DCO (Revision 10) [document reference 3.1] because the Applicants do not consider the conclusion of no significant impact to marine mammals from operational noise in the ES to warrant further monitoring requirements. Such a requirement appears to be unprecedented, and as such would affect the relative competitiveness of the Dogger Bank Projects in comparison with other schemes with similarly sized turbines who do not have such a condition included in their DCO. This recommendation is not relevant to Schedule 12 DML3 and Schedule 13 DML4 as these do not allow for the erection of wind turbines.	The MMO notes the Applicants comments and notes NE has requested something slightly different. - The MMO will keep a watching brief and provide comments at Deadline 9.

	accordance with condition 15(1)(g).		and validation of the effectiveness of mitigation which continues to be unresolved [REP6-077]. The ExA considers the additional wording may assist to resolve this issue		
Schedule 10 DML1; Part 2, 22(3)(f) Schedule 11 DML2 - Part 2, 22(3)(f) Schedule 12 DML3 - Part 2, 20(3)(f) Schedule 13 DML4 - Part 2, 20(3)(f) Schedule 14 DML5 - Part 2, 16(3)(d)	N/a	(f) undertake any monitoring necessary to validate the predictions made in the ES and HRA with respect to potential effects from indirect impacts on benthic Annex I habitats and linked receptor groups as relevant. Discussions should take place in advance with the MMO in consultation with the statutory nature conservation body on how potential indirect ecosystem impacts will be monitored and reported and written agreement on the approach to monitoring and evaluating indirect effects should be obtained from the MMO in consultation with the statutory nature conservation body before construction commences	Indirect effects between different receptor groups has been a constant and significant issue throughout the examination and remains largely unresolved. NE state it is particularly important to further understand indirect effects in relation to the placement of infrastructure within Dogger Bank SAC and along the ECC where there is a	The Applicants submit that the requirement for monitoring of potential effects from indirect impacts on benthic Annex I habitats and linked receptor groups is already secured through the In Principle Monitoring Plan (Revision 5) [document reference 8.23] and therefore does not require securing through the Draft DCO. The Applicants have explained the approach to monitoring for these indirect impacts in Appendix E - Ecological Halo Effects Technical Note (Revision 2) [document reference 15.7]: “76. The In Principle Monitoring Plan (Revision 4) [document reference 8.23] highlights that monitoring should take account of the set of broad benthic monitoring objectives which Natural England and the Joint Nature Conservation Committee have produced. These cover the conservation objectives for the Dogger Bank SAC and can be applied	The MMO notes the Applicant comments and understands NE is supportive of this monitoring but believes it could be covered elsewhere and deferred to the MMO based on how this would be secured. The MMO will review these comments in detail and provide a response at Deadline 9.

			potential impact pathway to Holderness Inshore MCZ. The ExA currently considers it reasonable and prudent to follow the SNCB's advice but also recognises that the approach to how this could be done needs to be discussed with the statutory nature conservation body.	to developments across the Dogger Bank Zone. These objectives are: • Objective 1: Determine the impacts on and recovery rates of sandbank physical features affected by wind farm installation, including large and fine scale topography, sediment composition and distribution; • Objective 2: Characterise and identify impacts on benthic biodiversity and community structure as a result of windfarm installation, i.e. changes in abundance, composition and distribution of native communities; • Objective 3: Determine the impacts of hard substrate infrastructure introduction on sedimentary benthic communities; and • Objective 4: Assess the impact of Objectives 2 and 3 on the wider community and structure i.e. linked receptors groups including epifauna, fish and birds. 77. Objectives 2 – 4 directly relate to potential halo effects (and (4) reef or refugia effects).	
Schedule 10 DML1; Part 2, 22(5) Schedule 11 DML2 - Part 2, 22(5) Schedule 12 DML3 - Part 2, 20(5) Schedule 13	5) In the event that the reports provided to the MMO under sub-paragraph (4) identify a need for additional monitoring, the requirement for any additional monitoring will be agreed with the	(5) In the event that the reports provided to the MMO under sub-paragraph (4) identify a need for additional monitoring or impacts which are unanticipated and/or in the view of the MMO in consultation with the relevant statutory nature conservation body are significantly beyond those predicted within the	The MMO requests that a provision for adaptive management is included within construction monitoring and surveys and NE expressed a	Following a meeting with the MMO on 13th May 2025, the Applicants agreed to update the IPMP to include further detail on the adaptive management process that the Applicants would implement in the event that monitoring showed a higher impact than was concluded in the ES and submitted the updated IPMP at Deadline 5. In the MMO's Deadline 6 submission [REP6-	The MMO welcomed the update to the IPMP. As the Applicants state Our position is always a condition would be better on the face of the DML. The MMO notes NE is supportive with

DML4 - Part 2, 20(5) Schedule 14 DML5 - Part 2, 16(5)	MMO in writing and implemented as agreed	environmental statement, the Habitats Regulations Assessment, and the Marine Conservation Zone Assessment the requirement for any additional monitoring will be agreed with the MMO in writing and implemented as agreed and an adaptive management plan to reduce effects to within what was predicted within the environmental statement, the Habitats Regulations Assessment, and the Marine Conservation Zone Assessment, unless otherwise agreed by the MMO in writing in consultation with the relevant statutory nature conservation body, must be submitted alongside the monitoring reports submitted under sub-paragraph (4). This plan must be agreed by the MMO in consultation with the relevant statutory nature conservation bodies to reduce effects to an agreed suitable level for this project. Any such agreed and approved adaptive management or mitigation should be implemented and monitored in full to a timetable first agreed in writing with the MMO in consultation with the	significant concern regarding the degree of adaptive management in the draft DCO in appendix J [REP3-056]. The ExA notes the additional wording on adaptive management to Revision 4 of the In Principle Monitoring Plan [REP5- 027] does not commit the effects to be reduced to within what was predicted within the environmental statement, rather it suggests additional monitoring and further discussion with the MMO and statutory nature conservation	069], it states that “the MMO welcomes the updates to include adaptive management. The MMO will always prefer a condition on the face of the DML but is content with the wording within the IPMP”. The Applicants therefore consider the matter of adaptive management resolved and do not propose to update the Draft DCO (Revision 10) [document reference 3.1].	minor amendments and will review and provide a response at Deadline 9 for the SoS to decide on if it needs to be included.

		relevant statutory nature conservation body. In the event that this adaptive management or mitigation requires a separate consent, the undertaker must apply for such consent. Where a separate consent is required to undertake the agreed adaptive management or mitigation, the undertaker shall only be required to undertake the adaptive management or mitigation once the consent is granted	bodies. The ExA also notes the dDCO applies adaptive management directly to aspects related to kittiwake and guillemot and razorbill implementation management plans and the ExA considers it appropriate this is extended to other receptors as has been done in other recent made DCOs for OWFs and has suggested the wording which has been accepted by the Secretary of State on other made DCOs. This would be useful to address concerns related to potential impacts to any		

			ecological receptor and also specific concerns including, but not limited to: • monitoring and remedial action for potential sediment blockage and repair of any breach at Spurn point • potential impacts to Holderness Inshore MCZ and Humber Estuary SAC • to provide evidence to support the use of the assumption that the bottlenose dolphin baseline distribution along the northeast English coast is the same as in Scotland. In the absence of a commitment by the applicants to commit to reduce effects to within		

			what was predicted within the environmental statement in the relevant control document, the ExA currently sees no other option other than to add it to the face of the DCO.		
Schedule 10 DML1; Part 2, 29(4) Schedule 11 DML2 - Part 2, 29(4)	N/a	4) The ornithological monitoring plan must provide details of proposed post-construction and operational surveys, including methodologies and timings, and a proposed format, content and timings for providing postconstruction and operational monitoring reports. The plan must— (a) specify each bird species survey objectives and explain how it will assist in informing a useful and valid comparison with the preconstruction position for each bird species and how it will enable the validation or otherwise of key predictions in the environmental statement; (b) have due regard to the need to undertake monitoring to determine the distribution and	The ExA considers it prudent to insert the following conditions based on other recently made DCOs, particularly in light of NE's extensive comments on the proposed ornithological monitoring in Table 1 of Appendix J [REP3-056] for which NE's Risk and Issue log [REP6- 077] point A12/A15 continues to	The Applicants could not find equivalent wording in any other Offshore Wind Farm DCO but are aware that similar condition wording was imposed within the Rampion 2 DCO by the Secretary of State, specifically for great black-backed gull and that the ExA have adapted this wording as part of their recommendation for the Projects. The reason the Secretary of State chose to include such a condition in the Rampion 2 DCO was because the ExA's report concluded that there could be a significant effect in respect of great black-backed gull when considered cumulatively with other offshore windfarms. As the Applicant concluded the significance of effect to be negligible (not significant), they did not provide adequate mitigation or compensation for great black-backed gull. The Secretary of State therefore took the	The MMO will review the comments from NE in relation to this.

		behaviour of each bird species within the array areas of the proposed developments and the rates of collision and avoidance of each bird species with wind turbine generators within the array areas; and (c) ensure that the outcome of the agreed surveys together with existing data and reports are drawn together to present a valid statement of the post-construction and operational position, with any limitations, and must make clear what pre-construction comparison is intended and the justification for this. (5) The undertaker must carry out the surveys for each bird species as agreed under sub-paragraph (4) and provide the post-construction and operational monitoring reports to the MMO and Natural England in the agreed format and in accordance with the agreed timetable, unless otherwise agreed in writing by the MMO, in consultation with Natural England. (6) Any monitoring report compiled in accordance with the monitoring schemes required under sub-paragraph (4) must be provided to the	indicate that these concerns are not fully resolved.	decision to amend the condition wording to include requirements for a great black-backed gull monitoring plan to be approved by the MMO in consultation with NE to determine whether the effects are as predicted by the Applicant. The Applicants do not consider this to be appropriate as the context in which this wording was created by the Secretary of State is neither applicable to the DBS Projects or suitably precise. The Applicants have already provided monitoring proposals for displacement of auks from the operational wind farm site, and collision risk in section 1.6.7 of the In Principle Monitoring Plan (Revision 5) [document reference 8.23]. These proposals have been put forward for impacts and species where there are evidence gaps and/or where the EIA and/or RIAA conclude a significant impact or AEoI, including where these conclusions have been taken on a without prejudice basis. This monitoring is in addition to the monitoring that will be undertaken to determine the success of compensatory measures for kittiwake and guillemot that are outlined in Appendix 1 - Project Level Kittiwake Compensation Plan (Revision 6) [REP6-010] and Appendix 2 - Guillemot [and Razorbill] Compensation Plan (Revision 5) [REP6-012]. The drafting of the	

		MMO and Natural England no later than four months following completion of the monitoring to which it relates, unless otherwise agreed in writing by the MMO, in consultation with Natural England. (7) All monitoring reports must be made publicly available and submitted to relevant evidence databases no later than six months following completion of the monitoring required by the ornithological monitoring plan unless otherwise agreed in writing by the MMO, in consultation with Natural England. (8) In the event that the reports provided to the MMO and Natural England under sub-paragraph (4) identify impacts which are unanticipated and/or in the view of the MMO in consultation with the relevant statutory nature conservation body are significantly beyond those predicted within the environmental statement, either an adaptive management plan to reduce effects to within what was predicted within the Environment Statement or a plan to deliver additional compensation must be		condition is also not necessary or reasonable, on the basis that this monitoring is already detailed and secured through the IPMP. The identified measures in the IPMP (Revision 5) [document reference: 8.23] would form the basis of discussions with Natural England in order to determine those most appropriate to take forward to implementation post-consent to form the Ornithological Monitoring Plan. As stated in response to [REP3-056], reiterated in the Applicants' response at Deadline 6 [REP6-052] and repeated here for convenience: 'The Applicants consider that it is important to retain flexibility in In Principle Monitoring Plans (IPMPs) to allow for the incorporation of new information as studies of seabird ecology in relation to offshore wind farms is constantly developing and do not propose to further update the IPMP for offshore ornithology within this Examination. Further detail on the monitoring aims and hypotheses will be provided in the development of these proposals in collaboration with Natural England and other statutory nature conservation bodies in the post-consent stages of the Projects.' With regard to adaptive management, following a meeting with the MMO on 13th May 2025, the Applicants agreed to update the IPMP to include further detail on the	

		submitted alongside the monitoring reports submitted under sub-paragraph (4) unless otherwise agreed by the MMO in writing in consultation with the relevant statutory nature conservation body. These plans must be agreed by the MMO in consultation with the relevant statutory nature conservation bodies. Any such agreed and approved adaptive management, mitigation or compensation should be implemented and monitored in full to a timetable agreed in writing with the MMO, in consultation with the relevant statutory nature conservation body. In the event that this adaptive management, mitigation or compensation requires a separate consent, the undertaker must apply for such consent. Where a separate consent is required to undertake the agreed adaptive management, mitigation or compensation the undertaker shall only be required to undertake the adaptive management, mitigation or compensation once the consent is granted.		adaptive management process that the Applicants would implement in the event that monitoring showed a higher impact than was concluded in the ES and submitted the updated IPMP at Deadline 5. In the MMO's Deadline 6 submission [REP6-069], it states that "the MMO welcomes the updates to include adaptive management. The MMO will always prefer a condition on the ace of the DML but is content with the wording within the IPMP". The Applicants therefore consider the matter of adaptive management resolved and do not propose to update the Draft DCO (Revision 10) [document reference 3.1]. The Applicants have updated the IPMP (Revision 5) [document reference: 8.23] to provide further details on content of the ornithological monitoring plan as provided in the ExA's recommended condition wording at Deadline 7	

Yours Sincerely,

[redacted]

[redacted]
Marine Licencing Case Officer

D +44 (0)[redacted]
E [redacted]@marinemanagement.org.uk

6. References

Behrens, J.W., Ærtebjerg, G., Petersen, J.K. and Carstensen, J., 2009. Oxygen deficiency impacts on burying habitats for lesser sandeel, Ammodytes tobianus, in the inner Danish waters. *Canadian Journal of Fisheries and Aquatic Sciences*, *66*(6), pp.883-895.

Bergstad, O.A., Høines, Å.S. and Krüger-Johnsen, E.M., 2001. Spawning time, age and size at maturity, and fecundity of sandeel, Ammodytes marinus, in the north-eastern North Sea and in unfished coastal waters off Norway. *Aquatic Living Resources*, *14*(5), pp.293-301.

Coull, K. A., Johnstone, R., and Rogers, S. I. 1998. Fishery Sensitivity Maps in British Waters. Published and distributed by . 1–63 pp.Ellis, J. R., Milligan, S. P., Readdy, L., Taylor, N., and Brown, M. J. 2012. Spawning and nursery grounds of selected fish species in UK waters. Science Series Technical Report, 147. Lowestoft. 1–56 pp.

Cresci, A., Perrichon, P., Durif, C.M., Sørhus, E., Johnsen, E., Bjelland, R., Larsen, T., Skiftesvik, A.B. and Browman, H.I., 2022. Magnetic fields generated by the DC cables of offshore wind farms have no effect on spatial distribution or swimming behavior of lesser sandeel larvae (Ammodytes marinus). *Marine Environmental Research*, *176*, p.105609.

Dickey-Collas, M., Bolle, L.J., van Beek, J.K. and Erftemeijer, P.L. (2009). Variability in transport of fish eggs and larvae. II. Effects of hydrodynamics on the transport of Downs herring larvae. Marine Ecology Progress Series, 390, pp. 183-194.

Ellis J.R., Milligan S.P., Readdy L., Taylor N., and Brown M.J., 2012. Spawning and nursery grounds of selected fish species in UK waters. Science Series Technical Report, Cefas Lowestoft, 147, 1-56.

ERM 2024.Potential spawning habitat heat map for Atlantic herring (Kyle-Henney et al., 2024), and preferred and marginal substrates (EMODNet 1:250k) overlaid with unmitigated and mitigated underwater noise contours associated with alternative piling locations at DBS West - south, and DBS East - south locations.

Formicki, K., Korzelecka-Orkisz, A. and Tański, A., 2019. Magnetoreception in fish. *Journal of Fish Biology*, *95*(1), pp.73-91.
Gauld, J.A. and Hutcheon, R., 1990. BRIEF COMMUNICATIONS Spawning and fecundity in the lesser sandeel, Ammodytes mavinus Raitt, in the north-western North Sea. *J. Fish Biol*, *36*, p.613.

Heath, M. 1993. An evaluation and review of the ICES herring larval surveys in the North Sea and adjacent waters. Bulletin of Marine Science, 52: 795-817.

Holland, G. J., Greenstreet, S. P., Gibb, I. M., Fraser, H. M., & Robertson, M. R. (2005). Identifying sandeel Ammodytes marinus sediment habitat preferences in the marine environment. *Marine Ecology Progress Series*, *303*, 269-282.

Johnsen, E., Rieucau, G., Ona, E. and Skaret, G., 2017. Collective structures anchor massive schools of lesser sandeel to the seabed, increasing vulnerability to fishery. *Marine Ecology Progress Series*, *573*, pp.229-236.

Kotthaus, A. Zuchtversuche mit Heringslarven (*Clupea harengus* L.). *Helgolander Wiss. Meeresunters* 1, 349–358 (1939). [redacted]
Kyle-Henney, M., Reach, I., Barr, N., Warner, I., Lowe, S. and Lloyd Jones, D. (2024) Identifying and Mapping Atlantic Herring Potential Spawning Habitat: An Updated Method Statement. A report for the marine aggregates industry.

Leo, E., Dahlke, F.T., Storch, D., Pörtner, H.O. and Mark, F.C., 2018. Impact of Ocean Acidification and Warming on the bioenergetics of developing eggs of Atlantic herring Clupea harengus. *Conservation physiology*, *6*(1), p.coy050.

Peck, M.A., Kanstinger, P., Holste, L. and Martin, M., 2012. Thermal windows supporting survival of the earliest life stages of Baltic herring (Clupea harengus). *ICES Journal of Marine Science*, *69*(4), pp.529-536.

Popper, A.N., Hawkins, A.D., Fay, R.R., Mann, D.A., Bartol, S., Carlson, T.J., Coombs, S., Ellison, W.T., Gentry, R.L., Halvorsen, M.B., Løkkeborg, S., Rogers, P.H., Southall, B., Zeddies, D.G. & Tavolga, W.N. (2014). Asa S3/Sc1.4 Tr-2014 Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report Prepared by ANSI-Accredited Standards Committee S3/Sc1 a (Springerbriefs in Oceanography).

Reach I.S., Latto P., Alexander D., Armstrong S., Backstrom J., Beagley E., Murphy K., Piper R. and Seiderer L.J., 2013.Screening Spatial Interactions between Marine Aggregate Application Areas and Atlantic Herring Potential Spawning Areas. A Method Statement produced for BMAPA.

Reach, I., Kyle-Henney, M., Barr, N., Warner, I., Lowe, S. and Lloyd Jones, D. (2024) Identifying and Mapping Sandeel Potential Supporting Habitat: An Updated Method Statement. A report for the marine aggregates industry.

Rowley, S.J. (2008). *Ammodytes tobianus* Lesser sand eel. In Tyler-Walters H. and Hiscock K. *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 24-11-2023]. Available from: [redacted]

Russell, F.S. 1976. The eggs and planktonic stages of British marine fishes, London: Academic Press. 524 pp.

RWE 2024. Dogger Bank South Offshore Wind Farms, Environmental Statement, Volume 7:

- Chapter 5 – Project Description, RWE, June 2024, Application Reference: 7.5, Rev. 02.
- Appendix 11-3 Underwater Noise Modelling Report, Application Reference: 7.11.11.3, Rev. 01.

RWE 2024. Dogger Bank South Offshore Wind Farms, Heat Mapping Report: Atlantic Herring and Sandeel, RWE, November 2024. Document Ref. 10.41, Rev. 01.

Wright, P.J., Jensen, H. and Tuck, I., 2000. The influence of sediment type on the distribution of the lesser sandeel, Ammodytes marinus. *Journal of Sea Research*, *44*(3-4), pp.243-256.