THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

Dogger Bank South Offshore Wind Farm

Appendix B6 to the Natural England Deadline 6 Submission
Natural England's comments and updated advice on Marine Physical Environment

For:

The construction and operation of the Dogger Bank South (East and West) Offshore Wind Farm located approximately 100-122km off the Northeast Coast in the Southern North Sea.

Planning Inspectorate Reference EN010125

13th June 2025

Appendix B6 – Natural England's Advice on Marine Physical Environment at Deadline 6

In formulating these comments, the following documents submitted by the Applicant have been considered in relation to the impacts of Dogger Bank South (East and West) Offshore Wind Farm (DBS) on Marine Physical Environment:

- [REP5-040] 15.6 Assessment of Coastal Processes at the Dogger Bank South Landfall (Rev 01)
- [REP5-026] 8.18 Disposal Site Characterisation Report (Rev 3) (Tracked)
- [REP5-028] 8.23 In-Principle Monitoring Plan (Rev 4) (Tracked)
- [REP5-037] 15.3 The Applicants' Responses to Deadline 4 Documents

A summary of our position on the documents submitted by the Applicant in relation to Marine Physical Environment is provided below, with detailed comments provided in Tables 1 - 3.

Overview

Natural England welcomes the Applicant's further assessment on sediment transport modelling in relation to nearshore cable protection provided in [REP5-040]. However, this updated assessment doesn't change our advice.

Main Concerns

1) <u>Nearshore cable protection</u>

We agree that the appropriate Worst-Case Scenario has been assessed, namely the impacts of two parallel berms of cable protection (140m L x 15m W x 0.5m H), 50m apart, in proximity of 350m seaward of Mean Low Water Springs.

i) Trapping sediment on the northern edge of cable protection

It is estimated from the modelling results that sediment would accumulate on one side of the cable protection until a ramp is formed, after which it would bypass the structure after a duration of one month. Natural England consider that further evidence is needed to support this one-month value. It is also important to note that this would occur at each berm, leading to a potentially longer disruption in sediment transport.

ii) Effects from any scouring

It is also predicted that scour will form on the southern side of the cable protection, and it is uncertain how large an area this might cover. Should scour pits form, this could result in further

disruption to sediment transport as once sediment passes the berm it will deposit in the scour pit, rather than having a flat surface to continue along. Natural England is therefore concerned that placement of cable protection measures adjacent to, or abutting, Holderness Inshore MCZ could lead to alteration of sediment transport processes and scour effects that affect/extend into the MCZ, or further along the adjacent coast.

iii) Lowering of the seabed

There is also potential for the seabed level to lower by 6m over the lifetime of the project. Natural England is concerned that the placement of cable protection at this location could lead to an area of greater resistance to seabed erosion and the cable protection protruding significantly above the surrounding seabed compared to at installation. It is unclear what the implications for sediment transport and/or coastal process would be in this scenario, and thus any potential requirement for physical intervention/remedial action.

iv) Significance of the impact

Overall, the Applicant predicts that ~1% of the annual sediment transport budget could be interrupted by the placement of cable protection in the nearshore, which they consider would have a negligible significance of effect. However, Natural England consider that the calculation to inform this has not accounted for the majority of sediment transport occurring at the bottom of the water column and could therefore have greater significance. We advise this should be further considered by the Applicant.

v) Realistic Worse Case Scenario

Natural England acknowledges that cable protection may not be required, and if is, it is unlikely to all be placed within the most shallow waters of the nearshore, or in this configuration. However, we note that the Applicant does not intend to further refine cable protection requirements until post-consent, and it is therefore this worst-case scenario that would be consented, and hence assessments and conclusions must be based on that. As a result, Natural England advises that the evidence provided is insufficient to categorically rule out risks to the Humber Estuary SAC and Holderness Inshore MCZ being of concern alone or in-combination.

vi) Consideration of potential impacts/risk management

We highlight that should sediment transport to Spurn Head, in-combination with other plans and projects, be reduced to an extent that Spurn is breached, the implications for the Humber Estuary European Marine Site (EMS) features, particularly Annex I intertidal mudflats and

sandflats, and saltmarsh which support internally important numbers of Annex I and II passage and overwintering birds would be significant.

We therefore maintain our advice that the conservation objectives for the Holderness Inshore MCZ being hindered and adverse effects on integrity for the Humber Estuary SAC cannot be ruled out beyond scientific doubt, if cable protection is placed within the 10m depth contour. We also consider that there is unlikely to be agreement between Natural England and the Applicant on this matter.

However, should the Secretary of State be minded to consent the works without further restrictions on cable protection placement, we strongly advise that conditions are included in the DCO/dML to require rigorous monitoring and remedial action, should impacts be detected. We believe that a sufficiently binding condition to undertake physical remediation to address the sediment blockage and also repair any breach at Spurn point is sufficient to address the risk of an adverse effect on effect on integrity of the Humber Estuary SAC and significant impacts to the Holderness Inshore MCZ

vii) Monitoring

Should cable protection be required we consider that monitoring would be required for the lifetime of the project, to include: repeat bathymetric surveys of potential scour and changes to bedload transport at the nearshore cable protection and that adjacent to Holderness offshore and benthic surveys to address any physical changes to structure and function of Spurn Point and the features within Holderness Inshore MCZ.

We highlight that previous planning applications have required ongoing monitoring where reductions in nearshore sediment transport of 0.5% have been predicted, as residual concerns could not be ruled out.

2) <u>Sediment disposal</u>

In the Applicant's response to Deadline 4 documents, they note that should material be deposited updrift of a dredging site then there is a possibility that the material would move to re-fill the area before any relevant works are completed, requiring further, remedial dredging activity. As a result, they consider that applying this mitigation could result in avoidable ecological impacts. Natural England acknowledges this, however, we note that this has not been raised as a concern by other projects proposing to implement sandwave levelling especially within less dynamic sandbanks such as Dogger Bank SAC. We therefore, consider it is for the Applicant to apply best endeavours to ensure the preparatory and installation works align to best facilitate Annex I sandbank recovery. Without this commitment we highlight that

while sandwave levelling is proposed as mitigation to reduce the likelihood of cable protection being required, there is a risk that sandwave levelling becomes impactful in its own right.

Table 1 - Natural England's Advice On: [REP5-040] 15.6 Assessment of Coastal Processes at the Dogger Bank South Landfall (Rev 01)

NE Ref	Section	Key Concern and/or Update	Natural England's Advice to Resolve Issue
1	Section 2.1, 3	As previously advised, we welcome the Applicant's commitment to using low profile cable protection within in water depths of less than 10m. This is currently secured within the DML specifically to comply with guidance in MGN 654 whereby cable protection would not change the chartered depth by more than 5% unless otherwise agreed with the Maritime and Coastguard Agency and Trinity House. However, this doesn't take potential impacts from increases in cable protection on the marine environment into account.	Natural England advises that reference should also be given to the cable protection height being restricted to minimise the impact on sediment transport, and that the DML be updated to include that if cable protection would be required at greater heights that this needs to also be agreed with the MMO in consultation with the SNCB. [R&I, B23]
2	Figure 6-5/8-5	Natural England welcomes the Applicant's further assessment and information on sediment transport pathways including from 35km seawards of Landfall offshore and around the western/southwestern Dogger Bank area.	Natural England considers this issue to be resolved. [R&I, B9]
3	Figure 3-1/C-1	Natural England notes that the estimated worst-case length of cable protection in the nearshore environment has been presented relative to nearby marine physical environment receptors (e.g. SACs, SPAs and Smithic Bank) however, it does not include Holderness Inshore MCZ.	We advise that the worst-case location of the nearshore cable protection should also be considered relative to Holderness Inshore MCZ. [R&I, B51]

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4	Section 5.4.2	It is estimated, based on model results, that sediment accumulation would occur until a ramp is formed and sediment would then bypass the structure after a duration of 1 month, based on the average annual sediment transport rates. It would help increase understanding of long-term effects if the Applicant could include supporting evidence of this timescale for sediment bypassing over the cable protection and any potential scouring. We also highlight that this would occur for each berm, leading to a potential longer delay should parallel cable protection be installed.	Natural England advises that further supporting evidence should be provided regarding the predicted bypassing timescale, to increase understanding of long-term changes to nearshore sediment transport processes due to the presence of the proposed cable protection measures and any associated scouring.
5	Section 6.3	The evidence presented by the Applicant further examines the original model results [REP2-018]. This shows that there is no strong current direction on top of Dogger Bank in the Array Areas and that the circular nature of the tidal ellipses suggests that sediment is continuously recycled, whereas along the margins/slope of Dogger Bank, the current directions are more elliptical and suggest that sediment transport pathways are to the northwest. It is also suggested that there is limited potential for deposition and the seabed is continually mobile. Bed shear stresses are also shown to be relatively higher on the slope region of the DBS West Array Area. While Natural England welcomes the further discussion of the previous model findings; we advise	We advise that the predicted changes in bed shear stress due to interactions with Project infrastructure, need to be used to assess potential changes in seabed sediment composition and distribution, sediment dynamics, seabed morphology over the lifetime of the Projects. These results will also need to be considered in terms of depositing like-for-like dredged sediment back into Dogger Bank SAC as outlined in the Cable Statement [REP4-051]. To make the results more meaningful, we also advise evaluating the predicted changes in bedload transport (due to the presence of Project infrastructure) in the context of the different seabed sediment conditions across the impacted areas of Dogger Bank. Through, for example, mapping of the different morphodynamic zones, considering their seabed sediment type and thickness, their predicted

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		that interpretation of the results need to go further to make them more meaningful in terms of potential impacts to the seabed over the lifetime of the Projects. For example, predicted changes in bed shear stress and bedload transport due to interactions with Project infrastructure need to be considered in terms of corresponding seabed sediment composition and distribution, seabed sediment thickness, and seabed morphology over the lifetime of the Projects.	seabed elevation changes, assessing sediment transport gradients, and their scour potential under a range of tide and wave conditions (including climate change allowance). [R&I, B19]
6	7.1.1.1	Natural England requires clarification on changes in sediment transport due to excavation of bore exit pits (see Table 2 below for similar query re exit pits).	Natural England advises the following further information is provided: 1. The dimensions of the exit pits have been provided (page 103) but not where the exit pits will be located in the 'subtidal' zone. We are currently awaiting confirmation from the Applicant on whether this could be within 350m seaward of MLWS, where these is a commitment for no cable protection to be used [R&I, C2]. 2. Installation of exit pits is detailed to occur over 18 months with each exit pit being open for four months. A maximum of six exit pits will be excavated and either backfilled manually with available side-cast material or left to infill naturally, with a volume of sediment being 5,616m^3. Further information is required about how the sediment removed from the exit pits will be deposited/stored during the

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			excavation, and/or where additional material will be sourced from for backfilling. Natural England has previously advised that side-cast material is unlikely to remain available in this location due to longshore sediment transport. [R&I, B16] Natural England advises that the post-installation monitoring should be used to confirm the recovery of the subtidal area and inform whether manual backfilling is needed.
7	Figure 7-3 & Section 7.2.1.1	Whilst continuous down-wearing of the seabed is considered unlikely at the location of the nearshore cable protection, there is the potential for up to 6m of seabed lowering over the operational lifetime of the Projects. This could leave the cable protection measures standing proud of the seabed/higher relative to the seabed than when installed. The implications for nearshore sediment transport processes and requirement for remedial action due to this seabed lowering and protrusion of the cable protection above the seabed, is unclear. Natural England queries that given the potential for seabed level lowering around the cable protection through the lifetime of the Projects, does the current berm design allow for up to 6m of seabed level changes at the edges?	Natural England advises that the Applicant considers the implications of the worst-case scenario (WCS) seabed lowering to nearshore sediment transport processes, and requirement for any remedial actions at the location of the proposed nearshore cable protection over the lifetime of the Projects.

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8	Section 7.2.1.1	Natural England notes that a degree of scour is anticipated at the cable protection measures over the operational lifetime of the Projects, but this is expected to be small, localised and occur over a long time. However, the degree of scour that may occur is uncertain at present. Natural England is, therefore, concerned that placement of cable protection measures adjacent to, or abutting, Holderness Inshore MCZ could lead to alteration of sediment transport processes and scour effects that affect/extend into the MCZ, or further along the adjacent coast. The Applicant has stated that *"the effects on bedload transport would not be observable but possibly detectable through repeat bathymetric surveys."* Therefore, as suggested by the Applicant, we consider that specific monitoring should be carried out to address these concerns.	We advise that the Applicant should further consider the potential impacts on the MCZ and adjacent coastline due to changes in nearshore sediment transport processes and potential scour effects associated with the placement of cable protection within the nearshore. Monitoring (repeat bathymetric surveys) of potential scour and changes to bedload transport at/near nearshore cable protection should be included in the IPMP. [R&I, B37]
9	Section 7.2.1.1, 7.2.1.4 & 7.2.1.5	<u>Changes to bedload sediment transport</u> Longshore sediment transport modelling indicates an average of 4.2% of the annual sediment budget could be interrupted if the cable protection occupied the full water column. The Applicant has determined that a 25% blockage of the water column would therefore result in changes likely to be in the order of 1%. However, the majority of sediment transport within a water column occurs near the bottom or seabed. It	We advise the Applicant to reflect on this calculation and the distribution of sediment transport in the water column. In addition, we highlight that whilst coastal protection works at both Easington and Withernsea were predicted to have a negligible effect on longshore transport at 0.5% of the annual yield; the residual concerns regarding downdrift sediment supplies required monitoring to be conditioned to analyse changes in the coastline following construction. Therefore, this is also recommended for the impacts of

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		appears the calculations have assumed an even spread of sediment transport through the water column. The Applicant has concluded there would be a negligible significance of effect due to the presence of cable protection in the nearshore. However, we remain concerned about the impact of changes in nearshore sediment transport due to the presence of cable protection.	cable protection which are predicted by modelling to have a greater impact on sediment transport yields. [R&I, B23]
10	Table 2-1, Section 7.2.1.1 & Table 7-6	The current assessment concludes that the magnitude of impact due to cable protection measures offshore of the depth of closure, would be negligible (Table 7-6). However, with regards to Smithic Bank, and as highlighted previously [R&I B28], the significance of potential changes to nearshore sediment transport processes and coastal morphology (e.g. Smithic Bank) due to the presence of cable crossings remain uncertain. Natural England does not consider that the Applicant's response [REP5-037] addresses our concern regarding the location of the Hornsea 4 cable crossing. Furthermore, the coastal processes modelling does not include nearshore cable crossings. Consequently, we consider that the available information is not sufficient to inform understanding of the potential impact of nearshore cable crossings/protection to Smithic Bank.	As previously advised, the information currently available does not provide sufficient detail to inform understanding of the potential impact of nearshore cable crossings/protection to Smithic Bank. We request that the Applicants provide a provide further information to increase understanding of potential impacts to nearshore sediment transport processes due to the presence of cable crossings/protection near/adjacent to Smithic Bank. [R&I, B28]

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11	7.2.1.3, 7.2.1.3.1 & 7.2.1.4	The magnitude of impact on bedload transport and seabed morphology due to the presence of cable protection on Dogger Bank has been assessed as negligible. Furthermore, the sensitivity of Dogger Bank has been assessed as low. This is despite the large cable protection footprint area (WCS 1.2km^2) and the presence of a thin veneer of mobile sediment that covers much of Dogger Bank which, as the Applicant states, are potentially susceptible to changes in bedload transport. The Applicant also refers to evidence from construction activities within other offshore wind farms on Dogger Bank that show that the seabed can recover quickly. However, the presence of cable protection on Dogger Bank would persist over the lifetime of the Projects (and potentially beyond, if not removed at end of Project life) meaning seabed recovery would not occur for several decades. We are also concerned that interactions between the installed infrastructure (cable protection, turbines, and OSP/OCPs) with tidal currents and wave-driven currents may result in changes to the sediment dynamics and seabed morphology. Therefore, Natural England advises that the significance of effects is likely to be greater than negligible.	Natural England advises that the significance of changes in sediment transport due to the presence of cable protection on Dogger Bank is likely to be greater than negligible. As highlighted in this latest coastal process assessment [REP5-040], there is limited potential for deposition and the seabed is continually mobile. To support the assessment conclusions and to increase understanding, it is important to consider the predicted changes in bed shear stress and bedload transport in the context of the different seabed sediment conditions and morphological areas on Dogger Bank under different wave and tide conditions (and making allowance for climate change), over the lifetime of the cable protection. [R&I, B29]

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12	Section 7.2.1	Natural England notes several cable protection measures are being considered: rock armour, concrete mattresses, steel bridging/ducting, Cable Protection System (CPS) ducting/articulated pipe (cast iron/plastic), concrete bridging and/or rock bags. However, the relative environmental impacts and removability of each type have not been considered. Furthermore, there is no commitment to remove external cable protection at the end of the lifetime of the Project(s).	We advise that all efforts should be made to minimise environmental impacts due to the use of external cable protection through following the avoid, reduce, mitigate hierarchy. Furthermore, removability of the cable protection measures needs to be considered for the end of the lifetime of the Project(s), including avoidance of those types of cable protection that are least likely to be recovered. [R&I, B48]

Table 2 - Natural England's Advice On: [REP5-026] 8.18 Disposal Site Characterisation Report (Rev 3) (Tracked)

NE Ref	Section	Key Concern and/or Update	Natural England's Advice to Resolve Issue
1	Section 7.1.3 and Table 7-1	Natural England welcomes the reduction in maximum volume of sediment disturbed by sandwave levelling (within the Array Areas and Offshore Export Cable Corridor) due to the bundling of cables.	Whilst we welcome the reduction, please note that we have highlighted concerns regarding the uncertainty of dredge volumes which are currently still unresolved (see R&I point B50 for further detail).
2	Section 8.1.2.4, para 147	Natural England welcomes the Applicant's commitment to bury the export cables across the intertidal and shallow subtidal zone. However, we note that the excavated material (sand with a minor fine fraction and glacial till) from the subtidal bore exit pits will be disposed of directly adjacent to the excavation location and is expected to be	We advise that further information and clarification is needed regarding the subtidal bore exit pits. We also advise that post-construction monitoring is used to confirm recovery and backfilling of the seabed at the exit pits. [R&I, B16]

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		redistributed as a combination of suspended and bed loads. It is not stated where in the subtidal zone the exit pits will be located, how the excavated material will be deposited, and whether it is anticipated that the exit pits will be left to refill naturally.	

Table 3 - Natural England's Advice On: [REP5-028] 8.23 In-Principle Monitoring Plan (Rev 4) (Tracked)

NE Ref	Section	Key Concern and/or Update	Natural England's Advice to Resolve Issue
1	Table 1-2	Natural England welcomes the proposed monitoring of secondary scour now included in the IPMP. However, we advise including targeted scour monitoring of seabed level changes and scour effects at any cable protection measures placed within the nearshore zone.	We advise that targeted scour monitoring should be carried out (i.e. repeat bathymetric surveys) at/adjacent to any cable protection placed within the nearshore zone. Consideration should also be given to potential intervention if the observed scour exceeds predictions. [R&I, B37]
2	Table 1-2	Natural England notes in the post-construction monitoring proposed for the Marine Physical Environment, that a desk-based assessment will be carried out to identify a representative sample of adjacent wind turbines with the greatest potential for scour. Whilst this is welcome, we highlight the difference in conditions between the top of Dogger Bank and the slope/margin of Dogger Bank, which will need to be considered when selecting the representative sample of turbine locations.	Owing to the different conditions on the top of Dogger Bank vs those on the margin/slope of Dogger Bank, we advise that the selection of samples for scour monitoring, should reflect these markedly different conditions within the two Arrays. We also advise clarification regarding scour monitoring at the OSP/OCPs, as well as at the turbines. [R&I, B37]

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		Furthermore, it is not stated whether scour at the OCP/OSPs will be monitored.	
3	Table 1-2	Natural England notes that sandwave/sandbank characterisation is included as a headline reason for pre-construction monitoring, and sandwave/sandbank recovery rates is included within the post-construction monitoring headline. However, there are no specific details of what these will involve.	As previously advised ([REP3-056], [REP5-054]), specific details should be provided of the proposed monitoring for sandwave/sandbank characterisation and recovery, including assessment of observed bedform migration rates and directions i.e. sandwave crest mapping using further bathymetric survey data. [R&I, B17, B27]