DBS Offshore Wind

RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Response to Natural England's Relevant Representations

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Company:	**RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited**	Asset:	**Development**
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Glossary

Term	Definition
Agricultural Land Classification (ALC)	Agricultural Land Classification is a grading system used to assess and compare the quality of agricultural land in England and Wales. A combination of climate, topography and soil characteristics and their unique interaction determines the grade of the land. The grades range from 1 to 5. Grade 1 being excellent, Grade 2 very good, Grade 3a and 3b good to moderate (no subdivide), Grade 4 poor and Grade 5 very poor.
Array Areas	The DBS East and DBS West offshore Array Areas, where the wind turbines, offshore platforms and array cables would be located. The Array Areas do not include the Offshore Export Cable Corridor or the Inter-Platform Cable Corridor within which no wind turbines are proposed. Each area is referred to separately as an Array Area.
Array cables	Offshore cables which link the wind turbines to the Offshore Converter Platform(s).
Baseline	The existing conditions as represented by the latest available survey and other data which is used as a benchmark for making comparisons to assess the impact of the Projects.
Beach	A deposit of non-cohesive sediment (e.g. sand, gravel) situated on the interface between dry land and the sea (or other large expanse of water) and actively 'worked' by present-day hydrodynamic processes (i.e. waves, tides and currents) and sometimes by winds.
Biodiversity Net Gain (BNG)	An approach to development that leaves biodiversity in a better state than before. Where a development has an impact on biodiversity, developers are encouraged to provide an increase in appropriate natural habitat and ecological features over and above that being affected to ensure that the current loss of biodiversity through development will be halted and ecological networks can be restored.
Concurrent	Installation of monopiles or pin piles happening at the same time at the DBS Projects.
Concurrent Scenario	A potential construction scenario for the Projects where DBS East and DBS West are both constructed at the same time.
Cumulative Effects	The combined effect of the Projects in combination with the effects of a number of different (defined cumulative) schemes, on the same single receptor / resource.

Term	Definition
Cumulative Effects Assessment (CEA)	The assessment of the combined effect of the Projects in combination with the effects of a number of different (defined cumulative) schemes, on the same single receptor/resource.
Cumulative impact	The combined impact of the Projects in combination with the effects of a number of different (defined cumulative) schemes, on the same single receptor / resource.
Decommissioning Plan	A document which would define the extent of works, in relation to the onshore infrastructure, which are required to be undertaken at the end of the operational lifetime of the Projects. The plan would be subject to agreement with relevant stakeholders at the time.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the value, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
Electrical Switching Platform (ESP)	The Electrical Switching Platform (ESP), if required would be located either within one of the Array Areas (alongside an Offshore Converter Platform (OCP)) or the Export Cable Platform Search Area.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	A document reporting the findings of the EIA and produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Glacial till	Poorly sorted, non-stratified and unconsolidated sediment carried or deposited by a glacier.
Habitats Regulations Assessment (HRA)	The process that determines whether or not a plan or project may have an adverse effect on the integrity of a European Site or European Offshore Marine Site.

Term	Definition
Horizontal Directional Drill (HDD)	HDD is a trenchless technique to bring the offshore cables ashore at the landfall and can be used for crossing other obstacles such as roads, railways and watercourses onshore.
Impact	Used to describe a change resulting from an activity via the Projects, i.e. increased suspended sediments / increased noise.
In Isolation Scenario	A potential construction scenario for one Project which includes either the DBS East or DBS West array, associated offshore and onshore cabling and only the eastern Onshore Converter Station within the Onshore Substation Zone and only the northern route of the onward cable route to the proposed Birkhill Wood National Grid Substation.
Inter-Platform Cable Corridor	The area where Inter-Platform Cables would route between platforms within the DBS East and DBS West Array Areas, should both Projects be constructed.
Inter-Platform Cables	Buried offshore cables which link offshore platforms.
Intertidal	Area on a shore that lies between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS).
Landfall	The point on the coastline at which the Offshore Export Cables are brought onshore, connecting to the onshore cables at the Transition Joint Bay (TJB) above mean high water.
Landfall Zone	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) and the Transition Joint Bays (TJBs) inclusive of all construction works, including the landfall compounds, Onshore Export Cable Corridor and intertidal working area including the Offshore Export Cables.
Marine Mammal Observers (MMObs)	Trained members of the team who will observe the Monitoring Area.
Mean High Water Springs (MHWS)	MHWS is the average of the heights of two successive high waters during a 24 hour period.
Mean Low Water Springs (MLWS)	MLWS is the average of the heights of two successive low waters during a 24 hour period.
Movement	A single trip (i.e. the arrival or departure from site) for the transfer of employees or delivery of goods.

Term	Definition
Nationally Significant Infrastructure Project	Large scale development including power generating stations which requires development consent under the Planning Act 2008. An offshore wind farm project with a capacity of more than 100 MW constitutes an NSIP.
Nearshore	The zone which extends from the swash zone to the position marking the start of the offshore zone (~20m).
Offshore Converter Platforms (OCPs)	The OCPs are fixed structures located within the Array Areas that collect the AC power generated by the wind turbines and convert the power to DC, before transmission through the Offshore Export Cables to the Project's Onshore Grid Connection Points.
Offshore Development Area	The Offshore Development Area for ES encompasses both the DBS East and West Array Areas, the Inter-Platform Cable Corridor, the Offshore Export Cable Corridor, plus the associated Construction Buffer Zones.
Offshore Export Cable Corridor	This is the area which will contain the offshore export cables (and potentially the ESP) between the Offshore Converter Platforms and Transition Joint Bays at the landfall.
Offshore Export Cables	The cables which would bring electricity from the offshore platforms to the Transition Joint Bays (TJBs).
Onshore Development Area	The Onshore Development Area for ES is the boundary within which all onshore infrastructure required for the Projects would be located including Landfall Zone, Onshore Export Cable Corridor, accesses, Temporary Construction Compounds and Onshore Converter Stations.
Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Preliminary Environmental Information Report (PEIR)	Defined in the EIA Regulations as information referred to in part 1, Schedule 4 (information for inclusion in environmental statements) which has been compiled by the applicants and is reasonably required to assess the environmental effects of the development.
Projects Design (or Rochdale) Envelope	A concept that ensures the EIA is based on assessing the realistic worst-case scenario where flexibility or a range of options is sought as part of the consent application.
Ramsar Site	Wetlands of international importance, designated under the Ramsar Convention.

Term	Definition
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of Receptors include species (or groups) of animals, plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Scoping report	The report that was produced in order to request a Scoping Opinion from the Secretary of State.
Scour protection	Protective materials to avoid sediment erosion from the base of the wind turbine foundations and offshore substation platform foundations due to water flow.
Sediment	Particulate matter derived from rock, minerals or bioclastic matter.
Sequential	Installation of monopiles or pin piles happening one after another at the DBS Projects.
Special Area of Conservation (SAC)	Strictly protected sites designated pursuant to Article 3 of the Habitats Directive (via the Habitats Regulations) for habitats listed on Annex I and species listed on Annex II of the Directive
Special Protection Area (SPA)	Strictly protected sites designated pursuant to Article 4 of the Birds Directive (via the Habitats Regulations) for species listed on Annex I of the Directive and for regularly occurring migratory species
Temporary Construction Compound	An area set aside to facilitate construction of the Projects. These will be located adjacent to the Onshore Export Cable Corridor and within the Onshore Substation Zone, with access to the highway.
The Applicants	The Applicants for the Projects are RWE Renewables UK Dogger Bank South (East) Limited and RWE Renewables UK Dogger Bank South (West) Limited. The Applicants are themselves jointly owned by the RWE Group of companies (51% stake) and Masdar (49% stake).
The Projects	DBS East and DBS West (collectively referred to as the Dogger Bank South Offshore Wind Farms).
Tidal current	The alternating horizontal movement of water associated with the rise and fall of the tide.
Wave height	The vertical distance between the crest and the trough
Wind turbine	Power generating device that is driven by the kinetic energy of the wind.

Acronyms

Term	Definition
AADT	Annual Average Daily Traffic
ADD	Acoustic Deterrent Device
ADMS-Roads	Atmospheric Dispersion Modelling System for Roads
AEoI	Adverse Effect on Integrity
AI	Artificial Intelligence
ALC	Agricultural Land Classification
ANS	Artificial Nesting Structure
AONB	Area of Outstanding Natural Beauty
AoS	Areas of Search
ARs	Artificial Reefs
BDMPS	Biologically Defined Minimum Population Scale
BEIS	Dept of Business Enterprise and Industrial Strategy
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
BNNC	Berwickshire North Northumberland Coast
CBRA	Cable Burial Risk Assessment
CEA	Cumulative Effects Assessment
CGR	Counterfactual of Growth Rate
CIMP	Compensation Implementation and Monitoring Plan
CI	Confidence Interval
CoCP	Code of Construction Practice

Term	Definition
CPGR	Counterfactual of Population Growth Rate
CPS	Counterfactual of Population Size
DBA	Dogger Bank A
DBB	Dogger Bank B
DBD	Dogger Bank D
DBS	Dogger Bank South
DCO	Development Consent Order
DEP & SEP	Dudgeon Extension Project and Sheringham Extension Project
DDV	Drop-down Video
DEFRA	Department for Environment, Food and Rural Affairs
DESNZ	Department of Energy Security and Net Zero
DLL	District Level Licencing
DML	Deemed Marine Licences
ECC	Export Cable Corridors
EDR	Effective Deterrent Range
EFT	Emissions Factors Toolkit
EIA	Environmental Impact Assessment
EIFCA	Eastern Inshore Fisheries and Conservation Authority
EMF	Electromagnetic Field
EPP	Evidence Planning Process
EPS	European Protected Species
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement

Term	Definition
ESP	Electrical Switching Platform
ETG	Expert Topic Group
ExA	Examining Authority
FFC	Flamborough and File
FID	Final Investment Decision
FLL	Functionally Linked Land
GBS	Gravity Based Structures
GCN	Great Crested Newt
GRCIMP	Guillemot [and Razorbill] Compensation Implementation and Monitoring Plan
GRCP	Guillemot [and Razorbill] Compensation Plan
HAT	Highest Astronomical Tide
HHW	Haisborough, Hammond and Winterton
HPAI	Highly Pathogenic Avian Influenza
HDD	Horizontal Directional Drill
HDV	Heavy Duty Vehicle
HRA	Habitats Regulations Assessment
IACPC	Impact Assessment & Conservation Payment Certificate
iPCoD	Interim Population Consequences of Disturbance Model
JNCC	Joint Nature Conservation Committee
KCP	Kittiwake Compensation Plan
KSCP	Kittiwake Strategic Compensation Plan
LAQM TG22	Local Air Quality Management Technical Guidance 22
LONI	Letter of No Impediment

Term	Definition
MA	Mentoring Area
MAFF	Ministry of Agriculture, Fisheries and Food
MarESA	Marine Evidence-based Sensitivity Assessment
MarLIN	Marine Life Information Network
MCZ	Marine Conservation Zone
MDP	Maximum Design Parameters
MDS	Maximum Design Scenario
MERP	Marine Ecosystems Research Programme
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
MMOb	Marine Mammals Observer
MPA	Marine Protected Areas
MRF	Marine Recovery Fund
MSL	Mean Sea Level
MU	Management Unit
NAS	Noise Abatement System
NE	Natural England
NERC	Natural Environment and Rural Communities
NMG	Non-Material Change
NNSSR	North Norfolk Sandbanks and Saturn Reef
NRMM	Non-Road Mobile Machinery

Term	Definition
NRW	Natural Resources Wales
NS	North Sea
NSIP	Nationally Significant Infrastructure Project
NSN	National Site Network
OCoCP	Outline Code of Construction Practice
ODOW	Outer Dowsing
OECC	Offshore Export Cable Corridor
OEMP	Outline Ecological Management Plan
OOMP	Offshore Operations and Maintenance Plan
OOOMP	Outline Offshore Operations and Maintenance Plan
OSMP	Outline Soil Management Plane
OWF	Offshore Wind Farm
PADSS	Principal Areas of Disagreement Summary Statement
PAM	Passive Acoustic Monitoring
PC	Process Contribution
PEC	Predicted Environmental Concentration
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PTS	Permanent Threshold Shift
PVA	Population Viability Analysis
RAG	Red Amber Green
RIAA	Report to Inform Appropriate Assessment
RLB	Red Line Boundary

Term	Definition
RR	Relevant Representation
RSPB	Royal Society for the Protection of Birds
RTD	Red-Throated Diver
SAC	Special Areas of Conservation
SACO	Supplementary Advice on Conservation Objectives
SANS	Strategic Artificial Nesting Structure
SD	Standard Deviation
SeaMaST	Seabird Mapping and Sensitivity Tool
SIP	Site Integrity Plan
SMP	Soil Management Plan
SNCB	Statutory Nature Conservation Body
SNS	Southern North Sea
SPA	Special Protection Area
SSC	Suspended Sediment Concentration
SSSI	Site of Special Scientific Interest
TCC	Temporary Construction Compound
TCE	The Crown Estate
TTS	Temporary Threshold Shift
UK	United Kingdom
UWN	Underwater Noise
UXO	Unexploded Ordnance
WCS	Worst Case Scenario

1 Introduction

1. This document presents the Applicants' responses to Natural England's Relevant Representations [RR-039] including Appendices A though F, and Appendix I, received following the closure of the Dogger Bank South statutory consultation period under section 56 of the Planning Act 2008. Responses to Appendix G and H of Natural England's Relevant Representation [RR-039] were submitted to The Planning Inspectorate at the pre-exam procedural deadline B of the 17th October 2024 (**Response to Natural England's Relevant Representations (Appendix G & H)** [PDB-006], in response to the Examining Authority's Procedural Decision **Rule 9 and 17 letter** [PD-005] dated 22nd October 2024, which requested further information to provide clarity on how Natural England's representations are being approached by the Applicants

2. The Applicants' responses to Relevant Representations received from other Interested Parties were submitted to The Planning Inspectorate at the pre-examination procedural deadline of the 8th October 2024 (see **The Applicants' Responses to Relevant Representations** [PDA-013].

3. Natural England's Relevant Representation [RR-039] outlines that its purpose is also to act as the Written Representation for Natural England on the proposals, and the size of the representation was therefore considered by the Applicants to be too substantial to enable reasoned responses to comments made within the two weeks notification provided by the **Rule 6 letter** [PD-002].

4. For ease of referencing and to facilitate future cross-referencing, the Applicants have used the existing Planning Inspectorate RR identification number (e.g. RR-001) and created a unique identifier for each response by itemising the RR into paragraphs or sections (e.g. RR-001: 1.1). The ID numbers can be found in the first column of each table.

2 Responses to Natural England's Relevant Representation

5. The Applicants' responses to Relevant Representations received from Natural England are provided in the below sections:

- Main document – section 2.1
- Appendix A DCO – section 2.2
- Appendix B Marine Physical Environment – section 2.3
- Appendix C Benthic and Intertidal Ecology – section 2.4
- Appendix D Benthic Compensation – section 2.5
- Appendix E Fish and Shellfish – section 2.6
- Appendix F Marine Mammals – section 2.7
- Appendix I Terrestrial Ecology and Ornithology – section 2.8

2.1 Responses to Relevant Representation

Table 2.1.1 Applicants' Responses to Natural England Relevant Representation

<table>
<tr><th>I.D.</th><th>Relevant Representation</th><th>Applicants' Comment</th></tr>
<tr><td>RR-039: 5.1</td><td>PART II – NATURAL ENGLAND'S ADVICE

5. The Natural Features Potentially Affected by this Application

5.1 The designated sites and interest features included within Tables 5.1 and 5.2 are those which may be significantly affected by the proposed project, based on the information provided to date. It should be noted that this list may change if new evidence emerges during the Examination. Gov.uk links have been provided to Natural England's Designated Site View system where the citation, conservation objectives and supplementary advice for designated nature conservation sites can be located. We have provided links, as these are large and live documents which are updated on a regular basis to incorporate the most up to date evidence. To avoid potentially out of date or inaccurate documents being referred to during the Examination we recommend that the links are utilised.</td><td>The Applicants acknowledge this comment.</td></tr>
<tr><td>RR-039: 5.2</td><td>5.2 In relation to SPAs, SACs and Ramsar sites, on the basis of the information submitted, Natural England is not satisfied that it can be excluded beyond reasonable scientific doubt that the project would have an adverse effect alone or in-combination on the integrity of the sites in Table 5.1. In relation to the MCZs in Table 5.1, Natural England is concerned that the conservation objectives of the site could be hindered. In relation to the SSSIs listed, Natural England is concerned that the protected features of the above SSSIs may be damaged or destroyed.

Table 5.1 Designated Nature Conservation Sites
<table><tr><th>Site Name</th><th>Conservation advice</th><th>Features for which Outstanding Concerns Remain</th></tr><tr><td>Holderness Inshore MCZ</td><td>Marine site detail (naturalengland.org.uk)</td><td>High energy circalittoral rock
Intertidal sand and muddy sand
Moderate energy circalittoral rock
Spurn Head (subtidal) and "the Binks"
Subtidal coarse sediment
Subtidal mixed sediments
Subtidal mud
Subtidal sand</td></tr><tr><td>Holderness Offshore MCZ</td><td>Holderness Offshore MPA | JNCC - Adviser to Government on Nature Conservation</td><td>Subtidal coarse sediment
Subtidal sand
Subtidal mixed sediments
Ocean quahog (Arctica islandica)
North Sea glacial tunnel valleys</td></tr></table></td><td>See the Applicants responses to comments raised on the listed sites in the Tables and documents listed below:

• Sites designated for benthic habitat features – Table 2.3.1 (Applicants' responses to Natural England's Appendix B Marine Physical Environment), Table 2.4.1 (Applicants' responses to Natural England's Appendix C Benthic and Intertidal Ecology) and Table 2.5.1 (Applicants' responses to Natural England's Appendix D Benthic Compensation).
• Sites designated for geological features – Table 2.3.1 and Table 2.4.1.
• Sites designated for fish features – Table 2.6.1.
• Sites designated for marine mammal features – Table 2.7.1 (Applicants' responses to Natural England's Appendix F Marine Mammals).
• Sites designated for marine ornithological features – Table 2.1.1 and Table 2.2.1 of Natural England's Relevant Representations - Appendix G & H [PDB-006]].
• Sites designated for terrestrial features - Table 2.8.1.</td></tr>
</table>

I.D.	Relevant Representation	Applicants' Comment

Site Name	Conservation advice	Features for which Outstanding Concerns Remain
Dogger Bank SAC	Dogger Bank MPA | JNCC - Adviser to Government on Nature Conservation	Sandbanks slightly covered by seawater all the time
Flamborough Head SAC	Marine site detail (naturalengland.org.uk)	Reefs Submerged or partially submerged sea caves Vegetated sea cliffs of the Atlantic and Baltic coasts
Humber Estuary SAC	Marine site detail (naturalengland.org.uk)	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) Estuaries Grey seal (*Halichoerus grypus*) Mudflats and sandflats not covered by seawater at low tide River lamprey (*Lampetra fluviatilis*) Salicornia and other annuals colonising mud and sand Sandbanks which are slightly covered by sea water all the time Sea lamprey (*Petromyzon marinus*)
Southern North Sea SAC	Southern North Sea MPA | JNCC - Adviser to Government on Nature Conservation	Harbour porpoise (*Phocoena phocoena*)
Berwickshire North Northumberland Coast (BNNC) SAC	Berwickshire and North Northumberland Coast - Special Areas of Conservation (jncc.gov.uk)	Grey seal (*Halichoerus grypus*)
Farne Islands SPA	Marine site detail (naturalengland.org.uk)	Guillemot (*Uria aalge*), Breeding Seabird assemblage, Breeding
Flamborough and Filey Coast SPA	Marine site detail (naturalengland.org.uk)	Gannet (*Morus bassanus*), Breeding Guillemot (*Uria aalge*), Breeding Kittiwake (*Rissa tridactyla*), Breeding Razorbill (*Alca torda*), Breeding Seabird assemblage, Breeding

I.D.	Relevant Representation	Applicants' Comment

Site Name	Conservation advice	Features for which Outstanding Concerns Remain
Greater Wash SPA	Marine site detail (naturalengland.org.uk)	Common scoter (*Melanitta nigra*), Non-breeding Little gull (*Hydrocoloeus minutus*), Non-breeding Little tern (*Sternula albifrons*), Breeding Red-throated diver (*Gavia stellata*), Non-breeding
Humber Estuary SPA	Marine site detail (naturalengland.org.uk)	Avocet (*Recurvirostra avosetta*) Bar-tailed godwit (*Limosa lapponica*) Bittern (*Botaurus stellaris*) Black-tailed godwit (*Limosa limosa islandica*) Dunlin (*Calidris alpina alpina*) Golden plover (*Pluvialis apricaria*) Hen harrier (*Circus cyaneus*) Knot (*Calidris canutus*) Little tern (*Sternula albifrons*) Marsh harrier (*Circus aeruginosus*) Redshank (*Tringa totanus*) Ruff (*Calidris pugnax*) Shelduck (*Tadorna tadorna*) Waterbird assemblage
Humber Estuary Ramsar	Designated Sites View (naturalengland.org.uk)	Bar-tailed godwit (*Limosa lapponica*) Black-tailed godwit (*Limosa limosa*) Dunlin (*Calidris alpina*) Golden plover (*Pluvialis apricaria*) Grey seal (*Halichoerus grypus*) Knot (*Calidris canutus*) Natterjack toad (*Epidalea calamita*) Redshank (*Tringa tetanus*) River lamprey (*Lampetra fluviatilis*), Passage Sea lamprey (*Petromyzon marinus*), Passage Shelduck (*Tadorna tadorna*), Wintering

Table 5.2 National Sites

Site Name	Conservation advice	Features for which Outstanding Concerns Remain
Dimlington Cliff SSSI	SSSI detail (naturalengland.org.uk)	EC Geological Conservation Review blocks - Quaternary of East England (Quaternary stratigraphy)

<table>
<tr><th>I.D.</th><th>Relevant Representation</th><th>Applicants' Comment</th></tr>
<tr><td></td><td>
<table>
<tr><th>Site Name</th><th>Conservation advice</th><th>Features for which Outstanding Concerns Remain</th></tr>
<tr><td>Flamborough Head SSSI</td><td>SSSI detail (naturalengland.org.uk)</td><td>Reefs
Submerged or partially submerged sea caves
Vegetated sea cliffs of the Atlantic and Baltic coasts
Aggregations of breeding birds including</td></tr>
<tr><td>Humber Estuary SSSI</td><td>Humber Estuary - 2000480 SSSI - 2000480</td><td>As per SPA Above

Non-breeding birds:
a. Brent goose (dark-bellied) (Branta bernicla bernicla)
b. Curlew (Numenius arquata)
c. Golden plover (Pluvialis apricaria)
d. Lapwing (Vanellus vanellus)

Marine Mammals:
e. Grey seal, (Halichoerus grypus)
Features:
• Assemblages of breeding birds - Lowland open waters and their margins</td></tr>
</table>
</td><td></td></tr>
<tr><td>RR-039: 5.3</td><td>5.3 Matrix to Determine Environmental Impact Assessment Effect Significance - We acknowledge that a matrix approach to determining the significance of effects on ecological features, is commonly used. However, this method often relies on value- rather than evidence-based judgements. The subjective evaluation of magnitude of impact and sensitivity/importance of receptors through expert judgement has led to many impact magnitudes and receptor importance/sensitivities being downgraded across topics in the EIA. We also note that any effect that is concluded to be of moderate or major significance in the ES, is deemed to be 'significant' in EIA terms, whereas effects concluded to be of negligible or minor significance, are deemed 'not significant' in EIA terms. This cut-off could exclude any effect concluded to be less than moderate, in turn, this could lead to errors in assessing cumulative effects adequately.</td><td>In the absence of existing data sources detailing the value of receptors (e.g. the Marine Life Information Network (MarLIN) database for habitats and species), expert judgement has been used to determine the value of a receptor. The Applicants disagree that any impact magnitudes and receptor importance/sensitivities have been 'downgraded', with determination of receptor value, magnitude and sensitivity being based on the definitions detailed in each chapter of the Environmental Statement (ES).

With regards to the cumulative effects assessments, as stated in section 5.5 of Appendix 6-1 Onshore Cumulative Effects Assessment Methodology [APP-077] and Appendix 6-2 Offshore Cumulative Effects Assessment Methodology [APP-078]:

Any effect that has been concluded to be of negligible significance (in Environmental Impact Assessment (EIA) terms) for the Projects alone, would make no material contribution to any potential cumulative effect, and was therefore scoped out of the</td></tr>
</table>

I.D.	Relevant Representation	Applicants' Comment
		Cumulative Effects Assessment (CEA). Effects of greater than negligible significance for the Projects alone have been considered cumulatively. As such, effects which were considered to be 'minor adverse' (or minor significance as stated in RR-039: 5.3), while not being significant in EIA terms, were brought through for assessment in the cumulative effects assessments. This approach is considered standard practice for CEAs conducted within EIAs and has been approved for numerous past offshore wind EIAs.
RR-039: 5.4	5.4 **Protected Species** - An application for a European Protected Species and/or wildlife licence may be required if the application will have impacts on the following species: • Harbour Porpoise • Great Crested Newt (GCN) • Bats • Badger • Breeding Birds • Otter • Reptiles • Water Vole	The Applicants are engaged in this process and will continue to consult with Natural England during the examination period in regard to obtaining a Letter of No Impediment (LONI) for bats and badgers. It has been confirmed with Natural England that no other European Protected Species licences are anticipated to be required.
RR-039: 5.5	5.5 It is understood that the Applicant intends to use District Level Licence (DLL) to ensure compliance with the legal status of GCN and mitigate for potential impacts on this species. A provisional DLL certificate for GCN has been requested from Natural England Wildlife Licensing Service (NEWLS).	A District Level Licence for great crested newts has been applied for and the Impact Assessment & Conservation Payment Certificate (IACPC) has been accepted and countersigned by Natural England. The IACPC can now be used for formal planning purposes.
RR-039: 5.6	5.6 Should the DCO be granted, Natural England advises the Applicant progresses with licence applications at the earliest opportunity. For reference, Natural England has adopted standing advice[1] for protected species which includes links to guidance on survey and mitigation.	The **Outline Ecological Management Plan** [APP-235] has outlined species that may require licences should the DCO be granted. The Applicants have been working closely with Natural England to ensure survey methodologies and potential mitigation measures are agreed and provide satisfactory outcomes to species in question.
RR-039: 5.7	5.7 **Other matters relating to Natural England's remit** - the following features are those which may be significantly affected by the proposed Dogger Bank South project based on the information provided to date: • Biodiversity net gain • Soils and best and most versatile agricultural land	The Applicants acknowledge this comment.
RR-039: 5.8	6. Principal Areas of Disagreement Summary Statement (PADSS) This PADSS should be read in conjunction with the Appendices of these Relevant Representations, which provide further detail on the areas of disagreement as well as other areas of disagreement which require resolution. For ease of reference, we have added a RAG rating for each principal area. Please note that the PADSS is ordered by topic and not by priority.	The Applicants acknowledge this comment.

[1] https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications

Table 2.1.2 Applicants' comments on Natural England's Principal Areas of Disagreement Summary Statement (PADSS) relevant representation

I.D.	The principal issue in question	The brief concern held by Natural England which will be reported on in full in WR / LIR	What needs to change, or be included, or amended so as to overcome the disagreement	Likelihood of the concern being addressed during Examination	RAG	Applicants' Comment
Development Consent Order (DCO)						
RR-039: NE1	Maximum piling parameters not secured	The DCO does not contain any restriction of the maximum hammer energy used during piling. This is a key metric for the noise impact to marine mammals and sensitive fish species.	The maximum limit assessed should be appropriately secured in the deemed Marine Licences (dMLs).	Likely Subject to this condition being secured		The Applicants acknowledge this comment and will make appropriate updates to the Deemed Marine Licences (dMLs) to reflect the comments made by Natural England.
RR-039: NE2	Deployment of cable protection	The DCO does not contain an end date for deployment of cable protection for within and outside of designated sites. Our standard advice is that cable protection should only be deployed for a maximum period of 10 years from the commencement of operations. Within any designated sites for benthic features, it should be stipulated that there should be no deployment of cable protection after the completion of construction.	Include a condition limiting the deployment of cable protection outside of designated sites to within 10 years of the completion of construction, and inside designated sites such as Dogger Bank SAC, no cable protection may be deployed after the completion of construction.	Likely Subject to this condition being secured.		In the Applicants' response to the MMO's relevant representation (see section 4.6 of **The Applicant's Responses to Relevant Representations** [PDA-013]), the Applicants confirmed that the **Outline Offshore Operations and Maintenance Plan** (OOOMP) [APP-248] will be updated to clarify that a separate marine licence, or licences, will be sought during operation for the deposit of new cable and scour protection (i.e. in areas where no protection was installed during construction). It is envisaged that these applications would cover 10 year periods post-construction. For clarity, it is intended that no new marine licences will be sought for any additional or replenishment protection required during the operational phase in areas that were protected as part of construction, unless such protection would exceed the maximum amounts authorised by the DMLs. The Applicants are of the opinion that a distinction should not be drawn in protection maintenance licencing terms between areas within or beyond any Marine Protected Areas as long as any future protection levels fall below the worst case scenario levels assessed within the ES and the Report to Inform Appropriate Assessment (RIAA). The impacts of this protection will be compensated for as part of the Dogger Bank South (DBS) benthic Special Area of Conservation (SAC) compensation proposals. The effects of such protection will have been comprehensively assessed as a permanent effect and compensated for through the DBS Development Consent Order (DCO) consenting process and further assessment and compensation discussions would be neither proportionate or necessary. If additional cable protection for maintenance purposes was required beyond the maximum limits authorised by the DMLs then a separate marine licence or licences would be required. Each DML includes a condition relating to the production of cable and scour (if appropriate) reports at the end of construction. In fulfilment of this condition the Applicants must provide a report detailing where protection

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						was laid during the construction campaign. The details presented in these reports would delineate the end of the construction period from a cable and scour protection perspective. Additional wording will be added to the relevant DML conditions requiring these reports to be updated where replenishment protection is deposited during the operational period.
Marine Physical Environment						
RR-039: NE3	Cable protection - nearshore	Natural England is concerned that cable protection in the nearshore could disrupt longshore sediment transport and impact features of the Holderness Inshore MCZ, Humber Estuary SAC and Smithic Bank.	A commitment should be made to avoid the placement of external cable protection within shallow nearshore water (i.e. within the 10m depth contour), or alternative methods of cable burial should be explored to remove the need for cable protection between mean low water springs and the 10m contour.	Potential resolution This is subject to the Applicant securing the advised commitment		The Applicants' position is that any Offshore Export Cables associated with the Projects will be buried beneath the intertidal zone at the landfall, and 350m seaward of mean low water spring (MLWS). No seabed cable protection will be used within these areas. Cable protection will be limited to 10% of the cumulative length of all cables laid between 350m seaward of MLWS and the 10m depth contour as measured against the lowest astronomical tide before the commencement of construction. This is secured in condition 3 of the dMLs 3 and 4 of the **Draft DCO** [APP-027]. The final locations and volumes of cable protection will not be known until later in the project development cycle. The assessment presented in section 8.7.4.5 of **Chapter 8 Marine Physical Environment** [APP-080], which identified no likely significant effects in EIA terms, is based on the application of these embedded mitigation measures, with the receptors assessed being informed by the Benthic Ecology and Physical Processes Expert Topic Group (ETG) held on 29th January 2024 (see record of the minutes from this meeting in **Appendix F1 - Minutes of meetings – ETG** [APP-043]. Hallermeier (1978)[2] is used to calculate closure depth based on a formula in the paper using wave height (in this case average significant wave heights recorded by the Hornsea buoy) and period in the nearshore zone. It is an established method, which takes account of locally derived parameters and has been used widely for analysis of the effective seaward boundary of wave-driven sediment transport. Using data input to this equation at the landfall this would typically be in around 6m of water, which is approximately 860m from the base of the cliffs.
RR-039: NE4	Cable protection - Dogger Bank SAC	The presence of cable protection measures on Dogger Bank (and within Dogger Bank SAC) could modify the hydrodynamic regime and affect sediment transport pathways contributing to the ecological 'halo effect'. See NE10.	Natural England advises that further justification is needed for the volumes of predicted external cable protection within Dogger Bank SAC.	Likely Subject to the Applicant providing further evidence.		With regards to the potential 'halo effect', the Applicants note the concern, but considers it unreasonable to raise at this stage of the process. Natural England has had the opportunity to raise what is essentially an additional impact at Scoping and Screening (in 2022), Section 42 (in 2023) or during any of the ETG consultation since 2022. The Applicants note that this impact was never raised in relation to the conclusions of the Plan Level Habitats Regulations Assessment (HRA) or in any of the Steering Group meetings for

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						the Strategic Plan (**Round 4 Dogger Bank Strategic Compensation Plan** [APP-060]). The Applicants are not aware that this impact has been discussed historically with regard to offshore wind and notes that if this is an emerging concern, it has not been raised in any relevant representations produced by Natural England in relation to other Round 4 or Extension projects submitted within the last 12 months. With regard to the substance of the concerns, the Applicants note the following from the paper cited by Natural England (Reeds *et al.* 2018)[3] (Applicants' emphasis): A number of studies have examined the effects of artificial and natural reefs on surrounding infauna (Ambrose and Anderson, 1990; Barros *et al.*, 2001; Davis *et al.*, 1982; Fabi *et al.*, 2002; Fukunaga and Bailey-Brock, 2008; Posey and Ambrose, 1994; Wilding, 2006; Zalmon *et al.*, 2012, 2014). **However, results of such investigations are widely variable in terms of the patterns described and the mechanisms proposed to be driving them.** Some studies observe a decline in infaunal abundance and species richness within close distances (e.g. several metres) of the artificial structures (Davis *et al.*, 1982; Wilding, 2006), while others observe enhanced species richness, abundance or biomass of certain species close to the reef (Davis *et al.*, 1982). These effects can also extend over large distances i.e. up to 200 m (Davis *et al.*, 1982). **In some cases, no significant effects at all on benthic infauna were detected** (Fukunaga and Bailey-Brock, 2008; Zalmon *et al.*, 2012). The conclusions highlight that: Comparisons with other studies has shown that the effects of Artificial Reefs (ARs) on soft sediments can vary depending on the type of structure and location, highlighting a requirement for site specific investigations. The evidence is therefore equivocal at best. The Applicants have undertaken their assessments in line with standard advice, the advice received from stakeholders throughout the development of the Projects in addition to best practice. With the above in mind, the Applicants are of the opinion that halo effects should not be considered any further. The scale of impacts from cable installation and cable protection is fully justified within the worst case Table 6-3 within the **Report to Inform Appropriate Assessment (RIAA) HRA Part 2 of 4** [APP-046]). Appendix J-1 of the Round 4 Plan Level HRA[31] assumed a maximum 10% of cable length requiring protection within the Dogger Bank SAC. Due to the

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						Projects array cable and Inter-Platform Cable layouts not yet being finalised at the time of submission, it was required to assess a potential worst-case distance of cabling that may require external cable protection measures. As such, to ensure the parameters assessed did not exceed those detailed within the Round 4 Plan Level HRA and to ensure the absolute worst case was assessed, this 10% of cable length requiring protection within the Dogger Bank SAC footprint was chosen. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The Examining Authority (ExA) was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Design Change 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the reduction in number of offshore platforms and reduction in cabling required in the Array Areas. Such changes would reduce the footprint of infrastructure and cable requirement on the seabed. Although the quantum of impact will be reduced the significance will remain the same.
RR-039: NE5	Flamborough Front	The presence of the Dogger Bank South Arrays (alone and in combination with other nearby offshore wind farms) could impact circulation, stratification, mixing, and sediment resuspension in the water column. This could in turn, cause changes to the Flamborough Front which could have far-reaching and long-term consequences for the wider marine ecosystem	Natural England advises that the Applicant should monitor potential changes to stratification, currents, and primary productivity during pre-construction, post-construction, and for the lifetime of the Projects.	Potential resolution This is subject to the In-Principle Monitoring Plan being updated.		As noted in section 8.7.4.3 (Changes to Water Circulation (Flamborough Front) due to the Presence of Infrastructure (Wind Turbines and Offshore Platforms)) of **Chapter 8 Marine Physical Environment** [APP-080], the structures could potentially create turbulent wakes at a local foundation scale which could locally change tidal mixing processes which may locally perturb the Flamborough Front and across the width of the array areas. However, the Flamborough Front is a strongly stratified regional feature in spring and summer and the high buoyancy forces associated with the stratification would not be destabilised by the local and relatively small turbulent wakes generated in the near field of each foundation. The North Sea within and around the array areas is stratified for less than 40 days a year and they are within a region categorised as intermittently stratified. The nearest seasonally stratified region (stratified for greater than 120 days) is located 17km west of the array areas. The Flamborough Front

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						may be present occasionally at the array areas, but for most of the time the water is well-mixed. With minimum spacings of 830m between monopile foundations across the array, it is unlikely that wake to wake interactions would occur, and individual wakes would remain independent of each other and quickly dissipate away from each foundation (in the order of minutes and tens to hundreds of metres). Given that the Flamborough Front is highly dynamic and ephemeral landscape-scale feature, it would not be affected by localised, small-scale changes in water column turbulence induced by individual near-field wakes at foundation locations, especially if the strength of stratification (due to buoyancy forces) was sufficient to overcome any increased mixing. Based on this, no monitoring is proposed to be undertaken for changes to stratification, currents, and primary productivity.
Benthic and Intertidal Ecology						
RR-039: NE6	Worst case habitat loss – Dogger Bank SAC	The Applicant has not considered the potential for changes to the physical and/or biological structure and function of Annex I sandbank beyond the footprint of the planned infrastructure. We are particularly concerned that secondary 'ecological halo' effects could be combined, resulting in broadscale changes in the benthic habitats and communities across the wider DCO area and a significant proportion of Dogger Bank SAC.	A robust assessment is needed of the potential Worst-Case area of impact on benthic communities within Dogger Bank SAC, and the nature and scale of that impact, as a result of changes to physical and biological process following the placement of structures and cable/scour protection on the seabed.	Likely This is subject to the Applicant providing an updated assessment		The Applicants note the concern, but considers it unreasonable to raise at this stage of the process. Natural England has had the opportunity to raise what is essentially an additional impact at Scoping and Screening (in 2022), Section 42 (in 2023) or during any of the ETG consultation since 2022. The Applicants note that this impact was never raised in relation to the conclusions of the Plan Level HRA or in any of the Steering Group meetings for the Strategic Plan (**Round 4 Dogger Bank Strategic Compensation Plan** [APP-060]). The Applicants are not aware that this impact has been discussed historically with regard to offshore wind and notes that if this is an emerging concern, it has not been raised in any Relevant Representations produced by Natural England in relation to other Round 4 or Extension projects submitted within the last 12 months. With regard to the substance of the concerns, the Applicants note the following from the paper cited by Natural England (Reeds *et al,* 2018) (Applicants' emphasis). A number of studies have examined the effects of artificial and natural reefs on surrounding infauna (Ambrose and Anderson, 1990; Barros *et al.*, 2001; Davis *et al.*, 1982; Fabi *et al.*, 2002; Fukunaga and Bailey-Brock, 2008; Posey and Ambrose, 1994; Wilding, 2006; Zalmon *et al.*, 2012, 2014). **However, results of such investigations are widely variable in terms of the patterns described and the mechanisms proposed to be driving them.**

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						Some studies observe a decline in infaunal abundance and species richness within close distances (e.g. several metres) of the artificial structures (Davis *et al.*, 1982; Wilding, 2006), while others observe enhanced species richness, abundance or biomass of certain species close to the reef (Davis *et al.*, 1982). These effects can also extend over large distances i.e. up to 200 m (Davis *et al.*, 1982). **In some cases, no significant effects at all on benthic infauna were detected** (Fukunaga and Bailey-Brock, 2008; Zalmon *et al.*, 2012). The conclusions highlight that: Comparisons with other studies has shown that the effects of Artificial Reefs (ARs) on soft sediments can vary depending on the type of structure and location, highlighting a requirement for site specific investigations. The evidence is therefore equivocal at best. The Applicants have undertaken their assessments in line with standard advice, the advice received from stakeholders throughout the development of the Projects in addition to best practice. With the above in mind, the Applicants are of the opinion that halo effects should not be considered any further.
RR-039: NE7	Cable protection - decommissioning	The Applicant has not committed to the removal of cable and scour protection within the Dogger Bank SAC at the point of decommissioning. This will cause permanent loss of the designated sandbank feature.	In line with recent Secretary of State Decisions for OWF NSIPs the Applicant should commit to removing all on and above seabed infrastructure at the point of decommissioning. This should be secured in the DCO and an outline Decommissioning Plan.	Potential resolution This is subject to the Applicant securing the advised commitment		The Applicants acknowledge this comment. The Applicants understand the sensitivities of the benthic habitats of the Offshore Development Area. In recognition of these sensitivities the Applicants have committed to embedded mitigation to minimise use of scour and external cable protection where practicable. Cable and scour protection methods and designs will be developed post-consent. The Applicants will give due consideration to the use of removable cable and scour protection measures during the detailed design stages of the Projects post-consent.
RR-039: NE8	Volumes of cable protection	The methods used to determine the amount of cable protection and any associated lasting loss/change of Annex I sandbank habitat within Dogger Bank Special Area of Conservation (SAC) are neither comprehensive nor transparent. It is therefore unclear how realistic the Maximum Design Scenario (MDS) is.	Further justification is needed for the volumes of predicted external cable protection in the Project Envelope.	Likely Subject to the Applicant providing further evidence.		The scale of impacts from cable installation and cable protection is fully justified within the worst case Table 6-3 within the Report to Inform Appropriate Assessment (RIAA) (**RIAA Habitats Regulations Assessment (HRA) Part 2 of 4** [APP-046]). Appendix J-1 of the Round 4 Plan Level HRA[4] assumed a maximum 10% of cable length requiring protection within the Dogger Bank Special Area of Conservation (SAC). Due to the Projects' array cable and Inter-Platform Cable layouts not yet being finalised at the time of submission, it was required to assess a potential worst case distance of cabling that may require external cable protection measures. As such, to ensure the parameters assessed did not exceed those detailed within the Round 4 Plan

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						Level HRA and to ensure the absolute worst case was assessed, this 10% of cable length requiring protection within the Dogger Bank SAC footprint was chosen. Additionally, the Applicants are in the process of preparing a change request relating to the relevant design parameters. The Examining Authority (ExA) was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the removal of all platforms from the Offshore Export Cable Corridor, reductions in the number of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas. The change request will be supported by the **Request for Design Change – Environmental Assessment Update** [document reference C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. These factors, if the change request is accepted, may result in changes to the values discussed above. However, although the quantum of impact will be reduced the significance of effect will remain the same.
RR-039: NE9	Mitigation	This mitigation included for sediment deposition is insufficient, particularly where there could be direct or indirect effects on Dogger Bank SAC or priority habitats.	Natural England advises that further mitigation options should be committed to by the Applicant.	Likely		Responses to Natural England's points on mitigation are provided through **Table 2.3.1** and **Table 2.4.1**.
Benthic Compensation						
RR-039: NE10	Alignment between strategic and project-led compensation	Compensatory measures proposed by the Applicant as part of their project level derogation case are expected to align with the measures and approach outlined in the Dogger Bank Strategic Compensation Plan (DBSCP) and be secured as a requirement of the DCO. However, the DBSCP and the project compensation do not align, with	Natural England advise that the DCO should secure compensation for both habitat loss and damage to Annex 1 sandbank.	Likely Subject to this being secured in the DCO		The compensation measures presented in **Appendix 3 - Project Level Dogger Bank Compensation Plan** [APP-059] do align with those presented in **Round 4 Dogger Bank Strategic Compensation Plan** [APP-060], in terms of the measures proposed. However, the Applicants consider that habitat damage was not adequately assessed within the Plan Level HRA and submits that this should not be included within the effects considered to result in Adverse Effect on Integrity within the RIAA (**RIAA HRA Part 2 of 4** [APP-046]) – see section 6.4.2.1.1. The **Round 4 Dogger Bank Strategic Compensation Plan** [APP-060] states the following (paragraph 3.1.4) (noting that although the following is

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		damage to sandbanks being excluded from the compensation requirements.				described as recovery from loss the text appears in relation to habitat damage) 'Recovery from habitat loss would not occur until decommissioning has been completed, and, may take 10-25 years (based on Natural England's advice)'. Natural England were asked by the Applicants during The Crown Estate strategic compensation Steering Group meetings to provide evidence for this position, and none has been provided to date. The advice provided ***Annex C1 - In relation to consideration of small-scale habitat loss within Special Areas of Conservation (SACs)*** does not present any quantitative evidence on either physical or temporal scale of damage effects. The Applicants have provided evidence for its case as signposted above and has provided additional evidence (including survey from the constructed Dogger Bank B project) in **Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [document reference: 10.44], which was submitted to the Planning Inspectorate on 7th November 2024. In summary, the Applicants consider that Natural England's position does not take account of the speed of recovery, which, the Applicants submit, is more rapid than suggested in their advice.
Fish and Shellfish Ecology						
RR-039: NE11	Spawning habitat loss - sandeel	The full scale of potential sandeel spawning habitat loss and/or change has not been assessed.	A robust assessment is needed of the potential worst-case area of impact on spawning habitat along the ECC and within Dogger Bank SAC sandbank feature, including the nature and scale of impact as a result of changes to physical and biological processes following the placement of structures and cable/scour protection on the seabed, and implications at a localised population level.	Likely This is subject to the Applicant providing an updated assessment		Whilst it is acknowledged that 34.85% of high potential sandeel habitat within the Dogger Bank Special Area of Conservation (SAC) has been indicated to fall within offshore wind farm array areas (not limited to those associated with the Projects), it must be acknowledged that the present of these array areas is not equitable to a potential loss in habitat (**Appendix B - Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050]). Rather, the potential loss / change of sandeel potential habitat should be determined based only on values provided within the assessment of Permanent Loss of Habitat and / or Change in Habitat Type as a Result of Changes in Substrate Composition, presented in section 10.6.2.6. of the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]). A worst case scenario associated with the development of the Projects determines a loss of habitat of 4.19km^2, across the Offshore Development Area, comprising both the Array Areas (2.05km^2) and the Offshore Export Cable Corridor (2.14km^2). Assuming a worst case scenario in which all permanent habitat loss associated with the development falls within areas of high potential sandeel habitat, this will result in a loss of 0.0008% of the high sandeel potential habitat within the Dogger Bank SAC (5049.7km^2).

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						It should be noted that revised sandeel potential habitat will be presented within the **Heat Mapping Report** [document reference 10.43] based on the MMO-approved Reach *et al.* (2024) methodology. This report will be submitted in late November 2024. A nominal assessment of Unexploded Ordnance (UXO) clearance impacts is included within the assessment of underwater noise impacts within section 10.6.1.4., with specific impact ranges relating to UXO presented in Table 10-23 of **Chapter 10 Fish and Shellfish Ecology** [APP-091]. Discussions regarding the "ecological halo effect" were not raised during previous rounds of comments, or at expert technical group meetings undertaken prior to Development Consent Order (DCO) submission. Potential impacts as a result of the developments as determined in collaboration with stakeholders and regulators are presented within the ES. See the Applicants' response to RR-039: C6 in **Table 2.4.1** for further details on this matter. Worst case scenarios have been used to determine the potential impact to potential habitat and spawning grounds of sandeel and herring respectively. This includes the use of the highest potential use of cable protection, as described within section 10.6.2.6. of **Chapter 10 Fish and Shellfish Ecology** [APP-091]. Additionally, the Applicants are in the process of preparing a change request relating to the relevant design parameters. The Examining Authority (ExA) was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the removal of all platforms from the Offshore Export Cable Corridor, reductions in the number of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas. The change request will be supported by the **Project Change Request – Environmental Assessment Update** [document reference C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. These factors, if the change request is accepted, may result in changes to the values discussed above. It should be noted that the Applicants' proposed changes to the Projects' Design Envelope, if accepted by the ExA, would reduce the footprint of habitat loss within the Offshore Development Area to approximately 3.78km² (1.7km² within the Array Areas and 2.08km² within the Offshore Export Cable Corridor). The changes will be summarised in the **Project**

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						Change Request 1 – Environmental Assessment Update [document reference C1.1] which will be submitted with the change request in early January 2025.
RR-039: NE12	Indirect effects on seabirds and marine mammals – RIAA conclusions	Natural England disagrees that impacts on mobile designated site interest features (i.e. seabirds from FFC SPA and harbour porpoise in SNS SAC) can be ruled out based solely on no significant impacts being concluded at a regional population level in the EIA assessment for forage fish species. The RIAA assessment has also only considered direct construction impacts on prey availability rather than the operational impacts of spawning habitat loss.	Assessments on herring and sandeel should be considered at a biologically relevant population level and should include loss and/or change of spawning habitat throughout the lifetime of the project. The implications on prey abundance and distribution within the foraging areas of Annex I and Annex II species from designated sites should be assessed.	Partial resolution likely Subject to the Applicant providing an expanded assessment. However, uncertainties will likely remain that are beyond the ability of the project to address. If impacts to designated site features cannot be ruled out, consideration may need to be given to addressing the wider ecosystem functionality of sandbanks within derogation proposals.		Indirect effects to predators such as marine mammals due to changes to prey have been assessed in sections 11.6.1.7 and 11.6.2.6 of **Chapter 11 Marine Mammals** [APP-095]. Due to the wide foraging ranges of marine mammals the significance was assessed as negligible or minor adverse, therefore Not Significant in EIA terms. Impacts upon prey are considered in the Plan Level HRA (RIAA Appendix I Marine Mammal Array Assessment Part 2; The Crown Estate, 2022[35]) under the following pressures P1 Habitat Loss / Gain, P2 Direct Physical Damage and P3 Indirect Physical Damage. The HRA concludes that: The effect of this habitat loss will be to reduce the area available for foraging and also the extent of habitat for species which form prey. However, all marine mammal species forage widely within the marine environment and the predicted loss of habitat represents a very small proportion of the foraging habitat available. Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. Damage to physical habitats could affect prey species, or benthic communities upon which these are dependent. However, all marine mammal species forage widely within the marine environment and the predicted loss of habitat represents a very small proportion of the foraging habitat available. Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. The Habitats Assessment (Appendix J) notes that indirect physical damage cannot be quantified at present but some effects are expected. Based on evidence presented in Appendix J which suggests that such effects will be relatively localised and generally accounted for within areas attributed to habitat loss it is considered that the scale of effects will not be significant in the context of possible impacts upon supporting habitats for marine mammals. Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. Although the overall effect of habitat loss will be to reduce the area available for foraging and the extent of habitat for prey species, habitat loss effects will be negligible given the small proportion of habitat occupied by

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						the structures compared to the large foraging ranges of the protected features, as indicated by the distances used in relation to screening. Similarly, although offshore wind structures may provide new foraging opportunities for some species (e.g. Clausen *et a*l, 2021[27]; Russel *et al*, 2014[28]) habitat gain effects are expected to be negligible in the context foraging ranges. Impacts upon prey are also considered in the Plan Level HRA (RIAA Appendix H – Ornithology Array Assessment Part 2; The Crown Estate, 2022[38]) under the following pressures P1 Habitat Loss / Gain, P2 Direct Physical Damage and P3 Indirect Physical Damage. In all cases the HRA concludes that: "All seabird species screened in forage widely within the marine environment and the predicted area of habitat damaged represents a very small proportion of the foraging habitat available. Any impact is, therefore, considered to be negligible and would not make an appreciable difference to any in-combination impact." The Applicants consider there to be good evidence that seabird populations will be very little affected by any impacts on their prey, even during construction which is the period when there is the most risk of effects on prey species (and for which consideration was made in the assessment). For example, the impact of seabirds on their prey stock biomass is very small (estimated across five ecosystems to average about 1% of the primary forage fish being consumed by all seabird species (Saraux *et al.* 2020[39])). Furthermore, forage fish stock biomass varies enormously from year to year while seabird population sizes change much more slowly. Thus, two things are apparent from this: fish stock fluctuations are not caused by seabird population fluctuations and seabird populations are little affected by the inter-annual variations in their prey. Population fluctuations are typical of forage fish species because their survival is very low while recruitment varies very widely from year to year. These factors taken together therefore indicate that small changes in prey stock biomass, as assessed in the Fish and Shellfish assessment (**Chapter 10 - Fish and Shellfish Ecology** [APP-091]), will have undetectable effects on the seabird populations which prey on those stocks, and even if prey stocks are affected more widely than currently assessed, this would still not result in seabird population impacts.
RR-039: NE13	Baseline characterisation - sandeel abundance	Sandeel abundance data has not been used to characterise the importance of the array areas as potential sandeel habitat.	We advise that the Applicant should use sandeel abundance data (such as the North Sea Sandeel Survey) to characterise the importance	Likely This is subject to the Applicant providing an updated assessment		The sandeel heat maps provided indicate sandeel potential habitat, as opposed to sandeel potential spawning habitat, as described within Latto *et al.* (2013).

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			of the array areas as sandeel habitat and support the assessment of impacts on localised sandeel populations			Abundance data have significant limitations in sampling techniques (i.e. not all sandeels would be sampled in trawls and grabs, which in turn sample a limited spatial area compared to the full extent of potential habitat). Instead, sandeel presence data represents a sufficient confidence in an area of potential habitat in supporting sandeel. The **Heat Mapping Report** [document reference 10.43] to be submitted in late November 2024, utilises the Marine Management Organisation (MMO) approved Reach *et al.* (2024) methodology, which includes OneBenthic sandeel presence data. This dataset indicates potential sandeel presence to a high degree of confidence. The use of drop-down video sandeel presence data has been included to ground-truth heat mapping results and has been used within the Environmental Statement (ES) (**Chapter 10 Fish and Shellfish Ecology** [APP-091]) as a supplementary, as opposed to a primary, dataset.
Marine Mammals						
RR-039: NE14	Southern North Sea SAC - harbour porpoise underwater noise impacts - Outline Site Integrity Plan (SIP)	Natural England is concerned that the SIP process is being exclusively relied on to address in-combination noise levels from multiple projects on SAC harbour porpoise in the post-consent phase. The Applicant has not committed to using Noise Abatement Systems (NAS) at this stage, increasing the risk that an adverse effect on site integrity (AEoI) cannot be avoided	The Applicant should commit to specific mitigation measures at this stage, particularly NAS, in the Outline Marine Mammal Mitigation Protocol and SIP, which can be removed at a later date if the revised SIP demonstrates they are not required.	Potential Resolution If changes can be made to the Outline MMMP, it is likely this issue can be resolved.		The Applicants acknowledge this comment and are considering additional mitigation methods such as Noise Abatement Systems (NAS) to reduce the impact area, should this be required once the final project design is available post-consent. This means NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters. Further responses regarding the Site Integrity Plan (SIP) and Marine Mammal Mitigation Protocol (MMMP) are presented in **Table 2.7.1** below.
RR-039: NE15	EIA/HRA conclusions	The conclusions are over-reliant on the outcomes of population modelling, and do not consider all assessments undertaken where higher impacts are indicated.	Assessments should be updated based on the highest predicted impact values, for all receptors and pathways, to inform the EIA and HRA conclusions. Where significant impacts cannot be ruled out, additional mitigation should be explored to avoid or reduce impacts.	Potential Resolution If the Applicant updates their EIA/HRA assessment it may be possible to resolve this issue		It should be noted that the different approaches to the assessments in sections 11.6.1.2 and 11.7.3 **Chapter 11 Marine Mammals** [APP-095] and sections 8.3.6.6.1.3; section 8.3.7.6.1.3 and section 8.3.8.6.1.2 of the **RIAA Habitats Regulations Assessment (HRA) Part 3 of 4** [APP-047] were provided to inform the worst case outputs used within the Interim Population Consequence of Disturbance (iPCoD) modelling rather than to assign significance. The Effective Deterrence Range (EDR) and dose response curve method tended to predict the greatest number of disturbed animals per pile. If the significance of effect is solely based on EDRs or dose response curve, this highlights the short-term disturbance only, therefore not considering any long term effects, or animals returning to the area after piling. Studies such as Benhemma-Le Gall *et al.* (2024)[50] and others

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						presented in section 11.6.1.2.1 of **Chapter 11 Marine Mammals** [APP-095] found that harbour porpoises and other marine mammals return to the area after piling and the current EDRs and dose response curves are potentially highly precautionary. It was the highest number of animals disturbed and the potential number of animals exposed to auditory injury (PTS) that were used as input parameters in the iPCoD modelling. In this way, the iPCoD modelling was used to understand the significance of the worst case related to disturbance and PTS numbers to the populations of relevance over the whole construction period and in the long term. In the case of disturbance, it was deemed that iPCoD gives the best potential to understand the likely consequences of disturbance to the populations in question. In relation to this, a change request is currently being prepared by the Applicants which amends some of the design parameters that feed into this assessment. The ExA was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the removal of the Electrical Switching Platform (ESP) from the Offshore Export Cable Corridor, reductions in the number of offshore platforms and overall reductions in cable lengths within the Array Areas. The proposed change request will be supported by a **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the Environmental Statement (ES) and the Report to Inform Appropriate Assessment (RIAA). This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts.
RR-039: NE16	Injury Zone for minke whale and harbour porpoise	The mitigation proposed by the Applicant is insufficient to mitigate the full piling injury zone for minke whale and harbour porpoise	The Applicant needs to demonstrate how the full injury zone will be mitigated, this could be through design changes or commitments to additional mitigation.	Potential Resolution If changes can be made to the Outline MMMP, it is likely this issue can be resolved.		The Applicants acknowledge this request and will add a section on the potential use of NAS as mitigation into the **Outline Marine Mammal Mitigation Protocol (MMMP)** [APP-249], which will be provided in late November. The Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.

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Offshore Ornithology						
RR-039: NE17	Assessment methodologies and EIA/HRA conclusions	Natural England cannot agree with the EIA or HRA conclusions presented due to several aspects of the assessment not being provided in line with SNCB guidance and/or Natural England advice given during the Evidence Plan Process (EPP) and/or our Best Practice Advice, these include: • baseline mortality rates and EIA reference populations • guillemot seasonality • gannet collision risk • approach taken to combining the impacts of the two arrays • apportioning approach for guillemot and razorbill • lack of, or incomplete in-combination assessments	Natural England advise that assessments in line with SNCB advice are provided in full, alongside the Applicant's preferred methodology. This advice has been provided during the EPP and repeated, where necessary, in Appendix G. Natural England will not be able to advise the Examination further on the ornithology impacts of the proposals until this material is provided.	Likely This is subject to the Applicant presenting assessments that are in line with SNCB advice.		The Applicants will provide a revised assessment in late November 2024 (**Offshore Ornithology EIA Update** [document reference 12.5] and **Offshore Ornithology RIAA HRA Update** [document reference 12.6]).
RR-039: NE18	Mitigation of likely very high impacts on seabirds	The baseline surveys indicate the potential for very high impacts on seabirds at both EIA and HRA scales. It is not clear how robustly ornithology impacts were factored in when designing the post-PEIR reductions of the array areas and whether further reduction could be undertaken to reduce impacts.	Further consideration should urgently be given to potential avoidance/ mitigation measures to reduce impacts on seabird features, such as array reductions, changes to design and layout of arrays, or increasing the hub height of turbines. Hotspot modelling of seabird densities and distributions in the study area may help to identify areas where impacts on seabird	Unlikely There is no guarantee this issue will be resolved within the Examination timeframe features are particularly high to inform an improved mitigation approach.		Mitigation relating to air gaps has been applied in accordance with the Round 4 Plan Level Habitats Regulation Assessment (The Crown Estate, 2022[4]) whereby, to reduce potential collisions with birds in flight (particularly kittiwakes), the clearance of the blades above the water was set ats a minimum 34m above mean sea level (MSL). This mitigation measure has been adhered to within the design envelopes of the Projects. As part of the progression of project design from the Preliminary Environmental Information Report to the application stage the array area boundaries were reduced and refined. A number of factors, including bird distribution data, were considered as part of the boundary refinement exercise. Density mapping data based on the site-specific aerial survey data was collated and examined to indicate areas within The Crown Estate lease options that showed higher and lower densities of birds, and this was used alongside other environmental and technical information to enact the boundary change. An outline of the factors considered in the boundary refinement exercise was presented as part of the minutes from the ornithology ETG meeting 6/2/24). The refinements to the array area

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						boundaries was, therefore, undertaken to help reduce impacts on important bird populations.
Ornithology Compensatory Measures						
RR-039: NE19	Agreed compensation levels – all measures	As noted above, it is not possible to agree the level of compensation required until impact assessments have been provided in line with SNCB advice. Additionally, the method for generating the required amount of compensation needs to be carried out in line with SNCB advice before it can be confirmed as sufficient.	See NE17. Once the impact assessment has been updated, the outputs should be used to generate compensatory requirements in line with SNCB advice.	See NE17.		Updates on the scale of compensation will be provided by the Applicants in late November 2024 following Ornithology EIA and ornithology HRA updates addressing comments raised in Relevant Representations in two documents: **Offshore Ornithology EIA Update** [document reference 12.5] and **Offshore Ornithology RIAA HRA Update** [document reference 12.6]. The Applicants are confident that the updated quantum of compensation can be accommodated by the sites identified in the **Guillemot and Razorbill Compensation Site Shortlist Refinement Report** [document reference 10.20] submitted on 29th October 2024 with the Applicants' response to the Examining Authority's Rule 9 and 17 letter dated 22nd October 2024 [PD-005].
RR-039: NE20	Location for predator eradication – FFC SPA guillemot and razorbill	A location or locations to deliver predator eradication is yet to be determined. Several sites on the Applicant's shortlist have previously been ruled out by other OWF projects, and feasibility studies have not been provided to demonstrate predator presence and auk habitat suitability at shortlisted sites. It is plausible that none of the short-listed locations are appropriate. It will not be possible to quantify the scale of compensation that might be achievable, and therefore if the impacts can be compensated, until a location or locations is identified.	Feasibility assessments for the shortlisted sites should be provided as a matter of urgency, to demonstrate the suitability of sites and the scale of compensation that could be delivered by the measure.	Potential resolution If the Applicant provides feasibility assessments for the shortlisted sites it might be possible to resolve this issue, but there is no guarantee a suitable site will be found.		The Applicants have undertaken a significant amount of work with regards to the shortlisted locations, including site surveys and landowner consultation. These studies have identified locations suitable for delivery of the compensation measure, whereby auk colonies have been identified where rats are confirmed as present, and there is additional available habitat for auks to colonies and where there is landowner appetite for predator eradication. The Applicants are in discussions with landowners to agree access for pre-eradication survey work, and to secure sites. Further details on location are provided in the **Guillemot and Razorbill Compensation Site Shortlist Refinement Report** [document reference 10.20] and the updated **Guillemot [and Razorbill] Compensation Plan** [APP-056] which were submitted on 29th October 2024 with the Applicants' response to the Examining Authority's **Rule 9 and 17 Letter** [PD-005] dated 22nd October 2024.
Air Quality – Onshore habitats						
RR-039: NE21	Air quality impacts to international and national designated sites	Air quality impacts to designated sites have been assessed using JNCC decision making thresholds. However, NE does not currently accept the use of this document. We	Assessment of air quality impacts to international and national designated sites should be undertaken using the thresholds included in	Likely This issue could be progressed with provision of an updated air quality assessment.		This has been addressed separately in **Annex A Technical Note: Comparison of Approaches using the Natural England Guidance NEA001 and JNCC Guidance (for NE RR Appx I)**. Natural England has reviewed the technical note prior to its submission to the Examining Authority and concurs with the findings. The **RIAA HRA Part 2 of 4** [APP-046] will be

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	due to construction traffic emissions.	therefore advise that the modelling that has been undertaken for the pollutants should be tested against NE's thresholds for impacts due to air emissions from traffic, as detailed in the guidance document NEA001.	Natural England's published guidance document NEA001.	Natural England and the Applicant are in active discussion regarding this approach through NE's DAS service.		updated to reflect the findings of the technical note, as requested by Natural England and will be submitted prior to the start of examination.

2.2 Responses to Appendix A DCO

Table 2.2.1 Applicants' responses to Natural England's Appendix A DCO

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: A1	N/A	The Development Consent Order (DCO) does not contain any restriction of the maximum hammer energy used during piling. This is a key metric for the noise impact to marine mammals and sensitive fish species. The maximum limit assessed should be appropriately secured in the deemed Marine Licences (dMLs).	Update the dML to include the maximum hammer energy to be used during piling of monopiles and pins.		The Applicants acknowledge this comment and will make appropriate updates to the Deemed Marine Licences (DMLs) to reflect the comments made by Natural England.
RR-039: A2	N/A	Natural England notes that the dMLs require a significant volume of pre-construction documentation to be submitted. The timing requirements require that this all be submitted 4 months prior to works. Please note this requirement covers 5 dMLs and should works commence simultaneously, five sets of documentation submitted in an overlapping period.	Natural England requests this time period be extended to six months.		The Applicants acknowledge this comment. As stated in the Applicants' response to the Marine Management Organisation's (MMO's) relevant representation (see section 4.6 of **The Applicant's Responses to Relevant Representations** [PDA-013]), the Applicants' position is that the submission of certain plans for approval at least four months prior to commencement of operation of licensed activities is appropriate and precedented (for example Hornsea Four and East Anglia One North Offshore Wind Farms (OWFs)). Notwithstanding that, the Applicants have confirmed that they will seek to agree the relevant timescales for submission of documentation with the MMO and will update the Examining Authority (ExA) once those discussions have taken place.
RR-039: A3	N/A	The Development Consent Order (DCO) does not contain an end date for deployment of cable protection for within and outside of designated sites. Natural England'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. Within any designated sites for benthic features, such as the Dogger Bank SAC, the condition should stipulate that there should be no deployment of cable protection after the completion of construction.	Natural England requests the inclusion of a condition limiting the deployment of cable protection outside of designated sites to within 10 years of the completion of construction, and inside designated sites such as Dogger Bank SAC, no cable protection may be deployed after the completion of construction. Agreement should also be sought on what is meant by completion of construction.		In the Applicants' response to the MMO's relevant representation (see section 4.6 of **The Applicant's Responses to Relevant Representations** [PDA-013]), the Applicants confirmed that the **Outline Offshore Operations and Maintenance Plan (OOOMP)** [APP-248] will be updated to clarify that a separate marine licence, or licences, will be sought during operation for the deposit of new cable and scour protection (i.e. in areas where no protection was installed during construction). It is envisaged that these applications would cover 10 year periods post-construction. For clarity, it is intended that no new marine licences will be sought for any additional or replenishment protection required during the operational phase in areas that were protected as part of construction, unless such protection would exceed the maximum amounts authorised by the DMLs. The Applicants are of the opinion that a distinction should not be drawn in protection maintenance licencing terms between areas within or beyond any Marine Protected Areas as long as any future protection levels fall below the worst case scenario levels assessed within the Environmental Statement (ES) and the Report to Inform Appropriate Assessment (RIAA). The impacts of this protection will be compensated for as part of the Dogger Bank (DBS) South benthic Special Area of Conservation (SAC) compensation proposals. The effects of such protection will have been comprehensively assessed as a permanent effect and compensated

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					for through the DBS DCO consenting process and further assessment and compensation discussions would be neither proportionate or necessary. If additional cable protection for maintenance purposes was required beyond the maximum limits authorised by the DMLs then a separate marine licence or licences would be required. Each DML includes a condition relating to the production of cable and scour (if appropriate) reports at the end of construction. In fulfilment of this condition the Applicants must provide a report detailing where protection was laid during the construction campaign. The details presented in these reports would delineate the end of the construction period from a cable and scour protection perspective. Additional wording will be added to the relevant DML conditions requiring these reports to be updated where replenishment protection is deposited during the operational period.
RR-039: A4	Article 1 Para 1 Interpretations Page 8	Natural England notes that the works permitted under definition of maintain are not linked or limited to the outline Offshore Operations and Maintenance Plan (OOOMP) or those assessed in the environmental statement. We consider that these works should be restricted to those that have been assessed and consented and the definition should clearly demonstrate this. This comment applies to schedules 10-14 where similar provisions are recorded, for brevity we will not repeat the comments.	The definition of maintain should be amended to show a clear linking to the OOOMP or Environmental Statement.		The Applicants do not consider that the wording within the definition of "maintain" in the **Draft DCO** [APP-027] and in each DML in Schedules 10 - 14 of the **Draft DCO** [APP-027] needs to be updated. The purpose of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 is to identify the likely significant environmental effects that will arise from a project. That facilitates the relevant decision maker making an informed decision on the likely effects of the project before they grant or refuse consent. The detail in an ES is not intended to be wholly prescriptive. That is not how the Environmental Impact Assessment (EIA) regime operates. In undertaking an EIA, a developer has to make certain assumptions about how the project will be undertaken, particularly in respect of the operation and maintenance phase. Key parameters that underpin the assessment will then be included in the final Offshore Operations and Management Plan. Where relevant, these key parameters relating to issues including, but not limited to, numbers of maintenance vessel movements, cable repair quantities, remedial cable protection quantities and number of jack-up activities have been included within the worst case scenario tables across ES chapters and within the assessments of operations and maintenance activities.
RR-039: A5	Article 1 Para 1 Interpretations Page 9	The definition of Natural England should be removed and all references to Natural England throughout the DCO should be amended to the Relevant Statutory Nature Conservation Body (SNCB). This is to ensure consistency with other DCOs and to future proof the DCO against any changes to Natural England's name or function. See wording used in the East Anglia Two DCO, for example.	References to Natural England should be replaced with 'the Relevant SNCB'.		The Applicants acknowledge this comment and will make appropriate updates to the DMLs to reflect the comments made by Natural England.
RR-039: A6	Schedule 2 Part 1	This requirement details the provision of landscaping. Natural England notes that Requirement 10 (2) lists the expected aspects to be detailed in the landscape	Update the wording to include monitoring and maintaining of the landscaping works.		The **Outline Landscape Management Plan** [APP-236] describes the landscape maintenance recommendations at section 1.7. It makes clear that the success of planting will be monitored for five years after implementation and that any damaged or diseased plants will be replaced during that period. A maintenance schedule is included as Table 1-5 of that document. As per

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
	Requirement 10 Page 61-62	management plan. We would note that the requirement for monitoring and maintaining of the landscaping works should also be secured here.			requirement 10 of the **Draft DCO** [APP-027], a written landscape management plan for each phase of the onshore works must be agreed with the relevant planning authority prior to commencement of the relevant phase, and these must be in accordance with the **Outline Landscape Management Plan** [APP-236]. Requirement 11 of the **Draft DCO** [APP-027] provides that the landscaping works must then be carried out in accordance with any landscape management plan approved under requirement 10. Requirement 11 also secures replacement of damaged or diseased plants within the five year maintenance period, in accordance with the **Outline Landscape Management Plan** [APP-236]. Because requirement 11 already deals with maintenance of landscaping, and because the **Outline Landscape Management Plan** [APP-236] contains the relevant monitoring details, the Applicants' position is that it is not necessary to update requirement 10 of the **Draft DCO** [APP-027] as requested.
RR-039: A7	Schedule 2, Part 1, Requirement 19	This requirement details the need for a Code of Construction Practice (CoCP) to be submitted to the LPA prior to commencement of the works, and for Natural England to be consulted on this document. We welcome this requirement. However, we advise the wording of this requirement should be updated to specifically state which environmental topics will be included within the CoCP and that paragraph (4) of this requirement should be amended to note that the relevant SNCB will be consulted by the relevant planning authority prior to the approval of any pre-commencement screening and fencing works.	We advise that the requirement wording is updated to state which environmental topics will be included within the CoCP and that paragraph (4) be amended to note that the relevant SNCB will be consulted by the relevant planning authority prior to the approval of any pre-commencement screening and fencing works. The production of the final soil management plan is not secured in the DCO wording. We advise this could be included within this requirement.		The Applicants do not agree that there is a need to list the different environmental topics that will be included within any final Code of Construction Practice (CoCP) in requirement 19 of the **Draft DCO** [APP-027]. The **Outline Code of Construction Practice (OCoCP)** [APP-234] includes construction mitigation from all onshore ES **Chapters 18** to **30** [APP-140 to APP-225]. Section 5 sets out the general site operation measures and section 6 the management of onshore environmental issues for each of the relevant environmental topics. Table 3-1 of the **OCoCP** [APP-234] also describes the outline documents that form appendices to the **OCoCP** [APP-234]. Because any final CoCP submitted and approved under requirement 19 must accord with the **OCoCP** [APP-234], it is implicit that the listed documents in Table 3-1 and environmental topics included in section 6 of the **OCoCP** [APP-234] will also be included within or, appended to any final CoCP. It is therefore not necessary to update the wording of requirement 19. The Applicants note Natural England's request to be included as a consultee in requirement 19(4) of the **Draft DCO** [APP-027] and will make this amendment in the **Draft DCO** [APP-027].
RR-039: A8	Schedule 2 Part 1 Requirement 32 Page 69	This requirement secures the Biodiversity Net Gain requirements of the project. However, we note that no time period is given for the duration of which the strategy should be monitored, maintained or when adaptive management measures may be implemented. Natural England advises the requirement should ensure the strategy is enforced for a period of thirty years, or for the lifetime of the development. It is also our recommendation that the project should aim for 10% BNG.	We welcome the commitment to secure BNG for this project and advise that the need to secure the BNG for a minimum of 30 years should be reflected in the DCO wording. We also encourage the delivery of minimum 10% BNG to be secured in the DCO wording.		The Applicants confirm that, as per paragraph 130 of the **Outline Biodiversity Net Gain (BNG) Strategy** [APP-157], the final BNG Strategy, which must be submitted and approved in accordance with requirement 32 of the **Draft DCO** [APP-027], will include: • A finalised metric calculation to assess the on-site net change in biodiversity and the requirements to deliver a net gain; • Details of the on-site and off-site measures to deliver no net loss, or where possible a net gain; and • Details of how compensation will be legally secured, managed and monitored for a minimum 30 year period. The Applicants do not believe it is necessary to update the wording of requirement 32 when this detail is already included in the **Outline BNG Strategy** [APP-157], with which the final BNG Strategy must accord.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					The Applicants acknowledge the recommendation to aim for a 10% BNG. Although there is not legal requirement for a Nationally Significant Infrastructure Project (NSIP) at present to achieve this, the Applicants will seek to achieve a net gain where possible, when preparing the final BNG Strategy and have committed to no net loss.
RR-039: A9	Schedule 10 General point	All comments raised on Schedule 10 also apply to Schedules 11-15 where similar conditions apply. For brevity we will not repeat comments and will only provide comments on Schedules 11-14 in conditions that differ from those provided on Schedule 12.	N/A		The Applicants note Natural England's comments. Unless specified otherwise, the Applicants' responses reference the relevant provisions of Schedule 10 but apply equally to Schedules 11 – 15 where similar conditions apply.
RR-039: A10	Schedule 10 Part 2 Condition 15 (1) Page 119-121	Natural England notes this condition does not include the requirement to submit an updated Operations and Maintenance plan. We also note that condition 10 (1) (c) requires details on cable protection. However, we assume this covers during construction cable protection only. We further note that operations and maintenance is provisioned for at condition 7. However, the wording at condition 7 only allows for the replenishment of cable protection. Natural England interprets this to mean the deemed Marine Licence (dML) only allows for new areas of cable protection to be installed during construction. We would appreciate if this could be confirmed.	Provide confirmation of the intention with regard to the conditioning of cable protection deployment after construction.		Condition 7(3) of DML1 at Schedule 10 of the **Draft DCO** [APP-027] requires the submission and approval by the MMO of an Offshore Operations and Management Plan, which must be substantially in accordance with the **Outline Offshore Operations and Management Plan** [APP-248]. The Applicants note that "Management" should be amended to "Maintenance" in this condition to reflect the title of the document and will make this amendment to the **Draft DCO** [APP-027]. As this plan is secured in Condition 7, there is no need for it to also be secured in Condition 15. Natural England's comment refers to cable protection being required in accordance with Condition 10(1)(c) – we assume this is meant to be a reference to Condition 15(1)(c). The Applicants can confirm that, other than in areas of existing cable protection, no new cable protection will be installed during the operation and decommissioning of the Projects without the acquisition of additional marine licences. Please see the response to RR-039: A3 for further detail.
RR-039: A11	Schedule 10 Part 2 Condition 15 (1) (g)	Natural England notes the inclusion of a Marine Mammal Mitigation Protocol (MMMP) and supports the use of such. However, the condition should also refer to the consideration of the use of noise abatement systems (NAS) within the MMMP.	Amend condition to include consideration of the use of NAS within the final MMMP.		The Applicants acknowledge this request and will add a section on the potential use of noise abatement systems (NAS) as mitigation into the **Outline Marine Mammal Mitigation Protocol (MMMP)** [APP-249]. The Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters. As the potential use of NAS will be included in the **Outline MMMP** [APP-249], it is not necessary for any amendments to be made to the drafting of this condition.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: A12	Schedule 10 Part 2 General	Natural England notes that at no point within the dML is the maximum hammer energy for piling secured. This is a key metric for the impact to marine mammals and sensitive fish species. This has been secured by condition on many similar projects, see East Anglia Two as a recent example. We would expect the maximum hammer energy for monopile and pin piles to be secured within the project design conditions.	Include a condition to secure the maximum hammer energy for piling of monopiles and pin piles.		The Applicants acknowledge this comment and have made appropriate updates to the DMLs to reflect the comments made by Natural England.
RR-039: A13	Schedule 10 Part 2 Condition 16 Page 122	Natural England notes that this condition stipulates the requirement to submit a Site Integrity Plan four months prior to piling. However, due to the complex nature of environmental considerations and the likely need to produce an updated HRA to fully consider the in-combination aspects of piling with up-to-date information, this time period is unlikely to be sufficient. Experience has shown that these plans may take several rounds of review and updates before they are discharged. In addition, should the plan be submitted too early then it is difficult to appropriately consider the in-combination aspects. Therefore, Natural England requests that the timing of this report be that it must be submitted no later than 6 months prior and no sooner than 9 months prior to the piling.	Amend the condition to give appropriate timing requirements.		The Applicants have agreed in the response to the MMO's relevant representation (see section 4.6, I.D. 79 of Table 4.6.2 of **The Applicants' Responses to Relevant Representations** [PDA-013]) that the DMLs will be updated so that the Site Integrity Plan (SIP) must be submitted no later than six months prior to the commencement of piling. The Applicants note Natural England's additional request that the SIP should be submitted no sooner than nine months prior to piling (in addition to no later than six months). The Applicants do not agree that this restriction is necessary or proportionate as it is possible that piling programmes will be known in sufficient detail more than nine months in advance of the start of piling operations.
RR-039: A14	Schedule 10 Part 2 Condition 17 Page 122	Natural England notes that this condition provides that most of the plans and documentation submitted in condition 15 be submitted 4 months prior to the works. Natural England notes that due to the size and complexity of this project, this time period is not appropriate. Given the large volume of documentation and the often complex nature, we request this be amended to six months prior to	Amend the condition to require documents be submitted 6 months prior to commencement.		The Applicants' position is that the submission of certain plans for approval at least four months prior to commencement of operation of licensed activities is appropriate and precedented (for example Hornsea Four and East Anglia One North OWFs). Notwithstanding that, the Applicants welcome that both the MMO and Natural England are open to discussion on this point and will therefore seek to agree the relevant timescales with the MMO and Natural England (where relevant) and update the ExA once those discussions have taken place.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		commencement. Alternatively, we are willing to discuss the required timing for each plan with the Applicant and the MMO. We would refer to East Anglia Two as a recent example of an OWF development with a standard 6 months requirement.			
RR-039: A15	Schedule 10 Part 2 Conditions 20-22 Page 123-124	Natural England notes that there is no requirement for ornithological monitoring. We consider that ornithological monitoring is required due to the potential impacts to ornithology from this development. In addition, we note that the MMO has some observations with the wording of the monitoring conditions. We support the MMO and are willing to engage with both the MMO and the Applicant to ensure appropriately worded monitoring conditions are included.	Update the conditions to include ornithological monitoring and to improve the wording after discussion with the MMO.		The Applicants disagree that there is a need for a specific ornithological monitoring condition in the DML as this is already secured through the submission and approval of the construction programme and monitoring plan under the relevant conditions of the DMLs (**Draft DCO** [APP-027]) (Conditions 15(1)(b), 20, 21 and 22 of DMLs 1 and 2; Conditions 13(1)(b), 18, 19 and 20 of DMLs 3 and 4; and Conditions 11(1)(b), 14, 15 and 16 of DML 5). The construction programme and monitoring plan must accord with the **In-Principle Monitoring Plan** [APP-247], which includes (at section 1.6.7) outlines of the in-principle monitoring proposed in relation to offshore ornithology. The construction programme and monitoring plan must be submitted to and approved by the MMO.
RR-039: A16	Schedule 12 Part 2 Condition 13 (1) (a) (v) Page 161 Schedule 13 Part 1 Condition 13 Page 184	Schedule 12 It is outlined for Pre-construction plans and documentation under Part 2, Condition 13 (1) (a) (v) of that "any exclusion zones or micro-siting requirements identified pursuant to 13(1)(f)(v) or relating to any habitats of principal importance identified as part of surveys undertaken in accordance with condition 19"; However, 13(1)(f)(v) does not exist. Furthermore, Condition 19 relates to *Construction monitoring surveys*, not pre-construction surveys (18)(4)(a). Schedule 13 Similar to above, it is outlined under Part 1 Condition 13 (1) (a) (v) that "any exclusion zones or micro-siting requirements identified pursuant to 14(1)(f)(v) or relating to any habitats of principal importance	We advise that the conditions should be amended as needed.		The Applicants note the comments from Natural England and have updated the cross-references (which, in Schedule 12, should be to Condition 13(1)(e)(iv) and Condition 18(4)(a) and, in Schedule 13, should be to Condition 11(1)(e)(iv) and Condition 14(4)(a)) in the **Draft DCO** [APP-027].

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		identified as part of surveys undertaken in accordance with condition 18"; However, 14(1)(f)(v) does not exist. Furthermore, Condition 18 relates to *Construction monitoring surveys*, not pre-construction surveys (18)(4)(a).			
RR-039: A17	Schedules 12 & 13 Part 2 Condition 24	Natural England notes the inclusion of a piling restriction between 1 August and 31 March for the transmission assets only. We defer to the MMO on the sufficiency of this restriction to mitigate impacts to fish species.	N/A		The Applicants acknowledge this comment.
RR-039: A18	General	Natural England notes that the Maximum Design Parameters for the number of piles that can be installed per day (including simultaneously and concurrently) have not been secured in the DCO/dML. This is a key metric for the impact assessment on marine mammals and sensitive fish species. Whilst we understand there will be a Marine Mammal Mitigation Protocol, we would expect the maximum number of piling activities to be secured within the project design conditions.	Include a condition to secure the maximum number of piling activities within and across the two arrays per day.		The Applicants acknowledge this comment and will make appropriate updates to the DMLs to reflect the comments made by Natural England.
RR-039: A19	General	Natural England notes the consent allows for deployment of cable protection but has no end date for such deployment. Our standard advice is that cable protection should only be deployed for a maximum period of 10 years from the commencement of operations, this is the maximum scope that we can support outside of designated sites. Within any designated sites for benthic features such as the Dogger Bank SAC, the condition should stipulate that there should be no deployment of cable protection after the completion of construction. Please see the	Include a condition limiting the deployment of cable protection outside of designated sites to within 10 years of the completion of construction and inside designated sites such as Dogger Bank SAC, no cable protection may be deployed after the completion of construction. Agreement should also be sought on what is meant by completion of construction.		Please see the response to RR-039: A3.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		draft Natural England position paper which outlines the reasoning for these restrictions.			
RR-039: A20	N/A	The purpose of the Applicant's Commitments Register is unclear to Natural England. We do not believe that it is a certified DCO document and therefore comments made are not legally binding.	Natural England advise further clarity is required from the Applicant on the purpose of the document before we can provide any detailed nature conservation advice.		The Applicants can confirm that the **Commitments Register** [App-231] is a certified document as listed in Schedule 19 of the **Draft DCO** [APP-027]. The document sets out all the commitments that the Applicants have made and details at what phase of the works they would be undertaken. This includes all mitigation measures detailed in the ES chapters as either embedded or additional mitigation. It also clearly sets out how the commitment is secured in the **Draft DCO** [App-027] and the relevant certified Application document that the measure is included within. The use of a commitments register is in accordance with the Planning Inspectorate Guidance: "Nationally Significant Infrastructure Projects: Commitments Register" (September 2024), which recommends that applicants produce such a document and keep it updated throughout the consenting process to track commitments made.
RR-039: A21	N/A	If this were to be a certified DCO document, Natural England believes that, as written, the commitments are too heavily caveated to give any clarity and/or certainty that commitments can and will be delivered. In addition, it would make post consent challenging due to the lack of specificity and unequivocal nature of the comments.	Natural England advise that any named document should be clear on what the Applicant's commitments/requirements are, and include any rationale/justification as to why the commitments are being made, even if how they will be delivered is currently unknown.		The Applicants have sought further clarity from Natural England on which specific measures they considered were too heavily caveated in the **Commitments Register** [App-231]. As noted in further detail in the response to RR-039: A22, all mitigation detailed in the ES chapters is included in the register. Natural England have clarified that specific comments on mitigation measures, which they feel are not specific enough are provided for each thematic within the 'Have the impacts been avoided / reduced by the use of appropriate mitigation?' section for EIA and Habitats Regulations Assessment (HRA) in their Relevant Representation responses. Therefore, specific responses on the wording of mitigation are included where raised throughout the Applicants' response to this relevant representation.
RR-039: A22	N/A	Natural England notes that the majority of OWF NSIPs have included a 'Schedule of Mitigation' within the application documents. However, this has not been included for the DBS Application. Therefore, we query if the Applicant's intention is for the Commitments Register to deliver the same function as a Schedule of Mitigation. If this is the case, then Natural England advise that our preference would be for a separate Schedule of Mitigation to be submitted and secured within the DCO, which follows previous projects' formats. If that document is not provided, then considerable updates to the Commitments Register would be needed	Natural England advise that a Schedule of Mitigation is provided for the DBS projects. If alternative approaches are taken by the Applicant, then any document needs to be more certain on key deliverables		The **Commitments Register** [App-231] sets out all the commitments that the Applicants have made and details at what phase of the works they would be undertaken. The Applicants can confirm this includes all embedded or additional mitigation, monitoring or compensation measures detailed in the ES chapters and it delivers the same function as a 'Schedule of Mitigation'. It also clearly sets out how the commitment or mitigation is secured in the **Draft DCO** [App-027] and the relevant certified Application document the measure is included within e.g. the **OCoCP** [APP-234]. Where a mitigation measure or commitment is relevant to multiple ES chapters wording has been standardised across assessments and this is clearly identified. This approach was adopted to avoid duplicating mitigation measures and commitments. This is also a similar approach to that adopted by the Hornsea Project Four Offshore Windfarm and the Applicants note that the naming of the document as a Commitments Register is in accordance with the Planning Inspectorate Guidance: "Nationally Significant Infrastructure Projects: Commitments Register" (September 2024). Natural England has provided further clarification to the Applicants in an email dated 5th November 2024 and asked that the structure of the document is considered in relation to the Schedule of Mitigation from the Norfolk Boreas Offshore Wind Farm Project. The Applicants

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		to list out all of the mitigation measures and ensure they are sufficiently secured.			confirm that they consider the **Commitments Register** [App-231] to be robust and provide sufficient detail on the mitigation measures committed to in the DCO application and do not propose to update it. However, they will discuss these recent comments further with Natural England.
RR-039: A23	N/A	As set out in the DCO comments (Table 1) - the OOOMP will need updating and a final plan submitted and agreed (in consultation with the relevant SNCB) prior to construction.	Secure this comment within the DCO.		The Applicants acknowledge this comment.
RR-039: A24	N/A	Natural England has queries in relation to the definition of maintain included within the OOOMP. We would wish this to align with the final DCO definition.	The definition of maintain should be consistent between the DCO and OOOMP.		The Applicants acknowledge this comment and will review the definition of "maintain" within these documents.
RR-039: A25	N/A	Section 2.1.3 - Natural England is concerned about what is and is not permitted as part of the DCO/dML through this named plan, in relation to replacement of cable protection over the lifetime of the project and any 'allowances' for new cable protection. Please see comments on the allowances above and within Appendix C of this Relevant Representation.	Natural England advise that further cable protection and scour prevention within Dogger Bank SAC would require a new marine licence, and that outside of the SAC a register should be kept and summited annually to the MMO on any placement of cable protection. This should include the volume, footprint and locations to ensue commitments have been adhered to and indirect impacts to designated sites avoided.		The Applicants acknowledge this comment. The Applicants intend to submit an updated **OOOMP** [APP-248]. Please see the response to RR-039: A3 for further detail.
A26	N/A	Natural England would welcome MMO views on Table 2-3 and the identification of additional scour prevention and cable protection within Dogger Bank SAC not requiring a marine licence. Additionally, we are concerned that whilst the use of sub-bottom profilers doesn't currently require a marine licence, there may be in-combination significant impacts as a result of cumulative under water noise pressures that may not be addressed through the OOOMP proposals as written.	Natural England will engage with the MMO to provide further comment on this at Deadline 1.		The Applicants welcome feedback on scour and cable protection. The Applicants will take a position on the possibility of provisions of a marine licence for sub-bottom profiler work when appropriate.

2.3 Responses to Appendix B Marine Physical Environment

Table 2.3.1 Applicants' responses to Natural England's Appendix B Marine Physical Environment

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: B1	N/A	Natural England is concerned that the construction and operation of the Dogger Bank South (DBS) Offshore Wind Farm (OWF) will adversely affect the extent and distribution; and physical structure of Dogger Bank SAC Annex I sandbank feature in terms of its sediment composition and distribution, and finer-scale topography, which will further hinder it's restore objective(s). Currently, we believe that further mitigation measures could be adopted to minimise the impacts to the designated site. It is not sufficient to rely on compensation measures alone, especially with the exclusion of compensation measures for damage/disturbance to Annex I sandbanks from installation activities.	Natural England strongly advises that all efforts should be made to avoid, reduce and mitigate impacts to this feature to minimise both alone and cumulative impacts to the sandbank feature extent and distribution.		Changes to the sediment composition and distribution of the Dogger Bank Special Area of Conservation (SAC) Annex I sandbank feature would be driven by changes to marine physical processes (tidal currents and waves), which control sediment transport. Project and site specific marine physical processes modelling has been undertaken, see **Appendix 8-3 Marine Physical Processes Modelling Technical Report** [APP-084]. The results predict a maximum change in current speeds due to the array structures of +/-0.01m/s to +/-0.02m/s. This is approximately 2-6% of the baseline speeds. The maximum changes to wave height are predicted to be between 0.04m and 0.06m. These are less than 1.5% of baseline wave heights. Given these results, tidal currents are the dominant driver of bedload sediment transport across the array areas, and hence changes in tidal current velocities (bed shear stress) induced by the infrastructure could potentially change sediment transport. The bed shear stress model outputs predict that (in general) the infrastructure would induce a reduction in sediment transport rates across the south of the array areas with a predicted increase across the north of the array areas. However, these changes to bed shear stress would not lead to significant changes to sediment composition and distribution because the changes in bed shear stress are less than 3% of the baseline bed shear stress and would then remain constant during the operational lifespan. Change of this magnitude would have no significant long-term effects on the mobilisation and sediment transport characteristics of the seabed sediments across the Dogger Bank SAC Annex I sandbank feature. The assessment undertaken in section 8.7 of **Chapter 8 Marine Physical Environment** [APP-080] determined that there would be no likely significant effects (in Environmental Impact Assessment (EIA) terms) to the Dogger Bank sandbank feature. As such, the Applicants consider the mitigation embedded in the Projects' design (detailed in Table 8-3 of **Chapter 8 Marine Physical Environment** [APP-080] to be proportionate to the potential magnitude of this impact. Additionally, the Applicants are in the process of preparing a change request relating to the relevant design parameters. The Examining Authority (ExA) was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the removal of all platforms from the Offshore Export Cable Corridor, reductions in the number of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas. The change request will be supported by the **Request for Design Change – Environmental Assessment Update** [document reference C1.1] which will describe any resultant changes to

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. These factors, if the change request is accepted, may result in changes to the values discussed above. However, although the quantum of impact will be reduced the significance of effect will remain the same.
RR-039: B2	N/A	Cable protection - Nearshore Natural England is concerned that cable protection placed in the nearshore could cause a permanent disruption to nearshore and longshore sediment transport on the Holderness Coast and impact features of the Holderness Inshore MCZ, the Humber Estuary SAC and Smithic Bank. Without further justification/evidence we currently do not support the Applicants arbitrary use of Hallermeier (1978) to determine a 'closure depth' distance from the cliffs of 860m for the placement of cable protection.	Natural England advise that a commitment should be made to avoid the placement of external cable protection within shallow nearshore water (i.e. within the 10m depth contour) at landfall. Should such a commitment not be made, we advise that alternative methods of cable burial and/or protection should be explored in line with the mitigation hierarchy, to remove or reduce the need for cable protection between MLWS and the 10m contour. Until such a commitment is made, it remains likely that the conservation objectives for the Holderness Inshore MCZ will be hindered.		The Applicants' position is that any Offshore Export Cables associated with the Projects will be buried beneath the intertidal zone at the landfall, and 350m seaward of mean low water spring (MLWS). No seabed cable protection will be used within these areas. Cable protection will be limited to 10% of the cumulative length of all cables laid between 350m seaward of MLWS and the 10m depth contour as measured against the lowest astronomical tide before the commencement of construction. This is secured in condition 3 of Deemed Marine Licences (DMLS) 3 and 4 of the **Draft Development Consent Order** (DCO) [APP-027]. The final locations and volumes of cable protection will not be known until later in the project development cycle. The assessment presented in section 8.7.4.5 of **Chapter 8 Marine Physical Environment** [APP-080], which identified no likely significant effects in EIA terms, is based on the application of these embedded mitigation measures, with the receptors assessed being informed during the Benthic Ecology and Physical Processes ETG held on 29th January 2024 (see record of the minutes from this meeting in **Appendix F1 - Minutes of meetings – ETG** [APP-043]. Hallermeier (1978)[2] is used to calculate closure depth based on a formula in the paper using wave height (in this case average significant wave heights recorded by the Hornsea buoy) and period in the nearshore zone. It is an established method, which takes account of locally derived parameters and has been used widely for analysis of the effective seaward boundary of wave-driven sediment transport. Using data input to this equation at the landfall this would typically be in around 6m of water, which is approximately 860m from the base of the cliffs.
RR-039: B3	N/A	Cable protection - Decommissioning Natural England is concerned that there is currently no commitment to the removal of cable/scour protection at end of project life (decommissioning).	Natural England advise that a commitment to remove all on and above seabed infrastructure associated with the development within benthic designated sites (excluding cable crossings) at the time of decommissioning should be secured in the DCO, to prevent permanent impacts to marine physical processes. Without a commitment in the DCO for the removal of infrastructure including the placement of cable protection, the worst-case scenario should		At this stage, it is not possible for the Applicants to determine whether components would be left in situ or removed from the seabed as part of decommissioning. This will be determined as part of the decommissioning plan which will be consulted on and require approval from the regulator towards the end of the Projects' lifetime (secured within Schedule 2, Part 1, Condition 7 of the **Draft DCO** [APP-027]. The benefits and disbenefits of retrieving cable and scour protection will need to be balanced at that point. There are a number of compelling reasons to consider leaving cable and scour protection infrastructure left in situ may including lesser impacts in terms of disturbance effects, the preservation of potential reef habit and lower health and safety risks realised through not retrieving and handling protection material. In addition to these arguable benefits, there may be practical issues associated with the removal of protection at certain locations such as protection deployed to protect cable crossings. At such locations the Applicants may not be in a position to decommission such external protection in crossing locations (as the

2 Hallermeier, R.J. (1978). 'Uses for a calculated limit depth to beach erosion', Proceedings of the 16th Coastal Engineering Conference. New York, USA. ASCE, 1493-1512.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
			assess the impacts of leaving assets permanently in situ.		export and / or array cables would be crossing or be crossed by third party assets). It is expected that most array and export cables (and any associated cable protection) would be left in situ. Exposed sections of cable are more likely to be cut and removed to ensure they do not become hazards to other users of the seabed. At this point in time, it cannot be accurately determined whether and which cables would be exposed at the time of decommissioning. With regards to assessing the worst case impacts to physical processes, it is assumed that decommissioning would be a reversal of the construction process whereby infrastructure would be removed. Nevertheless, it is also assumed that such impacts during decommissioning would be of similar or lesser scale compared to the construction phase. As such, the effect of decommissioning on the marine physical environment will be comparable to those during the constructions phase: • Changes in suspended sediment concentration due to foundation removal; • Changes in suspended sediment concentrations due to removal of parts of the array, Inter-Platform and Offshore Export Cables; • Deterioration in water quality associated with the release of sediment bound contamination; • Changes in seabed level due to removal of parts of the array, Inter-Platform and Offshore Export Cables; and, • Indentations on the seabed due to decommissioning vessels. The magnitude of effects would be comparable to or less than those identified for the construction phase. Accordingly, given the construction phase assessments concluded negligible significance of effect on the marine physical environment, it is anticipated that the same would be valid for the decommissioning phase regardless of the final decommissioning methodologies. The significance of effects will be the same for DBS East or DBS West in isolation and for DBS East and DBS West together.
RR-039: B4	N/A	Cable protection - Dogger Bank SAC Natural England is concerned that the presence of cable protection measures on Dogger Bank (and within Dogger Bank SAC) could modify the hydrodynamic regime and affect sediment transport pathways contributing to the 'halo effect' described in Appendix C to this response.	Natural England advise that further justification is needed for the volumes of predicted external cable protection within Dogger Bank SAC.		With regards to the potential 'halo effect', the Applicants note the concern, but considers it unreasonable to raise at this stage of the process. Natural England has had the opportunity to raise what is essentially an additional impact at Scoping and Screening (in 2022), Section 42 (in 2023) or during any of the Expert Topic Group (ETG) consultation since 2022. The Applicants note that this impact was never raised in relation to the conclusions of the Plan Level Habitats Regulations Assessment (HRA) or in any of the Steering Group meetings for the Strategic Plan (**Round 4 Dogger Bank Strategic Compensation Plan** [APP-060]). The Applicants are not aware that this impact has been discussed historically with regard to offshore wind and notes that if this is an emerging concern, it has not been raised in any relevant representations produced by Natural England in relation to other Round 4 or Extension projects submitted within the last 12 months.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					With regard to the substance of the concerns, the Applicants note the following from the paper cited by Natural England (Reeds *et al.* 2018)[3] (Applicants' emphasis); A number of studies have examined the effects of artificial and natural reefs on surrounding infauna (Ambrose and Anderson, 1990; Barros *et al.*, 2001; Davis *et al.*, 1982; Fabi *et al.*, 2002; Fukunaga and Bailey-Brock, 2008; Posey and Ambrose, 1994; Wilding, 2006; Zalmon *et al.*, 2012, 2014). **However, results of such investigations are widely variable in terms of the patterns described and the mechanisms proposed to be driving them.** Some studies observe a decline in infaunal abundance and species richness within close distances (e.g. several metres) of the artificial structures (Davis *et al.*, 1982; Wilding, 2006), while others observe enhanced species richness, abundance or biomass of certain species close to the reef (Davis *et al.*, 1982). These effects can also extend over large distances i.e. up to 200 m (Davis *et al.*, 1982). **In some cases, no significant effects at all on benthic infauna were detected** (Fukunaga and Bailey-Brock, 2008; Zalmon *et al.*, 2012). The conclusions highlight that; Comparisons with other studies has shown that the effects of Artificial Reefs (ARs) on soft sediments can vary depending on the type of structure and location, highlighting a requirement for site specific investigations. The evidence is therefore equivocal at best. The Applicants have undertaken their assessments in line with standard advice, the advice received from stakeholders throughout the development of the Projects in addition to best practice. With the above in mind, the Applicants are of the opinion that halo effects should not be considered any further. The scale of impacts from cable installation and cable protection is fully justified within the worst case Table 6-3 within the **Report to Inform Appropriate Assessment (RIAA) HRA Part 2 of 4** [APP-046]). Appendix J-1 of the Round 4 Plan Level HRA[4] assumed a maximum 10% of cable length requiring protection within the Dogger Bank SAC. Due to the Projects array cable and Inter-Platform Cable layouts not yet being finalised at the time of submission, it was required to assess a potential worst-case distance of cabling that may require external cable protection measures. As such, to ensure the parameters assessed did not exceed those detailed within the Round 4 Plan Level HRA and to ensure the absolute worst case was assessed, this 10% of cable length requiring protection within the Dogger Bank SAC footprint was chosen. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that

[3] Reeds, K.A., J.A. Smith, I.M. Suthers, & E.L. Johnston. (2018). An Ecological Halo Surrounding a Large Offshore Artificial Reef: Sediments, Infauna, and Fish Foraging. *Marine Environmental Research* 141 (July 1, 2018). https://doi.org/10.1016/j.marenvres.2018.07.011.

[4] The Crown Estate (2020) Offshore Wind Round 4 Plan, Habitats Regulations Assessment | Marine Data Exchange

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Design Change 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the reduction in number of offshore platforms and reduction in cabling required in the Array Areas. Such changes would reduce the footprint of infrastructure and cable requirement on the seabed. The changes are summarised in the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1]. Although the quantum of impact will be reduced the significance will remain the same.
RR-039: B5	N/A	Flamborough Front Natural England is concerned that the presence of structures in the Dogger Bank South (DBS) Arrays (alone and in combination with other nearby offshore wind farms) could cause turbulent current wakes which impact circulation, stratification, mixing, and sediment resuspension. In turn, changes to the Flamborough Front could have far-reaching and long-term consequences for the wider marine ecosystem.	Owing to the ecological importance of the Flamborough Front, and emerging evidence that suggests large offshore wind farm (OWF) clusters (i.e. Dogger Bank) may result in substantial impacts on stratification, currents, and sediment resuspension; Natural England advises that the Applicant should monitor potential changes to stratification, currents, and primary productivity during pre-construction, post-construction, and for the lifetime of the Projects. This should include 'trigger points' to allow interventions/remediation, if required.		As noted in section 8.7.4.3 (Changes to Water Circulation (Flamborough Front) Due to the Presence of Infrastructure (Wind Turbines and Offshore Platforms)) of **Chapter 8 Marine Physical Environment** [APP-080], the structures could potentially create turbulent wakes at a local foundation scale which could locally change tidal mixing processes which may locally perturb the Flamborough Front and across the width of the array areas. However, the Flamborough Front is a strongly stratified regional feature in spring and summer and the high buoyancy forces associated with the stratification would not be destabilised by the local and relatively small turbulent wakes generated in the near field of each foundation. The North Sea within and around the Array Areas is stratified for less than 40 days a year and they are within a region categorised as intermittently stratified. The nearest seasonally stratified region (stratified for greater than 120 days) is located 17km west of the array areas. The Flamborough Front may be present occasionally at the Array Areas, but for most of the time the water is well-mixed. With minimum spacings of 830m between monopile foundations across the array, it is unlikely that wake to wake interactions would occur, and individual wakes would remain independent of each other and quickly dissipate away from each foundation (in the order of minutes and tens to hundreds of metres). Given that the Flamborough Front is highly dynamic and ephemeral landscape-scale feature, it would not be affected by localised, small-scale changes in water column turbulence induced by individual near-field wakes at foundation locations, especially if the strength of stratification (due to buoyancy forces) was sufficient to overcome any increased mixing. Based on this, no monitoring is proposed to be undertaken for changes to stratification, currents, and primary productivity.
RR-039: B6	N/A	Numerical Modelling – Baseline Wave Conditions Natural England is concerned that the numerical modelling undertaken for assessing the effects of infrastructure on the wave regime	Natural England advise that the modelling should be updated to reflect the design parameters of the project being applied for (i.e. without gravity bases) and that the		The effects of GBS foundations for the Offshore Platforms would be greater in magnitude compared to the effects that monopile foundations would have. Therefore, the existing modelling results used gravity bases as input to over-estimate the effects of the Offshore Platforms. Hence, the actual effect of the Offshore Platforms in the Array Areas will be less than the predicted effect for GBS foundations. Given that only a small number of offshore

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		are based on unrealistic worst-case scenario (WCS) windfarm layouts. We do not consider that Option 2 presents the absolute WCS due to the unlikelihood of the array being installed in this layout. We consider that Option 1 presents a more realistic WCS (turbine spacing and windfarm layout) and should therefore be used for the assessment. Furthermore, gravity base foundations have now been removed from the Project envelope for turbines within the array areas but are still included in the modelling.	outputs of the more realistic layout out scenario (Option 1) should be carried through to the assessment.		platforms is proposed (four for DBS East or DBS West in isolation or eight for DBS East and DBS West together) compared to wind turbines (100 for DBS East or DBS West in isolation or 200 for DBS East and DBS West together), it is not necessary or proportionate to update the modelling, as a worst case scenario (WCS) has been modelled. As acknowledged by Natural England in response RR-039: B21 (below) and at the Marine Physical Processes ETG held on 11th September 2023 (see **Appendix F1 - Minutes of meetings - ETG** [APP-043], Option 2 is considered the absolute worst case array that could be achieved using the minimum spacing between the turbines, and hence would be the layout that induces the largest changes to waves (and tidal currents). The minimum turbine spacing presented within Option 2 is included within the design envelope that the Applicants are seeking consent for. Option 2 is considered realistic by the Applicants if the design process identifies situations where the minimum distance between turbines is required. The approach to the assessment of effects on the marine physical environment is to consider the WCS which, in the case of waves and tidal currents, is the turbine spacing presented Option 2. Option 1 would result in lesser effects, and therefore an assessment of that option would not present the WCS, which the Applicants are required to assess. **Chapter 8 Marine Physical Environment** [APP-080] concludes there would be no significant effects for Option 2, and so any other layout would also induce no significant effects. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the proposal to remove GBS foundations entirely and reduce the number of offshore platforms from eight to three in the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1]. As a result of the proposed changes, operational models have been re-run using monopile foundations as the worst-case scenario, with outputs presented in the updated **Appendix 8-3 Marine Physical Processes Modelling Technical Report (Revision 2)** [document reference: 7.8.8.3], to be issued for consultation alongside the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1].
RR-039: B7	N/A	Natural England consider that the mitigation proposed in relation to sediment deposition does not go far enough, especially with the Dogger Bank SAC and in areas where there are	Natural England advises that as a minimum, further mitigation measures are adopted by the Applicant and the relevant documents updated accordingly.		As detailed in **Chapter 9 Benthic and Intertidal Ecology** [APP-085], the maximum predicted deposition resulting from Offshore Export Cable Corridor trenching (the WCS for sediment deposition) will be up to 5cm within and immediately adjacent to the area of trenching, with a maximum change of up to 0.25m occurring in localised hotspots. While the suspended sediment plume could extend kilometres from the point of disturbance, the changes in

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		priority habitats and/or indirect impacts to designated site features could occur.	This is also applicable to Appendix C.		suspended sediment concentrations (SSCs) over these distances are small, typically below 1mg/l, persisting for a period of hours. The assessment undertaken in section 8.7 of **Chapter 8 Marine Physical Environment** [APP-080] determined that there would be no likely significant effects (in EIA terms) in relation to sediment deposition. As such, the Applicants consider the mitigation embedded in the Projects' design in relation to sediment deposition to be proportionate to the potential magnitude of this impact.
Project Parameters - Document(s) Used: [APP-071] 7.5 ES Chapter 5 – Project Description [APP-080] 7.8 ES Chapter 8 – Marine Physical Environment [APP-084] 7.8.8.3 ES Appendix 8-3 – Marine Physical Processes Modelling Technical Report					
RR-039: B8	7.5	The project parameters for marine process receptors are clearly defined.	N/A		The Applicants welcome agreement from Natural England on this point.
RR-039: B9	7.8 – Table 8-1	MDS parameters Natural England notes that for indentations on the seabed due to installation vessels, the Maximum Design Scenario (MDS) for anchoring for either DBS E or W in isolation is 244,640m2, however, the maximum total impacted area by anchoring is stated as 22,061m2. It is unclear which of these values is the MDS for seabed area affected by anchoring. This is also the case for the DBS E and DBS W concurrent/sequential scenario MDS.	Natural England advise that the MDS for seabed area affected by anchoring is clarified for all construction scenarios.		The 'Maximum total impacted area by anchoring' definition should read as 'Maximum total impacted area by anchoring during Offshore Export Cable installation'. The maximum anchoring area was divided between foundation installation and Offshore Export Cable installation to illustrate the lesser need for anchoring within the Offshore Export Cable Corridor compared to that for foundation installation.
RR-039: B10	7.8 – Table 8-1	MDS parameters For changes to bedload sediment transport due to cable protection measures: - For DBS E in isolation the total footprint of inter-platform cable protection is given as 183,312m2, whilst for DBS W in isolation it is 205,504m2 which equates to a total of 388,816m2. However, the equivalent total for the DBS E & W concurrent/sequential scenario total is stated as 536,484m2. - The number of array/inter-platform cable pipeline/cable crossings for DBS E and DBS W,	Natural England advise that the Applicant should clarify and provide further rationale for the MDS for seabed footprint of cable protection measures and crossings for the different project build scenarios.		1) As detailed in Table 5-13 of **Chapter 5 Project Description** [APP-071], the maximum length of cable protection for DBS East and West together is greater than the sum of DBS East and DBS West in isolation (342km compared to 115km and 129km respectively). This is due to additional Inter-Platform Cabling being required to connect the offshore platforms between the two Projects should both of them be constructed, whereas in the In Isolation scenario this additional cabling would not be required. Due to this difference in length of Inter-Platform Cabling required between the scenarios, the resulting footprints of Inter-Platform Cable protection for the Projects in isolation do not directly combine to form the concurrent / sequential Inter-Platform Cable protection footprint. 2) As noted above, additional lengths of Inter-Platform Cabling are required in addition to that included for the Projects in isolation, which subsequently results in a higher number of inter-

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		is 19 and 27, respectively (i.e. total of 46 crossings). However, for the DBS E and DBS W concurrent/sequential scenario, the total number of crossings is 61. - Similarly, the total footprint of pipeline/cable crossing material for array cables and inter-platform cables do not agree between the 'in isolation' scenarios and the sequential/ concurrent scenario.			platform pipeline / cable crossings than that reached when simply combining the number of inter-platform pipeline / cable crossings for the Projects in isolation. 3) As noted above, additional lengths of Inter-Platform Cabling are required in addition to that included for the Projects in isolation, which subsequently results in a higher footprint of inter platform pipeline / cable crossing material than that reached when simply combining the footprint of inter-platform pipeline / cable material for the Projects in isolation. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the proposed reduction in length of Inter-Platform Cables, from 23km per Project in isolation and 161km for the Projects together in the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1].
RR-039: B11	7.8 – Table 8-1	Natural England notes it has been assumed that "…10% of the [cable] route will require remedial protection within the Dogger Bank SAC site boundary". However, this is an arbitrary footprint, which has not been quantified, it is also not clear where in the SAC the cable protection may be required or why it would be needed.	Natural England advise that all efforts should be made to avoid the use of external cable protection within Dogger Bank SAC. Where this is not possible, environmental impacts should be reduced or mitigated as much as possible. Further, Natural England advises that the Applicant should provide the rationale for the requirement for remedial cable protection along 10% of the cable route especially within Dogger Bank SAC. We advise that evidence should be provided from Dogger Bank A and B offshore wind farm projects to justify a realistic worst-case scenario being presented. Recently consented windfarms with infrastructure within designated		Appendix J-1 of the Round 4 Plan Level HRA[4] assumed a maximum 10% of cable length requiring protection within the Dogger Bank SAC. Due to the Projects' array cable and Inter-Platform Cable layouts not yet being finalised at the time of submission, it was required to assess a potential worst case distance of cabling that may require external cable protection measures. As such, to ensure the parameters assessed did not exceed those detailed within the Round 4 Plan Level HRA and to ensure the absolute worst case was assessed, this 10% of cable length requiring protection within the Dogger Bank SAC footprint was chosen. As noted in the embedded mitigation measures for detailed in Table 8-3 of **Chapter 8 Marine Physical Environment** [APP-080], the Applicants are committed to burying Offshore Export Cables to 0.5-1.5m (depending on cable location) where practicable, minimising the requirement for external cable protection measures and thus effects on sediment transport. This includes any Offshore Export Cables located within the Dogger Bank SAC.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
			sites have produced an Outline Cable Burial Risk assessment on the likelihood of cable burial, using project specific geotechnical data and/or previous OWF project data from within the site to provide a realistic worst-case scenario. In addition, specific locations (informed by acoustic data) of areas requiring cable protection should be identified including identification of affected features/sensitive habitats. See also JNCC/NE best practice guidance.[5]		
RR-039: B12	7.8 – Table 8-1; and Section 8.7.4.5.1, Para 294	Operation and Maintenance Natural England notes that the WCS for remedial cable protection assumes 20% of the export cable route will require remedial protection outside of Dogger Bank SAC. Apart from the nearshore (subtidal) part of the Offshore Export Cable Corridor (OECC), it is unclear where along the cable route this may be required. The rationale for this requirement is also unclear. We also draw your attention to the following guidance regarding licensing requirements for cable protection: EN010087-001527-DL3 - Natural England - Draft Position Paper.pdf (planninginspectorate.gov.uk) Within the paper only 10% is considered permissible outside of a designated site and over the lifetime of the project.	Natural England advise that a realistic worst-case scenario on the locations for cable protection should be identified (informed by geophysical and geotechnical data). We also advise that the rationale (including supporting evidence) for this requirement should be provided, especially as it is beyond what has been proposed for other projects and there is a high likelihood that marine process could be disrupted by the presence of the cable protection.		A figure of 20% of Offshore Export Cable length requiring protection outside the Dogger Bank SAC was chosen based on assumptions made for other recent offshore wind farm projects located in areas of similar seabed composition such as Awel y Môr[6]. The lengths, locations and volumes of cable protection required will be iterated as the Projects are further developed and more detailed site investigation information becomes available. The Cable Burial Risk Assessment (CBRA) (**Cable Statement** [APP-244]) is now being updated using the results of the 2023 Site Investigation campaign which included geotechnical sampling on routes B and C. The results of the updated CBRA indicate volumes of protection required that are in broad alignment with those put forward within the application when the uncertainties are considered. As such, the Applicants believe that the 20% protection figure noted remains a realistic WCS.

[5] Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas | JNCC Resource Hub

[6] Volume 2, Chapter 1: Offshore Project Description (planninginspectorate.gov.uk)

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RR-039: B13	7.8 – Table 8-1	Natural England notes that Table 8-1 summarises the worst-case design parameters for likely significant effects (LSEs) scoped into the Environmental Statement (ES) for the marine physical environment assessment. However, we note that for Operational impact 6, "Cable Repairs and Reburial", the activity has been described, but no associated LSE pathways have been included (e.g. increased SSCs, seabed disturbance etc).	Natural England advise that the Applicant needs to specify the LSEs associated with Cable Repairs and Reburial activities and provide the Maximum Design Scenario (MDS) for each activity during operation (for all build scenarios). Where MPAs may be affected directly and indirectly, the WCS impact on each MPA and affected features should also be provided.		Column One of Operational impact 6 should read 'Changes in suspended sediment concentration, transport and seabed level due to cable repairs and reburial'. This additional text should also be applied to wherever 'Cable repairs and reburial' appears in **Chapter 8 Marine Physical Environment** [APP-080] (e.g. heading of section 8.7.4.6).
RR-039: B14	7.5 – Table 5-16 7.8 – Table 8-1	Natural England highlights that in Table 5-16 the WCS sandwave clearance volume for export cable installation is 62,424,700m3 for DBS W and DBS E built sequentially/concurrently. However, in 7.8, Table 8-1, this is stated to be 66,243,601m³. It is therefore unclear if sandwave clearance is included in the Table 8-1 total.	Natural England advises that clarification is provided on the WCS for sandwave levelling/seabed clearance.		The sandwave clearance volume of 66,243,601m³ is incorrect and based on earlier version of the Projects' Design Envelope. As noted, the sandwave clearance volume stated in Table 5-16 of **Chapter 5 Project Description** [APP-071] of 62,424,700³ is the correct value.
RR-039: B15	7.8 - Section 8.7.4.2 7.8.8.3: 8.3.2.5	Natural England disagree with the Worst-Case Scenario modelled for baseline wave and tidal impacts.	See comment B21.		Natural England is referred to the Applicants' response to RR-039: B6 for a view on the WCS modelled for wave and tidal current effects.
RR-039: B16	7.8 -Table 8-1 and Section 8.3.2.4	Natural England notes that the Applicant has not committed to the removal of cable/scour protection at the point of decommissioning. Without such a commitment, the worst-case scenario should assess the impacts of leaving assets permanently in situ rather than restrict the impact assessment to the operational lifetime of the windfarm. This should take into account changes in the physical baseline and movement of receptors during this time.	Natural England advise that a commitment to remove all on and above seabed infrastructure associated with the development within benthic designated sites (excluding cable crossings) at the time of decommissioning should be secured in the DCO, to prevent permanent impacts to marine physical processes. Without a commitment in the DCO for the removal of infrastructure including the placement of cable protection, the worst-case scenario should		Please see the response to RR-039: B3.

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			assess the impacts of leaving assets permanently in situ.		
Baseline Characterisation - Document(s) Used: [APP-080] 7.8 ES Chapter 8 – Marine Physical Environment [APP-081] 7.8.1 ES Chapter 8 – Marine Physical Environment Figure 8-1 to Figure 8-13 [APP-084] 7.8.8.3 ES Appendix 8-3 – Marine Physical Processes Modelling Technical Report [APP-244] 8.20 Cable Statement					
RR-039: B17	N/A	The survey data acquisition is broadly appropriate.	N/A		The Applicants welcome agreement from Natural England on this point.
RR-039: B18	8.20 – Appendix A & B	Cable Statement – Appendices A & B: Preliminary Cable Burial Risk Assessment (CBRA) and Installation Reports for the Array Area and Export Cable Route (August 2023) The Preliminary CBRA is based on the Projects' Red Line Boundary (RLB) at Preliminary Environmental Information Report (PEIR) stage. But Natural England highlights that the export cable corridor, indicative turbine layout and array area RLB have been significantly revised since PEIR compared to those assessed in the CBRA.	Natural England advise that an up-to-date and more detailed pre-consent cable burial assessment should be provided, based on the most recent RLB and turbine/cable layout. We advise that this should use project specific geotechnical data and/or data from constructed offshore windfarms to consider the likelihood of burial success to inform realistic maximum design parameters for cable protection requirements.		The supplied CBRA (**Cable Statement** [APP-244]) for the export cables is a preliminary CBRA which includes the consideration of several potential cable corridors. The development of the CBRA is an iterative process and may require further, multiple updates as designs develop and when a Contractor is selected and the burial methodology is finalised. The DMLs included in the **Draft DCO** [APP-027] require detailed cable risk assessments to be included as part of the construction method statement to be submitted and approved prior to commencement of the licensed activities, or any phase of those activities.
RR-039: B19	7.8.1 – Figure 8-5	Natural England advise that identification of regional scale sediment transport pathways is an important part of the baseline characterisation. Sediment transport pathways have been identified only for the landfall, adjacent coastline, nearshore and westernmost section of the Offshore Export Cable Corridor (OECC). Therefore, there is no information for the majority of the OECC and array areas.	Natural England advise that the Applicant should review available evidence to establish or infer sediment transport pathways for the remainder of the OECC and array areas. This will help inform the assessment of potential changes to sediment transport		A search of available evidence regarding regional sediment transport pathways along the Offshore Export Cable Corridor reveals no relevant information is available. Research into regional pathways is restricted to areas south of the Offshore Export Cable Corridor (e.g. Kenyon & Cooper, 2005[7]; the Southern North Sea Sediment Transport Study[8]; DTI Strategic Environmental Assessment[9]). Details of seabed mobility specific to the Offshore Export Cable Corridor are presented in detail in Section 8.5.8 of **Chapter 8 Marine Physical Environment** [APP-080] which is a more useful baseline for impact assessment than regional information.

[7] Kenyon, N.H., Cooper, W. (2005). Sandbanks, sand transport and offshore wind farms. Department of Trade and Industry. Kenyon MarineGeo and ABP Marine Environmental Research Ltd, UK.

[8] Sutherland, J., Brew, D. & Williams, A. (2002). Southern North Sea Longshore Sediment Transport.

[9] Cefas (2016). Suspended Sediment Climatologies around the UK, Strategic Environmental Assessment Programme. UK Department for Business, Energy and Industrial Strategy offshore energy

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
			pathways arising from the presence of built structures.		
RR-039: B20	7.5 – Para 217-218 7.8 - 8.5.16, Paras 122-125	Natural England notes that it is stated that "The drill, or other trenchless installation, bore would be of sufficient depth below the ground level to have no effect on coastal erosion. The TJBs (Transition Joint Bays) would be located beyond any areas at risk of natural coastal erosion across the anticipated operational life of the Projects". However, we note that East Riding of Yorkshire Council (ERYC) historical and recent cliff recession rates have been used to demonstrate rates of change at landfall. Therefore, we consider the beach elevation change data presented in the ES from 2008-2015 to be out of date. Establishing historical and more recent trends in beach and shore platform elevation change is a key part of the baseline characterisation for the marine (coastal) physical environment. This will help inform understanding of how the coast (at landfall) may evolve naturally over the lifetime of the Projects, establish coastal morphology sensitivity to scheme impacts, and inform asset integrity and cable burial assessments.	We advise that more recent beach/shore platform elevation change data should be sought and analysed (alongside the older data collected), to inform the cable burial/asset integrity assessment and assess coastal vulnerability through the lifetime of the Projects.		The Applicants have received from East Riding of Yorkshire Council cross section drawings for the beach at the landfall. Data has been made available every six months since 2003 up to the present day. This data and an interpretation of it will be included in the **Coastal Change Technical Note** [document reference: 11.6] (to be submitted late November 2024) alongside a revision of the coastal erosion information (see RR-039: B23).
RR-039: B21	7.8.8.3 - 8.3.2.5 7.8 - 8.7.4.2	Numerical Modelling of Changes to the Wave Regime due to the Presence of Infrastructure Natural England notes that numerical modelling has been undertaken to provide an evidence base for assessing the effects of infrastructure on the wave regime. Baseline wave conditions, and two windfarm layouts have been modelled, with the results from Option 2 being used for the assessment. Whilst we acknowledge that Option 2 presents the absolute WCS layout that could be achieved	Natural England advise that the modelling should be updated to reflect the design parameters of the project being applied for (i.e. without gravity bases) and that the outputs of the more realistic layout out scenario (Option 1) should be carried through to the assessment. However, we acknowledge that this will not have a material impact on assessment conclusions, but may have implications for post		Natural England is referred to the Applicants response to RR-039: B6 for a view on the WCS modelled for wave and tidal current effects.

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		using minimum spacing between the turbines, we do not consider that it provides a realistic worst case scenario due to the unlikelihood of the array being installed in this layout (confirmed by the Applicant during the Evidence Plan Process ETG3, date 11th September 2023). We consider that Option 1 presents a more realistic worst-case scenario in terms of turbine spacing and windfarm layout and should therefore be used for the assessment. Further, we note that gravity base foundations have now been removed from the Project envelope for turbines (but currently not platforms) within the array areas. However, they are still included in the modelling. The modelled results therefore do not represent the realistic worst-case scenario of the Project as applied for and overestimate the effects of the offshore platforms.	construction determining if impacts are greater than predicted.		
RR-039: B22	7.8.8.3 - 8.3.3.4, 7.8 - Section 8.7.4.1	Numerical Modelling of Changes to the Tidal Regime due to the Presence of Infrastructure Natural England notes that the hydrodynamic model was run for baseline conditions, Option 1 and Option 2. As above, we consider that Option 1 presents the most realistic WCS of the design scenarios modelled.	See comment B21.		Natural England is referred to the Applicants response to RR-039: B6 for a view on the WCS modelled for wave and tidal current effects.
RR-039: B23	7.8 – Section 8.5.16, Table 8-20	Natural England notes that data on coastal erosion was obtained from East Riding of Yorkshire Council to provide an historic understanding of coastal change. Predictions of coastal erosion were made using the UKCP18 high emission scenario (RCP8.5) at the 50% confidence level. However, we advise that the revised National Coastal Erosion Risk Mapping project (NCERM2; https://www.data.gov.uk/dataset/4b723013-b676-4202-aab5-a2bc449c72fb/national-coastal-erosion-risk-management-ncerm),	Natural England advises that Table 8-20 should be revised using the 95% confidence level. Cliff erosion is relevant in terms of reviewing whether construction impacts have altered baseline cliff erosion rates. Therefore, this should be done as part of the post construction monitoring rather than strictly being needed for the ES.		The Applicants have received up-to-date coastal erosion data from East Riding of Yorkshire Council. This data and an interpretation of it will be included in the **Coastal Change Technical Note** [document reference: 11.6] (to be submitted late November 2024) alongside a revision of the coastal erosion information (see RR-039: B23).

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		which uses the 70th and 95% confidence level to predict worst case erosion rates should be used			
RR-039: B24	7.8 - Section 8.8.4.2, Para 372; and Section 8.5.6, Para 77	Potential Cumulative Effects During O&M: Dogger Bank A (DBA) and Dogger Bank B (DBB) Natural England notes that it is stated that "any wave shadow effects created due to the presence of turbines in the Array Areas and Dogger Bank A and B will be to the south and southeast…no cumulative effects are expected but there is potential for in combination effects if the Dogger Bank A wave shadow extends into the northern part of the DBS East Array Area." However, Para 77 highlights that there is a significant secondary component from the south to south-south-west (S-SSW). Therefore, we advise that the spatial extent, and potential impacts, of this projected wave shadow has not been assessed.	Natural England advises that the Applicant should provide details of the spatial extent of any wave shadow effects extending from DBS into DBA. The implications of these wave shadow effects for the marine physical environment over the lifetime of the Projects should also be considered.		The Applicants agree that a wave shadow could also form to the north of the arrays for waves approaching from the south and south-southwest. It is likely that waves that approach the Projects from the south would also approach Dogger Bank A and B from the south at the same time. Hence, the wave shadows for all the wind farms would be to the north, with no potential for overlap and generation of cumulative effects. Also, the changes in significant wave height induced by the Projects wind turbines are predicted to be so small at less than 1.5% of baseline conditions, that cumulative changes to wave regime with Dogger Bank A and B will not be significant (see section 8.8.4 of **Chapter 8 Marine Physical Environment** [APP-080] for further details).
Environmental Impact Assessment - Document Used: [APP-071] 7.5 ES Chapter 5 – Project Description [APP-081] 7.8 ES Chapter 8 – Marine Physical Environment [APP-242] 8.18 Disposal Site Characterisation Report					
RR-039: B25	7.5 – Para 247	Emergency Intertidal Access Natural England advises that the potential impacts of extending North Turnpikes Road to the beach/cliffs are unclear. There are also insufficient details regarding what the emergency access may entail. Furthermore, it states that sensitive dune and cliff habitats would be protected, but no information is provided on how this would be done.	Natural England advise that the Applicants need to provide further details of this emergency intertidal access design and the coastal morphology and sensitive habitats that may be affected by its presence. Any environmental impacts associated with its construction, operation, and subsequent removal should be fully considered and assessed.		As stated in the ES, **Chapter 5 Project Description** [APP-071], paragraph 247. 'This access would only be used in the event of a construction emergency, such as a frac-out, whereby drilling fluid is released to the ground surface during trenchless crossing installation. A Satellite Temporary Construction Compound would be located at the end of Turnpike Road where there is an existing boat storage area. This would be returned to its current use on completion of the works at the Landfall Zone.' As shown on sheet 1 of the **Works Plan (Onshore) (Revision 3)** [PDA-003] Works no. 9A/B shows where the emergency beach access would be located on the beach, if required by the Contractor. It would be located in the intertidal between MHWS and MLWS. The Applicants can confirm that any vehicle required would track along the sand, a temporary haul road would not be constructed. As such, no physical works are proposed that are associated with the access prescribed by Works 9A/B. Works No. 10A/B (above MHWS) include the highly dynamic area of land immediately adjacent to the eroding cliff face. This is where the Applicants propose to install an access ramp shoreward of MHWS providing access to, but not extending into, the intertidal area. This ramp

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					would be suitable for temporary vehicular access to the beach. The access ramp would be designed when the contractor is appointed and would, as a worst case, remain in place for the duration of the construction works. The access point is currently used by members of the public and has been previously used as a boat launch but has eroded considerably since habitat surveys were completed between May and November 2023. There is currently no permanent access ramp. Appendix C of **Appendix 18-2 Habitat Survey Report** [APP-143], includes the results of the Habitat Survey. Sheet 1 of the map identifies moderate quality Maritime Cliff and Slope habitat (s2a) in this location. As detailed in Section 18.10.4.2.1, paragraph 73 of **Appendix 18-10 Biodiversity Net Gain Strategy** [APP-157] '*All intertidal habitats within the emergency beach access route [will be retained] (though it should be noted that protective matting may be installed within this area. This area will be monitored should emergency access be required). Should that habitat still be present the Applicant would propose to protect it from any crossing vehicles with suitable matting.*' The Applicants can confirm an assessment of the potential temporary impact to this habitat from use of an emergency beach access have not been included in **Chapter 18 Terrestrial Ecology and Ornithology** [APP-140]. Therefore, section 18.6.1.3, Construction Impact 3 will be updated and mitigation will be confirmed as installation of suitable protective matting should the habitat still be present prior to construction. Any mitigation added to the chapter, to align with the wording in **Appendix 18-10 Biodiversity Net Gain Strategy** [APP-157] will also be updated in the **Outline Ecological Management Plan (OEMP)** [APP-235] and both updated documents would be submitted in late November. As no construction works are proposed below MHWS for this access no updates to any offshore documents are proposed.
RR-039: B26	7.8 - Table 8-3 7.5 - Paras 228-229;	Trenchless Landfall Works Natural England notes a commitment has been made (DML 3 & 4 - Condition 13) whereby "Jack-up vessels will not be used within the area of the 1km Construction Buffer Zone which overlaps with the Holderness Inshore MCZ or the Smithic Bank sandbank without agreement of MMO in consultation with Natural England". We welcome this measure. However, we note that jack up barges, and other vessels, equipment, and infrastructure (e.g. floating units, sheet piles, tugboats, pontoons, Crew Transfer Vessels (CTVs), shallow drought vessels) may be used for trenchless landfall exit works during the different phases of development. It is unclear what the potential impacts of these activities may be to seabed and coastal morphology.	Natural England advise that the Applicant should consider and assess all potential impacts to seabed morphology that may arise due to trenchless landfall works during the lifetime of the Projects.		The equipment used at the landfall exit will only have a potential effect on seabed and coastal morphology, where it is temporarily sitting on the seabed. This would be restricted to jack-up vessels if they are used. Floating equipment will have no effect. The potential effect would be to create a small hole, which would over time, become shallower and less distinct due to infilling with mobile seabed sediments. **Chapter 8 Marine Physical Environment** [APP-080] concluded that the significance of effect on seabed morphology of using six jack-up vessels at each of 200 small wind turbines and nine offshore platforms would be negligible. Given this, the relatively small number of jack-up vessels that would be used at the landfall exit point (maximum of 3 vessels simultaneously during exit pit preparation) means the significance would also be negligible. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January.

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					All the changes are expected to be positive i.e. reducing or removing impacts. However, although the quantum of impact will be reduced the significance of effect will remain the same.
RR-039: B27	8.18, Section 7.2.1, Table 7-2, Paras 144-148 7.8 – Section 8.7.3.4, 8.1.2.4	Short Trenchless Cable Installation at Landfall Natural England notes that it is stated that excavated material will be disposed directly adjacent to the location of the excavation. Excavation will be undertaken at low tide, but the excavated material stored on the beach will become submerged at high tide where it will be mobilised and redistributed by seabed currents. However, it is also stated that the trench will be backfilled on completion of cable installation activities. Natural England highlight that retaining side cast material is rarely successful along this area of coastline due to the strong longshore currents.	Natural England advise that clarification is provided on what material will be used to backfill the trenches if the excavated material has been redistributed. We advise that sediment should be stored in such a way that it cannot be washed away.		The Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the removal of the requirement for short trenchless cable installation at landfall. Should this change be accepted by the Examining Authority (ExA), no works within the intertidal area would occur for the Projects and therefore no requirement for backfilling of intertidal trenches. Should this change not be accepted, the Applicants will consider further options for storage of material (for example storage of excavated material on barges) from any landfall exit pits in consultation with stakeholders.
RR-039: B28	7.8 - Section 8.9, Figures 8-6a-d, Para 91-100 and Para 171, 7.5 - Section 5.5.7.4.5	Sandwave Clearance Natural England notes that the WCS total volume of sandwave levelling or pre-sweeping within the Offshore Export Cable Corridor and Array Areas is 66,243,601m³ and 1,003,944m³, respectively. In addition, there may be further impacts to sandwaves or similar bedforms due to cable installation, foundation preparation, and other construction activities. We are, concerned that removal or modification of sandwaves could adversely affect nearby sandbanks, seabed topography, and affect flow and sediment transport patterns.	Natural England advise that all efforts should be made to avoid areas of sandwaves and/or minimise the need for sandwave levelling/pre-sweeping by micro-routing. If possible, dredged material should be placed to aid natural infilling of trenches. Best practice should be followed to assess and minimise potential impacts to sandwave/sandbank systems. For example within benthic MPAs, any sediment deposition from sandwave levelling should be located within areas of similar sediment type, as close to and upstream of the original sandwave, and is deposited using a fall pipe		The Applicants agree that removal or modification of sandwaves could potentially interfere with sediment transport pathways that supply sediment to the local sandbank systems. However, the dynamic nature of the sandwaves in this area means that any direct changes to the seabed associated with sandwave levelling are likely to recover over a short period of time due to natural sand transport pathways. This conceptual evidence-based assessment is supported on the findings of a review of the evidence base into the recovery of sandwaves at the similarly dynamic areas of Race Bank and Haisborough, Hammond and Winterton (HHW) SAC (ABPmer, 2018[10]). To install parts of the array and export cables for Race Bank Offshore Wind Farm, the crests of sandwaves were reduced in elevation. Multibeam echosounder monitoring was completed of pre- (2015/2016), during (2017) and post- (2018) sandwave levelling to assess the level of disturbance and the rate of natural recovery (restoration) of seabed morphology. Nine areas were chosen (seven array cables routes and two areas along the offshore cable corridors) where significant sediment mobility was expected. The results showed that along most of the nine study areas, the seabed had completely or nearly completely recovered to pre-construction levels (greater than 75% recovery of sandwaves in all areas). Work done by ABPmer (2018[10]) across HHW SAC for Norfolk Vanguard / Boreas Offshore Wind Farms provides another suitable analogy. ABPmer investigated sandwave properties (height,

[10] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-000379-5.3.7.1%20Information%20to%20Support%20HRA%20Appendix%207.1%20ABPmer%20Sandwave%20Study.pdf

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			(should a suction hopper dredger be used) to best ensure sandbank recovery and that the sediment remains within the designated site. We also advise that the proposed pre- and post-construction monitoring should be used to assess geomorphological recovery after cable installation.		wavelength, asymmetry, mobility and migration characteristics) and the sediment transport potential. The results showed that the sandwave area is in an active and highly dynamic environment, governed by flow speeds, water depth and sediment supply, all of which are conducive to the development and maintenance of sandbanks. Therefore, despite the disturbance to sandwaves intersecting the cable corridor, the HHW SAC sandbank system would remain undisturbed as new sandwaves will continue to be formed. They concluded that the overall form and functioning of any sandwave, or the SAC sandbank system, is not disrupted by levelling of the sandwaves. Similar physical and sedimentary processes apply to the area of sandwaves along the Projects' Offshore Export Cable Corridor. The driving forces (tidal currents) and sediment supply regime will be like the sandwaves in Race Bank and HHW SAC (as it is for all areas with sandwaves). Hence, the same principles of recovery would apply. ABPmer concluded that the estimated time for the cable trenches and the seabed levelling to be naturally infilled, and for sand waves to recovery would be in the order of a few days to a year. Also, they showed that the governing sediment transport processes within the HHW SAC occur at a much larger scale than the proposed bed levelling works. Therefore, these processes will not be disrupted by the localised bed levelling. The same can be said for the sandwaves in the Projects' Offshore Export Cable Corridor, and so there is no reason to believe that the sand waves would not recover in a similar fashion and at a similar rate, without upsetting the bigger landscape scale processes across the sand waves. As a variety of sediment types are present on the Dogger Bank, the Applicants believe that stipulating material to be disposed must be placed on the same material type cannot be guaranteed and would be difficult and onerous to apply in reality. Dredging, particularly for the linear aspects of the Projects such as the subsea cable installations, may occur over a variety of sediment types to allow installation to occur. The resultant mixed cargo could not be disposed of on any single, specific material type. Hence, compliance with such a condition would require the dredge, transit and deposition of very high numbers of potentially very limited cargoes of specific sediment types for specific disposal on patches of that same sediment type. The dredge, transit and disposal and the 'stop-start' nature of dredging mean that this would be highly time consuming and inefficient. Given the practical difficulties associated with this request, the Applicants do not agree that this should be added as conditions of the DMLs. Across the course of the pre-construction phase of the Projects, the Applicants will seek to minimise sandwave levelling require for cable installation.
RR-039: B29	7.8, Section 8.7.4.2	Numerical Modelling of Changes to the Wave Regime due to the Presence of Infrastructure Natural England notes that Model results (for both Options 1 and 2) show 'wave shadows' with potential reductions in significant wave height of up to 0.7m, with the largest effects due to the offshore platforms in the Array	Natural England advises that the implications of the predicted changes to wave climate over the lifespan of the Projects need to be fully considered in terms of impacts to the seabed sediment composition, sediment mobility,		For all scenarios, the greatest change in wave height is a reduction of up to 0.7m. However, this only occurs immediately adjacent to (less than 100m) the offshore platforms which as a WCS creates a blockage effect over an area with a diameter of 65m. Hence, the footprint of this change is insignificant compared to the area of Dogger Bank SAC. The larger areas of Dogger Bank SAC are affected by maximum changes to wave height of between 0.04m and 0.06m. These are less than 1.5% of baseline wave heights. It was concluded in **Chapter 8 Marine Physical Environment** [APP-080] that tidal currents are the

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		Areas. The amount of wave energy reaching the seabed affects the sediment composition and biological communities across Dogger Bank SAC. Therefore, we are concerned that the areas within the Arrays predicted to experience larger significant wave height reduction could affect seabed morphology (and in turn the biological communities) over the lifespan of the Projects.	and seabed morphology of the Dogger Bank SAC.		dominant driver of bedload sediment transport and seabed morphology (and in turn the biological communities) across the array areas, rather than waves.
RR-039: B30	7.8, Section 8.7.4.1	Numerical Modelling of Changes to the Tidal Regime due to the Presence of Infrastructure Natural England notes that Hydrodynamic model results show lower current speeds (shadow effects) along the western boundary of the Arrays, but also increased current speeds inside the Arrays. Similarly, there are shadow areas in the difference plots for bed shear stress, with areas of reduced bed shear stress adjacent to the western DBS W Array boundary and to the west and east of the DBS E Array boundary, but with areas of increased bed shear stress within the Arrays.	Natural England advise that the implications of predicted changes to current speeds and bed shear stress over the lifespan of the Projects need to be fully considered in terms of seabed sediment composition, sediment mobility, and seabed morphology of the Dogger Bank SAC.		Section 8.7.4.4 in **Chapter 8 Marine Physical Environment** [APP-080] provided an assessment of potential changes to bedload sediment transport and seabed morphology based on the results of the tidal current/bed shear stress modelling presented in **Appendix 8-3 Marine Physical Processes Modelling Technical Report** [APP-084]. Changes to the tidal regime are likely to be the main driver of any changes in bedload sediment transport and as a result, seabed morphology. The conclusions were that the near-field magnitude of impact on bedload sediment transport regime and seabed morphology would be low and the far-field magnitude of impact would be negligible. The predicted zone of influence for the Array Areas on bedload sediment transport regime and seabed morphology includes Dogger Bank. The section concluded that significance of the effect on Dogger Bank would be negligible.
RR-039: B31	8.8.3.2, Para 359	Dogger Bank D (DBD) As stated, there exists the potential for a temporal overlap in construction between Dogger Bank D and Dogger Bank South. Natural England notes that only overlaps between turbine installation activities have been considered. However, we note that the DBS landfall area and DBD landfall areas are likely to overlap. There is, therefore, the potential for cumulative effects at landfall which should be considered and assessed.	Natural England advise that there is the potential for cumulative effects due to overlapping construction activities at landfall which should be considered further, and the impact assessment updated once the DBD Preliminary Environmental Impact Report (S42) consultation is publish in early 2025.		The Applicants agree that construction of the landfall for the Projects has the potential for a temporal overlap with construction of the Dogger Bank D landfall (which will start no earlier than 2027), which could lead to a cumulative effect. It is highly unlikely that the landfall activities for the two wind farms would occur at the same time. Also, the locations of the landfall construction activities, and potentially the types of activities that may occur, are likely to be different. The Projects' landfall will be installed using trenchless techniques with an offshore exit point at least 50m from the Holderness cliffs. As noted in section 7.2.3.1.2 of the Dogger Bank D Scoping Report[11], a variety of methods could be adopted for that project which are likely to involve one or more cofferdams and / or the use of Horizontal Direction Drill (HDD). If HDD is used for Dogger Bank D, it is highly unlikely that the offshore exit point would be close enough to the Projects offshore exit point for any disturbances to overlap. Also, it is unlikely that the disturbances caused by cofferdam installation for Dogger Bank D and the trenchless installation activities for the Projects would overlap in space.

[11] Dogger Bank D Scoping Report

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					Hence, cumulative effects in relation to changes in suspended sediment concentration and transport due to landfall installation are not expected. The Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the removal of the requirement for short trenchless cable installation at landfall. Should this change be accepted by the ExA, no works within the intertidal area would occur for the Projects and therefore no potential for cumulative effects with any intertidal works proposed by Dogger Bank D.
RR-039: B32	7.8 - 8.7.1 and Table 8-21	Natural England highlights that while Dogger Bank sandbank has been included in the list of Marine Physical Environment Receptors (Table 8-21), Dogger Bank SAC has not. The qualifying feature of Dogger Bank SAC is Annex I sandbank which could be directly and indirectly affected by Project-related changes to its physical structure, topography, and sediment composition and distribution.	Natural England advise that Dogger Bank SAC should be included as a receptor in the Marine Physical Environment EIA. It should also be identified (along with other relevant designated sites) on Marine Physical Environment maps to inform understanding of potential impacts.		The principal receptors with respect to the marine physical environment are coastal or marine features with an inherent geological or geomorphological value or function which may be affected by the Projects. As the conservation objectives of SACs and Marine Conservation Zones (MCZs) are driven by their ecological functioning, they are not considered as receptors for the marine physical environment and are assessed in the relevant chapters. However, a designated site may have a morphological component. For example, the Dogger Bank SAC comprises part of the Dogger Bank which is a topographic high and a geomorphological feature. Therefore, Dogger Bank itself is included as a receptor in this assessment, but not the Dogger Bank SAC. Potential effects on the Dogger Bank SAC are detailed in **RIAA HRA Part 2 of 4** [APP-046].
RR-039: B33	7.8 - Section 8.8.4, Paras 374-376	Potential Cumulative Effects During Operation and Maintenance – Stratification/Flamborough Front Natural England highlights that the magnitude of impact (for cumulative effects on the Flamborough Front) is considered LOW in close proximity to structure[s], and negligible at the regional scale. This, coupled with a NEGLIGIBLE sensitivity of the Front, has resulted in the cumulative significance of effect being assessed as NEGLIGIBLE. We are unable to agree with this conclusion. As stated in Section 8.8.4, both "Dogger Bank A and Dogger Bank B schemes, and the Projects Array Areas are located in a region of the North	Natural England advise that the Applicant should first seek to reduce the risks as much as possible through consideration of the placement of foundation structures and reducing the WCS for foundation structures within the Array Areas. And, as advised for Hornsea Project Four, it is also important to establish a monitoring programme to record changes to stratification and primary productivity, in the form of pre-construction, post-		The cumulative significance of effect is assessed as negligible because any effects caused by the Projects structures would only interact with other offshore wind farms at a regional scale. The Projects-alone significance at a regional scale is negligible. There would be no interaction at a local scale. Hence, the overall cumulative negligible effect. Monitoring of the Flamborough Front can only be undertaken using remote sensing techniques. This is because, when the Flamborough Front is present, it is a 320 km-long zone separating the well-mixed cooler waters to the south from the warmer stratified waters to the north. The discontinuity in temperature is typically visible in satellite infrared imagery and this is the best method to investigate its location and structure. Trying to monitor the feature using deployment of Acoustic Doppler Current Profilers or other instruments located on the seabed or in the water column would only provide local-scale information which could not be reliably associated with any effects induced by the Projects structures.

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		Sea where there is the potential for seasonal stratification to occur as the Flamborough Front develops and migrates." Recent studies (e.g. Daewel *et al.*, 20222) show that the presence of large OWF clusters (e.g. Dogger Bank) could provoke large-scale hydrodynamic changes that impact marine primary production and the wider marine ecosystem. Therefore, we are concerned that structures in the DBS Arrays, such as foundations and piles, could cause turbulent current wakes which impact circulation, stratification, mixing, and sediment resuspension. In turn, changes to the Flamborough Front could have far-reaching and long-term consequences since the frontal system gives rise to nutrient-rich waters which create a biodiversity hotspot attracting seabirds and marine mammals to the area each year. Given the number of developments of offshore windfarms in the proximity of the Flamborough Front we advise that monitoring of potential change in stratification and productivity from the DBS development is needed to improve the evidence base and conclusions from the ES.	construction, and for the lifetime of the Projects. This should include 'trigger points' to allow interventions/remediation, if required. There are a number of research and monitoring programmes (e.g. Universities of Bangor and Hull) investigating the impacts of offshore windfarms on stratification and productivity which may provide useful evidence to inform the impact assessment.		
RR-039: B34	7.8 – Table 8.3	Natural England notes that the Applicant has made several commitments to reduce impacts on physical processes receptors, including: • Not using gravity base foundations for turbines in the array areas • Micro siting cables to avoid more challenging areas of seabed for cable installation • Using a trenchless technique to install the cables at landfall	Natural England welcomes these commitments.		No response is required.
RR-039: B35	7.8 - Table 8-3, Section 8.5.2, 8.13	Embedded Mitigation Measures. Natural England notes that Section 8.13 states that due to "the presence of bedrock in the shallow subsurface within the nearshore, there	Natural England advise that further information is needed to demonstrate the need for 10% of the cumulative cable length to be		See the Applicants response to RR-039: B2 regarding cable protection measures in the nearshore. The Applicants have not yet developed detailed designs relating to the length of cable protection required (or its location and the location of the trenchless transition exit pit) for the

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	7.5 - 5.5.7.7.2, 7.5.1, Figure 8.3.	is potential for cable protection measures to be required between -9 and -10 m below LAT." However, in Table 8-3, an embedded mitigation measure has been proposed whereby "Cable protection will be limited to 10% of the cumulative length of all cables laid between 350m seaward of MLWS and the 10m depth contour…" We are concerned that this could lead to placement of external cable protection (up to 1.4m high) within the active nearshore zone, potentially interrupting nearshore sediment transport processes and circulatory pathways around Smithic Bank, and longshore sediment transport towards the Humber Estuary SAC and Spurn Point. Natural England welcomes that at the landfall, mean low water spring (MLWS) tide level is approximately 130m seaward of the cliffs meaning that from the cliffs to approximately 480m seaward the cables will be buried and have no effect on coastal processes. We also note the findings by HR Wallingford (2011) that "*sediment transport driven by waves seaward of 250m from the cliffs at the landfall is very low (although still within the closure depth) and there will be no effect on these processes*". However, whilst NE agrees that the majority of longshore sediment transport occurs closer to shore, it is important to note that not all longshore sediment transport does. NE highlight findings from Alkyon[12] (1999) for this area of coast that "*It should be noted that the major impact area is confined to shallow water (about 500m from the cliff) and the longshore transport is much wider (about 1500m from the cliff)*". Natural England is concerned that the use of cable protection within the 10m depth contour would interrupt the longshore sediment transport supply to the Humber Estuary SAC	protected between 350m seaward of MLWS and the 10m depth contour. We advise that alternative methods of cable burial and/or protection should be explored in line with the mitigation hierarchy, to remove or reduce the need for cable protection between MLWS and the 10m contour. We highlight that the Dogger Bank A&B offshore wind farms have now installed their (bundled) export cables with no cable protection needed within the 10m depth contour. Further, Hornsea Project Four offshore wind farm reduced their cable protection requirement to 5% specifically across Smithic Bank to avoid cable protection in the nearshore area and across the full extent of the sandbank. The Northern Endurance Partnership has committed to installing their pipeline in a pre-cut trench which will be backfilled to minimise environmental impact, with no rock protection to be placed landward of 10m LAT within the Holderness Inshore MCZ and Holderness Offshore MCZ region. If cable protection is not removed from the project envelope, we advise that design solutions are investigated such as reducing the maximum height of any protrusions (currently estimated as 1.4m). Alternatives to rock protection which may be less impactful and more easily		export cable. Work is currently ongoing to provide an update on these topics and will continue post-consent. Any updates, should they be made within the timeframe of the examination, will be shared with all Interested Parties and the ExA. Regarding the potential height of cable protection measures within the 10m depth contour, as noted in paragraph 189 of **Chapter 14 Shipping and Navigation** [APP-121] the Applicants would follow the guidance contained in MGN 654 in relation to cable protection, namely that cable protection would not change the charted water depth by more than 5%, unless otherwise agreed with the Maritime and Coastguard Agency and Trinity House. This commitment is secured within the following conditions of the DMLs: • DML 1 & 2 – Condition 15; • DML 3 & 4 – Condition 13; and • DML 5 – Condition 11. As such, within the 10m depth contour the Applicants would be limited to a cable protection height of no greater than 50cm. Therefore, rock placement would not be used within the 10m depth contour, with other design solutions (such as concrete mattresses) being required should a need for cable protection measures be identified in the final design of the Projects.

[12] Environmental Assessment Process, Geomorphology West Sole Stabilisation Options, BP.

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		and Spurn Point. We advise that cable protection is likely to act as a groyne-like structure, thereby restricting longshore sediment transport and could also create scour around the structures. The impacts would be exacerbated further should cables not be bundled, and as outlined in the worst-case scenario, the maximum number of four cables be installed creating a series of peaks and troughs for sediment to overcome. Moreover, the effects of climate change could further increase the rate of erosion to the nearshore system, Humber and Spurn Peninsula.	decommissioned should also be explored, as was done for the Sheringham Shoal and Dudgeon Offshore Windfarm Extension Projects. We also advise that the commitment and associated DCO condition should also be refined to only placing cable protection within -9 and -10m below LAT, as the Applicant has already identified this as being the area potentially requiring cable protection. See also Comment C23 in Appendix C regarding bundling the export cables.		
RR-039: B36	7.8 - Page 41, Table 8-3, and 8.5.16, Points	Embedded Mitigation Measures Natural England is concerned that currently there is insufficient information regarding beach elevation change and shore platform down wearing to inform the assessment of potential construction- and operation-related impacts to coastal morphology at landfall.	Whilst we note that there is a commitment to carry out beach profile change monitoring (pre- and post-construction) if trenchless technique exit pits are located within the intertidal area, we advise that beach profile change monitoring should be carried out regardless. This will not only confirm beach recovery and support predictions regarding impacts to Holderness cliffs, but also monitor cable burial success and asset integrity over the lifetime of the Projects.		The Applicants have received from East Riding of Yorkshire Council cross section drawings for the beach at the landfall. Data has been made available every six months since 2003 up to the present day. This data and an interpretation of it will be included in the **Coastal Change Technical Note** [document reference: 11.6] (to be submitted late November 2024) alongside a revision of the coastal erosion information (see RR-039: B23).
RR-039: B37	7.8, Page 34, Table 8-1	Decommissioning Natural England notes that it is stated that it "is likely that offshore project infrastructure will be removed above the seabed and reused or recycled where practicable." Furthermore, it is stated that removal of "*some or all of the infield, interlink and export cables may be undertaken, although scour and cable protection would likely be left in situ other than where there is a specific*	Firstly, Natural England advise that the Applicant should commit to the removal of all structures on and above the seabed and consider the potential decommissioning of any proposed external cable/scour protection (including evidence on the likelihood of its success and impacts). Secondly, we advise that the Applicant should consider and		The wind turbines would be reused or recycled during decommissioning. Hence, the only above-surface infrastructure that may be left post-decommissioning is either scour and cable protection siting slightly proud of the seabed or buried beneath the seabed. Any potential long-term significance of effects due to this remaining infrastructure would be the same as those assessed for the operational phase of the wind farm for those parameters. In all cases the significance during operation is negligible.

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		condition for its removal." However, potential long-term impacts to the marine physical environment and physical processes of any assets left in situ have not been assessed in the EIA.	assess the long-term impacts to the marine physical environment of any assets left in situ for the lifetime of the assets within a pre-construction outline Decommissioning plan.		
RR-039: B38	7.8, Tables 8-23, 8-25, 8-27, 8-29	Dogger Bank and Smithic Bank Value Natural England notes that the value of Dogger Bank and Smithic Bank have been assessed as LOW, which we do not agree with. Dogger Bank is of national and international importance and of wider-scale ecological importance and we consider it be of HIGH value. Smithic Bank provides shelter to the northern part of the Holderness Coast including the town of Bridlington. It is an important fish nursery and feeding ground, in turn supporting the birds at Flamborough Head. Therefore, we advise that Smithic Bank is of HIGH value.	Natural England advise that the value of both Dogger Bank and Smithic Bank is HIGH. This should be taken into consideration by the Applicant and their assessment updated where necessary.		With regards to the marine physical environment, the Applicants acknowledge that following the definition of value in Table 8-10 of **Chapter 8 Marine Physical Environment** [APP-080], Dogger Bank and Smithic Bank are now assigned medium as the receptors are not designated, but of local / regional importance. The original values assigned as low in **Chapter 8 Marine Physical Environment** [APP-080] are therefore changed to medium. To assign high values in terms of the marine physical environment, the feature would need to be designated. This change in value would not alter the original assessment conclusions reached in **Chapter 8 Marine Physical Environment** [APP-080], with regards to Smithic Bank and Dogger Bank.
RR-039: B39	7.8, 8.7.3.10	Indentations on the Seabed Due to Installation Vessels Natural England is concerned that the anticipated disturbance footprint due to installation vessels could represent a considerable long-term change to seabed topography and the physical structure of the qualifying habitat of Dogger Bank and Dogger Bank SAC. It is predicted that the seabed disturbance footprint due to installation vessels would be limited in scale and temporary in nature '*with indentations infilling through natural processes over days to months*.' However, supporting evidence for seabed recovery has been provided based on pre-installation (2010) and post-removal surveys (2022) for two Met Masts in DBS B and C OWFs (i.e. after a period of 12 years). Currently, there is insufficient information to support the conclusion that the duration, reversibility and, thus, magnitude of	Natural England advise that the Applicant should provide further supporting evidence for seabed recovery following installation vessel impacts. This will also support the EIA conclusions. Additional mitigation should be explored to minimise impacts to the seabed morphology at Dogger Bank and the SAC during construction and Operation and Maintenance activities.		Each wind turbine installation could potentially generate about 6,600m² of indentations. Where these indentations are created in areas of mobile sediment, they are likely to be infilled through natural sediment transport processes. This is the most likely scenario given the shallow geology of the array areas, where sediment (sand) deposited in the modern marine environment has been proven in boreholes to reach thicknesses of up to 9.5m. However, there is a possibility that some of the indentations would be formed in areas of seabed that contain no (or little) mobile sediment, where static geological formations (e.g. the underlying Dogger Bank Formation) are exposed at the seabed or are close to seabed under a veneer of sediment. In these cases, the indentations are likely to remain unchanged over the longer-term, which would change the seabed topography in relatively small, isolated areas across the Array Areas. However, the substrate that will be exposed within the indentations will have the same geological composition as the surrounding seabed. So, in terms of qualifying habitat (seabed / substrate type), they would remain unchanged. As such, section 8.7.3.10 of **Chapter 8 Marine Physical Environment** [APP-080] determined that there would be no likely significant effects (in EIA terms) in relation to Indentations on the Seabed Due to Installation Vessels.

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		impact on seabed morphology will be LOW. Consequently, we are unable to agree with the assessment conclusion that effect significance will be NEGLIGIBLE. Additionally, evidence from Triton Knoll post installation monitoring is demonstrating that Jack Up Barge leg depressions are still present after two years.			
RR-039: B40	8.7.3.6	Construction-related changes at Dogger Bank Natural England notes that the sensitivity of Dogger Bank (and Dogger Bank SAC) to changes in seabed level due to seabed preparation for foundation installation, drill arisings, cable installation, installation vessel indentations, has been assessed as NEGLIGIBLE. This assessment is based on a HIGH tolerance, HIGH recoverability, and LOW value. We advise that these construction activities and similar operation and maintenance activities are likely to result in changes to the extent and distribution and physical structure of the site's sandbank feature in terms of its sediment composition and distribution, and finer-scale topography, which will further hinder its RESTORE objective(s).	Natural England advise that further mitigation measures should be adopted and secured to minimise the impacts as much as possible. In addition, Natural England advises that pre- and post-construction monitoring should be carried out to validate predictions of seabed elevation change and extent of deposition, sediment composition and distribution change, and seabed recovery across the Array Areas and Inter-Platform Corridor within Dogger Bank SAC. And should impacts be found to be greater than predicted then the necessary recourse should be taken.		The anticipated maximum depth of seabed preparation will be 0.5m, which is within the natural range of elevation change that is currently being experienced across Dogger Bank. Also, route selection and micro-siting will be used to avoid areas of seabed that pose a significant challenge to installation. This will minimise the requirement for seabed preparation and the associated seabed disturbance. Where seabed preparation is required, the seabed will be disturbed (up to 0.5m in depth). The coarser sediment (sand) that is disturbed would fall rapidly and the resulting change would be a low protrusion above the existing seabed that is local to the release point. The deposited sediment would be like the sediment on the seabed that it has replaced and the surrounding seabed. Over time, tidal currents would remobilise and transport this sediment as bedload, and the distribution and physical structure of the area would return to baseline conditions. Any fine sediment released into the water column could potentially settle. The overall change in elevation of the seabed due to deposition of sediment from the plume for foundations was modelled (see **Appendix 8-3 Marine Physical Processes Modelling Technical Report** [APP-084]. The results show the maximum change in seabed level was less than 5mm. This sediment would be continually resuspended on each tide and eventually widely dispersed, to reduce the thickness to a point where it will be effectively zero. As such, the Applicants do not believe that any migration further to that detailed in section 8.3.3 of **Chapter 8 Marine Physical Environment** [APP-080] is required with regards to construction related changes to marine physical processes across Dogger Bank (and Dogger Bank SAC).
RR-039: B41	8.7.4.3, Points 110 & 277 7.8 – Section 8.5.12	Flamborough Front Natural England notes that the Applicant states that the "*front becomes nutrient rich and is considered to be ecologically important.*" Yet, the value of the Flamborough Front has been assessed as MEDIUM. We advise that the Flamborough Front is of HIGH value owing to its colocation with particularly high primary production and ecological importance.	Owing to the ecological importance of the Flamborough Front, and emerging evidence that suggests large OWF clusters (i.e. Dogger Bank) may result in substantial impacts on stratification, currents, and sediment resuspension; Natural England advises that the Applicant should monitor potential changes		The Applicants agree that the value of the Flamborough Front is high due to the reasons indicated. However, the sensitivity is considered negligible. This is because although the feature may be present in the array areas in summer between 70% and 90% of the time and in autumn and spring, between 30% and 50% of the time, it does not commonly stratify in the vicinity of the Projects' Array Areas on a seasonal basis. Natural England is referred to the Applicants response to RR-039: B5 for a view on potential changes to turbulent mixing due to the interaction of tidal flows with the Projects' structures.

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		However, there is an evidence gap regarding current and predicted future levels of primary production in the vicinity of the DBS Arrays. The sensitivity of the Front has also been assessed as NEGLIGIBLE. However, there is insufficient evidence regarding the future location of the Flamborough Front relative to the DBS Arrays over the lifetime of the Projects. We note that in Section 8.5.12 the Applicant suggests that "*it may be present in the Array Areas, Inter-Platform Cable Corridor and the Offshore Export Cable Corridor during summer 70-90% of the time (Miller & Christodoulou, 2014). During autumn and spring, the front may be present in the Array Areas and Inter Platform Cable Corridor between 30-50% of the time (Miller & Christodoulou, 2014).* There is also a lack of evidence regarding potential changes in turbulent mixing due to the interaction of tidal flows with the DBS Array Areas infrastructure. We are, therefore, unable to agree with the EIA conclusions	to stratification, currents, and productivity. This is in line with advice given to Hornsea Project Four by Natural England, MMO and Cefas: EN010098-001704-DL5 - Natural England - Comments on any submissions received at Deadline 4 and 4a 2.pdf (planninginspectorate.gov.uk). We also refer the Applicant to the monitoring proposals made by Hornsea Project Four EN010098-001741-Hornsea Project Four - Other- G5.33 Clarification Note on Marine Processes Mitigation and Monitoring.pdf (planninginspectorate.gov.uk). The results of monitoring should be combined with monitoring results from other nearby windfarms and with up-to-date research such as this from the University of Hull-Primary production and carbon export across the Flamborough frontal system: interaction with offshore wind energy - Aura Centre for Doctoral Training (hull.ac.uk). If impacts are found to be greater than predicted and the windfarms can be excluded from causing a significant impact, then remedial actions will need to be undertaken.		
RR-039: B42	7.8 - Section 8.5.7, 8.7.4.5, Table 8-52, Paras	Changes to Bedload Sediment Transport and Seabed Morphology Due to the Presence of Cable Protection Measures Near Smithic Bank Natural England notes that in Section 8.7.4.5.5, it is stated that there is "the potential for the cable protection measures to affect net	Natural England advise that the Applicant needs to consider more fully potential impacts to nearshore and circulatory sediment transport processes near Smithic Bank due to the presence		The sediment transport processes controlling the development and evolution of Smithic Bank are landscape-scale, both spatially and temporally. Bathymetry evidence suggests that since 1979 there have been large-scale changes to the morphology of the bank over wide areas, including areas that will be occupied by the proposed Offshore Export Cable Corridor. These changes constitute a significant movement of large volumes of sand, which will continue. The volume of sand transport that will be interrupted by any cable protection near Smithic Bank will be extremely small (orders of magnitude less) in comparison to the much larger volume

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	87, 306-308, 366	sediment transport direction in the nearshore which would potentially affect parts of Smithic Bank and the geological features of the Holderness Inshore MCZ." However, Section 8.5.7 suggests that there is "relatively little sediment exchange between Smithic Bank and the Holderness coast to the south (and vice versa)." We highlight that Pye *et al.* (2015)4 observed a high degree of chemical similarity between the sands at the southern parts of Smithic Bank and beach sediments collected between Fraisthorpe and Skipsea. The same study also suggested that "*sediment eroded from the cliffs between Skipsea and Fraisthorpe is transported along the beach and also offshore towards the southern and eastern parts of Smithic Bank*." This potential exchange of sediment between South Smithic and the Holderness Coast is an important consideration in terms of impacts to the nearshore and circulatory sediment transport processes due to the presence nearby of cable protection measures and cable crossings. Currently, there is insufficient information regarding the location and significance of cable crossing (with Hornsea Project Four) and nearshore cable protection measures relative to Smithic Bank to support the impact assessment conclusions.	of cable protection and cable crossings.		being transported due to natural physical and sedimentary processes. Hence, the continued high-volume movement of sand within and around Smithic Bank will not be significantly affected by the relatively small volumes of sand that may be intercepted by the cable protection. See **Figure 8-2 - Location and Indicative sediment transport pathways across Smithic Bank derived from bedform geometry** (in **Chapter 8 - Marine Physical Environment Figure 8-1 to Figure 8-13** [APP-081]) which presents the Offshore Export Cable Corridor in relation to the Smithic Bank (as delimited by the Joint Nature Conservation Committee (JNCC)). There will also be no potential for effect on bedload sediment transport at cable protection at cable crossing points. This is because the locations of the crossings are outside and seaward of the boundary of Smithic Bank on a coarse seabed in deeper water and not subject to processes driving the bank evolution. The nearest crossing is with the Hornsea Project Four cable corridor to the east of the bank. The positions of the cable crossings are outside the sediment transport pathway controlling the form and function of Smithic Bank or any sediment exchange with the coast.
RR-039: B43	7.8, 8.7.4.5.4, Table 8-52	Changes to Bedload Sediment Transport and Seabed Morphology Due to the Presence of Cable Protection Measures on Dogger Bank Natural England notes that the sensitivity of Dogger Bank has been assessed as NEGLIGIBLE, whilst its tolerance and recoverability to changes to bedload transport and seabed morphology due to the presence of cable protection measures, have been assessed as HIGH. However, the specific location where cable protection measures may be required is unclear. Moreover, neither a seabed mobility	Natural England advise that, firstly, the Applicant should attempt cable burial across Dogger Bank to avoid placement of cable protection measures within Dogger Bank SAC. Secondly, we advise that a seabed mobility assessment should be carried out to inform the cable burial assessment and, thus, the requirement for cable protection measures.		Cable protection may be required across parts of Dogger Bank. The specific location of these cable protection measures will be decided post-consent. The final designs will be informed by seabed mobility studies which will also be completed post-consent. The WCS height of the protection above the seabed assessed was 1.4m, which represents the worst case height of cable protection measures across the entirety of the Offshore Development Area. A protrusion of this height would have little effect on the tidal currents but could potentially affect the sediment transport driven by those currents, by presenting an obstruction to the onward passage of sediment along the sediment transport pathway. Across Dogger Bank, where the seabed is composed of mobile sand, it can be transported under existing tidal conditions. If the cable protection does present an obstruction to this bedload transport the sediment would first accumulate one side or both sides of the obstacle (depending on the gross and net transport at that location) to the height of the protrusion (up

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		assessment nor sediment transport modelling have been carried out to assess the likely effects of cable protection placement. Consequently, we are concerned that the presence of cable protection measures on Dogger Bank could modify the hydrodynamic regime and affect sediment transport pathways. We, therefore, advise that there is insufficient information to support the impact assessment conclusions.	Lastly, if cable protection measures are found to be necessary, potential changes to seabed sediment transport processes and seabed morphology should be fully assessed for the WCS option for cable protection measures on Dogger Bank.		to 1.4m). With continued build-up, it would then form a 'ramp' over which sediment transport would eventually occur by bedload processes, thereby bypassing the protection. The gross patterns of bedload transport across the cable protection would therefore not be impacted significantly.
RR-039: B44	7.8 - Section 8.7.5 7.5 - Section 5.5.1.2 & 5.5.1.3	Potential Effects During Decommissioning It is suggested that the magnitude of decommissioning effects on the marine physical environment would be comparable to those during the construction phase. However, we advise that the baseline conditions at the end of design life may differ significantly from those at pre-construction and the value of receptors may change over the lifetime of the project. Consequently, the present EIA may not be sufficient to confidently determine decommissioning impacts at the end of the design life of the Projects. Furthermore, we note that a number of alternatives to decommissioning are emerging, including repowering and life extension. Whilst these alternative options may be beyond the scope of the present ES, we advise that as such alternatives are progressed and adopted, the EIA will need to be updated.	Natural England advise that the Applicants should provide a pre-consent outline decommissioning plan which considers the potential long-term impacts to the marine physical environment and processes of any assets left *in situ*.		The Applicants do not agree that drafting an outline decommissioning plan at this stage would be helpful. The reasons for this include, but are not limited to: • Final designs for the Projects not being available. Without knowing what is to be built, it is not possible to develop clear plans for decommissioning; • Decommissioning is unlikely to be undertaken for several decades. At the present time the technologies available to enact decommissioning cannot be understood; and • Best-practices and the legislative regimes relating to decommissioning will be better understood closer to the timing of decommissioning.
HRA - Document Used: [APP-046] 6.1 RIAA HRA Part 2 of 4 – Annex I Offshore Habitats and Anne x II Migratory Fish [APP-049] 6.1.1 Appendix A – Habitats Regulations Assessment Screening					
RR-039: B45	6.1 - Tables 4-2, 6.4, Section 6.4.2.1.1,	Natural England notes that "*Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion*" has been screened out for Operation and Maintenance (O&M) for Offshore Annex I Habitats and Dogger Bank SAC. However, this potential	We agree that "*Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion*" should be included in the assessment of potential effects (for the Projects		The Applicants welcome Natural England's agreement with regards to the potential effects screened in for assessment. As the **RIAA HRA Part 2 of 4** [APP-046] is a point in time document that reflects the position of the Applicants at the time of submission, it will not be updated. Any updates in assessments as a result of changes to the project envelope or stakeholder comments will be captured though submissions to the examination.

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	Tables 6-4 and 6-6	effect has been included in the assessment (Section 6.4.2.1.1).	alone and in-combination) but advise that the screening tables should be updated to reflect this.		
RR-039: B46	6.1.1 – Table 4.2 6.1 – 6.6.1.1	We note that the HRA Screening Report lists the following Annex 1 features for the Humber Estuary SAC are to be screened in for further assessment: • Estuaries. • Mudflats and sandflats not covered by seawater at low tide. • Sandbanks which are slightly covered by seawater all the time. • Coastal lagoons. • Salicornia and other annuals colonising mud and sand Atlantic salt meadows (Glauco Puccinellietalia maritimae) However, Section 6.6.1.1 of the RIAA only lists 'Sandbanks which are slightly covered by seawater all the time' and 'Mudflats and sandflats not covered by seawater at low tide' as having been assessed.	Natural England advise that the full list of features identified at Screening should be assessed in the RIAA.		The Applicants acknowledge the following Annex I features were screened in for further assessment within **Appendix A Habitats Regulations Assessment Screening** [APP-049] and should have been included within **RIAA HRA Part 2 of 4** [APP-046]: • Estuaries; • Coastal lagoons; and • Salicornia and other annuals colonising mud and sand Atlantic salt meadows (*Glauco puccinellietalia maritimae*). As detailed within the **RIAA HRA Part 2 of 4** [APP-046], the potential effects in relation to the Projects on the Humber Estuary SAC are smothering and siltation rate changes (Heavy and Light) for all phases and introduction of other substances (solid, liquid or gas) for the construction phase only. With regards to smothering and siltation rate changes (Heavy and Light) during the construction phase of the Projects, the Applicants have committed to not installing cofferdams in the exit pits. The exit pits will be excavated up to 3m below ground level, potentially creating localised sediment sinks. Considering beach sediments are relatively thin along the Holderness coast, significant accumulations of sediment within the pits are not expected and as the construction activities require the pits to remain open for up to four months, if sediment begins to accumulate in the pits, it will be excavated and returned to the beach where it can be transported alongshore to the south, as per the prevailing sediment transport regime. Upon completion of trenchless duct installation and following export cable installation within the trench between the bore pits and MLWS, the trenches will be backfilled to reinstate the intertidal zone close to its original morphology. This activity would result in some localised and short-term disturbance of sediment on the beach, but there would be no long-term effect on sediment transport processes in the wider region. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the removal of the requirement for short trenchless cable installation at landfall. Should this change be accepted by the Examining Authority (ExA), no works within the intertidal area would occur for the Projects.

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					During the operational phase, as noted in paragraphs 151 to 153 of **RIAA HRA Part 2 of 4** [APP-046], the gross patterns of bedload transport across the export cables would therefore not be affected significantly, either due to the export cables across the most active zone of wave-driven sediment transport being buried or with sediment building up a 'ramp' over an placed protection measures further offshore. As such, given the minimal reduction in sediment transport predicted to occur as a result of nearshore cable protection for the Projects, it is concluded that the sites conservation objectives will be maintained in the long-term. There is, therefore, no potential for an Adverse Effect on Integrity (AEoI) to Annex I habitats within the Humber Estuary SAC in relation to siltation rate changes from the Projects alone and therefore, subject to natural change, the Annex I habitat features will be maintained in the long term as favourable. With regards to the introduction of other substances (solid, liquid or gas) during the construction phase, the conclusions reached within section 6.6.2.2.1 of **RIAA HRA Part 2 of 4** [APP-046] remain valid for these additional Annex I habitat features. In summary, given the small exceedance, limited duration and footprint of effect there is, therefore, no potential for an AEoI to the Humber Estuary SAC from introduction of other substances (solid, liquid or gas) from the Projects alone or in combination with other plans and projects and therefore, subject to natural change, the qualifying features of the Humber Estuary SAC will be maintained in the long term.
RR-039: B47	General	Natural England is concerned that construction related changes to Dogger Bank SAC (e.g. indentations from installation vessels etc.) have not been appropriately assessed.	See comments B39 and B40 for further information.		Please see the responses to RR-039: B39 and B40 above.
RR-039: B48	6.1 - 6.6.2.1.2	Dogger Bank D OWF has not been included in the in-combination assessment for impacts to the Humber Estuary SAC. We note that the Project has recently consulted on its revised EIA Scoping and will be making landfall directly south of DBS.	Natural England advises that Dogger Bank D should be included in the in-combination assessment for impacts to the Humber Estuary SAC.		The Scoping Report for Dogger Bank D[11], publicly released following the submission of the Projects' **Draft DCO** [APP-027] application in June 2024, does not state the potential location or indicative proportions of any cable protection measures to be used within that projects offshore export cable corridor. As such, there is insufficient information available at this time to include Dogger Bank D in the Projects cumulative assessment on the Humber Estuary SAC.
RR-039: B49	General	Natural England advises that further mitigation could be applied to reduce impacts as set up in the previous comments	See previous comments.		Please see the responses to RR-039: B1, B7, B35, B36, B39, B40, B55 and B65.
RR-039: B50	6.1 - 6.6.2.1	Natural England cannot rule out an adverse effect on integrity for the Humber Estuary SAC due to the current condition allowing 10% of the export cable to be protected from 350m seaward of MLWS to the 10m depth contour.	See comment B35 and B42 regarding cable protection placement in the nearshore.		Please see the responses to RR-039: B35 and B42 above.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		Natural England is concerned that the use of cable protection within the 10m depth contour would interrupt the longshore sediment transport supply to the Humber Estuary SAC and Spurn Point.			
MCZ Assessment - Document Used: [APP-240] 8.17 Stage 1 Marine Conservation Zone Assessment					
RR-039: B51	General	Natural England advises that concerns raised with regards to the overall EIA in relation to impact from cable installation and operation are all also relevant within the MCZ assessment	Natural England advises that the MCZ Stage 1 impact assessment is updated based on the comments provided on the impact assessment		Please see the responses regarding the impact assessment from RR-039: B25 to B44 above.
RR-039: B52	8.17.1	NE agrees that all relevant sites/features have been screened in for assessment.	N/A		The Applicants welcome agreement with Natural England on this point.
RR-039: B53	Section 3.2.1 Table 3.1	Natural England notes that an EIA matrix has been used to determine magnitude rather than considering if there is an impact pathway to the MCZ features and utilising conservation objectives, conservation advice and advice on operations.	Natural England advises that this section of the MCZ assessment is updated in line with Stage 1 MCZ Assessments undertaken for other OWF projects, for example Sheringham and Dudgeon Extension Projects. Until this is updated, we are unable to agree with the conclusions of this assessment.		The methodology detailed in section 3.2.1 Assessment of Risk to Conservation Objectives within the **Stage 1 Marine Conservation Zone Assessment** [APP-240] follows the industry standard approach to assessing the risk of hindering the conservation objectives of any affected MCZs. It should be noted that the approach to defining magnitude detailed in this section matches that detailed in the Sheringham and Dudgeon Extension Projects example noted in this response. The Natural England Advice on Operations documents for the Holderness Offshore and Holderness Inshore MCZs were used to inform the assessment, with appropriate references included to these documents within the **Stage 1 Marine Conservation Zone Assessment** [APP-240].
RR-039: B54	5.1.3.4.1 Para. 68	Natural England notes that the impacts assessment does not consider sandwave levelling along the export cable corridor	Natural England advises against deposition of sand in locations where SSC and deposition become significantly elevated above baseline level and suggest this is secured in the commitments register.		The Offshore Export Cable Corridor does not overlap the Holderness inshore MCZ or Holderness Offshore MCZ and therefore no direct effects will occur as a result of sandwave levelling. Increased SSC in the Offshore Export Cable Corridor due to the seabed preparation for cable installation is considered throughout the **Stage 1 Marine Conservation Zone Assessment** [APP-240]. Seabed preparation for cable installation is considered to include all activities presented in section 5.1.3.1: boulder clearance, removal of existing out of service cables, pre-lay grapnel and sandwave levelling.
RR-039: B55	5.5 P47	Mitigation Measures Natural England advises that mitigation measures to minimise scour protection as written provides no certainty that impacts will be minimised to acceptable levels.	Natural England advises that further consideration is required of mitigation measures that will reduce impacts to the MCZ.		Following receipt of Relevant Representations from all interested parties, the Applicants have now committed to no anchoring being undertaken within the Holderness Inshore MCZ, therefore removing the potential for any direct effects from the Projects on the site. The existing condition within the **Draft DCO** [APP-027] regarding no use of jack-up vessels within

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		Natural England advises that pre-construction surveys do no not relate to either the MCZ or mitigation measures unless surveys cover the secondary impacts zone within the MCZ, and remedial actions are taken should impacts be greater than predicted.			the Holderness Inshore MCZ will be updated to reflect this new position on anchoring. In reflection of the above, there is no potential for any scour protection to be utilized in any MCZ.
RR-039: B56	Para. 135	Natural England is concerned that temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable recovery.	Natural England advises that further evidence is provided to demonstrate that impacts will be temporary, and recovery can occur in the short term.		A separate technical note regarding the indirect effects of sediment deposition on the specific biotopes within the Holderness Inshore MCZ and Holderness Offshore MCZ will be submitted in late November 2024, which will present further evidence that was previously used to support the assessment conclusions reached in the **Stage 1 Marine Conservation Zone Assessment** [APP-240].
RR-039: B57	8.17 – Para 203	Natural England highlights that the assessment leans on a number of statements including "Changes to the sedimentation rate will be within the natural range" and "The resilience for all biotopes has been determined to be high to medium (recovery in <2 years or less than 10 years respectively)" etc. However, these statements have not been referenced, therefore undermining the confidence that can be applied in the assessment process.	Natural England advises that all evidence being used to support assessments are suitably referenced in order that confidence can be placed in conclusions drawn.		A separate technical note regarding the indirect effects of sediment deposition on the specific biotopes within the Holderness Inshore MCZ and Holderness Offshore MCZ will be submitted in late November 2024, which will present further evidence that was previously used to support the assessment conclusions reached in the **Stage 1 Marine Conservation Zone Assessment** [APP-240].
RR-039: B58	8.17 – Section 10.3	Dogger Bank D OWF has not been included in the in-combination assessment for impacts to Spurn Point. We note that the Project has recently consulted on its revised EIA Scoping and will be undertaking a Section 42 consultation on the draft application in early 2025.	Natural England advise that Dogger Bank D should be included in the in-combination assessment for impacts to Spurn Point.		The Scoping Report for Dogger Bank D[11], publicly released following the submission of the Projects **Draft DCO** [APP-027] Application in June 2024, does not state the potential location or indicative proportions of any cable protection measures to be used within that projects offshore export cable corridor. As such, there is insufficient information available at this time to include Dogger Bank D in the Projects cumulative assessment on the Spurn Head geological feature.
RR-039: B59	8.17	Natural England welcomes that the Project's ECC will no longer directly route through Holderness Inshore MCZ, and no permanent infrastructure or jack up vessels will be located within the site to avoid direct impacts.	N/A		The Applicants acknowledges this comment and confirms that the Offshore Export Cable Corridor no longer routes through the Holderness Inshore Marine Conservation Zone (MCZ). In addition, the Applicants have now committed to no anchoring being undertaken within the Holderness Inshore MCZ, therefore removing the potential for any direct effects from the Projects on the site. The existing condition within the **Draft DCO** [APP-027] regarding no use of jack-up vessels within the Holderness Inshore MCZ will be updated to reflect this new position on anchoring.
RR-039: B60	8.17 – Para 226	Further mitigation could be applied to avoid potential impacts to sediment transport on the MCZ.	See comment B35 and B42 regarding cable protection placement in the nearshore and on		Please see the responses to RR-039: B35 and B42.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
			Section 5.5 of the MCZ Stage I assessment.		
RR-039: B61	8.17 – Para 228, 229, 232	Natural England advise that the conservation objectives for the Holderness Inshore MCZ could be hindered due to the current dML condition allowing 10% of the export cable to be protected from 350m seaward of MLWS to the 10m depth contour. Natural England is concerned that the use of cable protection within the 10m depth contour would disrupt sediment transport associated with Holderness Inshore MCZ. In addition, the use of Easington as an example to demonstrate that impacts on sediment transport will not be significant on the MCZ is not appropriate due to location of the Easington pipelines being located further to the south of current cable corridor.	See comment B35 and B42 regarding cable protection placement in the nearshore.		Please see the responses to RR-039: B35 and B42.
Assessment of SSSI impacts - Document Used: [APP-080] 7.8 ES Chapter 8 – Marine Physical Environment					
RR-039: B62	7.8 - 8.7.3.9, Table 8-65, Table 19-1-1, 7.19.19.1	Natural England notes that it is stated that there is a potential for impacts to Withow Gap Skipsea SSSI due to cable installation/removal at/between construction/decommissioning. However, it is our understanding that the landfall option with the potential to interact with this SSSI has been withdrawn.	The cliff and foreshore are of national geological importance. Therefore, if there is no impact pathway to the SSSI, then we advise that the impact assessment should be updated. Conversely, if an impact does exist due to construction and decommissioning activities, this be fully considered and assessed.		The Applicants can confirm that following the removal of Landfall 9 after PEIR consultation, the Projects no longer directly interact with the Site of Special Scientific Interest (SSSI) as part of any landfall works. The assessment presented in section 8.7.3.9 of **Chapter 8 Marine Physical Environment** [APP-080] notes that the final landfall is located near the Withow Gap, Skipsea SSSI and so was considered for any potential indirect effects of the Projects. This assessment concluded a minor adverse effect due to a negligible magnitude of impact and high sensitivity. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					The change proposed of relevance to this comment is the removal of the short trenchless crossing option from the Projects' Design Envelope. Should this change be accepted, there will no potential impact pathway between the Projects and the Withow Gap, Skipsea SSSI.
RR-039: B63	N/A	General This document will need updating pre-consent based on comments Natural England has provided on the EIA within Appendix B and C as currently we do not agree with conclusions on the level of impacts.			Please see the responses to relevant representations on level of impacts within this table and **Table 2.4.1**.
RR-039: B64	N/A	Natural England notes that the whole of the offshore windfarm array footprints, the inter-cable platform corridor and the export cable corridors will be disposal locations, but deposition will only occur where possible within the same sediment. Given that sandwave levelling is likely to be undertaken by suction hopper dredge and then sediment released at the sea surface, it is unlikely that this will occur.	Natural England advises that disposal options are explored to ensure that sediment is deposited in similar sediment types.		As a variety of sediment types are present on the Dogger Bank, the Applicants believe that stipulating material to be disposed must be placed on the same material type cannot be guaranteed and would be difficult and onerous to apply in reality. Dredging, particularly for the linear aspects of the Projects such as the subsea cable installations, may occur over a variety of sediment types to allow installation to occur. The resultant mixed cargo could not be disposed of on any single, specific material type. Hence, strict adherence with this request would be difficult to achieve. However, in line with the request made by Natural England. However, **the Projects can commit to including detail relating to sandwave levelling and deposition within the Cable Statement** [APP-242]. An update of this document will be submitted in late November 2024. However, it is likely that the sediment will be disposed of in the permanent cable burial corridor within the Offshore Export Cable Corridor, and the Applicants will try to avoid areas of priority habitats under Natural Environment and Rural Communities (NERC) 2006, by the inclusion of a 50m buffer around the NERC habitats.
RR-039: B65	N/A	Natural England advises that the mitigation in Section 5.2 does not go far enough, especially with the Dogger Bank SAC and in areas where there are priority habitats and/or indirect impacts to designated site features could occur. Natural England advises that the following mitigation measures are adopted (but not exclusively) - All deposition of dredged sediment within the Dogger Bank SAC should be done through the use of a fall pipe and adjacent and upstream of the dredge location in same sediment type to ensure sediment stays within the site and enables sandwave recovery. - Drill arisings should be deposited with similar sediment characteristics i.e. not on sandbanks. Therefore, adjacent to turbines is unlikely to be	Natural England advises that as a minimum, further mitigation measures are adopted by the Applicant and the relevant documents updated accordingly		The Applicants have not yet defined the dredging methodology as the requirements will depend on the cable installation methodology and the associated requirements for seabed preparation (quantity and location of sediment to be dredged). The Applicants therefore cannot commit to using a fall pipe and redepositing the sediment upstream of the dredged location. However, The Applicants can commit to not disposing of sediment by rainbowing. As a variety of sediment types are present on the Dogger Bank, the Applicants believe that stipulating material to be disposed must be placed on the same material type cannot be guaranteed and would be difficult and onerous to apply in reality. Dredging, particularly for the linear aspects of the Projects such as the subsea cable installations, may occur over a variety of sediment types to allow installation to occur. The resultant mixed cargo could not be disposed of on any single, specific material type. Hence, strict adherence with this request would be difficult to achieve. However, in line with the request made by Natural England. However, the Projects can commit to including detail relating to sandwave levelling and deposition within the **Cable Statement** [APP-242]. An update of this document will be submitted late November 2024. However, it is likely that the sediment will be disposed of in the permanent cable burial corridor within the Offshore Export Cable Corridor, and the Applicants will try to avoid areas of priority habitats under NERC 2006, by the inclusion of a 50m buffer around the NERC habitats.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		appropriate. This requirement is a condition of Dogger Bank A, B, C and Sofia. - Sandwave deposition should avoid areas of priority habitats under NERC 2006 by the inclusion of a 50m buffer around the NERC habitats. - Deposition of dredge material along the export cable should utilise a fall pipe where there is a risk of increases in suspended sediment concentrations impacting on designated site features and those of ecological importance.			
RR-039: B66	N/A	Section 7.2.1 Intertidal Exit pit – please see comments within Appendix B on potential loss of stored material prior to backfilling. We advise that alternative storage options are explored.	Natural England advises that alternative storage options for material from the landfall exit pits are explored.		The Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the removal of the requirement for short trenchless cable installation at landfall. Should this change be accepted by the Examining Authority (ExA), no works within the intertidal area would occur for the Projects and therefore no requirement for backfilling of intertidal trenches. Should this change not be accepted, the Applicants will consider further options for storage of material (for example storage of excavated material on barges) from any landfall exit pits in consultation with stakeholders.
RR-039: B67	N/A	General: Natural England advises that this document needs to better consider risk and implications of secondary scour occurring.			The risk and implications of secondary scour occurring have been considered by the Applicants in **Chapter 8 Marine Physical Environment** [APP-080] where it was concluded that any secondary scour effects associated with scour protection would be confined to within a few metres of the direct footprint of that scour protection material. Post-construction surveys are proposed to monitor scour protection measures and secondary scour in **Chapter 8 Marine Physical Environment** [APP-080] and the **In-Principle Monitoring Plan** [APP-247]. Monitoring will be used to identify the extent, volume and integrity of any scour protection used and determine whether remedial action is required (**In-Principle Monitoring Plan** [APP-247]).
RR-039: B68	N/A	Section 1.2 - We draw your attention to comments within Appendices B and C in relation to minimising environmental impacts	Please see comments with Appendices B and C		Please see the responses within this table and **Table 2.4.1.**

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		as much as possible through the choice of scour prevention/cable protection and highlight the need the to make every effort to avoid using those that are least likely to be recovered at the time of decommissioning.			
RR-039: B69	N/A	General: This document will need updating pre-consent based on comments Natural England has provided on the EIA within Appendix B and C, as we currently do not agree with conclusions included within the document. Once this update is provided, we will provide further nature conservation advice.			The Applicants consider that the scale of impacts from cable installation and cable protection is fully justified within the worst case Table 8-1 within **Chapter 8 Marine Physical Environment** [APP-080] and Table 6-3 within the **RIAA HRA Part 2 of 4** [APP-046]). Furthermore, the **RIAA HRA Part 2 of 4** [APP-046]) and **Chapter 8 Marine Physical Environment** [APP-080] and **Chapter 9 Benthic and Intertidal Ecology** [APP-085] are point in time documents that reflect the position of the Applicants at the time of submission. These will not be updated. The **Cable Statement** [APP-244] will continue to be updated throughout the lifetime of the Projects, including any potential additional mitigation agreed by the Applicants. Any updates in assessments as a result of changes to the project envelope or stakeholder comments will be captured though submissions to the Examination. Additionally, the Applicants are in the process of preparing a change request relating to the relevant design parameters. The Examining Authority (ExA) was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the removal of all platforms from the Offshore Export Cable Corridor, reductions in the number of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas. The change request will be supported by the **Request for Design Change – Environmental Assessment Update** [document reference C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. These factors, if the change request is accepted, may result in changes to the values discussed above. However, although the quantum of impact will be reduced the significance of effect will remain the same.

2.4 Responses to Appendix C Benthic and Intertidal Ecology

Table 2.4.1 Applicants' responses to Natural England's Appendix C Benthic and Intertidal Ecology

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: C1	N/A	Insufficient evidence Natural England is concerned that the methods and information used to determine the amount of cable protection and any associated lasting loss/change of Annex I sandbank habitat within Dogger Bank Special Area of Conservation (SAC) are neither comprehensive or transparent, and as such, it is not clear how realistic this Maximum Design Scenario (MDS) is. Whilst an Adverse Effect on Integrity (AEoI) is acknowledged, there is a need to further quantify the impact, and consider potential adverse ecological changes beyond the immediate footprint of infrastructure, to inform the levels of compensation required.	N/A		The scale of impacts from cable installation and cable protection is fully justified within the worst case Table 6-3 within the Report to Inform Appropriate Assessment (RIAA) (**RIAA Habitats Regulations Assessment (HRA) Part 2 of 4** [APP-046]). Appendix J-1 of the Round 4 Plan Level HRA[4] assumed a maximum 10% of cable length requiring protection within the Dogger Bank Special Area of Conservation (SAC). Due to the Projects' array cable and Inter-Platform Cable layouts not yet being finalised at the time of submission, it was required to assess a potential worst case distance of cabling that may require external cable protection measures. As such, to ensure the parameters assessed did not exceed those detailed within the Round 4 Plan Level HRA and to ensure the absolute worst case was assessed, this 10% of cable length requiring protection within the Dogger Bank SAC footprint was chosen. Additionally, the Applicants are in the process of preparing a change request relating to the relevant design parameters. The Examining Authority (ExA) was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the removal of all platforms from the Offshore Export Cable Corridor, reductions in the number of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas. The change request will be supported by the **Request for Design Change – Environmental Assessment Update** [document reference C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. These factors, if the change request is accepted, may result in changes to the values discussed above. However, although the quantum of impact will be reduced the significance of effect will remain the same. With regard to "*potential adverse ecological changes beyond the immediate footprint of infrastructure*" (also described as a 'halo effect'), see the Applicants response to RR-039: C6.
RR-039: C2	N/A	Impacts on SPAs Natural England notes that the Applicant's current assessments fail to consider the pressures/impacts on supporting benthic habitats for Special Protection Area (SPA) features.	N/A		The supporting role of benthic habitats for other features is considered within both the ornithology assessment (**Chapter 12 Offshore Ornithology** [APP- 103] and **RIAA HRA Part 4 of 4** [APP-048]) and marine mammal assessment (**Chapter 11 Marine Mammals** [APP-095] and **RIAA HRA Part 3 of 4** [APP-047]). Relevant impacts are assessed within **Chapter 9 Benthic and Intertidal Ecology** [APP-085] and then cross-referenced in the relevant inter-related assessments (i.e. ornithology and marine mammals) for all phases of the Projects (construction, operation and decommissioning). This is standard practice in offshore wind assessments.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					The Applicants note that Natural England have not referenced **RIAA Appendix B Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050] in their review. This document presents an overview of sandeel habitats across the two SACs (based upon modelling of the potential for habitat to be suitable for sandeel) considering impact footprints of the Projects in the context of the SACs and also the wider Southern North Sea across which ornithological and marine mammal features forage. Updated sandeel heat mapping using the Reach *et al.* (2024)[33] methodology is presented within the **Heat Mapping Report** [document reference: 10.43] to be submitted in late November 2024. This is overlaid with impacts ranges for "fish with a swim bladder not used in hearing", to provide further context around the sandeel potential within the region. It should be noted however that this updated sandeel heat mapping does not materially change the original mapping presented in **Chapter 10 Fish and Shellfish Ecology** [APP-091] or that used to inform the **RIAA Appendix B Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050] report or the outcomes of the assessments which considered the original mapping outputs.
RR-039: C4	N/A	Mitigation Natural England is concerned that mitigation measures fail to provide sufficient confidence that the potential presence of Section 41 Natural Environment and Rural Communities (NERC) Act 2006 Habitats will be given due regard and impacts avoided wherever possible.	N/A		Table 9-3 within **Chapter 9 Benthic and Intertidal Ecology** [APP-085] details the commitment to pre-construction surveys and micro-siting. Pre-construction surveys will be undertaken to determine the presence of potential Annex I / UK BAP Priority Habitats within the proposed wind turbine locations or the Offshore Export Cable Corridor. The preconstruction survey methodology would be agreed with the Marine Management Organisation (MMO) in consultation with Natural England. The survey design would be based on best practice at the time and is anticipated to consist of a mixture of geophysical, drop-down video (DDV) and grab surveys (as applicable) to ensure a comprehensive ground-truthing of the proposed final wind turbine locations and cable route design. Initial geophysical surveys will be reviewed with DDV ground truthing surveys to confirm presence as appropriate. This shall then be used to inform detailed layout design in the design plan and will inform the mitigation scheme requirements.
RR-039: C4	N/A	Permanent loss of Annex I habitat Natural England is concerned that the Applicant has not committed to the removal of cable and scour protection at the point of decommissioning, thereby creating permanent habitat loss/change within Dogger Bank SAC.	N/A		At this stage, it is not possible for the Applicants to determine whether components would be left in situ or removed from the seabed as part of decommissioning. This will be determined as part of the decommissioning plan which will be consulted on and require approval from the regulator towards the end of the Projects' lifetime (secured within Schedule 2, Part 1, Condition 7 of the **Draft Development Consent Order** (DCO) [APP-027]. It is important to note that Infrastructure left in situ may present a lesser impact in terms of potential changes to marine water and sediment quality. In order to present an assessment of the worst case scenario the likely significant effects of the deposition of scour and cable protection on habitat loss have been assessed as permanent to a minor adverse degree. The classification of these effects as permanent was undertaken in consultation with stakeholders. This assessment covers the worst case eventuality that cable and scour protection may not be removed. The impacts of the Projects on the Dogger Bank

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					SAC will be compensated for, with compensation plans to be agreed with stakeholders including Natural England.
RR-039: C5	N/A	RIAA - Insufficient Baseline Evidence and Assessment Rationale Natural England is concerned about the absence of appropriate characterisation or consideration of the specific communities of designated features within Flamborough Head SAC - there appears to be no baseline from which it has been possible to consider the sensitivity or recoverability of the designated benthic receptors to the identified pressure pathways (e.g. using the Marine Evidence-based Sensitivity Assessment (MarESA) approach). Due to the lack of sufficient evidence, Natural England cannot advise that a potential AEoI of the Flamborough Head SAC either alone, or in-combination can be excluded.	N/A		The Applicants highlight that the Flamborough Head SAC is located approximately 3km from the Offshore Export Cable Corridor, given there was no pathway for direct impact, no baseline survey was considered necessary and existing information from Natural England was used as the basis for the baseline conditions and likely sensitivities of its features. As noted within section 6.5.2 of the **RIAA HRA Part 2 of 4** [APP-046], the Annex I reef habitat within the Flamborough Head SAC was specified as being subtidal chalk reef, as detailed in the Joint Nature Conservation Committee (JNCC) (2022)[13], and in line with the baseline presented in the Hornsea Project Four RIAA[14]. The assessment then goes on to detail how communities typically associated with this habitat are known to be tolerant of light increases in sediment smothering, with the sensitivity derived from the pressures assessed in the De-Bastos and Hill (2016)[15], which is a MarESA assessment. The other Annex I habitat assessed within this section,' submerged or partially submerged sea caves', is characterised by species such as *Hildenbrandia rubra, Pseudendoclonium submarinum, Sphacelaria nana and Waerniella lucifuga*[5] (also known as *Pilinia rimosa*). Such species are typically found within sea caves, with *H. rubra* being a common encrusting red seaweed around the UK[16], *P. submarinum* a green marine algae found in the upper littoral zone[17] and *S. nana* and *W. lucifuga* being species typically found on cave walls and overhanging rocks[18][19]. The Natural England Advice on Operations details the potential sensitivities for effects of smothering and siltation rate changes (light) on biotopes characteristic of the submerged or partially submerged sea caves within the Flamborough Head SAC[20]. Of the 15 biotopes detailed, the sensitivity for smothering and siltation rate changes (light) from *Power cable: laying, burial and protection* activities ranges from not relevant to low, and not relevant to medium for smothering and siltation rate changes (heavy). As noted within section 6.5.2 of the **RIAA HRA Part 2 of 4** [APP-046], the average depth of sediment deposition from the Offshore Export Cable Corridor would reach an average of 1-5mm within 10km of the point of disturbance, therefore within range of the Flamborough Head

13 JNCC. (2022c). Flamborough Head - Special Areas of Conservation.Available at: https://sac.jncc.gov.uk/site/UK0013036

14 EN010098-001686-Hornsea Project Four - Other- B2.2 Report to Inform Appropriate Assessment Part 1.pdf

15 Echinocardium cordatum and Ensis spp. in lower shore and shallow sublittoral slightly muddy fine sand - MarLIN - The Marine Life Information Network

16 An encrusting red seaweed (Hildenbrandia rubra) - MarLIN - The Marine Life Information Network

17 Culture of the upper littoral zone marine alga Pseudendoclonium submarinum induces pathogenic interaction with the fungus Cladosporium cladosporioides: Phycologia: Vol 50 , No 5 - Get Access

18 MBDP-NI: Sphacelaria nana - Species account

19 Pilinia rimosa Kützing :: AlgaeBase

20 Designated Sites View

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					SAC which is located approximately 3km from the closest point of the Projects' Offshore Export Cable Corridor. As noted in the MarESA pressures and benchmarks on smothering and siltation rate changes, light siltation rate changes are defined as up to 5cm of fine material added to the habitat in a single, discrete event[21]. Therefore, no heavy smothering and siltation rate changes would occur as a result of the Projects' Offshore Export Cable Corridor installation activities. As such, given the low sensitivity of the existing biotopes to light smothering and siltation rate changes and the minimal potential sediment deposition depth of sediments disturbed by the Projects' Offshore Export Cable Corridor installation activities, it was determined that there is no potential for an Adverse Effect on Integrity (AEoI) to Annex I habitats within the Flamborough Head SAC in relation to smothering and siltation rate changes (Heavy and Light) from the Projects alone or in combination with other projects. therefore, subject to natural change, the Annex I habitat features will be maintained in the long term as favourable.
RR-039: C6	N/A	RIAA – Insufficient Consideration / Evidence Natural England is concerned that the Applicant has not considered or assessed the potential for changes to the physical and/or biological structure and function of Annex I sandbank beyond that of the footprint of the planned infrastructure, where evidence indicates the potential for changes over multiple times the area of the structure footprints. Natural England is particularly concerned that secondary 'ecological halo' effects could be combined and exacerbated which could result in broadscale changes in the benthic habitats and communities across the wider DCO area and a significant proportion of Dogger Bank SAC.	N/A		The Applicants note the concern, but considers it unreasonable to raise at this stage of the process. Natural England has had the opportunity to raise what is essentially an additional impact at Scoping and Screening (in 2022), Section 42 (in 2023) or during any of the Expert Topic Group (ETG) consultation since 2022. The Applicants note that this impact was never raised in relation to the conclusions of the Plan Level HRA or in any of the Steering Group meetings for the Strategic Plan (**Round 4 Dogger Bank Strategic Compensation Plan** [APP-060]). The Applicants are not aware that this impact has been discussed historically with regard to offshore wind and notes that if this is an emerging concern, it has not been raised in any relevant representations produced by Natural England in relation to other Round 4 or Extension projects submitted within the last 12 months. With regard to the substance of the concerns, the Applicants note the following from the paper cited by Natural England (Reeds *et al.* 2018[3]) (Applicants' emphasis) *A number of studies have examined the effects of artificial and natural reefs on surrounding infauna (Ambrose and Anderson, 1990; Barros et al., 2001; Davis et al., 1982; Fabi et al., 2002; Fukunaga and Bailey-Brock, 2008; Posey and Ambrose, 1994; Wilding, 2006; Zalmon et al., 2012, 2014).* ***However, results of such investigations are widely variable in terms of the patterns described and the mechanisms proposed to be driving them.*** *Some studies observe a decline in infaunal abundance and species richness within close distances (e.g. several metres) of the artificial structures (Davis et al., 1982; Wilding, 2006), while others observe enhanced species richness, abundance or biomass of certain species close to the reef (Davis et al., 1982). These effects can also extend over large distances i.e. up to 200 m (Davis et al., 1982).* ***In some cases, no significant effects at all on benthic infauna were detected*** *(Fukunaga and Bailey-Brock, 2008; Zalmon et al., 2012).*

[21] MarESA pressures and benchmarks - MarLIN - The Marine Life Information Network

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					The conclusions highlight that *Comparisons with other studies has shown that the effects of Artificial Reefs (ARs) on soft sediments can vary depending on the type of structure and location, highlighting a requirement for site specific investigations.* The evidence is therefore equivocal at best. The Applicants have undertaken their assessments in line with standard advice, the advice received from stakeholders throughout the development of the Projects in addition to best practice. With the above in mind, the Applicants are of the opinion that halo effects should not be considered any further.
RR-039: C7	N/A	Inappropriate EIA methodology Natural England strongly disagrees with the approach that has been taken by the Applicant in valuing benthic receptors and note that all of the biotopes identified within the boundary of Dogger Bank SAC (i.e. throughout the array and in the eastern section of the export cable corridor (ECC)), are representative of Annex I sandbank communities. As such, these biotopes should, according to the Applicants own methods, be considered high value (not low value). In addition, the Applicant has altogether failed to consider those biotopes which represent designated features within the adjacent Flamborough Head SAC.	N/A		The Applicants have provided two assessments; those found within the Environmental Impact Assessment (EIA) and HRA. In the EIA (**Chapter 9 Benthic and Intertidal Ecology** [APP-085]) it is explained in section 9.4.3.1.1 that sensitivity is primarily based upon the ecological sensitivity of the receptor to an effect and this is based on the MarESA biotope sensitivities. Whilst value (in this case being part of a designated feature) may be used as a modifier to increase sensitivity this is not automatically done and is subject to expert judgement. Given the ubiquity of the biotopes within the Dogger Bank across the Southern North Sea, it was not considered that the value element was required to modify the sensitivity. Whether these biotopes are within or outwith a designated site is not relevant in this case. Note that in the case of the piddock feature, higher sensitivity was assigned not only due to ecological sensitivity but also as this is much rarer. The value is considered therefore within the HRA (**RIAA HRA Part 2 of 4** [APP-046]). The status of the biotopes as part of a designated site is the primary consideration and the key driver in the difference in the conclusions on adverse effect on integrity within the Appropriate Assessment from significance in the EIA. The Annex I habitat features of the Flamborough Head SAC were assessed in section 6.5.2 of the **RIAA HRA Part 2 of 4** [APP-046]. A separate technical note regarding the indirect effects of sediment deposition on the specific biotopes of the Flamborough Head SAC in relation to the Environmental Statement (ES) has been included alongside this response.
Project Parameters - Document(s) Used: [APP-071] 7.05 ES Chapter 5 – Project Description [APP-085] 7.09 ES Chapter 9 – Benthic and Intertidal Ecology [APP-240] 8.17 Stage 1 MCZ Assessment [APP-244] 8.20 Cable Statement [APP-248] 8.24 Outline Offshore Operations and Maintenance Plan					
RR-039: C8	7.05 - Table 5-3	Inconsistency in impact calculations	Natural England advises the maximum temporary construction		• Maximum anchoring footprint – The Applicants note the 44,091m² was an error in the original ES, and agree the total is 44,122m². This change will be incorporated in any future revisions of this assessment, and has been included in the parameters presented in the

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		Natural England notes many of the calculations provided are inconsistent across the various chapters/documents. For example, the following calculations may need addressing: • The 'Maximum anchoring footprint – export cable installation (m²)' is given as 22,061 for both DBS (East) and DBS (West). However, the total footprint for East and West together is given as 44,091. We consider the total should be 44,122. • The 'Total (Array Areas and Offshore Export Cable Corridor (m²))' values for East, West and East and West together do not match the sum of the individual column values. East is given as 31,092,743; we calculate it to be 31,092,741. West is given as 28,564,668; we calculate it to be 28,564,666. DBS East and West together is given as 61,761,463; we calculate it to be 61,786,350. • We also note that the values for East and West together are higher than the sum of East and West individually for several parameters. Clarity is needed on whether this is an error or due to additional infrastructure being included in the combined total, e.g. inter-platform cables.	footprints are reviewed and updated where necessary.		**Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1]. It is expected that the change request will be submitted in early January 2025 following targeted consultation. • As noted in Table 9-1 of **Chapter 9 Benthic and Intertidal Ecology** [APP-085] the final totals were based on the unrounded figures of the parameters detailed in that table. As such, there is a small variation in the total figures stated in the table compared to the figure reached when adding the rounded figures of each parameter. The Applicants agree that the figure for Dogger Bank South (DBS) East and DBS West together should have been stated as 61,786,350m² in Table 5-3. It should be noted that the figures detailed in Table 9-1 of **Chapter 9 Benthic and Intertidal Ecology** [APP-085] add up to this 61,786,350m² figure, so the worst case scenario for disturbance of the seabed has been assessed. • The difference between the footprints between DBS East and West separately and together is due to different infrastructure being required for the different scenarios. For example, due to the potential requirement for the Offshore Convertor Platforms to connect to each other between DBS East and DBS West (should the Projects be built concurrently / sequentially), an increased length of Inter-Platform Cables would be required over and above the length of Inter-Platform Cabling assumed for DBS East / DBS West in-isolation (342km of Inter-Platform Cables for DBS East / DBS West together as opposed to 115km for DBS East and 129km for DBS West in isolation). The Applicants can provide further explanation for any other parameters identified that do not clearly add together for the Projects combined.
RR-039: C9	7.05 - 5.5.1.1.3 & 8.17	Cable protection requirements - Nearshore It is suggested that cable protection may be used at the landfall exits, however there is a commitment to not use cable protection in the intertidal area and/or for 350m seaward of Mean Low Water Springs (MLWS). The use of cable protection at the exit pits is also contradictory to the cable landfall activities set out in the Project Description (Ref. 5.6.2.4 Para. 231 and 232) and MCZ	Natural England advises that clarity is provided on the use of cable protection at the Horizontal Direction Drilling (HDD) exit pits.		Deemed Marine Licences (DMLs) 3 and 4 presented within the **Draft DCO** [APP-027] contain conditions (Condition 3 within each DML) which restrict the deposition of cable protection entirely between Mean High Water Springs and 350 metres seaward of Mean Low Water Spring. Within the area between 350 metres seaward of MLWS and the 10 metre depth contour as measured against Lowest Astronomical Tide (as at the date of commencement of construction of the licensed activities), no more than 10% of the length of the Offshore Export Cables will be protected. These conditions taken together provide clarity on the limits of protection that will be used within nearshore areas, including in the vicinity of HDD exit pits.

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		Stage 1 assessment (Ref 5.1.4.1.1. Para. 83 and 84) that only describe cables being buried and exit pits naturally backfilling.			
RR-039: C10	7.05 - Table 5.7	Natural England is concerned that there is no inclusion of a drill arising footprint and/or consideration of mitigation measures for any impacts	Please see comments on the RIAA.		The potential volume of drill arisings was included in Table 9-1 of **Chapter 9 Benthic and Intertidal Ecology** [APP-085] and considered in the assessment included in that chapter. Drill arisings were considered within the overall volume of increased suspended sediment concentrations (including sediment deposition and smothering). As the assessment for increased suspended sediment concentrations (including sediment deposition and smothering) reached a conclusion of minor adverse effect, no specific mitigation measures with regards to drill arisings were included within the assessment.
RR-039: C11	8.20 - Table 1-4 7.05 - Table 5-4; Table 5-5; 5.5.1.1.3; 5.5.7.7.3; Table 5.4	Cable protection requirements - Construction It is not clear what information has been used to determine the maximum length of cable protection required - arbitrary high level percentage values appear to have been quoted within the Cable Statement. It is also unclear what the allowance for cable protection for unsuccessfully buried cables is based on. Particularly within Dogger Bank SAC, we consider cable protection realistic worst case estimates should be based on an assessment of likely burial success and considered more fully in the Outline cable burial risk assessment within the 'Cable Statement [APP-242], informed by geotechnical investigations. This is in line with our advice provided on all recent applications for cable installation within designated sites, with Applicants providing a more realistic worse case scenario.	In order for a meaningful assessment to be made, Natural England advises the Applicant to provide a transparent justification for the WCS quantification of cable protection both within, and outside of, Dogger Bank SAC. This justification should draw upon previous experience and available information about the ground type within the Array area and along the ECC route. The WCS should also include any possible post-construction measures such as the placement of additional scour replenishment during the operational phase and implications from the removal and replacement of scour protection during cable repairs especially where a new cable loop is included (Table 5.24). Any implications from the changes in scour prevention/cable protection elevation above the seabed should also be considered to ensure it remains within the parameters assessed.		Please see response to RR-039: C1 above.
RR-039: C12	7.05 – Table 5-4; Table 5-5	Cable protection requirements – Operation Natural England advises that clarity is needed on how the potential for the addition of further cable/scour protection	Natural England advises that further detail is provided on how the total worst case habitat loss and/or disturbance scenarios have been		Any replacement cable protection measures would not be additive to the worst case area detailed in Table 5-4 of **Chapter 5 Project Description** [APP-071] and would represent a replacement of the existing export cable protection. Any potential replacement of array or

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	Section 5.5.1.1.4 Table 5-6 8.24 – Table 2-2	during the operational phase has been considered and included within the worst-case calculations for cable/scour protection. We highlight that Table 2-2 of the Outline Offshore Operations and Maintenance Plan (OOMP; APP-248) includes a maximum estimate of 2.5km of export cable protection requiring replacement for each Project over the Projects' lifespan. This does not appear to have been included in Table 5-6 of the Project Description (we assume because it would not be a temporary footprint), but it is unclear if it has been included in the lifetime footprints given in Table 5-4. An equivalent figure has also not been provided for inter-platform and inter-array cables.	determined with respect to cable/scour protection. We advise that the standard for quantities of additional scour and/or cable protection outside of benthic SACs is for the replenishment of 10% of any scour prevention/cable protection laid during installation within a 10-year period, as long as the overall footprint is not increased. **But any additional scour prevention/cable protection during the operational phase with a designated site will require a separate marine licence.** Please see next point.		Inter-Platform Cable protection measures would also not be additive to the worst case area detailed in Table 5-4. Please see response to RR-039: C13 for further information.
RR-039: C13	7.05 - Table 5-4 Table 5-5 8.24 - Table 2-3	Cable protection requirements - Operation Natural England is concerned that Table 2-3 of the OOMP indicates that the Applicant considers the lifetime footprints presented in Tables 5-4 and 5-5 to be allowances for cable protection to be installed at any point through the lifetime of the Projects, rather than the amount that will be required for the construction phase alone, which will subsequently have a footprint and impact for the lifetime of the project. We advise that once construction is completed, a further Marine Licence would be required for the placement of any additional protection within benthic SACs.	Natural England advises that the maximum design parameters for the export cable corridor and array area, including the lifetime footprint, should be revised to only include cable/scour protection anticipated to be installed during construction. We also advise that the OOMP is updated to reflect the licensing requirements for additional cable/scour protection installed within Dogger Bank SAC during operation. We refer the Applicant to the following guidance regarding licensing requirements for cable protection: EN010087-001527-DL3 - Natural England - Draft Position Paper.pdf (planninginspectorate.gov.uk)		The maximum design parameters reflect the levels of scour and cable protection that could be required for the Projects during construction and / or operation. As such they represent the maximum proposed levels for installation during construction and no revisions are proposed to the levels presented within the worst case scenarios as a result. The Applicants confirm that **Offshore Operations and Maintenance Plan** (OOMP) [APP-248] will be updated to reflect the position that new marine licence(s) would be sought for the Projects to allow the deposit of cable and / or scour protection in areas not previously protected during construction throughout the operation phases. It is envisaged that these applications would cover 10 year periods post-construction. For clarity, it is intended that no new marine licences will be sought for any replenishment protection required during the operational phase in areas that were protected as part of construction. The Applicants are of the opinion that a distinction should not be drawn in protection maintenance licencing terms between areas within or beyond any Marine Protected Areas as long as any future protection levels fall below the worst case scenario levels assessed within the Environmental Statement and the RIAA. The effects of this protection will be compensated for as part of the DBS benthic SAC compensation proposals. The effects of such protection will have been comprehensively assessed as a permanent effect compensated for through the DBS DCO consenting process. Further assessment and compensation discussions would be neither proportionate or necessary. If additional cable protection for maintenance purposes was required beyond the maximum limits established in the DMLs, then a separate marine licence or licences would be required.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: C14	7.09: Table 9-1 and Para 156	Use of Cofferdams Natural England notes contradictions with regard to the inclusion of cofferdams in the Project scope. Table 9-1 provides dimensions of cofferdams for DBS West and DBS East and West combined, however the same dimensions given for DBS East are allocated to the HDD exit pits. Further, paragraph 156 states that the Project has committed to not using cofferdams within the exit pits.	Natural England advises that clarification is provided on the WCS for the landfall works in relation to cofferdam usage and that any documents and assessments are updated accordingly.		The Applicants can confirm no cofferdams would be used in the within the Projects' Landfall Zone. The inclusion of cofferdams within Table 9-1 was an error. The Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the removal of the requirement for short trenchless cable installation at landfall. Should this change request be accepted, no works within the intertidal area would occur for the Projects. Notwithstanding the above, the Applicants can confirm cofferdams are no longer within the Projects' Design Envelope, regardless of whether the change request is accepted.
Baseline Characterisation - Document(s) Used: [APP-085] 7.09 ES Chapter 9 – Benthic and Intertidal Ecology [APP-088] 7.9.9.2 ES Appendix 9-2 – Intertidal Survey Report					
RR-039: C15	7.09 – whole chapter	Flamborough Head SAC Natural England considers that the Applicant has not appropriately identified and/or described potentially sensitive benthic receptors within designated sites within the Zone of Influence, namely, Flamborough Head SAC. In the absence of having appropriately characterised or considered the specific communities of designated features (e.g. biotopes), there appears to be no baseline from which it has been possible to consider the sensitivity or recoverability of the designated benthic receptors to the identified pressure pathways (e.g. using Marine Evidence based Sensitivity Assessment, MarESA).	Natural England advises that all benthic receptors within the Zone of Influence, particularly those within designated sites, need to be sufficiently characterised to enable a robust, evidenced assessment to be undertaken and presented in light of EIA and HRA requirements. In the absence of characterisation of benthic receptors at a suitable resolution, the worst-case scenario needs to be presented (e.g. most sensitive biotope within the broadscale habitat used as a basis for assessments).		Please see response to RR-039: C5.

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RR-039: C16	N/A	Whilst NE consider that some baseline data needs revisiting in terms of interpretation (see comments C15, C17 (above/below)), we do not consider that any additional data is required.	N/A		Noted, please see the Applicants responses to RR-039: C5 and C17.
RR-039: C17	7.9.9.2 & 7.09: Section 9.5.2	Intertidal Surveys Natural England advises that the baseline survey methods within the intertidal zone have not been applied in a sufficiently robust manner to confidently identify the biotopes and communities present, and the habitat data which has been collected appears to have been inaccurately interpreted. Natural England notes that the reported presence of *Arenicola marina* and *Lanice conchilega* is in contradiction with the "*barren Atlantic littoral coarse sand*" that has been assigned to the entirety of the intertidal study area. The mapping of barren coarse sediment from the lower to the upper shore also goes against what is commonly known about the intertidal ecology and communities in the area. Both *Arenicola marina* and *Lanice conchilega* are found in medium to fine sands which are characterised by an element of sediment stability and water retention (this is in contradiction to the coarse sand biotope that has been assigned to the shore at landfall). These less mobile sediments can be expected to support more diverse communities such as EUNIS biotopes 'Polychates in littoral fine sand' and/or '*Lanice conchilega* in littoral sand', within which *Arenicola marina* and *Lanice*	Natural England advises that the data which has been collected to date for the intertidal zone should be revisited and used to develop a more accurate understanding of the intertidal.		Upon review of the previously recorded survey material for the Projects, the Applicants agree with Natural England's position regarding the mapping of biotopes in the intertidal. Zones 1 and 2 of Landfall 8 and Zones 1-3 of Landfall 9 (as demarcated in Figure 3-1 and 3-2 of **Appendix 9-2 Intertidal Survey Report** [APP-088] remain classified as the biotope barren littoral coarse sand. However, noting the (albeit limited) recorded presence of potential *Arenicola marina* and *Lanice conchilega* casts further down the shore Zone 3 of Landfall 8 and Zones 4 of Landfall 9 should be classified as the biotope 'Polychaetes in littoral fine sand'. With regards to the existing assessment undertaken for the intertidal zone, the sensitivity of the biotope 'Polychaetes in littoral fine sand' to the pressures previously assessed in the ES are as follows (Ashley, M., & Watson, A., 2024[22]): • Habitat structure changes – removal of substratum – Medium sensitivity • Abrasion/disturbance of the surface of the substratum or seabed – Low Sensitivity • Penetration or disturbance of the substratum subsurface – Low Sensitivity As such, the sensitivity of 'Polychaetes in littoral fine sand' to these pressures are no greater than that of 'Barren littoral coarse sand', which also had a worst-case medium sensitivity to 'Habitat structure changes – removal of substratum'. Therefore, this reclassification of this area of the intertidal zone does not alter the original conclusions of **Chapter 9 Benthic and Intertidal Ecology** [APP-085] of minor adverse significance of effect. The Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the removal of the requirement for short trenchless cable installation at landfall. Should this change request be accepted, no works within the intertidal area would occur for the Projects, and therefore no potential impacts on the biotopes within the intertidal zone.

[22] Ashley, M., & Watson, A., 2024. Polychaetes in littoral fine sand. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [online]. Available from: https://www.marlin.ac.uk/habitat/detail/1125

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		conchilega (respectively) are characterising species.			
Environmental Impact Assessment - Document Used: [APP-045] 6.1 RIAA HRA Part 1 of 4 – Introduction and Terrestrial Ecology [APP-046] 6.1 RIAA HRA Part 2 of 4 – Annex I Offshore Habitats and Annex II Migratory Fish [APP-071] 7.05 ES Chapter 5 - Project Description [APP-085] 7.09 ES Chapter 9 – Benthic and Intertidal Ecology [APP-241] 8.17.1 Appendix A - Marine Conservation Zone Assessment Screening Report [APP-242] 8.18 Disposal Site Characterisation Report					
RR-039: C18	7.09 – whole chapter	Ecological Halo Effect Natural England is concerned that the Applicant has failed to consider the likely cumulation of benthic 'ecological halo effect' which can be expected following the placement of structures on the seabed. Owing to localised changes in biological communities colonising hard structures, combined with the changes to the physical processes which are expected, the physical structure and function, and subsequent biological structure and function of the benthos can be expected to be altered over an area multiple times that of the original infrastructure footprint. Natural England are particularly concerned that secondary 'ecological halo' effects will be combined and exacerbated in the array areas as a result of the network of potential parallel and perpendicular lengths of cable protection, which could result in broadscale changes in the benthic habitats and communities across the wider DCO area and	Natural England advises that a robust assessment is needed of the potential Worst-Case area of impact on benthic communities within Dogger Bank SAC sandbank feature, and the nature and scale of that impact, as a result of changes to physical and biological processes following the placement of structures and cable/scour protection on the seabed. Once assessments have been updated, monitoring should be secured via the In-principal monitoring plan to determine whether the residual impacts are as predicted.		Please see the response to RR-039: C6.

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		a significant proportion of Dogger Bank SAC.[23][24]			
RR-039: C19	7.09: Section 9.4.3, Table 9-9 Section 9.6.2.1.1.1, Table 9-15	EIA Methodology Natural England advises that the EIA methods lack transparency, specifically, it is not clear how the 'value' of receptors has been consistently incorporated into the assessment process. We highlight that the Applicant has considered all biotopes within the red line boundary, with the exception of those characterised by piddocks, to be "*of low value as they are not specifically designated as requiring protection under national or international law*". Natural England strongly disagrees with this approach and note that all of the biotopes listed in Table 9-15, where present within the red line boundary within Dogger Bank SAC, are representative of Annex I sandbank communities. As such, these biotopes should, according to the Applicant's own methods outlined in Table 9-9, be considered high value (not low value). In addition, the Applicant has given no consideration to those biotopes which contribute to designated features within the adjacent Flamborough Head SAC.	Natural England advises that the methods and rationale the Applicant has applied to valuing benthic receptors, and how value has been used within the assessment process, is reviewed and documents updated accordingly. Once the value of benthic receptors has been more appropriately and transparently considered, the significance of impacts on all benthic receptors should be reassessed. For example, biotopes which contribute to the extent of Annex I habitats within the Dogger Bank SAC be appropriately valued.		Regarding EIA sensitivity, please see the response to RR-039: C7. The Annex I habitat features of the Flamborough Head SAC were assessed in section 6.5.2 of the **RIAA HRA Part 2 of 4** [APP-046]. A separate technical note regarding the indirect effects of sediment deposition on the specific biotopes of the Flamborough Head SAC in relation to the ES has been included alongside this response.
RR-039: C20	7.09: Table 9-9	Natural England disagrees with "*Habitats or species that provide prey items for other species of conservation value"* being considered of low value in the assessment. We note that large areas within the red line	Whilst Natural Egland recognises that within the wider marine environment impacts to habitats that provide prey availability may be considered as low. However, it should be recognised that		The supporting role of benthic habitats for other features is considered within both the ornithology assessment (**Chapter 12 Offshore Ornithology** [APP- 103] and **RIAA HRA Part 4 of 4** [APP -048]) and marine mammal assessment (**Chapter 11 Marine Mammals** [APP -095] and **RIAA HRA Part 3 of 4** [APP -047]). The impacts are assessed within **Chapter 9 Benthic and Intertidal Ecology** [APP-085] and then cross-referenced in the relevant assessments for all

[23] De Borger, E., Ivanov E., Capet A., Braeckman, U., Vanaverbeke J., Grégoire M., and Soetaert, K. (2021) Offshore Windfarm Footprint of Sediment Organic Matter Mineralization Processes. Frontiers in Marine Science Volume 8 2021

[24] Reeds, K.A. & Smith, J.A. & Suthers, I.M. & Johnston, E.L. (2018). An ecological halo surrounding a large offshore artificial reef: Sediments, infauna, and fish foraging. Marine Environmental Research 141 URL: An ecological halo surrounding a large offshore artificial reef: Sediments, infauna, and fish foraging (researchgate.net) An ecological halo surrounding a large offshore artificial reef: Sediments, infauna, and fish foraging (researchgate.net)

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		boundary act as spawning/nursery grounds for sandeel and herring, both of which are an important prey resource for Annex I bird species and Annex II marine mammal features of designated sites. See Appendix E for further comments on indirect effects.	some areas remain more important than others. The importance of the 'Dogger Bank' area for fish species is well documented. Therefore we advise that a generic low value can't be attributed to all areas within the red line boundary. In addition, Natural England advises that impacts to benthic habitats which reduce/remove their ability to support benthic communities which are integral to maintaining populations of Annex I and II designated site features, as required by designated site conservation objectives for those features, needs to be fully considered within the ES.		phases of the Projects (construction, operation and decommissioning). The Applicants consider that the assessment is line with best practice for offshore wind assessments. The Applicants note that Natural England have not referenced **RIAA Appendix B Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050] in their review. This document presents an overview of sandeel habitats across the two SACs (based upon modelling of the potential for habitat to be suitable for sandeel) considering impact footprints of the Projects in the context of the SACs and also the wider Southern North Sea across which ornithological and marine mammal features forage. Updated sandeel heat mapping using the Reach *et al.* (2024)[33] methodology is presented within the **Heat Mapping Report** [document reference: 10.43] to be submitted in late November 2024. This is overlaid with impacts ranges for "fish with a swim bladder not used in hearing", to provide further context around the sandeel potential within the region. It should be noted however that this updated sandeel heat mapping does not materially change the original mapping presented in **Chapter 10 Fish and Shellfish Ecology** [APP-091] or that used to inform the **RIAA Appendix B Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050] report. The presence of sandeel (or any other prey species) is not relevant to the boundary of the Dogger Bank SAC which was designated on the basis of bathymetry and benthic (invertebrate) communities (JNCC, 2011[25]). Sandeel are not named as 'key and influential species of the [sandbank] feature, although they are discussed in relation to 'Characteristic Communities' in the Supplementary Advice on Conservation Objectives (SACO) for Dogger Bank (JNCC, 2022)[26]. Sandeel in particular were highlighted by the Applicants in the **RIAA Appendix B Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050] noting that in the SACO (JNCC, 2022[26]), sandeel are described as being more resident than other species and that mapping of potential herring spawning habitat shows the Dogger Bank SAC as being of limited suitability (see Figure 2-1 of **Heat Mapping Report** [document reference: 10.43]. Impacts upon prey for ornithology receptors are considered in the Plan Level HRA (RIAA Appendix H – Ornithology Array Assessment Part 2, The Crown Estate, 2022[38]) under the following pressures P1 Habitat Loss / Gain, P2 Direct Physical Damage and P3 Indirect Physical Damage. In all cases the HRA concludes that *"All seabird species screened in forage widely within the marine environment and the predicted area of habitat damaged represents a very small proportion of the foraging habitat available. Any*

25 JNCC (2011). Dogger Bank SAC Selection Assessment Version 9.0. Joint Nature Conservation Committee. [Online]. Available at: https://data.jncc.gov.uk/data/98f5e14d-7242-4b32-84fe-f110c5e37300/DoggerBank-SelectionAssessment-v9.pdf

26 JNCC (2022). Supplementary Advice on Conservation Objectives for Dogger Bank Special Area of Conservation: December 2022. [Online]. Available at: https://data.jncc.gov.uk/data/26659f8d-271e-403d-8a6b-300defcabcb1/doggerbank-saco-v2.pdf

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					impact is, therefore, considered to be negligible and would not make an appreciable difference to any in-combination impact." Impacts upon prey for marine mammal receptors are considered in the Plan Level HRA (RIAA Appendix I Marine Mammal Array Assessment Part 2[35]) under the following pressures P1 Habitat Loss / Gain, P2 Direct Physical Damage and P3 Indirect Physical Damage. The HRA concludes that (Applicants emphasis): *The effect of this habitat loss will be to reduce the area available for foraging and also the extent of habitat for species which form prey. However, all marine mammal species forage widely within the marine environment and the predicted loss of habitat represents a very small proportion of the foraging habitat available.* ***Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact.*** *Damage to physical habitats could affect prey species, or benthic communities upon which these are dependent. However, all marine mammal species forage widely within the marine environment and the predicted loss of habitat represents a very small proportion of the foraging habitat available.* ***Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact.*** *The Habitats Assessment (Appendix J) notes that indirect physical damage cannot be quantified at present but some effects are expected. Based on evidence presented in Appendix J which suggests that such effects will be relatively localised and generally accounted for within areas attributed to habitat loss it is considered that the scale of effects will not be significant in the context of possible impacts upon supporting habitats for marine mammals.* ***Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact.*** Although the overall effect of habitat loss will be to reduce the area available for foraging and the extent of habitat for prey species, habitat loss effects will be negligible given the small proportion of habitat occupied by the structures compared to the large foraging ranges of the protected features, as indicated by the distances used in relation to screening. Similarly, although offshore wind structures may provide new foraging opportunities for some species (e.g. Clausen *et al.*, 2021[27]; Russel *et al.*, 2014[28]) habitat gain effects are expected to be negligible in the context foraging ranges.

27 Clausen, K.T., Teilman, J., Wisniewska, D.M., Balle, J.D., Delefosse, M. & van Beest, F.M. (2021). Echolocation activity of harbour porpoises, Phocoena phocoena, shows seasonal artificial reef attraction despite elevated noise levels close to oil and gas platforms. Ecol Solut Evid. 2021; 2: e 12055. DOI: 10.1002/2688-8319.12055.

28 Russell, Deborah J. F., Sophie M. J. M. Brasseur, Dave Thompson, Gordon D. Hastie, Vincent M. Janik, Geert Aarts, Brett T. McClintock, Jason Matthiopoulos, Simon E. W. Moss, and Bernie McConnell. "Marine Mammals Trace Anthropogenic Structures at Sea." Current Biology 24, no. 14 (July 21, 2014): R638–39. https://doi.org/10.1016/j.cub.2014.06.033.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: C21	7.09: Section 9.6.2.1.1.2, Para 147 6.1 (Part 1 of 4) - 2.1.6.3.4 Para. 93 6.1 (Part 2 of 4) - Table 5.15 7.05 - 5.5.3.1 Para 71	Indentations Natural England highlights that the Applicant refers to Section "8.7.4.10 in Volume 7, Chapter 8 Marine Physical Environment (application ref: 7.8) for further information on seabed recoverability regarding indentations" created by UXO clearance. However, this section does not exist in the referenced chapter. Whilst there is a Section 8.7.3.10 in Chapter 8 covering "Indentations on the Seabed Due to Installation Vessels", this and other sections on indentations do not cover UXO clearance. Natural England also highlights that any such recoverability studies are also likely to be relevant to impacts caused by jack-up operations. Natural England advises that recovery will be highly dependent upon the nature of the sediments/habitat in which the impacts are occurring. We consider that recovery is altogether unlikely within the irreplaceable NERC Section 41 habitats which have been identified within the red line boundary (i.e. Piddocks with a sparse associated fauna in sublittoral very soft chalk or clay). As one of the rarer communities found within the survey stations for DBS, loss of this community from DBS East will represent a large percentage loss of this community from the designated site over an ecologically meaningful/prolonged time, potentially with no recovery.	Natural England advises the Applicant to evidence their claim that "*craters would be expected to re-fill with sediment over the course of days*". We highlight that evidence from previous high order UXO clearances within the Dogger Bank SAC have shown only partial infilling several months post-clearance. Natural England notes from Table 5.15 within the project description that UXO clearance activities are likely to be undertaken within benthic MPAs. Natural England requires the Applicant to evidence that the seabed depressions from both UXO detonations and Jack-Up legs will back-fill with similar sediment type, noting that fine sand and mud tends to collect preferentially in depressions owing to increased mobility of fine particle size. Natural England therefore advises that if depressions are created in areas of coarse or mixed sediments, then the area may need to be considered as permanent habitat change/loss unless it can be otherwise evidenced. The Applicant should also add the loss of benthic habitat as a result of UXO clearance, particularly within Dogger Bank SAC, to the worst-case calculations (e.g. Table 9-1), whether that loss be temporary or otherwise.		See RR-039: C3 with regard to pre-construction survey and micro-siting commitments for the piddock habitat. The **Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [AS-025], submitted to The Planning Inspectorate on the 7th November 2024, notes that Dogger Bank B undertook monitoring of craters caused by high-order Unexploded Ordnance (UXO) clearance in 2023 (Dogger Bank B, 2023)[29]. The UXO clearance campaign was completed in February-March 2023, with a survey of the craters in June 2023 at five of six clearance locations. This survey showed that in all cases the craters had infilled rapidly, in some cases infilling was largely complete, and even where there was the least recovery in (DBB_027) a 0.8m crater infilled to approximately 0.4m depth. Any potential effects on the Dogger Bank SAC resulting from UXO detonation would be subject to a separate marine licence that would be applied for post-consent.

29 Dogger Bank B (2023) Dogger Bank B UXO crater survey results, June 2023

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: C22	7.05: 5.5.3.2.3 Para 75 5.5.7.7.2	Natural England advises against the use of rock protection within designated sites because evidence suggests it is unlikely that it can be removed at the time of decommissioning without resulting in wider environmental impacts, i.e. inclusion of removal of designated site feature or some rock remaining. We also advise against the use of grout bags, unless filled locally sourced sediment similar to that within the SAC. This is because of potential degradation of the bags over time. This is consistent with similar advice on other OWF projects.	Natural England refers yourselves and the Applicant to the following paper on cable protection decommissioning Scour and Cable Protection Decommissioning Study - NECR403 (naturalengland.org.uk) We would welcome consideration being given to scour prevention/cable protection options that are most readily removable as a mitigation measure.		The Applicants note that the presence of piddock habitat within the Dogger Bank is potentially the result of bottom contacting fisheries removing overlaying sediments and exposing substrates suitable for the piddocks. This habitat is not mentioned in the site selection documentation (JNCC, 2011[25]) or the SACO for Dogger Bank (JNCC, 2022[26]). This habitat is not a recognised feature of sandbanks. Recovery of the sandbank feature as a result of the cessation of fisheries within the SAC may well lead to the loss of the piddock habitat.
RR-039: C23	7.05: Section 5.3 & 5.5.7.1	Natural England welcomes the removal of HVAC cables from the project design envelope, thereby reducing the number of export cables needed from six to four. However, we consider that a further commitment should be made to bundle the HVDC export cables for each array. This would halve the number of trenches needed (from two to one for each array) and reduce cable protection requirements. We highlight that bundled export cables have been successfully installed for the Dogger Bank A&B offshore wind farms, ~1 km north of the DBS ECC (at landfall).	Natural England advises that the Applicant commits to bundling the export cables for each project as mitigation		Following the receipt of Grid Connection Offers from National Grid Electricity System Operator (now National Energy System Operator) for the Projects the Applicants have selected a 1,450MW symmetrical monopile design. As a result, the Applicants can commit to bundling pairs of the export cables, i.e. only one pair for each Array Area. This commitment will be captured within an update to the **Cable Statement** [APP-244] which will be submitted in late November 2024.
RR-039: C24	7.09: Section 9.3.3, Table 9-3 8.17.1 - Section 5.5 6.1 - Section 6.3.1 Table 6.2 8.18	Natural England notes that the provision of a Cable Statement/Cable Burial risk assessment is not embedded mitigation, as the specific commitments within the final detailed plans will be key in determining the effectiveness of the mitigation.	Natural England advises that should further commitments and/or changes to project design be made by the Applicant that the impact assessment should be updated.		The Applicants note Natural England's position regarding the provision of a Cable Statement / Cable Burial Risk Assessment as embedded mitigation. The Cable Statement will continue to be updated throughout the lifetime of the Projects, including any potential additional mitigation agreed by the Applicants. Any updates in assessments as a result of changes to the Projects' Design Envelope or stakeholder comments will be captured though submissions to the examination.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: C25	7.09: Section 9.6.3.3	Natural England disagrees with the Applicant on the significance of impacts to sandbank features (assessed as minor adverse). As raised above (C15), the Applicant has failed to adequately consider those biotopes which form and/or support designated features/species. We also do not agree with the assessment of impacts on benthic features within Flamborough Head SAC.	See comment C15.		The Applicants have provided two assessments; the EIA (**Chapter 9 Benthic and Intertidal Ecology** [APP-085]) and HRA (**RIAA HRA Part 2 of 4** [APP-046]). Sandbank features (which are an Annex I habitat under the Habitats Regulations) are not assessed within the EIA, these are covered within the RIAA, which is where the biotopes assessed in the EIA are considered in terms of the sandbank feature. See RR-039: C7 The Annex I habitat features of the Flamborough Head SAC were assessed in section 6.5.2 of the **RIAA HRA Part 2 of 4** [APP-046]. A separate technical note regarding the indirect effects of sediment deposition on the specific biotopes of the Flamborough Head SAC in relation to the ES has been included alongside this response.

HRA - Document Used:

[APP-045] 6.1 RIAA HRA Part 1 of 4 - Introduction and Terrestrial

[APP-046] 6.1 RIAA HRA Part 2 of 4 – Annex I Offshore Habitats and Annex II Migratory Fish

[APP-244] 8.20 Cable Statement

[APP-080] 7.08 ES Chapter 8 - Marine Physical Environment

[APP-085] 7.09 ES Chapter 9 – Benthic and Intertidal Ecology

[APP-242] 8.18 Disposal Site Characterisation Report

RR-039: C26	General	Natural England advises that the RIAA will need updating to ensure that all revisions to the assessments are incorporated within it	N/A		The RIAA (**RIAA HRA Part 2 of 4** [APP-046]) is a point in time document that reflects the position of the Applicants at the time of submission. It will not be updated. Any updates in assessments as a result of changes to the Projects' Design Envelope or stakeholder comments will be captured though submissions to the examination. With regard to the benthic conclusions, any changes are unlikely to result in changes to the conclusions of the assessment, merely the quantum of impact (e.g. footprint area).
RR-039: C27	6.1 (Part 1 of 4) - Page 16	The SNCBs do not agree with the Applicant that an AEoI can be excluded from the disturbance/damage of Annex I sandbanks within the Dogger Bank SAC. This is because unlike more dynamic sandbanks, the length of time for recovery could be up to 25 years (as discussed as part of the R4 Plan Level Benthic compensation)	We draw your attention to the R4 Plan Level benthic compensation that includes the requirement for benthic compensation for disturbance/damage caused to Annex I 'glacial till' Annex I Sandbanks within Dogger Bank SAC		The Applicants note that the **Round 4 Dogger Bank Strategic Compensation Plan** [APP-060] states that (paragraph 3.1.4) (noting that although the following is described as recovery from loss the text appears in relation to habitat damage) 'Recovery from habitat loss would not occur until decommissioning has been completed, and, may take 10-25 years (based on Natural England's advice)' Natural England were asked by the Applicants during The Crown Estate strategic compensation Steering Group meetings to provide evidence for this position, and none has been provided to date. The advice provided in Natural England's Relevant Representation, RR-039: Annex C1- In relation to consideration of small-scale habitat loss within Special Areas of Conservation (SACs), does not present any quantitative evidence on either physical or temporal scale of damage effects.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					The Applicants have provided evidence for its case as signposted above and has provided additional evidence (including survey from the constructed Dogger Bank B project) in **Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [document reference: 10.44], which was submitted to the Planning Inspectorate on 7th November 2024. In short, the Applicants consider that Natural England's position does not take account of the speed of recovery, which clearly is more rapid than suggested in their advice.
RR-039: C28	6.1 (Part 2 of 4)	All relevant sites have been screened in.	N/A		The Applicants welcome agreement with Natural England on this point.
RR-039: C29	6.1 (Part 2 of 4) – Table 6-4 and Table 6-6	Natural England disagrees with penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion, being screened out for the Operation and Maintenance phase for Dogger Bank SAC.	Natural England advises that penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion, be screened in for Dogger Bank SAC for the Operation and Maintenance phase.		This impact is not screened out. Section 6.4.2.1.1of the RIAA (**RIAA HRA Part 2 of 4** [APP-046]) states: Construction, operation and maintenance and decommissioning activities will result in abrasion / disturbance of the substrate on the surface of the seabed / penetration and / or disturbance of the substratum below the surface of the seabed
RR-039: C30	7.09 – whole chapter	Natural England notes that appropriate consideration and assessment of potential impacts on the conservation objectives for Special Protection Areas (SPA) and SACs where the benthic habitats serve as supporting habitats for bird and marine mammal features, including Flamborough and Filey Coast SPA and the Southern North Sea SAC, has not been adequately undertaken.	Natural England advises that full consideration of the likely nature, extent, duration, and significance of impacts upon SPA and SAC supporting habitats is required to inform a robust assessment of the likely impacts upon designated ornithological marine mammal features.		Please see the response to RR-039: C2
RR-039: C31	6.1 (Part 1 of 4) - 2.1.6.3.4	Natural England is concerned that impacts from UXO detonation on benthic habitats and any resulting depressions has not been considered in the RIAA.	Natural England advises that impacts to benthic designated site features should be considered in the RIAA. Please see previous comment C21.		Any potential effects on the Dogger Bank SAC resulting from UXO detonation would be subject to a separate marine licence that would be applied for post-consent.
RR-039: C32	6.1 (Part 1 of 4) - Para. 102	Natural England notes that there is no consideration of the footprint of impacts from cable laying	Natural England advises either this is included and or relevant sign posting to section of other RIAA documentation.		The footprint of impacts from cable installation are stated in the first line of the worst case Table 6-3 within the RIAA (**RIAA HRA Part 2 of 4** [APP-046]).
RR-039: C33	6.1 (Part 2 of 4) - Section	Natural England highlights that the worst-case suspended sediment concentrations from trenching activities in the ECC are inconsistent between the RIAA and EIA	Natural England advise that the EIA and/or RIAA are updated with accurate worst-case prediction values for suspended sediment		**Chapter 9 Benthic and Intertidal Ecology** [APP-085] and the **RIAA HRA Part 2 of 4** [APP-046]) differ in terms of the areal coverage. The text in paragraph 177 of the ES covers the full length of the Offshore Export Cable Corridor, as opposed to just the area within the Dogger Bank SAC.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
	6.4.2.2.1 para 47 7.09 - Section 9.6.2.2.1.2 para 177	chapters, stated as "*of up to 5 mg/l within 1km of the point of disturbance*" (ref RIAA 6.1, para 47), to "1,000 - 1,500 mg/l" (ref 7.09 ES Chapter 9, para 177) - for an undefined range.	concentrations arising from trenching in the ECC.		Paragraph 177 of **Chapter 9 Benthic and Intertidal Ecology** [APP-085] refers to the 1,000 - 1,500 mg/l range in reference to the potential sediment disturbance range from the Offshore Export Cable Corridor. The Applicants can confirm this is incorrect. This 1,000 - 1,500 mg/l range could occur only within the centre of the DBS East Array Area in the worst case, resulting from Array Cable trenching (see section 8.3.4.5.2 of **Marine Physical Processes Modelling Technical Report (Revision 2)** [document reference: 7.8.8.3] for further information). For the Offshore Export Cable Corridor, the worst case suspended sediment concentration is up to 750mg/l within the direct footprint of the cable trenching activities. It should be noted that this correction does not alter the assessment conclusions reached in either **Chapter 9 Benthic and Intertidal Ecology** [APP-085] or the **RIAA HRA Part 2 of 4** [APP-046]
RR-039: C34	6.1 (Part 2 of 4): Section 6.4.1.1.3 Para 19	Dogger Bank SAC We note that the Applicant has calculated an 'as built' estimate of habitat loss for consented projects within Dogger Bank SAC to inform impacts to extent and distribution. Natural England disagrees with this approach as 'as built' parameters are not legally secured.	Natural England advise that consented parameters should be used to inform habitat loss estimates for assessment within Dogger Bank SAC.		The as-built numbers are included in **RIAA HRA Part 2 of 4** [APP-046]) for reference and to highlight that constructed footprints tend to be lower than consented ones. However, the 11.71km² footprint quoted in paragraph 19 (section 6.4.1.1.3) is the consented footprint and this is used in the in-combination assessment presented in paragraph 114 (section 6.4.2.5.2) not the constructed footprint.
RR-039: C35	6.1 (Part 2 of 4): Section 6.4.2.1.1, Para 20; 7.09 - Section 9.6.2.2.1.2 Para 178 8.18 Section 5.2	It is noted from the RIAA HRA Part 2 of 4 that "any sediment removed from within the Dogger Bank SAC during construction activities will be disposed of within the Offshore Development Area located within the SAC boundary, ensuring no sediment is lost from the sandbank habitat." It is also noted from ES Chapter 9 that "Dredged material from sandwave levelling during the construction process will be disposed at a site yet to be determined at the time of writing" with further information whereby "redeposition of dredged material for the Projects will disperse over a large area and, thus, will settle at a minimal depth over the existing seabed". Furthermore, the Disposal Site Characterisation Report has stated that "with respect to the Array Areas and the part of the Offshore Export Cable Corridor within the Dogger Bank SAC, reuse, recycling or other recovery is not	Natural England advises that clarification is provided on the WCS for sandwave levelling/seabed clearance. We also advise that within benthic MPAs any sediment deposition is located within areas of similar sediment type, as close to and upstream of the original sandwave, and is deposited using a fall pipe (should a suction hopper dredger be used) to best ensure sandbank recovery and that the sediment remains within the designated site. An outline sandwave levelling, deposition and recovery plan should be provided as either a standalone document or as part of the Cable Statement [APP-242] /Outline Cable Burial Risk Assessment		Noted. The Applicants have derived worst case scenarios for the Projects which are informed by initial site investigation work undertaken to inform this DCO application. The detailed proposals relating to sandwave levelling and seabed clearance will be developed by the Projects during the post-consent stages. See response RR-039: B28 in the Applicants responses Appendix B Marine Physical Environment (section 2.3) for further information regarding sandwave clearance. As a variety of sediment types are present on the Dogger Bank, the Applicants believe that stipulating material to be disposed must be placed on the same material type cannot be guaranteed and would be difficult and onerous to apply in reality. Dredging, particularly for the linear aspects of the Projects such as the subsea cable installations, may occur over a variety of sediment types to allow installation to occur. The resultant mixed cargo could not be disposed of on any single, specific material type. Hence, strict adherence with this request would be difficult to achieve. However, in line with the request made by Natural England the Projects can commit to including detail relating to sandwave levelling and deposition within the **Cable Statement** [APP-242] post-consent. An interim update of this document will be submitted in late November 2024).

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		appropriate" (in relation to any sediment removed from within the Dogger Bank SAC during construction activities will be disposed of within the Offshore Development Area located within the SAC boundary, ensuring no sediment is lost from the sandbank habitat). Whilst we do not object to the above, please see our comments in Appendix B Marine Physical Environment for further queries regarding the WCS sandwave clearance volume for export cable installation			
RR-039: C36	6.1 (Part 2 of 4): Section 6.4.2.6.1	Dogger Bank SAC Natural England highlights that within the RIAA it is argued that the habitat loss impacts are "*minimal*". Natural England does not agree with this assessment. Whilst it is stated that infrastructure from the DBS East and West array areas and offshore ECC would only cause loss of, or disturbance to, a small percentage of Dogger Bank SAC, this is not an insignificant area that is being impacted as it equates to c.3050 football pitches. Please see Annex 1 to this Appendix which discusses small scale losses. We also draw the Examiner's attention to the many anthropogenic activities already operating or under construction across a considerable proportion of Dogger Bank SAC (e.g. Dogger Bank A, B, C and Sofia offshore wind farms (OWF), marine aggregates, oil and gas etc), in addition to several planned activities (e.g. Dogger Bank D OWF, new oil and gas, carbon capture and storage), which are also adding to the cumulative pressures on the interest features of the SAC resulting in the designated site having a restore conservation objective. Thus, whilst the	N/A		The Applicants consider that 'minimal' needs to be seen in context, the Applicants consider that the context is the percentage of area within the Dogger Bank SAC (which is approximately 12,000km²) – the disturbance during construction 31.4km² equates to 0.2% of the area of the SAC and, as previously discussed (see RR-039: C21) is a temporary impact, the habitat loss of 2.25km² equates to 0.018% of the area of the SAC. Please refer to the **Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [AS-025] for a discussion of small-scale losses. With regard to habitat loss, the Applicants do not dispute that (given the unfavourable condition of the SAC) any habitat loss, however minimal, would lead to a conclusion of adverse effect on integrity, based on previous decisions (this is the case for Projects alone or in-combination). The Applicants disagree that this conclusion is valid for damage (alone or in-combination) where the scale of the effect and the evidence of recovery must be considered (see **Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [APP-025].

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		spatial extent of the area impacted by Dogger Bank South may be small relative to the SAC as a whole, when all pressures are summed it will lead to an adverse effect on the site integrity, as concluded in the Plan Level HRA.			
RR-039: C37	6.1 (Part 2 of 4): Section 6.4.2.6.1	Dogger Bank SAC Natural England agrees with the Applicant's conclusion that physical change to another seabed / sediment type will result in a permanent loss of Annex I sandbank habitat feature within Dogger Bank SAC, and as such, an AEoI cannot be ruled out. However, Natural England does not agree with the worst-case calculation of area of loss that has been presented. This is, in part, because we are not confident that the calculations for loss are based on realistic worst-case calculations. In addition, the Applicant has also failed to consider the likely benthic 'ecological halo effect' which can be expected following the placement of structures on the seabed where the physical and biological structure and function of the benthos can be expected to be altered over an area multiple times that of the original structure (see comment C18). Natural England is particularly concerned that secondary 'ecological halo' effects could collectively result in broadscale changes in the benthic habitats and communities across the wider DCO area and a significant proportion of Dogger Bank SAC.	Natural England advises that the Applicant provides a robust assessment of the potential Worst-Case area of impact on benthic communities within Dogger Bank SAC sandbank feature. Consideration should be given to the nature of the impact as a result of changes to physical and biological processes, following the placement of structures and cable/scour protection on the seabed.		The Applicants consider that 'minimal' needs to be seen in context, the Applicants consider that the context is the percentage of area within the Dogger Bank SAC (which is approximately 12,000km²) – the disturbance during construction 31.4km² equates to 0.2% of the area of the SAC and, as previously discussed (see RR-039: C21) is a temporary impact, the habitat loss of 2.25km² equates to 0.018% of the area of the SAC. Please refer to **the Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [APP-025] for a discussion of small-scale losses. With regard to habitat loss, The Applicants do not dispute that (given the unfavourable condition of the SAC) any habitat loss, however minimal, would lead to a conclusion of adverse effect on integrity, based on previous decisions (this is the case for Projects alone or in-combination). The Applicants disagree that this conclusion is valid for damage (alone or in-combination) where the scale of the effect and the evidence of recovery must be considered (see **Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [APP-025].
RR-039: C38	6.1 (Part 2 of 4) - Section 6.5.2	Flamborough Head SAC Natural England advises that the Applicant has not appropriately identified and/or described benthic receptors within Flamborough Head SAC, which is within the Zone of Influence of secondary impacts. As	Natural England advises that all benthic receptors within Flamborough Head SAC which are within the Zone of Influence, need to be sufficiently characterised to enable a robust, evidenced assessment to be		Please see the response to RR-039: C5 above.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		such, it is not clear how the Applicant has considered the sensitivity and/or resilience of the designated benthic receptors to the secondary pressure pathways that have been described (i.e. elevated suspended sediments and smothering). The Applicant has predicted that up to 5mm of sediment deposition can be expected up to 10 km away from the source of disturbance, yet Flamborough Head SAC is within 3km, indicating that potentially significant secondary pressures could reach sensitive designated features. Flamborough Head SAC has been designated for intertidal, infralittoral and circalittoral rock, as well as submerged and partially submerged sea caves, all of which are susceptible to the effects of sediment deposition. In the absence of having appropriately characterised or considered the specific communities of these designated features (e.g. biotopes), there appears to be no baseline from which it has been possible to consider the sensitivity or recoverability of the designated benthic receptors to the identified pressure pathways (e.g. using MarESA).	undertaken and presented in light of HRA requirements. In the absence of characterisation of benthic receptors at a suitable resolution, the worst-case scenario needs to be presented (e.g. most sensitivity biotope within the broadscale habitat used as a basis for assessments).		
RR-039: C39	6.1 (Part 2 of 4) - Table 6-1; 6.4.2.2.1 Para 47 7.08 – Section 8.7.3.3 Paras 172 – 173 7.8.8.3 –	Natural England advise that a tidal ellipse is used to estimate the zone of greatest influence for sediment plumes for the array area and export cable corridor. We note that the Zone of Influence (ZoI) for suspended sediment has been updated to 8km (6.1, Table 6-1) based on site specific physical processes modelling undertaken. It is unclear as to where the 8km ZoI is derived from. Tables 8-3-17 and 8-3-18 of ES Appendix 8-3 (Marine Physical Processes Modelling Technical Report) outline estimated sediment plume size based on	Natural England advises that the Applicant should provide further clarity on estimated sediment plume sizes including which values have been used to assess for Changes in Suspended Sediment Concentration and Transport due to Cable Installation (Array, Inter Platform and Export) and smothering and siltation for all relevant parts of the Application.		The Applicants note that the 8km ZoI stated in the **RIAA HRA Part 2 of 4** [APP-046] is incorrect. The correct ZoI, as used in **Chapter 8 Marine Physical Environment** [APP-080] and **Chapter 9 Benthic and Intertidal Ecology** [APP-085] is 14km which represents the maximum tidal excursion ellipse offshore of Flamborough Head. The 18km figure stated in **Chapter 8 Marine Physical Environment** [APP-080] is in relation to the maximum extent of the sediment plume during peak tidal currents from the cable corridor to the east of Flamborough Head where tidal currents are strong. However, at such distances the sediment concentration would be below 1mg/l and thus be indistinguishable from the existing background levels of sediment in the water column. With regards to the assessment presented in **RIAA HRA Part 2 of 4** [APP-046], the change in ZoI would not alter the designated sites screened in for assessment within this report or the outcomes of the assessment itself, given the distances of those sites from the Projects.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
	Tables 8-3-17 & 8-3-18	modelled maximum suspended sediment concentrations exceeding 0.5mg/l (threshold value) for export cables during trenching and levelling respectively. The estimated bottom layer plume size is 8km for halfway between shore and Array areas for levelling activities (Table 8-3-18). However, for trenching activities for the same location, the size is of a greater magnitude at 12km (Table 8-3-17). Thus, it is unclear how the 8km ZoI has been derived. Furthermore, it is stated in 6.1 RIAA HRA Part 2 of 4, para 4 that in the "*worst case (trenching activities within the Offshore Export Cable Corridor) suspended sediment concentrations of up to 5mg/l occur within 1km of the point of disturbance, with values returning to background levels within 5-7km of the cable corridor*". This contradicts with what is outlined in ES Chapter 8 para 172 where these values are attributed to levelling activities and where para 173 states that trenching can result in the maximum extent of the plume during peak tidal currents reaching 18km from the cable corridor to the east of Flamborough Head. Note, this comment is also applicable to Appendix B (Marine Physical Processes).			Given the low sensitivity of the biotopes within the SAC (in particular due to their high recoverability; the small area of effect in relation to available sandeel and other fish habitat (both within the SAC and beyond); and the episodic nature of the effect it is considered that changes to suspended solids would not significantly affect: • The **extent** of the sandbank feature in terms of its biological assemblages; • The **biological structure and function** in terms of the key and influential species and characteristic communities present; and • The function of the feature within the site. Therefore, there is still no potential for an AEoI of the Dogger Bank SAC in relation to changes to suspended solids from the Projects alone or in-combination with other plans / projects.
RR-039: C40	N/A	Natural England draws your attention to our Appendix B on Marine Physical Processes which considers in-combination impacts on marine processes, which may also impact benthic habitats. However, because an alone impact on Annex I Sandbanks cannot be excluded for DBS East and West we provide no further in-combination comments in this Appendix.	N/A		The Applicants acknowledge this comment.
RR-039: C41	6.1 (Part 1 of 4) -	Natural England is concerned that the placement of drill arisings adjacent to	Natural England advise that as mitigation the Applicant should commit to the placement of drill arisings in areas of similar		The maximum potential volume of drill arisings across both Projects as assessed in the **RIAA HRA Part 2 of 4** [APP-046] was 68,160m³ for DBS East and DBS West together, which was included within the total potential volumes of displaced sediment within the Dogger Bank SAC. Given the proportion of drill arisings in relation to the overall potential volume of displaced

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
	Para. 47 and 55 6.1 (Part 2 of 4) -Para. 82, 90, 98 and 115	turbines may result in further habitat loss/change.	habitat/particle size. Otherwise, we advise this will need to be assessed similar to that of scour prevention/cable protection as a lasting impact included within the AEoI and commitments to remove at the time of decommissioning will be required.		sediment within the Dogger Bank SAC is minimal (representing 0.3% of the 20,361,344m^3 assessed within the **RIAA HRA Part 2 of 4** [APP-046]), it is considered proportionate and acceptable to include consideration of drill arisings within the assessment of overall displaced sediment rather than separating drill arisings out into their own assessment. As noted in the Clarification Note on Drill Arisings and Deposited Sediments originated by Hornsea Project Four during that projects examination[30], deposited material is likely to be winnowed away by natural processes and therefore it is also potentially a temporary effect with seabed recovery likely despite a minimal potential for smothering.
RR-039: C42	6.1 (Part 1 of 4) - 2.1.4.1.3 APP-046 Table 6.2	Natural England is concerned that gravity based foundations are still included for offshore platforms when they have been removed for turbine foundations. Given the size of these foundations and scale of the impact on Annex I sandbanks and the likelihood of degradation over 30 years putting their removal at risk we advise further consideration is given to the removal of these foundations and an installation option.	Natural England advise that as a further mitigation measure, gravity based foundations are not used for offshore platforms.		All gravity based structure (GBS) foundations were removed from the Projects' Design Envelope for the Dogger Bank SAC following Preliminary Environmental Information Report (PEIR). This is clearly stated in **Chapter 5 Project Description** [APP-071] section 5.3, paragraph 41. Only the ESP, should it be located on the Offshore Export Cable Corridor, retains the potential to be constructed with a gravity base. The physical process modelling presented within the DCO application (**Appendix 8-3 Marine Physical Processes Modelling Technical Report** [APP-084]) did include GBS foundations. At the time the modelling was undertaken, GBS foundations were considered the worst case for offshore platforms located within the DBS Array Area only (a maximum of four structures per project) for platforms in the modelling, as this was undertaken before the decision to remove gravity based foundations for platforms located in the Dogger Bank SAC was finalised. Following completion of the modelling, a commitment was made to not use GBS foundations within the DBS Array Areas. Therefore, the 'modelled' worst case scenario for offshore platform foundations located in the Array Areas assessed in the ES is gravity bases, whereas the realistic worst case scenario relates to monopile foundations. Given that this presented a worse outcome than the realistic worst case scenario, it was not remodelled for the DCO application. Additionally, the Applicants are in the process of preparing a change request relating to the relevant design parameters. The Examining Authority (ExA) was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the removal of all platforms from the Offshore Export Cable Corridor, reductions in the number of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas. The change request will be supported by the **Request for Design Change – Environmental Assessment Update** [document reference C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are

[30] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-001653-Hornsea%20Project%20Four%20-%20Other-%20G5.5%20Clarification%20Note%20on%20Drill%20Arisings%20and%20Deposited%20Sediments.pdf

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					expected to be positive i.e. reducing or removing impacts. These factors, if the change request is accepted, may result in changes to the values discussed above. The change proposed of relevance to this comment is the removal of GBS foundations entirely from the Projects Design Envelope.
RR-039: C43	7.05: Section 5.5.13.2	Cable protection Natural England highlight that the Applicant intends to leave "most array and export cables (and any associated cable protection)…in situ" following decommissioning. We acknowledge that leaving buried cables in situ can be appropriate at decommissioning. However, Natural England strongly advises that a commitment is secured in the DCO for the removal of all on and above seabed infrastructure at the time of decommissioning, including cable and scour protection. Natural England advises that any placement of scour prevention/cable protection constitutes a lasting impact over the lifetime of the project which is potentially irreversible i.e. even if removed at the time of decommissioning there is no guarantee that habitats can/will recover. Unless it can be demonstrated otherwise, the scale of impacts is likely to further hinder the conservation objectives of the site, taking the site further away from achieving its 'restore objective' The Secretary of State decision for Hornsea Project Three, Norfolk Boreas, Norfolk Vanguard and Dudgeon and Sheringham Shoal (Offshore Windfarm) Extension Projects (DEP and SEP) supports this position with a requirement to provide compensation measures.	Natural England advise that a commitment to remove of all on and above seabed infrastructure at the time of decommissioning, should be secured in the DCO, as has been required for all offshore wind farms previously consented within the Dogger Bank SAC. We highlight that in the Guidance Notes for Industry for the Decommissioning of Offshore Renewable Energy Installations under the Energy Act, 2004, it is expected that "*all installations and structures will be fully removed at the end of their operational life to minimise residual liabilities and that approval of decommissioning programmes will be based on this assumption*" in accordance with the assumptions set by the International Maritime Organisation in 1989 and in line with OSPAR requirements. Natural England further advises that returning the seabed to its pre-development status will contribute to achieving Good Environmental Status of the wider marine environment as required by the UK's Marine Strategy and as above is in line with OSPAR requirements.		The Applicants acknowledge Natural England's response. At this stage, it is not possible for the Applicants to determine whether components would be left in situ or removed from the seabed as part of decommissioning. This will be determined as part of decommissioning planning which will be subject to consultation and would require approval from the regulator towards the end of operational period. It is important to note that infrastructure left in situ may present a lesser impact in terms of potential changes to marine water and sediment quality. In order to present an assessment of the worst case scenario the likely significant effects of the deposition of scour and cable protection on habitat loss have been assessed as permanent to a minor adverse significance of effect. The classification of these effects as permanent was undertaken in consultation with stakeholders. This assessment covers the worst case eventuality that cable and scour protection may not be removed. The impacts of the Projects on the Dogger Bank SAC will be compensated for, with compensation plans to be agreed with stakeholders including Natural England.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: C44	7.05 - Section 5.5.7.7.2	Natural England notes that the Applicant has not committed to using any specific type of cable protection and has not considered the limitations some methods present with regard to successful decommissioning and/or likelihood of degradation over the lifetime of the project which could have wider impacts in the case of grout bags/bagged solutions.	Natural England advise that due consideration should be given to the nature of the cable protection used and should favour those engineering options with the greatest likelihood of successful removal at the Projects' end of life (see comment C43 (above).		Please see the responses to RR-039: 039: C22 and RR-039: C43.
RR-039: C45	7.09 - Table 9-3	Natural England welcomes that the Applicant has given consideration to identifying areas of shallow glacial till in the Offshore Development Area to inform post-consent discussions on micrositing cables. However, we do not consider the DCO conditions listed secure this as they only refer to identifying priority habitats, which would not include glacial till.	Natural England advises that this mitigation should be applicable to underlying glacial sediments within Dogger Bank SAC as well as priority habitat identified along the ECC, e.g. piddocks. We advise that the DCO conditions listed are updated to secure this. We also advise that a pre-consent Outline Cable Burial Risk Assessment within an updated Cable Statement which thoroughly considers all available geotechnical information to implement mitigation measures which further avoid, reduce and mitigate impacts by ensuring that optimal cable burial depths can be achieved, thus avoiding/reducing the need for cable protection and enabling a realistic worst case scenario to be assessed.		The Applicants note Natural England's concerns and suggest that the commitment relating to micro-siting in the offshore environment presented in the **Commitments Register** [APP-231] (Ref: Co91) can be clarified to encompass surficial deposits of glacial till, with the **Draft DCO** [APP-027] also updated to provide a more precise definition of the habitat types and habitat designations considered for future micro-siting. An updated version of the **Draft DCO** [APP-027] will be submitted in late November 2024.
RR-039: C46	6.1: 6.4.1.1.3	Dogger Bank SAC Natural England notes the Applicant's comparison to the scale of impact from fisheries on Dogger Bank SAC compared to OWF, and the recent introduction of byelaws and closure of the sandeel fishery enabling recovery of the sandbank feature from this pressure. Whilst NE acknowledge that fishing activity has historically had a broader impact on	N/A		The comparison with fisheries is valid to highlight the scale of the impact from the Projects and provide some context. As described in the RIAA (**RIAA HRA Part 2 of 4** [APP-046]), paragraphs 20, based on previous Government estimates, fisheries impacts affected 70% of the area of the SAC. The removal of this greater pressure is important context for the recovery of the sandbank feature from the Projects' damage impacts which would temporarily affect 0.2% of the area of the SAC (as a worst case).

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		Dogger Bank, this does not reduce or negate the impacts of other industries which are additional to pre-existing impacts. Neither does mitigation introduced for the impacts of one industry remove the need for another industry to mitigate its impacts.			
RR-039: C47	General	Flamborough Head SAC Natural England does not consider that the RIAA has been sufficiently evidenced for us to be able to rule out an AEoI of the Flamborough Head SAC either alone, or in-combination.	See comment C15 and C38.		Please see the response to RR-039: C5 above.
RR-039: C48	General	Dogger Bank SAC Natural England agrees with the Applicant's conclusion that physical changes to another seabed/sediment type will result in a permanent loss of Annex I feature within Dogger Bank SAC, and as such, an AEoI cannot be ruled out. However, we have concerns that the scale of impacts has not been sufficiently considered, which will have implications for the level of compensation required.	See previous comments.		Please see the response to RR-039: C37.
RR-039: C49	6.1: Section 6.4.2.1.1	Natural England disagrees with the conclusion of no potential AEoI on Dogger Bank SAC in relation to abrasion/ disturbance of the seabed. We highlight that The Crown Estate Round 4 Plan Level HRA (2022) concluded that AEoI could not be ruled out for this pathway.	See previous comments.		The Applicants consider that habitat damage was not adequately assessed within the Plan Level HRA and presents evidence within the RIAA (**RIAA HRA Part 2 of 4** [APP-046]) for why this should not be included within the effects considered to result in AEoI– see section 6.4.2.1.1. The Applicants have provided evidence for its case as signposted above and has provided additional evidence (including survey from the constructed Dogger Bank B project) alongside this response (**Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [AS-025]).
RR-039: C50	General	Please see Appendix D for our comments on benthic compensatory measures.	See Appendix D.		The Applicants acknowledge this comment.
Priority Habitats and Species listed under Section 41 list of the Natural Environmental and Rural Communities (NERC) Act, 2006 - Document Used: [APP-085] 7.09 ES Chapter 9 – Benthic and Intertidal Ecology					

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: C51	7.09 - 9.5.1.4.2	Natural England notes that the biotope 'A4.231 Piddocks with a sparse associated fauna in sublittoral very soft chalk or clay' has been identified in the DBS East Array Area and Array Area Construction Buffer Zone. This biotope (and peat and clay exposures more generally) is considered likely to be irreplaceable (Defining Irreplaceable Marine Habitats - NECR474 (naturalengland.org.uk)) and is also a priority habitat under Section 41 of the NERC Act 2006.	Natural England advises that the Applicants EIA would benefit from appropriately considering the importance and rarity of peat and clay exposures, and every effort should be made to avoid impacts to these priority habitats where possible. This is particularly the case where habitats support rare and/or irreplaceable communities such as boring piddocks.		Please see the response to RR-039: C21.
RR-039: C52	7.09 - Table 9-3	Natural England highlights that the Applicant has made no strong commitment to avoid/microsite around Priority Habitats as listed under Section 41 of the NERC Act 2006.	Natural England advises that the adoption of mitigation measures via a Benthic Mitigation Plan are further considered in order that impacts (particularly permanent loss), on all Section 41 Habitats are avoided and/or reduced wherever feasible through mitigation measures such as micro-siting.		The Applicants suggest that the commitment relating to micro-siting in the offshore environment presented in the **Commitments Register** [APP-231] (Ref: C091) can be clarified to encompass Priority Habitats as listed under Section 41 of the NERC Act 2006, with the **Draft DCO** [APP-027] also updated to provide a more precise definition of the habitat types and habitat designations considered for future micro-siting. An updated version of the **Draft DCO** [APP-027] will be submitted in late November 2024.
RR-039: C53	7.09 - Section 9.8	Natural England advises that in the event that further Priority Habitats are identified during the Examination as a result of comments above, assessments will require updating.	Natural England advises that in the event that further Priority Habitats are identified as a result of the above comments, and mitigation cannot avoid those habitats, cumulative impact assessments will require updating.		It is unclear how further Priority Habitats could be identified during the Examination, no further survey information will be submitted.
RR-039: C54	N/A	General This document will need updating pre-consent based on comments Natural England has provided on the EIA within Appendix B and C as currently we do not agree with conclusions on the level of impacts.			The RIAA (**RIAA HRA Part 2 of 4** [APP-046]) and ES (**Chapter 9 Benthic and Intertidal Ecology** [APP-085]) are point in time documents that reflect the position of the Applicants at the time of submission. These will not be updated. Any updates in assessments as a result of changes to the project envelope or stakeholder comments will be captured though submissions to the Examination.
RR-039: C55	N/A	Natural England notes that the whole of the offshore windfarm array footprints, the inter-cable platform corridor and the export cable corridors will be disposal locations, but deposition will only occur where possible within the same sediment. Given that	Natural England advises that disposal options are explored to ensure that sediment is deposited in similar sediment types.		Please see the response to RR-039: C35.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		sandwave levelling is likely to be undertaken by suction hopper dredge and then sediment released at the sea surface, it is unlikely that this will occur.			
RR-039: C56	N/A	Natural England advises that the mitigation in Section 5.2 does not go far enough, especially with the Dogger Bank SAC and in areas where there are priority habitats and/or indirect impacts to designated site features could occur. Natural England advises that the following mitigation measures are adopted (but not exclusively) - All deposition of dredged sediment within the Dogger Bank SAC should be done through the use of a fall pipe and adjacent and upstream of the dredge location in same sediment type to ensure sediment stays within the site and enables sandwave recovery. - Drill arisings should be deposited with similar sediment characteristics i.e. not on sandbanks. Therefore, adjacent to turbines is unlikely to be appropriate. This requirement is a condition of Dogger Bank A, B, C and Sofia. - Sandwave deposition should avoid areas of priority habitats under NERC 2006 by the inclusion of a 50m buffer around the NERC habitats - Deposition of dredge material along the export cable should utilise a fall pipe where there is a risk of increases in suspended sediment concentrations impacting on designated site features and those of ecological importance.	Natural England advises that as a minimum, further mitigation measures are adopted by the Applicant and the relevant documents updated accordingly.		Please see the response to RR-039: C35.
RR-039: C57	N/A	Section 7.2.1 Intertidal Exit pit – please see comments within Appendix B on potential loss of stored material prior to backfilling.	Natural England advises that alternative storage options for material from the landfall exit pits are explored.		Please see the response to RR-039: C14.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		We advise that alternative storage options are explored.			
RR-039: C58	N/A	General: Natural England advises that this document needs to better consider risk and implications of secondary scour occurring.			The risk and implications of secondary scour occurring have been considered by the Applicants in **Chapter 8 Marine Physical Environment** [APP-080] where it was concluded that any secondary scour effects associated with scour protection would be confined to within a few metres of the direct footprint of that scour protection material. Post-construction surveys are proposed to monitor scour protection measures and secondary scour in **Chapter 8 Marine Physical Environment** [APP-080] and the **In-Principle Monitoring Plan** [APP-247]. Monitoring will be used to identify the extent, volume and integrity of any scour protection used and determine whether remedial action is required (**In-Principle Monitoring Plan** [APP-247]). The Applicants will update the **Outline Scour Protection Plan** [APP-251] in line with information on secondary scour presented in **Chapter 8 Marine Physical Environment** [APP-080] and the **In-Principle Monitoring Plan** [APP-247]. The updated **Outline Scour Protection Plan** [APP-251] will be submitted in late November 2024.
RR-039: C59	N/A	Section 1.2 - We draw your attention to comments within Appendices B and C in relation to minimising environmental impacts as much as possible through the choice of scour prevention/cable protection, and highlight the need the to make every effort to avoid using those that are least likely to be recovered at the time of decommissioning.	Please see comments with Appendices B and C.		Please see the response to RR-039: C4.
RR-039: C60	N/A	General: This document will need updating pre-consent based on comments Natural England has provided on the EIA within Appendix B and C, as we currently do not agree with conclusions included within the document. Once this update is provided, we will provide further nature conservation advice.			The Applicants consider that the scale of impacts from cable installation and cable protection is fully justified within the worst case Table 9-1 within **Chapter 9 Benthic and Intertidal Ecology** [APP-085]. Furthermore, the RIAA (**RIAA HRA Part 2 of 4** [APP-046]) and **Chapter 8 Marine Physical Environment** [APP-080] and **Chapter 9 Benthic and Intertidal Ecology** [APP-085] are point in time documents that reflect the position of the Applicants at the time of submission. These will not be updated. The **Cable Statement** [APP-244] will continue to be updated throughout the lifetime of the Projects, including any potential additional mitigation agreed by the Applicants. Any updates in assessments as a result of changes to the project envelope or stakeholder comments will be captured though submissions to the Examination. Additionally, the Applicants are in the process of preparing a change request relating to the relevant design parameters. The Examining Authority (ExA) was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					removal of all platforms from the Offshore Export Cable Corridor, reductions in the number of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas. The change request will be supported by the **Request for Design Change – Environmental Assessment Update** [document reference C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. These factors, if the change request is accepted, may result in changes to the values discussed above. However, although the quantum of impact will be reduced the significance of effect will remain the same.
RR-039: Annex C1	N/A	Annex C1 - In relation to consideration of small-scale habitat loss within Special Areas of Conservation (SACs) in relation to cable protection Natural England provides the following advice: 1.1. Natural England will usually consider permanent, long-lasting and irreversible loss to be an adverse effect unless it can be clearly demonstrated otherwise. 1.2. The following points should be considered (but not exclusively) when providing evidence to underpin an assessment of whether an impact is likely to be an adverse effect: • Location of the predicted loss in terms of whether it sits on a designated or supporting feature of the site. • Duration of the loss – for loss to be considered temporary it must be clearly time-limited to the point where the impact is predicted to return to the same pre-impact condition and must include a detailed remediation plan using proven techniques as part of the licence. • Scale of the loss in relation to the feature / sub feature of the site including consideration of the quality and rarity of the affected area. • Impact on structure, functioning or supporting processes of the habitat. • Feature condition; and	N/A		Please see **Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [document reference: AS-025].

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		• Existing habitat loss within the same site/ feature/ sub feature. 1.3. Whilst there are no hard and fast rules or thresholds, in order for Natural England to advise that there is no likelihood of an adverse effect the Applicant would need to demonstrate the following: 1) That the loss is not on the priority habitat/feature/ sub feature/ supporting habitat and/or 2) That the loss is temporarily and reversible (within guidelines above) and/or 3) That the scale of loss is so small as to be de minimus alone and/ or 4) That the scale of loss is inconsequential including other impacts on the site/ feature/ sub feature 1.4. As set out in (C-294/17 Cooperatie Mobilisation for the Environment UA and Others v College van gedeputeerde staten van Limburg and Others) and other case law relating to People over Wind (2018) for a plan/project to be consented within a designated site there needs to be sufficient certainty in the evidence presented and the recoverability of the features and/or absolute certainty that any proposed mitigation measures will remove an adverse effect on integrity. 1.5.Therefore, we welcome any further work the Applicant can do to provide more certainty in relation to the Worst Case Scenario presented and/or minimise the impacts as much as possible.			

2.5 Responses to Appendix D Benthic Compensation

Table 2.5.1 Applicants' responses to Natural England's Appendix D Benthic Compensation

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039 - D 0.0.1	N/A	1.1. As the derogations materially differ in content/structure to a standard Environmental Statement chapter, our comments are provided in a different format to the other Appendices. We have provided a summary table for each project level compensation measure (Tables 1 - 3), followed by detailed comments on the compensation plans and supporting documents (Table 4). The summary RAG table is used to highlight areas of agreement and outstanding concern. The following criteria is used to assess each category in the summaries: SNCBs have broad confidence in this aspect of the measure, though there may be some uncertainties that need addressing There are significant concerns/uncertainties regarding this aspect of the measure, but they have the potential to be resolvable. Major uncertainties remain with this aspect of the measure, which if not resolved would make compensation undeliverable. SNCBs cannot be confident at this stage that the measure is deliverable. Note to Examining Authority (ExA)	N/A	N/A	No response is required.
RR-039 - D 0.0.2	N/A	1.2.We draw the Examiners attention to the fact that the delivery mechanism for benthic compensation for the Dogger Bank South (East and West) Offshore Windfarm ('the Project') is complicated. This is due to unknowns and uncertainties associated with delivery of the Round 4 Plan Level compensation as agreed by the Secretary of State and required by The Crown Estate (TCE) as the competent authority, and the use of Strategic Benthic Compensation (SBC) measures most likely to be delivered by DEFRA through the Marine Recovery Fund (MRF).	N/A	N/A	The Applicants expect further information on this topic to be included within an upcoming ministerial statement, due to be issued Q4 2024.
RR-039 - D 0.0.3	N/A	1.3.Owing to this project being the first to require Plan Level benthic compensation, and strategic compensation and the MRF still being under development, it is unlikely all of the answers relating to specific project level compensation and any contributions to strategic compensation by the Applicant will be available during this project's Examination. Therefore, it is the Statutory Nature Conservation Bodies (SNCBs) view that it may neither be necessary or appropriate to discuss the merits of a particular designated site extension as part of the Dogger Bank South Examination. Thus, the SNCBs will focus our Examination advice on ensuring that all the impacts will be compensated for and that the mechanisms for delivering compensation are secured within the DCO and are legally complaint.	N/A	N/A	The Applicants agree that the specifics of the location of compensation are a matter for the Defra process and the detail of the mechanisms of the MRF. The Applicants agree that the focus of the examination should be on the impacts to be compensated for, the evidence and the wording of the **Draft DCO** [APP-027].

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039 - D 0.0.4	N/A	1.4 The SNCBs fully recognise that the Examining Authority (ExA) may have further questions on the Defra MPA designations work, delivery of strategic compensation and the Round Four Plan Level benthic compensation. We suggest that these are directed to DEFRA and The Crown Estate respectively.	N/A	N/A	The Applicants expect further information on this topic to be included within an upcoming ministerial statement, due to be issued Q4 2024.
Compensation measure: Strategic Compensation - New site designation or Extension for Annex I Sandbanks					
RR-039: D 0.1.1	N/A	We refer the ExA to the published 'Offshore Wind Leasing Round 4 Dogger Bank Strategic Compensation Plan' (April 2024). In Section 7.1.1 it is stated that "*It is agreed by the Steering Group that new site designation or site extension (new areas or features added to existing sites) is the recommended compensation measure of in this DBSCP and this follows advice received from Defra that this is an available strategic compensation measure that can be used to compensate for habitat loss and damage caused by the Round 4 Plan. It states that any new site/ site extensions will be determined by Defra and be designated as a strategic compensation measure which will benefit multiple projects. This DBSCP recognises that a team in Defra will work to identify potential areas for designating new sites, or extending existing sites, working closely with Natural England and JNCC. The information presented in this report is included as supporting evidence that the measure is appropriate for the specific purposes of the DBSCP, but without prejudice to the future outcome of the Defra-led process.*" Subsequently, delivery discussions have commenced between DEFRA, JNCC and Natural England. It has been agreed that the scope of the strategic compensation should include all offshore wind farm (OWF) projects in English waters within the pipeline contributing to the Government 2030 target, where benthic compensation is deemed necessary. Due to multiple projects, designated sites and interest features, it will not be limited to provision of Annex I sandbank compensation. This measure is therefore also the recommended compensation measure for the Dogger Bank South (DBS) (East and West) OWF for Annex I Sandbank feature. It is the SNCB's view that this measure has the greatest likelihood from an ecological perspective, of providing adequate compensation for the impacts to the Dogger Bank SAC and maintaining coherence of the National Sites Network.	If and when further information becomes available during Examination, we will update accordingly. However, any assurances in the security of this measure should be sought directly from DEFRA.		The Applicants expect further information on this topic to be included within an upcoming ministerial statement, due to be issued Q4 2024.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: D 0.1.2	N/A	It is the SNCB's view that with the Secretary of State's support for the compensation measure, it is now technically feasible. The evidence included within the Applicant's documentation and within the Dogger Bank Strategic Compensation Plan supports the SNCB's position that there are areas of seabed not currently protected which if protected and appropriately managed, could provide similar ecological function to those Annex I features which are likely to be subject to lasting loss/change and/or disturbance.	No further comment.		The Applicants have been aware from the outset that there was potential for derogation and compensation and provided technical input on potential strategic compensation measures prior to the Plan Level Habitats Regulations Assessment (HRA)being finalised. This input is referenced in the Plan level HRA (The Crown Estate, 2022[31]) and consisted of initial proposals for extension to the Dogger Bank Special Areas of Conservation (SAC). The Applicants have been heavily involved in the Plan Level Compensation Steering Group and undertook extensive seabed surveys of the area to the north of the existing Dogger Bank SAC in 2023 (this was provided to the Steering Group and is appended to **Round 4 Dogger Bank Strategic Compensation Plan** [APP-060]. The Applicants have therefore undertaken extensive efforts to expedite delivery of compensation and will continue to provide further input if requested.
RR-039: D 0.1.3	N/A	The SNCBs are currently not in agreement with the Applicant on the presented Worse Case Scenario (WCS) of habitat damage of Annex I Sandbanks within Dogger Bank SAC.	The SNCBs advise that the points raised in Appendix B and C of our Relevant Representations/Written Representations (RR/WR) are addressed. Further feedback on the development of this measure should be sought from DEFRA.		Noted, please see the response to RR-039: D2.
RR-039: D 0.1.4	N/A	The SNCBs have outstanding concerns in relation to the outcomes of the Impact Assessment and evidence used to support conclusions on scale and significance of potential impacts from cable installation activities and the placement of cable protection from DBS. Until these issues are resolved we do not agree with the Applicant on the scale and extent of the compensation measures required. As set out in the Round 4 Plan Level compensation document, the designation of a new site or existing site extension will be led on by a team in DEFRA in collaboration with interested parties, therefore delivery mechanisms, scale costs and timeframes presented by the Applicant cannot and should not be relied upon.	The SNCBs advise that the points raised in Appendices B and C of our RR/WR are addressed.		The scale of impacts from cable installation and cable protection is fully justified within the worst case Table 6-3 of the RIAA (**RIAA HRA Part 2 of 4** [APP-046]). Note that the Applicants are in the process of preparing a change request relating to the relevant design parameters. The ExA was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drilling (HDD) exit from the Projects Design Envelope, the removal of all platforms from the Offshore Export Cable Corridor, reductions in the numbers of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas.

[31] The Crown Estate (2022) Record of the Habitats Regulations Assessment Undertaken under Regulation 63 of The Conservation of Habitats and Species Regulations 2017 and Regulation 28 of The Conservation of Offshore Marine Habitats and Species Regulations 2017 Offshore Wind Leasing Round 4

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
					The change request will be supported by a **Project Change Request – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the Environmental Statement, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. With regard to the conclusion on significance, it is assumed Natural England are referring to the disagreement on disturbance / damage effects and recovery time. This point is covered in RR-039: D 2.
RR-039: D 0.1.5	N/A	Please see above points, where we recognise that there are likely to be time lags between impact occurring and compensation achieving the desired outcomes. In this scenario, the SNCBs would wish to see the project contribution to the measure to be such that it ensures an overall environmental net positive outcome for the impacted feature over the lifetime of the project.	If and when further information becomes available during Examination, we will update accordingly. However, any assurances in the security of this measure should be sought directly from DEFRA.		The Applicants expect further information on this topic to be included within an upcoming ministerial statement, due to be issued Q4 2024.
RR-039: D 0.1.6	N/A	Location of measure This is still under consideration by DEFRA, NE and JNCC and as yet, nothing has been agreed and/or secured.	If and when further information becomes available during Examination we will update accordingly. However, any assurances in the security of this measure should be sought directly from DEFRA.		As previously stated, the Applicants have provided justification for the area to the north of Dogger bank SAC to provide a suitable location for compensation (**Extension of the Dogger Bank SAC for HRA Derogation Compensation – Rationale and Evidence Base** [APP-062]) and have undertaken extensive surveys of this area (this was provided to the Steering Group and is appended to **Round 4 Dogger Bank Strategic Compensation Plan** [APP-060]. The data have been provided to the Defra process. The Applicants recognise that other areas are under consideration for the strategic measure and the ultimate location chosen will come from the Defra process.
RR-039: D 0.1.7	N/A	Long term implementation This is still under consideration by DEFRA, NE and JNCC and as yet, nothing has been agreed and/or secured.	If and when further information becomes available during Examination we will update accordingly. However, any assurances in the security of this measure should be sought directly from DEFRA.		The Applicants have undertaken extensive efforts to expedite delivery of compensation since the initial stage of the Plan Level HRA process (see RR-039: D 0.1.2) and will continue to provide further input to the Defra process if requested.
RR-039: D 0.1.8	N/A	Success criteria/Ability to prove additionality. This is still under consideration by DEFRA, NE and JNCC and as yet, nothing has been agreed and/or secured.	If and when further information becomes available during Examination we will update accordingly. However, any assurances in the security of this		

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
			measure should be sought directly from DEFRA.		
RR-039: D 0.1.9	N/A	It is the SNCB's view that this measure has the greatest likelihood from an ecological perspective of maintaining the coherence of the National Site Network, and even with uncertainties surrounding the project impacts, we believe that sufficient capacity can be built into the design of the measure to compensate for the impacts of this project as a sole measure.	The SNCBs advise that the points raised in Appendices B and C of our RR/WR are addressed so that the realistic WCS can be included within the compensation measure.		The Applicants' agree with Natural England's comment.
Compensation measure: Reduction of fishing pressures as a supplementary measure for Annex I Sandbanks					
RR-039: D 0.2.1	N/A	The SNCBs highlight that the use of byelaws to remove fisheries pressures from another SAC has ecological merit as a compensation measure. However, outside of a designated site this would require legislative changes to address impacts from other industries that could still occur. In addition, it currently remains unclear how this measure will ensure the coherence of the National Site Network. The SNCBs note that this is not being developed by the Applicant as a sole measure, but as a *'supplementary'* measure if site extension fails	This is outside of the SNCBs' remit and the Applicant will need to liaise with TCE, DEFRA, MMO (and Eastern Inshore Fisheries and Conservation Authority (EIFCA) depending on location).		Noted. The Applicants consider that removal of fisheries would have ecological merit but note the issues with implementation highlighted by Natural England. The Applicants consider the restriction of fishing activity to be a supporting compensatory measure that would only be incorporated if needed to provide increased confidence in the overall success of the wider compensation package. This measure would therefore only be progressed should the scale of compensation from new site designation or extension fall short of 100% of the required compensation. The Applicants consider that new site designation should be sufficient as compensation and reduction of fisheries should not be required.
RR-039: D 0.2.2	N/A	The SNCBs do not consider either fisheries removal inside or outside of a designated site as viable within the Project's timeframe. Within designated sites the MMO and EIFCA are already implementing byelaws to reduce the fisheries pressures and any option outside of a designated site will need agreement from The Crown Estate for a seabed lease and management measures put into place. Please note, outside of designated sites this measure not taken forward in the Round 4 Plan Level Compensation Plan. The evidence is similar to that for strategic compensation for site designation/extension, and therefore we advise that Strategic Compensation in the form of new designation/designated site extension would be the preferred mechanism.	No comment		
RR-039: D 0.2.3	N/A	The SNCBs are currently not in agreement with the Applicant on the presented Worse Case Scenario (WCS) of habitat damage of Annex I Sandbanks within Dogger Bank SAC.	The SNCBs advise that the points raise in Appendices B and C of our RR/WR are addressed.		The Applicants acknowledge Natural England's comment. Please see the response to RR-039: D 2.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: D 0.2.4	N/A	The scale/extent of the measure has not been presented in detail and/or agreed with Natural England, JNCC or DEFRA.	No comment		Please see the response to RR-039: D 0.2.1 & RR-039: D 0.2.2.
RR-039: D 0.2.5	N/A	We do not believe that this measure will be available in the project timeframes	This is outside of the SNCB remit and the Applicant will need to liaise with TCE, DEFRA, MMO (and EIFCA depending on location).		
RR-039: D 0.2.6	N/A	The location of the measure has not been presented in detail and/or agreed with TCE, Natural England, JNCC or DEFRA.	This is outside of the SNCB remit and the Applicant will need to liaise with TCE, DEFRA, MMO (and EIFCA depending on location).		
RR-039: D 0.2.7	N/A	There is a requirement for changes in legislation for the delivery of this measure outside of designated sites and therefore until that is secured further long-term implementation remains unknown.	This is outside of the SNCB remit and the Applicant will need to liaise with TCE, DEFRA, MMO (and EIFCA depending on location).		
RR-039: D 0.2.8	N/A	Success criteria/Ability to prove additionality. - As per the above comment in relation to long-term implementation	No comment.		
RR-039: D 0.2.9	N/A	We do not believe that this is currently suitable as a sole compensatory measure. But this may change post examination of this project	This is outside of the SNCB remit and the Applicant will need to liaise with TCE, DEFRA, MMO (and EIFCA depending on location).		
Compensation Measure: Seagrass Habitat Creation/Restoration for Annex 1 sandbanks					
RR-039: D 0.3.1	N/A	The SNCBs refer the ExA to the published 'Offshore Wind Leasing Round 4 Dogger Bank Strategic Compensation Plan' (April 2024). In section 3.4.2 it is stated that "Although lower on the compensation hierarchy than the other measures, seagrass meadows do occur on some sandbanks within coastal subtidal and intertidal zones and seagrass is a sub-feature of other designated Annex I sandbanks, such as those within Fal and Helford SAC and Plymouth Sound and Estuaries SAC (Natural England, 2023a; Natural England, 2023b). Suitability as compensation for sandbank is supported by the listing of seagrass as a flora associated with sandbank in Natura 2000 (now National Sites Network) guidance habitat guidance (European Commission, 2013). Nonetheless, seagrass restoration is a lower preference measure compared to	N/A		Noted. The Applicants consider that Seagrass Habitat Creation / Restoration for Annex 1 sandbanks would have ecological merit but note the issues with implementation highlighted by Natural England. The Applicants consider that new site designation should be sufficient as compensation Seagrass Habitat Creation / Restoration for Annex 1 sandbanks should not be required.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		those supporting the same ecological function of the habitat being compensated for". We advise the same is true for project level compensation and welcome this not being progressed by the Applicant at this time			
RR-039: D 0.3.2	N/A	The SNCBs refer the ExA to the published 'Offshore Wind Leasing Round 4 Dogger Bank Strategic Compensation Plan' (April 2024). In section 3.4.3 it is stated that "The Steering Group had significant concerns about the deliverability of seagrass restoration, even on a small scale as there have been no long term successes with seagrass restoration in the UK. Seagrass restoration is included as a potential measure only where it would be a minor part of a wider package in terms of the required compensation. Given the intention to compensate for Annex I sandbank habitat, which is, by definition, a subtidal habitat, seagrass restoration for the purpose of compensation for DBSW and DBSE projects shall be limited to subtidal seagrass. The measure is retained in the DBSCP as an additional option which could potentially be employed if the Steering Group considered that it was necessary to supplement other measures, or potentially as an adaptive management response." This is also applicable to project level compensation. NE is in the process of drafting a paper on the current seagrass restoration projects.	N/A		Please see the response to RR-039: D 0.3.1.
RR-039: D 0.3.3	N/A	The SNCBs are not in agreement with the Applicant on the presented Worse Case Scenario (WCS) of excluding compensation for damage to Annex I sandbank	Please see our comments in Appendices B and C.		Please see the response to RR-039: D 2.
RR-039: D 0.3.4	N/A	The scale/extent of the measure has not been presented in detail and/or agreed with the SNCBs.	Please see our comments in Appendices B and C.		
RR-039: D 0.3.5	N/A	The location of the measure has not been presented in detail and/or agreed with the SNCBs.	N/A		
RR-039: D 0.3.6	N/A	Location of measure – N/A	N/A		
RR-039: D 0.3.7	N/A	Long term implementation – N/A	N/A		

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: D 0.3.8	N/A	The SNCBs advise that this measure could only be considered as part of a package providing <10% of the required compensation and/or potential adaptive management for part delivered compensation. There would also be a requirement for the provision of subtidal seagrass, not intertidal. Therefore, we advise that other measures are progressed first. If other options are being progressed, then there is an expectation this compensation will not be taken forward.			
Document Used: [APP-059] 6.2.3 Appendix 3 – Project Level Dogger Bank Compensation Plan [APP-061] 6.2.3.2 Outline Dogger Bank Compensation Implementation and Monitoring Plan [APP-062] 6.2.3.3 Annex C - Extension of the Dogger Bank SAC for HRA Derogation Compensation – Rationale and Evidence Base					
RR-039: D 1	General Comment on Alternatives Test	In our advice to The Crown Estate (dated 25th February 2022) on the plan-level HRA, JNCC stated that "The possibility of a derogations case was identified early in the R4 leasing process (as detailed in the presentation for the first EWG meeting). It is not therefore unreasonable to assume that The Crown Estate were aware of the need to look at alternative solutions as part of this prior to the bidding process. It follows therefore that The Crown Estate should have made provision within the bidding process for delivery in excess of 7GW to allow for alternative projects to be considered on the grounds of AEOI if required. Indeed, The Crown Estate did make provision for projects to be awarded up to 8.5GW but chose only to award 7GW, thereby not allowing for the adequate consideration of alternative solutions at the Habitat Regulations Assessment stage." Whilst changes to how alternatives are considered have been made for projects of Critical National Priority under the National Policy Statement for Energy (2023), the leases for Round 4 projects were made prior to this and so JNCC maintains that the alternatives have not been adequately considered.	N/A		The Applicants case on alternatives is presented in **Habitats Regulations Derogation: Provision of Evidence** [APP-062].
RR-039: D 2	6.2.3 - Section 1.2 Para 12	The SNCBs note that the compensatory measures proposed by the Applicant as part of their project level derogation case are expected to align with the measures and approach outlined in the Dogger Bank Strategic Compensation Plan (DBSCP) and be secured as a requirement of the DCO. However, we note that the DBSCP and the project compensation do not align, with the exclusion of compensation requirements for damage to sandbanks.	In our role as Statutory Nature Conservation Advisers, we draw the Examiner's attention to the omission of benthic compensation measures for habitat disturbance of Annex I sandbanks from the project level compensation documents (as submitted). We therefore respectfully request that further consideration is given to Plan Level compensation		The compensation measures presented in **Appendix 3 Project Level Dogger Bank Compensation Plan** [APP-059] do align with those presented in **Round 4 Dogger Bank Strategic Compensation Plan** [APP-060], in terms of the measures proposed. However, the Applicants consider that habitat damage was not adequately assessed within the Plan Level HRA and submits that this should not be included within the effects considered to result in Adverse Effect on Integrity within the RIAA (**RIAA HRA Part 2 of 4** [APP-046]) – see section 6.4.2.1.1.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		We would fully expect the DCO to include compensation for both habitat loss and damage.	requirements as agreed by the Secretary of State for the Depart of Energy Security and Net Zero. As the competent authority for the Plan Level HRA we suggest that any queries relating to Plan Level compensation requirements are directed to The Crown Estate (TCE) via the Developer.		The **Round 4 Dogger Bank Strategic Compensation Plan** [APP-060] states the following (paragraph 3.1.4) (noting that although the following is described as recovery from loss the text appears in relation to habitat damage) 'Recovery from habitat loss would not occur until decommissioning has been completed, and may take 10-25 years (based on Natural England's advice)' Natural England were asked by the Applicants during The Crown Estate strategic compensation Steering Group meetings to provide evidence for this position, and none has been provided to date. The advice provided in RR-039: Annex C1 - In relation to consideration of small-scale habitat loss within Special Areas of Conservation (SACs), does not present any quantitative evidence on either physical or temporal scale of damage effects. The Applicants have provided evidence for its case as signposted above and has provided additional evidence (including survey from the constructed Dogger Bank B project) in **Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [document reference: 10.44], which was submitted to the Planning Inspectorate on 7th November 2024. In summary, the Applicants consider that Natural England's position does not take account of the speed of recovery, which, the Applicants submit, is more rapid than suggested in their advice.
RR-039: D 3	6.2.3 -Para. 13 and Section 5 and 6	If the Applicant is delivering Plan Level compensation, it is assumed that the Applicant does not also have to provide project level compensation, but this is not explicit here. In addition, it is also unclear why the Applicant has developed a project level compensation plan as DEFRA are moving ahead with work on new designations as a form of compensation following the agreement by DEFRA and SoS back in February 2024. Information on the expected impacts of OWF projects on designated habitats has been collected from developers and the DEFRA team will be taking this into account when developing the proposals, alongside advice from SNCBs on ecological viability, ratios and any management measures that may be required. Ultimately it will be for DEFRA to determine the amount of compensation required, irrespective of what the Applicant has detailed in Section 5 Compensation Quantum.	The SNCBs request legal clarification from the Applicant on this.		The Applicants have provided a project level plan (**Appendix 3 Project Level Dogger Bank Compensation Plan** [APP-059]) in line with their understanding of Natural England expectations (as expressed in pre-application meetings) for the DCO application. The DCO application materials present the information contained within the Strategic Plan (**Round 4 Dogger Bank Strategic Compensation Plan** [APP-060]) in line with submissions from recent project submissions and provide a reference for how the proposals align with the Natural England checklist. Whilst it is acknowledged that compensation would be delivered through the strategic mechanism, the Applicants envisage that some form of project level implementation plan will be required, hence the submission of the **Outline Dogger Bank Compensation Implementation and Monitoring Plan** [APP-061].

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
RR-039: D 4	6.2.3 - Para. 15 and 19	It is not clear to the SNCBs the role of the Steering Group going forwards if strategic compensation is progressed by DEFRA, as they will determine individual project 'contribution' as set out above.	The SNCBs seeks further clarity from TCE on this matter.		The Applicants' agree with Natural England's comment.
RR-039: D 5	6.2.3 - Section 4.2.1.2 Para. 80	The SNCBs welcome the original Dogger Bank OWFs (A, B,C and Sofia) being included in the in-combination assessment. However, we do not agree with the inclusion of any 'as built' figures as this is not legally secured.	The SNCB advise that figures included in consents are used to inform in-combination assessments.		The as-built numbers are included in **RIAA HRA Part 2 of 4** [APP-046]) for reference and to highlight that constructed footprints tend to be smaller than consented ones. However, the 11.71km² footprint quoted in paragraph 19 (section 6.4.1.1.3) is the consented footprint and this is used in the in-combination assessment presented in paragraph 114 (section 6.4.2.5.2), rather than the constructed footprint.
RR-039: D 6	6.2.3 - Section 5.2 Table 5-1	The SNCBs welcome the Plan Level and the Project Level compensation comparison. But highlight point D2 above with regard to aligning.	No further comment		Please see the response to RR-039: D2.
RR-039: D 7	6.2.3 - Section 5.3	Compensation multiplier This is not agreed or signed up to by the SNCBs and if site extension is progressed, it will be agreed as part of DEFRAs MPA Designation work. Therefore, it is our view that it is not necessary or appropriate to agree this as part of this Examination.	No further comment		Compensation multipliers were discussed by the steering group (see section 6.3 of **Round 4 Dogger Bank Strategic Compensation Plan** [APP-060]), however no values were agreed. The Strategic plan states that: "Ratios close to 1:1 are appropriate in circumstances where confidence in delivery is high." Given that compensation will be delivered strategically via the Defra process, the Applicants consider that there is a high degree of confidence that the quantum and quality of compensation will be high and therefore the proposed ratio is appropriate. However, the Applicants do not agree that this ratio should be wholly determined by the Defra process without any input from this consenting process.
RR-039: D 8	6.2.3 - Section 6.2.4 Para. 118 and 6.2.3.3	Location: [APP-062] 6.2.3.3. Annex C – Extension of the Dogger Bank SAC for HRA Derogation Compensation – Rationale and Evidence Base We note the Applicant has submitted information on a possible site extension to the Dogger Bank SAC. This material was previously submitted to The Crown Estate, to inform the content of the delivery of Round Four Plan Level strategic benthic compensation, which has also been submitted in support of their application. Strategic compensation for impacts to benthic Marine Protected Areas (MPAs) in the form of designated site extensions and/or new	No further comment		Noted. The Applicants have undertaken extensive efforts to expedite delivery of compensation since the initial stage of the Plan Level HRA process (see RR-039: D 0.1.2) and will continue to provide further input to the Defra process if requested.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues.	Risk	Applicants' Comment
		designations is being progressed by DEFRA, with technical support from the SNCBs. This document and other sources of information will therefore be considered as part of the wider work looking at benthic compensation requirements for multiple offshore windfarms. While the document demonstrates one of many options that are likely to be considered for a designated site extension; we highlight that the powers to designate sit with DEFRA, and there is a work programme underway to identify potential locations. Therefore, it is the SNCBs view that it is neither necessary nor appropriate to discuss the merits of a particular designated site extension as part of the Dogger Bank South Examination. We fully recognise that the Examining Authority may have further questions on the DEFRA MPA designations work and the Round Four Plan Level strategic benthic compensation. We suggest that these are directed to DEFRA and The Crown Estate respectively.			
RR-039: D 9	6.2.3 - Section 6.2.6 Para. 130	Whilst any monitoring requirements may fall under the responsibility of NE or JNCC, this is not yet determined and/or agreed. However, we fully expect monitoring costs associated with compensation measures to be borne by those developers requiring the compensation through the MRF.	The SNCBs request further clarity is provided from DEFRA when available		Noted. The Applicants reiterate that monitoring should be in line with the monitoring process in the existing MPA network and should be proportionate to that currently undertaken for the existing network.
RR-039: D 10	6.2.3 – Section 6.2.6 Para. 132	Because the SNCBs believe that disturbance should also be included in any compensation requirements, we do not agree that the need to consider adaptive management finishes once construction has completed.	The SNCBs request further clarity is provided from DEFRA when available		Please see the response to RR-039: D 2.
RR-039: D 11	6.2.3 - Section 6.2.6 Para 133	It is the view of the SNCBs that adaptive management will be a consideration of DEFRA's MPA designations programme	The SNCBs request further clarity is provided from DEFRA when available		The Applicants acknowledge this comment. No response is required.
RR-039: D 12	6.2.3.2. - Dogger Bank CIMP documents	It is not clear if a Dogger Bank CIMP will be required in addition to the Round 4 Plan Level one or the Strategic compensation work.	The SNCBs request further clarity is provided from DEFRA and TCE when available		Please see the response to RR-039: D 3.

2.6 Responses to Appendix E Fish and Shellfish

Table 2.6.1 Applicants' responses to Natural England's Appendix E Fish and Shellfish

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: E 1	N/A	Impact on Sandeel from Underwater Noise Underwater noise (UWN) modelling for Atlantic herring has been conducted and overlayed onto habitat suitability heat maps but the same has not been done for sandeel. Whilst Natural England agree that sandeel are not as sensitive to noise as herring, given the high spawning potential of habitat within the array areas, Natural England are concerned that this could result in mortal injury, recoverable injury and temporary threshold shift (TTS) impacts.	Natural England advises that the Applicant conducts UWN modelling and produces underwater noise contours that are overlayed on the sandeel habitat suitability heat maps to assess the potential impacts of mortal injury, recoverable injury and TTS on sandeel.		Sandeel species do not possess a swim bladder, and therefore fall within the receptor group "fish without a swim bladder" for the purposes of assessment of underwater noise impacts. This receptor group is the least sensitive of all receptor groups to underwater noise impacts, and are capable of detecting particle motion only, and not sound pressure (Popper *et al.*, 2014[32]). When compared to Atlantic herring, which fall within the most sensitive "fish with a swim bladder used in hearing" receptor group, the mortality and potential mortal injury, and recoverable injury thresholds for "fish without a swim bladder" are significantly lower. For pile driving thresholds these values differ significantly between receptor groups at >219 dB SEL_{cum} (fish without a swim bladder) compared to >207 dB SEL_{cum} (fish with a swim bladder used in hearing) for mortality and potential mortal injury; and >216 dB SEL_{cum} (fish without a swim bladder) compared to >203 dB SEL_{cum} (fish with a swim bladder used in hearing) for recoverable injury. This translates to mean impact range distances of 450m (mortality and potential mortal injury), and 690m (recoverable injury) for "fish without a swim bladder" compared to 2.3km (mortality and potential mortal injury) and 3.6km (recoverable injury) for "fish with a swim bladder used in hearing" (**Appendix 11-3 Underwater Noise Modelling Report** [APP-099]). TTS thresholds remain the same at 186 dB SEL_{cum}. Within the impact assessment, ranges for "fish with a swim bladder used in hearing" are used to represent a worst case scenario due to their greatly increased levels of sensitivity to underwater noise impacts when compared to other receptor groups. This is the standard approach used for the assessment of underwater impacts in UK waters. It is acknowledged that piling will occur in locations where there is the potential for sandeel habitat, however, impacts at a population level are not anticipated due to their low sensitivity to underwater noise impacts. Updated sandeel heat mapping using the Reach *et al.* (2024)[33] methodology will be presented within the **Heat Mapping Report** [document reference: 10.43], to be submitted in late November 2024. This is overlaid with impacts ranges for "fish without a swim bladder", to provide further context around the sandeel potential within the region. It should be noted however that this updated sandeel heat mapping does not materially change the original mapping presented in **Chapter 10 Fish and Shellfish Ecology** [APP-091], and the determination of minor adverse effect on the species associated with underwater noise, which is not significant in Environmental Impact Assessment (EIA) terms.

[32] 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. L., Zeddies D. G. and Tavolga W. N. (2014). Sound exposure guidelines for Fishes and Sea Turtles. Springer Briefs in Oceanography.

[33] 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. Available at: https://www.erm.com/globalassets/insights/documents/Identifying_and_Mapping_Sandeel_Potential_Supporting_Habitat_An_Updated_Method_2024_w_Appendices.pdf [Accessed October 2024].

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: E 2	N/A	Baseline characterisation - sandeel abundance Potential spawning habitat suitability heat maps have been used for the underwater noise impact assessments for sandeel. Whilst these provide an overview of potential spawning habitat, they do not provide evidence of abundance. Further, the use of drop-down video is not an agreed method to determine presence/absence of sandeel across the assessed area, and again provides no information on abundance	Natural England advises that the Applicant should utilise sandeel abundance data (such as the North Sea Sandeel Survey) to characterise the importance of the array areas as sandeel habitat and support the assessment of impacts on localised sandeel populations.		The sandeel heat maps provided indicate sandeel potential habitat, as opposed to sandeel potential spawning habitat, as described within Latto *et al.* (2013)[34]. Abundance data have significant limitations in sampling techniques (i.e. not all sandeels would be sampled in trawls and grabs, which in turn sample a limited spatial area compared to the full extent of potential habitat). Instead, sandeel presence data represents a sufficient confidence in an area of potential habitat in supporting sandeel. The **Heat Mapping Report** [document reference 10.43] to be submitted in late November 2024, utilises the Marine Management Organisation (MMO) approved Reach *et al.* (2024)[33] methodology, which includes OneBenthic sandeel presence data. This dataset indicates potential sandeel presence to a high degree of confidence. The use of drop-down video sandeel presence data has been included to ground-truth heat mapping results and has been used within the Environmental Statement (ES) (**Chapter 10 Fish and Shellfish Ecology** [APP-091]) as a supplementary, as opposed to a primary, dataset.
RR-039: E 3	N/A	Spawning Habitat Loss for sandeel The full scale of potential spawning habitat loss and/or change for sandeel has not been assessed. A significant proportion (34.85%) of high potential sandeel spawning habitat within Dogger Bank SAC has been calculated to be within offshore wind farm (OWF) array areas in the in-combination assessment. Our understanding is that this does not include areas of the Export Cable Corridors (ECC) overlapping with the SAC, which also include additional high potential spawning habitat that could be subject to habitat loss/change through the introduction of cable protection. Impacts from UXO clearance have not been assessed. Whilst we agree that surveys to identify the locations and number of UXOs would not be conducted until post-consent, we consider that a nominal assessment should be included as has been done for other receptors, e.g. marine mammals and benthic.	Natural England advises that a robust assessment is needed of the potential worst-case area of impact on spawning habitat along the ECC and within Dogger Bank SAC sandbank feature. This should include the nature and scale of impact as a result of changes to physical and biological processes following the placement of structures and cable/scour protection on the seabed, and implications at a localised population level.		Whilst it is acknowledged that 34.85% of high potential sandeel habitat within the Dogger Bank Special Area of Conservation (SAC) has been indicated to fall within offshore wind farm array areas (not limited to those associated with the Projects), it must be acknowledged that the present of these array areas is not equitable to a potential loss in habitat (**Appendix B - Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050]). Rather, the potential loss / change of sandeel potential habitat should be determined based only on values provided within the assessment of Permanent Loss of Habitat and / or Change in Habitat Type as a Result of Changes in Substrate Composition, presented in section 10.6.2.6. of the ES (**Chapter 10 Fish and Shellfish Ecology** [APP-091]). A worst case scenario associated with the development of the Projects determines a loss of habitat of 4.19km^2, across the Offshore Development Area, comprising both the Array Areas (2.05km^2) and the Offshore Export Cable Corridor (2.14km^2). Assuming a worst case scenario in which all permanent habitat loss associated with the development falls within areas of high potential sandeel habitat, this will result in a loss of 0.0008% of the high sandeel potential habitat within the Dogger Bank SAC (5049.7km^2). It should be noted that revised sandeel potential habitat will be presented within the **Heat Mapping Report** [document reference 10.43] based on the MMO-approved Reach *et al.* (2024)[33] methodology. This report will be submitted in late November 2024. A nominal assessment of Unexploded Ordnance (UXO) clearance impacts is included within the assessment of underwater noise impacts within section 10.6.1.4., with specific impact ranges relating to UXO presented in Table 10-23 of **Chapter 10 Fish and Shellfish Ecology** [APP-091]. Discussions regarding the "ecological halo effect" were not raised during previous rounds of comments, or at expert technical group meetings undertaken prior to Development Consent

[34] Latto, P.L., Reach, I.S., 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 Supporting habitat for sandeel. A Method Statement produced for the British Marine Aggregates Producers Association (BMAPA).

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		The Applicant has also not considered the likely cumulation of benthic 'ecological halo effect' which can be expected following the placement of structures on the seabed. This halo effect can lead to changes in benthic and epifaunal community composition, which could have implications for sandeel spawning habitat. We are particularly concerned that secondary 'ecological halo' effects will be combined and exacerbated in the array areas as a result of the network of potential parallel and perpendicular lengths of cable protection, which could result in broadscale changes in the benthic habitats and communities across the wider DCO area and a significant proportion of Dogger Bank SAC. It is unclear how impacts on high potential spawning habitat due to cable protection have been assessed (for sandeel and Atlantic herring). Cable protection requirements are currently based on high percentage estimates and could all potentially be placed within high potential spawning habitat.			Order (DCO) submission. Potential impacts as a result of the developments as determined in collaboration with stakeholders and regulators are presented within the ES. See the Applicants' response to RR-039: C6 in **Table 2.4.1** for further details on this matter. Worst case scenarios have been used to determine the potential impact to potential habitat and spawning grounds of sandeel and herring respectively. This includes the use of the highest potential use of cable protection, as described within section 10.6.2.6. of **Chapter 10 Fish and Shellfish Ecology** [APP-091]. Additionally, the Applicants are in the process of preparing a change request relating to the relevant design parameters. The Examining Authority (ExA) was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the removal of all platforms from the Offshore Export Cable Corridor, reductions in the number of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas. The change request will be supported by the **Request for Design Change – Environmental Assessment Update** [document reference C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. These factors, if the change request is accepted, may result in changes to the values discussed above. It should be noted that the Applicants' proposed changes to the Projects' Design Envelope, if accepted by the ExA, would reduce the footprint of habitat loss within the Offshore Development Area to approximately 3.78km² (1.7km² within the Array Areas and 2.08km² within the Offshore Export Cable Corridor). The changes will be summarised in the **Project Change Request 1 – Environmental Assessment Update** [document reference C1.1] which will be submitted with the change request in early January 2025.
RR-039: E 4	N/A	Indirect effects and impacts on relevant sub-populations For EIA and the RIAA, the Applicant suggests that if there were no significant impacts identified for potential prey species in their respective assessments then there would be no significant impacts on ornithology and marine mammal receptors. Natural England disagree with this.	Given the potential for indirect effects on designated predator features from impacts on forage fish prey species, Natural England advises that assessment of potential impacts on sub-populations of key fish species is necessary, e.g. potential localised depletion and/or reduced resilience of the wider stock. Natural England advises that the assessments should		Indirect effects to predators such as marine mammals due to changes to prey have been assessed in sections 11.6.1.7 and 11.6.2.6 of **Chapter 11 Marine Mammals** [APP-095]. Due to the wide foraging ranges of marine mammals the significance was assessed as negligible or minor adverse, therefore Not Significant in EIA terms. Impacts upon prey are considered in the Plan Level Habitat Regulations Assessment (HRA) (RIAA Appendix I Marine Mammal Array Assessment Part 2; The Crown Estate, 2022[35]) under the following pressures P1 Habitat Loss / Gain, P2 Direct Physical Damage and P3 Indirect Physical Damage. The HRA concludes that:

[35] The Crown Estate (2022). RIAA Appendix I Marine Mammal Array Assessment Part 2. Available at: https://www.marinedataexchange.co.uk/details/TCE-3582/2022-the-crown-estate-2020-offshore-wind-round-4-plan-habitats-regulations-assessment/packages/10650?directory=%2F&type=Report#downloads

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		The assessments undertaken in the Fish and Shellfish chapter consider impacts at a regional population level and only consider fish and shellfish as receptors, rather than potential sources of impact. NE consider that an understanding of the relative importance of the site as a foraging area, and potential for any impacts on prey abundance and distribution, is critical in framing the predicted impacts that can be quantified. Further assessment is therefore needed to understand how more localised impacts on fish and shellfish might influence prey availability for seabirds and mammals. We suggest that any negative impact on forage fish may have an impact on vulnerable seabirds – particularly kittiwake. These pathways should be considered in more detail and conclusions evidenced. Please see Annex E1 for further detail.	consider both direct and indirect impact pathways to sandeel and herring at a biologically relevant population scale, for both the construction and operation phases of the Projects. For herring this would be the Banks spawning component of the North Sea stock, and for sandeel the specific genetic population present in the Project area.		The effect of this habitat loss will be to reduce the area available for foraging and also the extent of habitat for species which form prey. However, all marine mammal species forage widely within the marine environment and the predicted loss of habitat represents a very small proportion of the foraging habitat available. Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. Damage to physical habitats could affect prey species, or benthic communities upon which these are dependent. However, all marine mammal species forage widely within the marine environment and the predicted loss of habitat represents a very small proportion of the foraging habitat available. Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. The Habitats Assessment (Appendix J) notes that indirect physical damage cannot be quantified at present, but some effects are expected. Based on evidence presented in Appendix J which suggests that such effects will be relatively localised and generally accounted for within areas attributed to habitat loss it is considered that the scale of effects will not be significant in the context of possible impacts upon supporting habitats for marine mammals. Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. Although the overall effect of habitat loss will be to reduce the area available for foraging and the extent of habitat for prey species, habitat loss effects will be negligible given the small proportion of habitat occupied by the structures compared to the large foraging ranges of the protected features, as indicated by the distances used in relation to screening. Similarly, although offshore wind structures may provide new foraging opportunities for some species (e.g. Clausen *et a*l, 2021[36]; Russel *et al*, 2014[37]) habitat gain effects are expected to be negligible in the context foraging ranges. Impacts upon prey are also considered in the Plan Level HRA (RIAA Appendix H – Ornithology Array Assessment Part 2; The Crown Estate, 2022[38]) under the following pressures P1 Habitat Loss / Gain, P2 Direct Physical Damage and P3 Indirect Physical Damage. In all cases the HRA concludes that: "All seabird species screened in forage widely within the marine environment and the predicted area of habitat damaged represents a very small proportion of the foraging habitat available.

[36] Clausen, K.T., Teilman, J., Wisniewska, D.M., Balle, J.D., Delefosse, M. & van Beest, F.M. (2021). Echolocation activity of harbour porpoises, Phocoena phocoena, shows seasonal artificial reef attraction despite elevated noise levels close to oil and gas platforms. Ecol Solut Evid. 2021; 2: e 12055. DOI: 10.1002/2688-8319.12055

[37] Russell, Deborah J. F., Sophie M. J. M. Brasseur, Dave Thompson, Gordon D. Hastie, Vincent M. Janik, Geert Aarts, Brett T. McClintock, Jason Matthiopoulos, Simon E. W. Moss, and Bernie McConnell. (2024). Marine Mammals Trace Anthropogenic Structures at Sea. Current Biology 24, no. 14 (July 21, 2014): R638–39. https://doi.org/10.1016/j.cub.2014.06.033

[38] The Crown Estate (2022). RIAA Appendix H Ornithology Array Assessment Part 2. Available at: https://www.marinedataexchange.co.uk/details/TCE-3582/2022-the-crown-estate-2020-offshore-wind-round-4-plan-habitats-regulations-assessment/packages/10650?directory=%2F&type=Report#downloads

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
					Any impact is, therefore, considered to be negligible and would not make an appreciable difference to any in-combination impact." The Applicants consider there to be good evidence that seabird populations will be very little affected by any impacts on their prey, even during construction which is the period when there is the most risk of effects on prey species (and for which consideration was made in the assessment). For example, the impact of seabirds on their prey stock biomass is very small (estimated across five ecosystems to average about 1% of the primary forage fish being consumed by all seabird species (Saraux *et al.* 2020[39])). Furthermore, forage fish stock biomass varies enormously from year to year while seabird population sizes change much more slowly. Thus, two things are apparent from this: fish stock fluctuations are not caused by seabird population fluctuations and seabird populations are little affected by the inter-annual variations in their prey. Population fluctuations are typical of forage fish species because their survival is very low while recruitment varies very widely from year to year. These factors taken together therefore indicate that small changes in prey stock biomass, as assessed in the Fish and Shellfish assessment (**Chapter 10 Fish and Shellfish Ecology** [APP-091]), will have undetectable effects on the seabird populations which prey on those stocks, and even if prey stocks are affected more widely than currently assessed, this would still not result in seabird population impacts.
RR-039: E 5	N/A	Spawning habitat loss mitigation The Applicant considers that mitigation is not applicable for impacts to fish species as all impacts have been assessed as either negligible or minor adverse. Irrespective of the assessment conclusions, Natural England do not agree with this due to the potential for indirect effects on designated predator species. We consider that mitigation options are available to the Applicant that should be explored further, particularly with respect to cable protection placement.	Natural England advises that the Applicant should consider additional mitigation to avoid and/or reduce the loss of potential sandeel and herring spawning habitat.		For indirect effects to marine mammals and offshore ornithology, please see the above response (RR-039: E4). The Applicants have proposed changes to the Projects' Design Envelope as detailed in RR-039: E3) which, if accepted by the ExA, would reduce the footprint of infrastructure within the Offshore Development Area, including cable protection measures. The changes will be summarised in the **Project Change Request 1 – Environmental Assessment Update** [document reference C1.1] which will be submitted with the change request in early January 2025. The Applicants have not yet developed designs detailing the extents of cable protection required, or its location along the Offshore Export Cable Corridor. Development work is currently ongoing to provide an update on these topics. Any updates that become available during the examination process will be shared with all interested parties and the ExA. It should be noted, however, that the final extents of cable protection to be deployed will not be fully understood until detail design has been completed post-consent and until cable installation is completed.
RR-039: E 6	N/A	References and Evidence for assessing impacts	Natural England advises that the Applicant provides suitable references and evidence to support statements used in the impact assessment to		Recovery period is one of a number of factors used in the determination of magnitude (alongside likelihood, and variation from background). Magnitude has been considered

[39] Saraux C, Sydeman WJ, Piatt J, *et al*. (2020). Seabird-induced natural mortality of forage fish varies with fish abundance: Evidence from five ecosystems. Fish and Fisheries. 2020;00:1–18. https://doi.org/10.1111/faf.12517

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		Impact assessments on fish receptors have been concluded as negligible or minor adverse impacts, based on assumptions that receptors can recover from impacts within 2-10 years. The Applicant has not provided references or evidence to support these statements, therefore we cannot agree with the Applicant's conclusions.	conclude negligible or minor adverse impacts.		alongside sensitivity (which itself is determined based on a number of factors) for the determination of impact and potential significance. The justification for recovery periods is provided within the 'magnitude' section of each impact assessed and may be determined using references and evidence where available, alongside expert judgement to contextualise this potential magnitude. Prescriptive recovery periods for recovery of fish and shellfish populations to the impacts assessed within the ES are rarely, if ever available due to the extent of development-specific factors that must be considered on a case-by-case basis when undertaking offshore EIAs. In many cases the 2-10 year recovery period that makes up one part of the determination of magnitude is conservative to account for this uncertainty.
RR-039: E 7	N/A	Natural England's Remit It should be noted that Natural England's remit differs to that of Cefas. Natural England has provided advice in relation to sandeel and herring at a localised level, focusing on the predator-prey impact pathways for designated predator features of designated sites. This is to ensure that the site fulfils its function and makes due contribution to the National Site Network. Cefas' role is to advise on how the Project might interact with fish populations as a whole. This context should be considered when reading the advice of both organisations and is likely to be the reason for any perceived differences.	Natural England defers to Cefas for comments on Atlantic herring and sandeel data sources, modelling assessment methodology and conclusions on population level effects.		The Applicants acknowledge this comment.
Project Parameters - Document(s) Used: [APP-071] 7.5 ES Chapter 5 - Project Description [APP-091] 7.10 ES Chapter 10 - Fish and Shellfish Ecology [APP-092] 7.10.1 ES Chapter 10 - Fish and Shellfish Ecology Figure 10-1 to Figure 10-10					
RR-039: E 8	7.10 – Table 10-1	Natural England considers the Applicant's use of the terms "concurrent" and "simultaneous" throughout the application in reference to piling activities is confusing.	Natural England seeks clarity on if concurrent and simultaneous are being used interchangeably, or if they each refer to specific situations. We advise that the use of these terms should be consistent as the Maximum Design Parameters relating to them (e.g. a maximum of 4 piles being installed within a day (concurrently), 2		In the context of piling activities specifically, concurrent and simultaneous have been used interchangeably to indicate periods where multiple piling activities may occur at a single point in time. Concurrent piling may occur in both the "In Isolation" scenarios, and within the "Concurrent / Sequential" construction scenarios.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
			of which may be installed simultaneously) will need to be secured in the DCO.		

RR-039: E 9	7.05, 7.10 – Table 1	Natural England notes that the Project Description includes three potential foundation options for the Electrical Switching Platform (ESP) in the ECC: jacket piles, monopiles, or a gravity-based structure. However, it is unclear if gravity bases have been included in the worst-case scenario for operational habitat loss in the ECC in Table 1.	Natural England advises that the Applicant provides clarity on the impacts of the gravity-based structure option for the ESP and update the assessments as needed.		Gravity based structures (GBS) have been included in Table 10-1 of **Chapter 10 Fish and Shellfish Ecology** [APP-091], which lists the following under 'Permanent loss of habitat and / or change in habitat type as a result of changes in substrate composition":
					• Total worst case area of scour protection for ESP in Offshore Export Cable Corridor – 56,410m².
					  ○ Footprint of GBS - 3,318m²; and
					  ○ Footprint of scour protection alone – 53,092m².
					However, the Applicants are in process of preparing a change request relating to a number of design parameters which includes the removal of the ESP from the Offshore Export Cable Corridor. The ExA was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. Should the change request be accepted by the ExA, no GBS foundations would be included within the Projects' Design Envelope.

RR-039: E 10	7.10.1-Figure 10-8 and Figure 10-10	Natural England notes that the underwater noise modelling for Atlantic herring for monopile and pin-pile installations uses a worst-case position of piling in the northern most point of the DBS West array. Given the proximity of High and Very High herring spawning potential habitat toward the coast, Natural England advises that a potential worst-case position at the most south-westerly point of the DBS West array is assessed as this may result in greater overlap with the High and Very High herring spawning potential habitat.	Natural England advises that a worst-case scenario is modelled at the most south-westerly location of the DBS West array to assess the potential underwater noise impacts from piling on Atlantic herring.		Noise modelling has been undertaken to maximise the total extent of UWN impacts to present a worst case scenario to Fish and Shellfish Ecology receptors as a whole. Positions for UWN modelling locations were presented and discussed throughout the EIA development process, and modelling locations were agreed with stakeholders and regulators during previous comment rounds and at Expert Topic Group (ETG) meetings which were attended by Natural England representatives. Therefore, revised underwater noise modelling is not proposed.
RR-039: E 11	7.10 Table 10-1	Natural England advises further clarity is needed regarding simultaneous piling for monopiles for the in-isolation development scenario. Should two monopiles be installed simultaneously, Natural England advises the	Natural England advises that the Applicant provides underwater noise models for the worst-case scenario in each build out scenario.		Sandeel species do not possess a swim bladder, and therefore fall within the receptor group "fish without a swim bladder" for the purposes of assessment of underwater noise impacts. This receptor group is the least sensitive of all receptor groups to underwater noise impacts, and are capable of detecting particle motion only, and not sound pressure (Popper *et al.*, 2014)[32]. See response to RR-039: E 1 for further discussion.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		worst-case scenario for underwater noise and vibration impacts on sandeel would be two simultaneous monopile piling events in the DBS West array area.			Noise modelling has been undertaken to maximise the total extent of UWN impacts to present a worst case scenario to Fish and Shellfish Ecology receptors as a whole. Positions for UWN locations, including for concurrent piling, were presented and discussed throughout the EIA development process, and modelling locations were agreed with stakeholders and regulators during previous comment rounds and at ETG meetings. Dogger Bank South (DBS) West and East concurrent locations were selected as this scenario represents the impact resulting in greatest extent of noise disturbance, in terms of area. It should be noted that an updated Underwater Noise Modelling Report will be issued for consultation alongside the **Project Change Request 1 – Environmental Assessment Update** [document reference C1.1]. This report will be updated to account for the potential removal of ESP from the Offshore Export Cable Corridor, and the resulting changes to concurrent piling scenarios which would result from this removal if the change request was accepted. It is expected that the change request will be submitted to the ExA in early January 2025 following the targeted consultation. Revised sandeel heat mapping using the Reach *et al.* (2024) methodology will be presented within the **Heat Mapping Report** [document reference 10.43] which will be overlaid with impacts ranges for "fish with a swim bladder not used in hearing", to provide further context around the sandeel potential within the region. This report will be submitted in late November 2024.
RR-039: E 12	7.10 – Figure 10-1 to Figure 10-10	Natural England notes further clarity is needed regarding concurrent piling across the DBS East and West array areas and the ECC. The Applicant has provided underwater noise modelling for three pin-piles piled concurrently across the array areas and in the ECC, and has committed to no concurrent monopiling occurring across the arrays area with the ECC, however it is unclear if two monopiles (one in DBS West, one in DBS East) and pin piling in the ECC could occur concurrently.	Natural England advises clarification is needed on the worst-case scenario for concurrent piling.		The worst case scenario assessed in **Chapter 10 Fish and Shellfish Ecology** [APP-091] was for two concurrent monopiles (four sequential) in the Array Areas or three concurrent jacket pin piles (12 sequential) in both the Array Areas and the Offshore Export Cable Corridor. The Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal HDD exit from the Projects' Design Envelope, the removal of all platforms from the Offshore Export Cable Corridor, reductions in the number of platforms in the Array Areas and overall reductions in cable lengths within the Array Areas. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference C.1.1] which will describe any resultant changes to the assessment conclusions presented in the ES, thus informing a consultation with relevant stakeholders (as agreed by the ExA) as part of the change request process. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the removal of the ESP from the Projects' Design Envelope. Therefore, if the intended change is accepted by the ExA, piling along the Offshore Export Cable Corridor would be removed from all construction scenarios. Should this change not be accepted, no piling of any type will occur along the Offshore Export Cable Corridor at the same time as piling within the Array Areas. Therefore, no concurrent piling of any kind will occur between the Offshore Export Cable Corridor and piling activities within the Array Areas.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
Baseline Characterisation - Document(s) Used: [APP-050] 6.1.2 Appendix B - Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC [APP-091] 7.10 ES Chapter 10 - Fish and Shellfish Ecology					
RR-039: E 13	7.10 - 10.4.6, Para 33	Natural England notes that Potential spawning habitat suitability heat maps have been used for the underwater noise impact assessments for herring and sandeel. Whilst these provide an overview of potential spawning habitat, they do not provide evidence of abundance. Further, the use of drop-down video only provides a snapshot in time and is not an agreed method to determine presence/absence of sandeel across the assessed area.	Natural England advises that the Applicant should also utilise sandeel abundance data (such as the North Sea sandeel dredge survey) to support the assessment of impacts on localised sandeel populations.		Sources used to determine the fish and shellfish ecology baseline draw on both commercial and scientific datasets. Site-specific surveys were not undertaken to inform the Fish and Shellfish Ecology chapter (**Chapter 10 Fish and Shellfish Ecology** [APP-091]), as project specific surveys on fish and shellfish often fail to provide an accurate representation of local baselines due to the limited temporal window over which they may realistically occur. Significant variation in species richness and abundance as a result of seasonal variation is better captured in landings data and long term scientific data sets, as have been used within this assessment. Sandeel presence data from site-specific surveys has been used to support the characterisation of the site for sandeel habitat. Revised heat maps for both herring and sandeel using the MMO-approved Kyle-Henney *et al.* (2024)[40], and Reach *et al.* (2024)[33] methodologies respectively, will be presented within the **Heat Mapping Report** [document reference 10.43], to be submitted in late November 2024.
RR-039: E 14	7.10, 6.1.2 - 10.5.1, Para 39	Natural England highlights that it is unclear which sandeel species have been included in the habitat suitability assessment. The Applicant currently includes 'Ammodytes spp.' but does not clarify if this specifically includes the lesser sandeel (*Ammodytes marinus*) and the small sandeel (*Ammodytes tobianus*). There is also no detail on whether greater sandeel (*Hyperoplus lanceolatus*) and smooth sandeel (*Gymnammodytes semisquamatus*) have been considered.	Clarity should be provided as to whether data included in the sandeel assessment relates to only Ammodytes spp or other sandeel species as well to ensure confidence in the data and models presented to inform the assessment.		Industry standard practice is to refer to all sandeel species under the colloquial term 'sandeel', in accordance with the Latto *et al.* (2013)[34] method. As such, the sandeel receptor group assessed within this Application refers to Raitt's sandeel *Ammodytes marinus*, lesser sandeel *Ammodytes tobianus*, greater sandeel *Hyperoplus lanceolatus*, Corbin's sandeel *Hyperoplus immaculatus* and smooth sandeel *Gymnammodytes semisquamatus*.
RR-039: E 15	N/A	Natural England have no additional comments to make on this section.	N/A		The Applicants acknowledge this comment.
RR-039: E 16	N/A	Natural England defer to Cefas regarding the suitability of the data and modelling methodology.	To note.		The Applicants acknowledge this comment.
Environmental Impact Assessment - Document Used:					

[40] 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. Available at: https://www.erm.com/globalassets/insights/documents/Identifying_and_Mapping_Atlantic_Herring_Potential_Spawning_Habitat_An_Updated_Method_2024_w_Appendices.pdf

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
[APP-071] 7.5 ES Chapter 5 - Project Description [APP-080] 7.8 ES Chapter 8 – Marine Physical Environment [APP-085] 7.9 ES Chapter 9 – Benthic and Intertidal Ecology [APP-091] 7.10 ES Chapter 10 - Fish and Shellfish Ecology [APP-092] 7.10.1 ES Chapter 10 - Fish and Shellfish Ecology Figure 10-1 to Figure 10-10 [APP-050] 6.1.2 Appendix B - Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC [APP-093] 7.10.10.1 ES Appendix 10-1 - Fish and Shellfish Ecology Consultation Responses [APP-099] 7.11.11.3 ES Appendix 11-3 - Underwater Noise Modelling Report [APP-231] 8.6 Commitments Register					
RR-039: E 17	7.10	Given the potential for indirect effects on designated predator features from impacts on forage fish prey species, Natural England advises that assessment of potential impacts on sub-populations of key fish species is necessary, e.g. potential localised depletion and/or reduced resilience of the wider stock. We advise that impacts on herring should be considered against the context of the Banks spawning component of the North Sea stock. We advise that sandeel should be considered against the context of the specific genetic population of sandeel present in the Project area.	Natural England advises that assessments should consider the impact pathways at a biologically relevant population scale e.g., Banks herring population, sandeel genetic population. Further advice regarding the assessment of indirect effects can be found in Annex E1.		The assessment of potential effects upon Atlantic herring has been undertaken for the Banks spawning population specifically, however noting that the Banks spawning population contributes to the wider NSAS stock dynamics. This assessment will be further investigated within the Atlantic herring section of the **Heat Mapping Report** [document reference 10.43], to be submitted in late November 2024. Potential effects on sandeel are considered in the context of the Dogger Bank SAC, which is expected to retain a level of genetic homogeneity. The application of the Reach *et al.* (2024)[33] heat mapping methodology will introduce the additional Wright *et al.* (2019)[41] defined areas of genetic similarity within the sandeel section of the **Heat Mapping Report** [document reference 10.43].
RR-039: E 18	7.10 - Para 316	Electromagnetic field (EMF) impacts from cables on sandeel and Atlantic herring have not been considered. The Applicant states in reference to other fish receptor groups (not including elasmobranchs) "*these species, if displaced by EMF effects, would find suitable habitat elsewhere in the offshore area, or in the wider Fish and Shellfish Ecology Study Area*". However, we highlight that sandeel are known to bury into sediments, are demersal	Natural England advises the Applicant to assess the impacts of EMF on sandeel and herring high potential spawning habitat.		When compared to elasmobranchs, the sensitivity of other Fish and Shellfish receptor groups is well understood to be significantly lower due to their lack of specialised electrosensitive sensory organs used for predation. This difference in EMF sensitivity is acknowledged in the preceding sentence to that cited within the comments: "*Other fish receptor groups (e.g. pelagic, demersal, and migratory) are comparatively less reliant on electrosensitivity and are highly mobile and / or exhibit flexibility in their range of habitats.*" This statement includes both sandeel and herring species. No available literature presenting potential impacts associated with EMF at the levels anticipated for this development on these species has been identified, and so the potential sensitivity on elasmobranchs (medium) should be considered a worst-case. In combination with the negligible magnitude of impact for all construction scenarios, EMF

[41] Wright, P.J., Christensen, A., Régnier, T., Rindorf, A., and van Deurs, M. (2019). Integrating the scale of population processes into fisheries management, as illustrated in the sandeel, Ammodytes marinus. ICES Journal of Marine Science, 76 (6): pp. 1453-1463.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		spawners and have high site fidelity. Additionally Atlantic herring are demersal spawners and are likely to be in close proximity to the cable along the Export Cable Corridor. We therefore consider there to be a viable pathway for impact that should be assessed.			effects arising from cables during the operational phase are determined to have a negligible effect on all Fish and Shellfish receptors.
RR-039: E 19	7.10	Natural England notes that impacts from habitat loss for sandeel and herring from UXO clearance have not been assessed as "*specific surveys to identify potential locations of UXO would not be undertaken until the DCO for the Projects is granted*". Whilst we agree that this is the case, we consider that a nominal assessment should be included as has been done for other receptors, e.g. marine mammals and benthic.	Natural England advises further assessment is required to quantify likely loss of habitat from UXO clearance.		A nominal assessment of UXO clearance impacts is included within the assessment of underwater noise impacts within section 10.6.1.4., with specific impact ranges relating to UXO presented in Table 10-23 (**Chapter 10 Fish and Shellfish Ecology** [APP-091]). The **Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage** [document reference 11.7], submitted alongside the responses to this relevant representation) notes that Dogger Bank B undertook monitoring of craters caused by high-order UXO clearance in 2023[29]. The UXO clearance campaign was completed in February-March 2023, with a survey of the craters in June 2023 at five of six clearance locations. This survey showed that in all cases the craters had infilled rapidly, in some cases infilling was largely complete, and even where there was the least recovery in (DBB_027) a 0.8m crater infilled to approximately 0.4m depth. Due to the temporary, episodic and relatively localised nature of the impact, recoverability of the receptors and the extent of the receptors across the wider region, the magnitude of potential habitat loss from UXO clearance is considered negligible. As such, the potential effect of habitat loss resulting from UXO clearance is considered to be minor adverse.
RR-039: E 20	7.10 - 10.6.2.7, para 302	Natural England notes that impacts from localised heating from the cables have been assessed in reference to water temperature increase, with no specific receptors identified as being impacted. However, Natural England advises further assessment is required for localised heating of sediment and possible impacts to high/very high potential sandeel and herring spawning habitat.	Natural England advises the Applicant to further assess potential impacts from localised heating of sediment from the cables to herring and sandeel, and their potential spawning habitat.		As is discussed in relation to sea water heating within section 10.6.2.7 of **Chapter 10 Fish and Shellfish Ecology** [APP-091], whilst the heating of sediments surrounding the cable may occur, this is anticipated to be highly local to the cable. Modelling of changes in sediment temperature has been undertaken for a range of offshore cable developments in UK waters, with results indicating that changes in sediment temperature are not significant beyond an order of meters. Modelling undertaken for the NorthConnect project[42] indicated that changes in sediment temperature of >1°C were limited to within 2.5m of the cable, and changes of >7°C being limited to within 0.2m. Therefore, the limited spatial extent of heating associated with cables are unlikely to result in a significant effect.
RR-039: E 21	7.10 - Table 10-1	Natural England notes that the Applicant plans to bury cables where possible, but that cable protection may be used at cable crossings or in areas of hard substrate.	Natural England advises that clarity is needed on how localised impacts on high potential spawning habitat loss due to cable protection have been		Impacts associated with potential habitat loss resulting from cable protection are assessed within section 10.6.2.6 of **Chapter 10 Fish and Shellfish Ecology** [APP-091]. Within this section both sandeel and herring species are discussed, with these species forming the basis of a determination of medium sensitivity to this impact for both benthic and pelagic fish receptor groups respectively.

[42] NorthConnect: Chapter 18: Electric and Magnetic Fields & Sediment Heating. Available online at: https://marine.gov.scot/sites/default/files/18_emf_sediment_heating_0.pdf

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		As noted by the Applicant, sandeel have high site fidelity and specific sediment constraints for spawning. The use of cable protection therefore poses an impact pathway of permanent habitat loss through composition alterations.	assessed for sandeel and Atlantic herring. See comment E30.		
RR-039: E 22	7.9	Natural England is concerned that the Applicant has not considered the likely cumulation of benthic 'ecological halo effect' which can be expected following the placement of structures on the seabed. We are particularly concerned that secondary 'ecological halo' effects will be combined and exacerbated in the array areas as a result of the network of potential parallel and perpendicular lengths of cable protection, which could result in broadscale changes in the benthic habitats and communities across the wider DCO area and a significant proportion of Dogger Bank SAC.	Natural England advises that a robust assessment is needed of the potential Worst-Case area of impact on benthic communities, particularly those highlighted as spawning areas along the ECC, and within Dogger Bank SAC sandbank feature, and the nature and scale of that impact, as a result of changes to physical and biological process following the placement of structures and cable/scour protection on the seabed.		Discussions regarding the "ecological halo effect" were not raised during previous rounds of comments, or at ETG meetings undertaken prior to DCO submission. Potential impacts as a result of the developments as determined in collaboration with stakeholders and regulators are presented within the ES chapter. See the Applicants' response to RR-039: C6 in **Table 2.4.1** for further details on this matter.
RR-039: E 23	7.11.11.3 – 11-3	Natural England notes that the Applicant has modelled fish as both stationary and fleeing receptors for underwater noise thresholds. We advise that there is currently insufficient evidence to support the inclusion of fleeing behaviour of fish into models (see E26). For the purposes of environmental assessments, it is therefore advised that fish are considered to be stationary receptors within underwater noise models. This is in line with Natural England's Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards (Phase III, 8.3.1.3.1 Fleeing).	For all underwater noise modelling Natural England advises that fish are assessed as stationary receptors, our conclusions on impacts will therefore be based on the values provided that are in line with this advice.		All determinations of underwater noise impacts on fish and shellfish species have assumed species to be stationary receptors as specified within section 10.6.1.4. and section 10.6.2.4. of **Chapter 10 Fish and Shellfish Ecology** [APP-091].
RR-039: E 24	7.10.1 - Fig 10-9	Natural England highlights that the caption for Figure 10-9 states "*Underwater noise impacts from piling operations at…*" but does not specify the type of piling operation modelled.	Natural England advises that clarity is needed on whether this figure is showing modelling of monopiling or pin piling in the Export Cable Corridor.		Figure 10-9 (**Chapter 10 Fish and Shellfish Ecology** Figure 10-1 to Figure 10-10 [APP-092]) indicates modelling of underwater noise impacts associated with monopiling within the Array Areas. This is indicated within section 10.6.1.4.2. of **Chapter 10 Fish and Shellfish Ecology** [APP-091] where reference to the figure is introduced.

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RR-039: E 25	7.10.1 - Fig 10-1 to Fig 10-10	Natural England notes that the underwater noise impacts from pin piling concurrently within DBS East, DBS West and the ECC are modelled and provided in Figure 10-10. However, the underwater noise impacts from concurrent monopiling in DBS West, DBS East and pin piling in the Export Cable Corridor has not been provided. This has the potential to be the worst case scenario if included in the design envelope (see E12).	Natural England advises that clarity is provided on the WCS for concurrent piling. In the case that monopiling in the array areas can occur concurrently with pin piling within the ECC, Natural England advises the Applicant to provide underwater noise models and figures to assess impacts on fish receptors.		The Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). The change proposed of relevance to this comment is the removal of the ESP from the Projects' Design Envelope. Therefore, if the intended change is accepted by the ExA, piling along the Offshore Export Cable Corridor would be removed from all construction scenarios. Should this change not be accepted, no piling of any type will occur along the Offshore Export Cable Corridor at the same time as piling within the Array Areas.
RR-039: E 26	7.10 - 10.6.1.4, Para 165	Natural England notes the Applicant's statement "Soft start and ramp up periods have been incorporated within the modelling to allow for avoidance behaviour." As highlighted in E23 Natural England advises that fish are modelled as stationary receptors and that soft start and ramp up approaches are not appropriate mitigation measures for fish. This mitigation is designed primarily for marine mammals that exhibit consistent fleeing behaviours. The few studies investigating fish fleeing responses do not show consistent, directional fleeing out of the area of influence. Fish responses to underwater noise are highly variable, and rarely directional (i.e., shoaling in place, or in haphazard directions, flinching, fleeing into shelter).	Natural England advises that these are not appropriate mitigation measures for impacts to fish. We therefore advise they are removed from the assessment and a more appropriate worst-case scenario is presented.		All determinations of underwater noise impacts on fish and shellfish species have assumed species to be stationary receptors as specified within section 10.6.1.4. and section 10.6.2.4. of **Chapter 10 Fish and Shellfish Ecology** [APP-091]. Information pertaining to soft start procedures has been included for reference only as it relates directly to underwater noise impacts. Previous iterations of the ES did consider fish as fleeing receptors hence the inclusion of wording relating to this mitigation being incorporated into the modelling, however following consultation with stakeholders and regulators they are now considered to be stationary throughout the assessment. No changes to the modelling of UWN impacts on fish and shellfish receptors based on this mitigation measure have been made.
RR-039: E 27	7.10 -Fig 10-1 to Fig 10-10	Natural England highlights that the Applicant has not presented a figure showing modelled noise contours for concurrent pin piling in the array areas only (i.e. excluding the Export Cable Corridor).	Natural England advises the Applicant to provide a figure showing modelled noise contours for the worst-case scenario locations for pin piling in the array areas only.		At the time of assessment the Applicants did not consider modelling of concurrent pin pilling within the Array Areas excluding the Offshore Export Cable Corridor a scenario to be necessary, as the worst case regarding pin piling was three locations concurrently (as noted in Table 10-3 of **Chapter 10 Fish and Shellfish Ecology** [APP-091]. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The change proposed of relevance to this comment is the removal of the ESP from the Projects' Design Envelope. Should the proposed removal of the ESP be accepted by the ExA (see **Project Change Request 1 – Environmental Assessment Update** [document reference C1.1] for further information), piling along the Offshore Export Cable Corridor would

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					no longer be required. As such, concurrent monopiling within the Array Areas only would represent the worst case scenario in regards to impacts associated with UWN (Table 10-1; **Chapter 10 Fish and Shellfish Ecology** [APP-091]). Ranges for pin piling should be considered as no greater than that presented within the assessment. To note, as part of the proposed changes **Appendix 11-3 Underwater Noise Modelling Report** [APP-099] will be updated which presents a figure showing modelled noise contours for concurrent pin pilling in the Array Areas. This will accompany the **Project Change Request 1 – Environmental Assessment Update** [document reference C1.1] during consultation and is expected to be submitted to the ExA in early January 2025.
RR-039: E 28	7.10 - Para 175	Natural England does not agree that the references used to justify the following statement are applicable to impulsive noise from pile driving: "*exposure to high ambient noise may have a habituating effect leading to a weaker or lack of response compared to the received levels alone (e.g. in fish: Chapman and Hawkins (1969), Peña et al. (2013)*". The noise sources studied in these references were ship/trawl noise and seismic air guns, respectively.	Natural England advises that habituation should not be taken into account within the assessment without provision of more appropriate supporting evidence.		Habituation to ambient noise leading to a weaker response to an impulsive noise source is known to occur, and whilst it is acknowledged that piling is a higher energy sound source compared to seismic airguns (both sources of impulsive noise), a decreased response should be expected compared to fish in a comparatively quiet soundscape absent of any major shipping / vessel traffic.
RR-039: E 29	General	Natural England notes that the Applicant has stated that mitigation is not applicable for impacts to fish species, as all impacts have been assessed as either negligible or minor adverse. However, Natural England do not agree with these conclusions at present (see E33). We also do not agree that mitigation is not applicable owing to the risks of indirect effects on designated predator species through impacts on fish prey species. We consider mitigation options are available to the Applicant, as detailed in the rows below.	Further consideration of appropriate mitigation methods should be undertaken.		The Applicants acknowledge this comment, please see the Applicants responses to RR-039: E 5, RR-039: E6 and RR-039: E33 for further details. For indirect effects to marine mammals due to changes of prey, please see comment (RR-039: E 4). The Applicants acknowledge the requirement for effective and appropriate mitigation measures to minimise the risk to fish, however mitigation measures described in the Marine Mammal Mitigation Protocol (MMMP) (**Outline MMMP** [APP-249]) are also likely to mitigate effects of underwater noise to fish species as well, therefore reducing the indirect effects to marine mammals.
RR-039: E 30	General	Natural England have provided detailed comments on cable protection mitigation in relation to benthic and marine processes receptors in Appendices B and C, we advise these are also applicable to reducing impacts to spawning habitat.	Natural England advises that the Applicant commit to additional mitigation to reduce impacts to herring and sandeel spawning habitat.		The Applicants have not yet developed designs detailing the extents of cable protection required, or its location along the Offshore Export Cable Corridor. Development work is currently ongoing to provide an update on these topics. Any updates that become available during the examination process will be shared with all interested parties and the ExA. It should be noted, however, that the final extents of cable protection to be deployed will not be fully

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		In addition to these comments, we consider that the Applicant should explore options to avoid placing cable protection within high – very high potential spawning habitat areas for herring and sandeel in the ECC and array areas. Currently, the full volume/length of cable protection applied for (20% of the ECC length, 10% for the interarray cables) could be installed within these areas. We advise that a commitment should be made to avoid placing cable protection in these areas, or to only a certain proportion of the full volume being allowed in these areas. It should also be demonstrated through the Cable Burial Risk Assessment why it is thought the volumes applied for are needed and cannot be refined down further. We consider cable protection estimates should be based on an assessment of likely burial success.			understood until detail design has been completed post-consent and until cable installation is completed.
RR-039: E 31	General	Natural England highlight that as the Applicant has not currently committed to the removal of cable/scour protection at the point of decommissioning (see Benthic Appendix, Ref C43), any impacts to spawning habitat will be permanent. Without such a commitment, the worst-case scenario should assess the impacts to spawning grounds if assets are left permanently in situ, rather than restrict the impact assessment to the operational lifetime of the windfarm.	Natural England strongly advises that a commitment is made to remove all on and above seabed infrastructure within high - very high potential spawning habitat for sandeel and herring at the time of decommissioning, to prevent permanent impacts to spawning areas within the ECC and array areas. We advise this should be secured in the DCO.		No decision regarding the final decommissioning policy for the offshore Projects infrastructure including landfall, has yet been made. It is also recognised that legislation and industry best practice change over time. It is likely that offshore projects infrastructure will be removed above the seabed and reused or recycled where practicable. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that for the worst case scenario, the impacts will be no greater than those identified for the construction phase. Due to this uncertainty, the assessment of habitat loss at the operation stage is considered as permanent within the impact assessment (section 10.6.2.6. Permanent Loss of Habitat and / or Change in Habitat Type as a Result of Changes in Substrate Composition; (**Chapter 10 Fish and Shellfish Ecology** [APP-091]).
RR-039: E 32	8.6; 7.10.10.1 - Figure 10-8	The Applicant has committed to a seasonal restriction on piling in the ECC from August – October to mitigate the impacts of underwater noise on Atlantic herring. Whilst we welcome this, we highlight that the behavioural threshold (135 dB) modelled also overlaps the high and very high spawning habitat potential sites when piling in the array areas.	Natural England supports the seasonal restriction in the ECC to prevent disturbance to Atlantic herring during spawning. However, as the modelling indicates that behavioural impacts from piling in the array area are also likely to occur, we advise that a seasonal restriction should also be committed to for piling in the array areas. We defer to Cefas		The Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). The change proposed of relevance to this comment is the removal of the ESP. Therefore, if the intended change is accepted by the ExA, piling along the Offshore Export Cable Corridor would be removed from all construction scenarios. As piling at the Offshore Export Cable Corridor would no longer considered, concurrent monopiling within the Array Areas would represent the worst case scenario in regards to impacts associated within underwater noise (Table 10-1; **Chapter 10 Fish**

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			for further advice on timings of any such restriction.		**and Shellfish Ecology** [APP-091]). Ranges for pin-piling would be considered as no greater than that presented within the assessment. Should this change not be accepted, no piling activity will take place within the Offshore Export Cable Corridor between the months of August and October as stated within the embedded mitigation of **Chapter 10 Fish and Shellfish Ecology** [APP-091]). The remaining overlapping UWN impacts referenced in this comment pertain to the 135dB distances included within assessment following requests during previous consultation. However, the position is maintained that the source from which this threshold is derived (Hawkins *et al.* 2014)[43] is not fit for purpose. Primary reasons include, but are not limited to, differences in species (herring were not the target species of the paper), and environment (study undertaken in a quiet loch, as opposed to a busy region of the North Sea) within which the study was undertaken, and an absence of evidence that the behavioural changes noted within the study could be considered as an impact, particularly when considered at a population level. The research presented in Hawkins *et al.* (2014)[43] was carried out on a separate species (sprat) in an enclosed area where the use of powered vessels was restricted, exposure to anthropogenic noise was low, and no habituation was predicted. In the paper, the authors clearly state: "*In this paper, data have been presented on the levels of impulsive sound to which sprat and mackerel respond. However, these data cannot yet be used to define the sound exposure criteria. More detailed studies of the behaviour of these species are required to establish whether the responses observed are likely to result in adverse effects upon the survival of individuals*." Within a follow-up paper (Popper and Hawkins, 2019)[44], this is expanded on further, with authors stating that they do not consider findings appropriate when defining underwater noise impacts on the study-specific species, let alone herring which were not considered within the paper: "*We would stress, however, that it would be premature to use these data to define sound exposure criteria for sprat and mackerel. Other schools of the same species, under different conditions, might respond differently*". In the case of UWN modelling at the Projects, not only are conditions different, but the species is distinct as well. It is the Applicants' opinion that to use the 50% response level of 135dB re 1 µPa2s SELs would be to misinterpret the results of the cited papers and would be contrary to the authors' stated conclusions. As such, the Applicants do not agree that the Hawkins *et al.* (2014)[43] research establishes the best-available scientific evidence but rather that it presents preliminary findings that will be important to establishing a more comprehensive behavioural disturbance metric in future studies. In contrast, the current assessment uses the established criteria in Popper *et al.* (2014)[32], as this approach has been developed specifically to provide a

[43] Hawkins, A.D., Roberts, L. & Cheesman, S. (2014). Responses of free-living coastal pelagic fish to impulsive sounds. Journal of the Acoustical Society of America, 135(5), pp. 3101-3116. doi:10.1121/1.4870697

[44] Popper, A.N. & Hawkins, A.D. (2019). An overview of fish bioacoustics and the impacts of anthropogenic sounds on fishes. Journal of Fish Biology, 94(5), pp. 692-713.

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					science-based criteria for effects of anthropogenic sound (including pile driving and shipping) on fishes. This approach is in line with industry standard and has been used and accepted by the Secretary of State across a significant number of offshore renewables developments both within the region and nationally. These developments include, but not limited to, Hornsea Project Three, Hornsea Project Four, East Anglia ONE North, and Seagreen Alpha and Bravo. For these reasons, it is the Applicants' opinion that a seasonal restriction on piling within the Array Areas is not necessary or proportionate and that the impacts of underwater noise on fish species relevant to the Projects are considered to be those defined within Popper *et al.* (2014)[32], as presented within Figures 10-8-to 10-10 (**Chapter 10 Fish and Shellfish Ecology**, Figures [APP-092]). In addition, noise abatement systems (NAS) is being included within the Projects procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.
RR-039: E 33	7.10 - Section 10.12, Table 10-35	Impact assessments on fish receptors have been concluded as negligible or minor adverse, based on assumptions that receptors can recover from impacts within 2-10 years. The Applicant has not provided references or evidence to support these statements, therefore Natural England cannot agree with the Applicant's conclusions.	Natural England advises that the Applicant provides suitable references and evidence to support statements used in the impact assessment to conclude negligible or minor adverse impacts.		Please see the response to RR-039: E6.
HRA - Document Used: [APP-046] 6.1 RIAA HRA Part 2 of 4 – Annex I Offshore Habitats and Annex II Migratory Fish [APP-049] 6.1.1 Appendix A - Habitats Regulations Assessment Screening [APP-050] 6.1.2 Appendix B - Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC [APP-247] 8.23 In-Principle Monitoring Plan					
RR-039: E 34	6.1, 6.1.1	The Applicant's assessment does not consider the impacts of the Projects on Humber Estuary SAC river lamprey and sea lamprey, regarding impacts to preferred prey availability. We highlight the conservation objective "*to maintain the abundance of preferred food items required by the species*". We advise that young river lamprey are noted as preferring herring, sprat and flounder.	Natural England advises that indirect effects on Humber Estuary SAC river lamprey and sea lamprey should be screened into the assessment. Further advice regarding the assessment of indirect effects can be found in Appendix E1.		The Applicants note that this potential pathway for LSE was not raised in previous consultations held for **Appendix A - Habitats Regulations Assessment Screening** [APP-049], when the document was issued in December 2022 for initial review or when the report was issued for further review alongside the Projects Preliminary Environmental Information Report (PEIR) in 2023. With regards to the potential for indirect effects on river lamprey and sea lamprey for prey species, given the uncertainty regarding these species movements within the marine environment (as noted in RR-039: E37), assessing specific locations favoured by river and sea lamprey for feeding is not possible.

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					River lamprey is restricted to coastal waters preying on a variety of other species (Canal & River Trust, 2022[45]). Although there is potential for effects of the Projects to impact upon prey of this species this could only occur in coastal waters within which there is limited infrastructure (and greatest potential for impact during temporary construction activities). Sea lamprey are found across the North Sea (OSPAR, 2009[46]) and parasite other fish species including shad, herring, pollock, salmon, mullets, cod, haddock, basking sharks (OSPAR, 2009). Sea lamprey and their prey could therefore interact with any number of industries and activities across the North Sea. Given the wide range of prey types, determining any source-pathway-receptor relationship specific to the Projects is not possible for either species. Given this, the Applicants believe the conclusions of no significant effect on fish species reached in **Chapter 10 Fish and Shellfish Ecology** [APP-091] can be used as the basis to determine that there is no potential for impacts to preferred prey availability.
RR-039: E 35	6.1.1 - 4.2.2.1 para 92	The Applicant states that the impacts of underwater noise from the Project will not affect Annex II migratory fish species given its distance offshore and using a worst case of piling in the most-western part of the western array. Natural England advises that clarity is needed on whether this model included the impacts of piling concurrently in both DBS East and DBS West. In addition, we advise that the worst-case piling event for migratory fish species, given its proximity to the coast, is likely to be when piling takes place in the ECC which has been proposed throughout the application.	Natural England advises that underwater noise impacts from piling in the ECC are fully assessed for Annex II migratory fish.		The Applicants can confirm that **Appendix 11-3 Underwater Noise Modelling Report** [APP-099] (which was submitted alongside the DCO application) was used to inform the assessment detailed in **Report to Inform Appropriate Assessment Habitats Regulations Assessment Part 2 of 4** [APP-046], included modelling outputs for concurrent monopiling for DBS East and DBS West. Potential effects on Annex II migratory fish species from underwater noise changes were screened in for assessment solely regarding potential UXO clearance activities along the Offshore Export Cable Corridor (see **Appendix A - Habitats Regulations Assessment Screening** [APP-049]). The Applicants note that underwater noise impacts from piling in the ECC were not raised in previous consultations held for **Appendix A - Habitats Regulations Assessment Screening** [APP-049], when the document was issued in December 2022 for initial review or when the report was issued for further review alongside the Projects' Preliminary Environmental Information Report (PEIR) in 2023. The Applicants acknowledge that sea lamprey are also known to either migrate through or spend part of their lifecycle in the North Sea (see RR-039: E37 for further discussion). However, given the gaps in the knowledge of sea lamprey's distribution at sea (as noted by Natural England in RR-039: E37) it cannot be determined whether sea lamprey could be located within the vicinity of any piling events along the Offshore Export Cable Corridor. As such the Applicants consider there is not sufficient existing evidence of sea lamprey presence near locations of any piling events to require an assessment be undertaken. As river lamprey are a river/coastal dwelling species[47], there is no potential pathway for effect between piling activities along the Offshore Export Cable Corridor and river lamprey.

[45] Canal & River Trust. (2022). River lamprey. [Online]. Available at: https://canalrivertrust.org.uk/enjoy-the-waterways/fishing/caring-for-ourfish/freshwater-fish-species/rare-and-protected-fish/river-lamprey

[46] OSPAR (2009). Background Document for Sea lamprey Petromyzon marinus. Online]. Available at: https://qsr2010.ospar.org/media/assessments/Species/p00431_Sea_lamprey.pdf

[47] JNCC. (2022b). River lamprey (*Lampetra fluviatilis*) SAC/SCI/cSAC distribution map - Special Areas of Conservation. [Online]. Available at: https://sac.jncc.gov.uk/species/S1099/map

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
					However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change proposed of relevance to this comment is the removal of the ESP from the Projects' Design Envelope. Therefore, if the intended change is accepted by the ExA, piling along the Offshore Export Cable Corridor would be removed from all construction scenarios. Should this change not be accepted, no piling of any type will occur along the Offshore Export Cable Corridor at the same time as piling within the Array Areas. Therefore, no concurrent piling of any kind will occur between the Offshore Export Cable Corridor and piling activities within the Array Areas.
RR-039: E 36	6.1.2 - 3.2, Para 23, Figure 1	A significant proportion (34.85%) of high potential sandeel spawning habitat within Dogger Bank SAC has been calculated to be impacted in the cumulative assessment (in-combination with Dogger Bank A, B, C, D and Sofia). Natural England's understanding is that this cumulative assessment does not include the Export Cable Corridor areas, which we advise based on Figure 1, would include additional high potential spawning habitat impacts, particularly if cable protection is used.	Natural England advises that the assessment is updated to provide the total habitat loss within the SAC, including loss occurring within any overlap of the ECCs with the site. See also E19 and E22 in relation to the total habitat loss area to be assessed.		The 34.85% area stated in **Appendix B Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050] represents the percentage of high potential sandeel spawning habitats within the array area boundaries for all offshore wind farms in planning or consented within the Dogger Bank SAC. As noted in paragraph 24 of the report however, the affected habitat (i.e. within the footprint of seabed infrastructure or temporary disturbance to habitat will occur during construction and maintenance activities) within these areas will be significantly lower than the overall extent of the combined array areas. As detailed in **Appendix B Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050], based on the publicly available information for the schemes listed an area of approximately 11.71km² may be permanently lost within the Dogger Bank SAC. It is noted that parts of the export cable corridors of all projects also cross the SAC, however given the actual footprint of infrastructure is much smaller than the consented boundaries and most of the export cable corridors will have no above surface infrastructure, these corridors have not been included within this calculation. However, as mentioned in RR-039: E 3, the Applicants are in the process of preparing a change request relating to a number of design parameters. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference C1.1], in which the Applicants will propose to reduce the number of Offshore Platforms from eight to three and reduce the overall length of cabling within the Array Areas. Such changes would lead to a subsequent reduction in area of foundations. scour protection, cable protection measures and cable / pipeline crossings. If accepted by the ExA, this would reduce the total habitat loss within the Dogger Bank SAC resulting from the Projects from 2.25km² to 1.9km², an approximately 17% decrease in area of habitat loss. As such, the overall potential habitat loss from all wind farms within the Dogger Bank SAC would be reduced to 11.36km². It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. As noted in the **Appendix B Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC** [APP-050], the potential figure of habitat loss within the Dogger

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					Bank SAC did not include Dogger Bank D as no detailed information on the projects footprint was available at the time of writing time.
RR-039: E 37	6.1.1, 6.1 - 4.2.3.3, 4.2.4 7.4.2.1.1 - para 188 & para 191	The Applicant states that: "… both river and sea lamprey are river/coastal dwelling species (JNCC, 2022b, 2023b)". This contradicts the Applicant's subsequent statement on sea lamprey distributions: "Based on a review of available information the following Annex II species [sea lamprey] are known to either migrate through or spend part of their lifecycle in the North Sea." Natural England acknowledges that there are gaps in the knowledge of sea lamprey marine lifehistory, however, sea lamprey have been known to be identified at considerable depths (Henderson, 2003[48]; Maitland, 2003[49]).	Natural England advises that the statements and assessment of sea lamprey are updated to include their marine life-history phase. However, we acknowledge that based on the current available evidence there is no significant impact pathway from underwater noise and vibration in the array areas or from UXO clearance, and this species would be scoped out at the LSE stage as concluded by the Applicant.		The Applicants welcome Natural England's agreement with regards to the screening conclusions detailed in **Appendix A Habitats Regulations Assessment Screening** [APP-049]. The Applicants acknowledge this inconsistency in the original wording regarding the distribution of sea lamprey, and would propose the following updates to the specified text: 'While both river and sea lamprey are river/coastal dwelling species (JNCC, 2022b, 2023b), it is acknowledged that sea lamprey are also known to either migrate through or spend part of their lifecycle in the North Sea'.
RR-039: E 38	6.1	In the RIAA, the Applicant suggests that if there were no significant impacts identified for potential fish prey species in the EIA assessment then there would be no significant impacts on ornithology and marine mammal receptors. Natural England disagree with this. The assessments undertaken for EIA in the Fish and Shellfish chapter consider impacts at a regional population level and only consider fish and shellfish as receptors, rather than potential sources of impact. NE consider that an understanding of the relative importance of the Project site as a foraging area, and potential for any impacts on prey abundance and distribution is critical in framing the predicted impacts that can be quantified. Further assessment is therefore needed to understand how more localised impacts on	Given the potential for indirect effects on designated predator features from impacts on forage fish prey species, Natural England advise that assessment of potential impacts on sub-populations of key fish species is necessary, e.g. potential localised depletion and/or reduced resilience of the wider stock. Natural England advise that the assessments should consider both direct and indirect impact pathways to sandeel and herring at a biologically relevant population scale, for both the construction and operation phases of the Projects. For herring this would be the Banks spawning component of the North Sea stock, and for sandeel		Please see the Applicants response to RR-039: E4 above.

[48] Henderson, P. A. 2003. Background information on species of shad and lamprey., Bangor, Countryside Commission for Wales

[49] Maitland PS (2003). Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series No. 5. English Nature, Peterborough.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		fish and shellfish might influence prey availability for seabirds and mammals. We suggest that any negative impact on forage fish may have an impact on vulnerable seabirds – particularly kittiwake. These pathways should be considered in more detail and conclusions evidenced. Please see Annex E1 for further detail.	the specific genetic population present in the Project area.		
RR-039: E 39	N/A	In-combination assessment - Natural England do not have any significant issues with this part of the application.	N/A		The Applicants acknowledge this comment.
RR-039: E 40	8.23 - Table 1-3	The Applicant has proposed pre- and postconstruction habitat sampling to validate statements made regarding habitat suitability and recoverability for sandeel. Natural England welcomes this but advises that longer-term sandeel monitoring would provide a more robust evidence base and would be beneficial in assessing the impacts of the Project on Dogger Bank sandeel populations (e.g. changes in sediment composition that could arise from dispersing drill spoil or settling of sediments suspended by cable laying)	Once assessments have been updated, Natural England advises that monitoring should be secured via the In-Principal Monitoring Plan to determine whether the residual impacts are as predicted. We advise that this could be via provision of a post-consent Sandeel Monitoring Plan, or the inclusion of sandeel specific objectives in the Benthic Monitoring Plan.		The Applicants acknowledge this comment. The approach to pre- and post-construction monitoring will be confirmed in detailed plans which will be prepared in accordance with the **In-Principle Monitoring Plan** [APP-247]. The exact details of the monitoring to be undertaken will be agreed post-consent, in consultation with the MMO and Natural England.
RR-039: E 41	General	Natural England advises that comments made in relation to EIA mitigation are applicable here.	To note.		The Applicants acknowledge this comment.
RR-039: E 42	6.1	Natural England agree there is unlikely to be significant effects from direct impacts to Annex II species from piling within the array areas. However, the prey interactions as described in E34 have not been assessed and therefore further assessment is required.	Natural England advises that prey availability for lamprey is assessed as per comments above.		Please see the Applicants response to RR-039: E34 above.
RR-039: E 43	N/A	Natural England acknowledge that herring and sandeel are not designated features and therefore derogations for direct impacts to these species would not be required. However, should impacts to these species contribute to an adverse effect on site	To note.		Please see the Applicants response to RR-039: E4 above regarding indirect effects on prey species for marine mammals and offshore ornithology.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		integrity for designated predator species or Annex 1 sandbank feature, consideration of prey availability/spawning habitat may need to be incorporated into compensation measures for those sites.			
RR-039: Annex E1.1	N/A	Annex E1: Natural England's Advice on the assessment of indirect effects. 1. Natural England welcomes that the Applicant has made efforts to address advice provided during the Evidence Plan Process to include an assessment of impacts on mobile designated features resulting from impacts to prey fish species, and that consideration has also been given to sandeel as a component of the Dogger Bank SAC [APP-050]. However, we consider that the current assessment is insufficient to advise that impacts on Annex I ornithology receptors at FFC SPA and Annex II harbour porpoise in SNS SAC, in relation to conservation objectives for the distribution, abundance and availability of key food and prey items to be restored (FFC SPA) or maintained (SNS SAC) can be excluded. We are also unable to advise that impacts on the characteristic community and ecological function which are key attributes of Dogger Bank SAC through impacts to sandeel can be excluded. **Therefore, we believe that the conservation objects for FCC SPA, SNS SAC and Dogger Bank SAC are likely to be hindered in relation to changes to ecological communities and impacts to prey availability.**	N/A		Please see the Applicants responses regarding potential effects on prey species in RR-039: E3 and RR-039: E4 above.
RR-039: Annex E1.2	N/A	2. The Applicant's assessment concludes that if no significant impacts are identified on fish and benthic receptors in their respective assessments, then there will be no significant impacts on ornithology and marine mammal receptors both in terms of EIA and the RIAA. Natural England disagrees with this assumption. The assessments undertaken in	N/A		Please see the Applicants responses regarding potential effects on prey species in RR-039: E3 and RR-039: E4 above.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		the Fish and Shellfish chapter consider impacts at a regional population level and only consider fish and shellfish as receptors, rather than potential sources of impact. Indirect effects of impacts on habitat and prey on birds and mammals may occur at different thresholds than for the receptors themselves. It is Natural England's view that while there may be no significant impacts on wider stocks of forage fish, this does not mean there may not be redistributions or local declines that could impact specific seabirds or mammals at certain times of the year, especially in areas known to be 'hot spots' for particular fish species. For example, we highlight that sandeel have high site fidelity and specific sediment constraints for spawning, and DBS is likely to impact on specific sub-populations of both sandeel and herring. The RIAA has also only considered direct impacts on fish during the construction period in terms of impacts to prey availability for birds and mammals. Consideration has not been given to the implications of permanent loss of spawning habitat on local forage fish population levels and what this could mean for prey availability.			
RR-039: Annex E1.3	N/A	3. We highlight that should the project be consented that an estimated 30.45% of high potential spawning habitat in Dogger Bank SAC would be within offshore wind farm (OWF) array areas, with 11.71 km2 of predicted direct habitat loss. The Dogger Bank South (DBS) projects contribute 2.25 km2 of this loss (by the Applicant's assessment) and have not committed to removal of cable/scour protection at end of life so there will beno ability for populations to recover. Also, the estimated loss does not reflect the potential for indirect loss or deterioration of spawning habitat in the near vicinity. Broadscale habitat change could	N/A		Please see the Applicants responses regarding potential effects on prey species in RR-039: E3 and RR-039: E4 above.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		occur as introduced hard substrate is colonised, changing the community composition of the surrounding area (ecological halo effects). This is likely to be further exasperated by the presence of structures in the marine environment which will also affect sediment transport and water column movement with the potential for seascape scale changes in stratification mixing zones, particularly as there are now four OWFs along the Flamborough front and six on Dogger Bank. There is also no consideration of the 'reef effect' created by the presence of the wind turbines and the potential increase in more pelagic species which also forage on sandeels. Further assessment is needed to understand how all of these factors will affect sandeel populations in this area, and how those changes might influence prey availability for seabirds and mammals foraging in the area.			
RR-039: Annex E1.4	N/A	4. Natural England advises that APP-050 (6.1.2 Appendix B - Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea SAC) is expanded to include FFC SPA receptors. Direct and indirect impact pathways from relevant thematic areas (Benthic, Marine Physical Environment, Fish and Shellfish) on localised forage fish abundance and distribution in and around the project area should be included and discussed in relation to the implications for key seabird and marine mammal species. We advise the following aspects should be considered: • Evidence to determine the relative importance of the project area as a foraging area at different times of year, e.g. foraging ranges of FFC SPA species and overlap with the project area at different times of year.	N/A		Please see the Applicants responses regarding potential effects on prey species in RR-039: E3 and RR-039: E4 above.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		• Impact assessments focussed on the specific subpopulations of sandeel (and herring) found in the project area. • Broadscale habitat change as a result of ecological halo effects and implications for spawning habitat. • Implications of marine processes and changes to sediment transport, stratification, and frontal systems • Changes to the ecosystem functionality of the sandbank and the food web it supports.			
	N/A	5. We acknowledge that it will not be possible for a single project to address all of the evidence gaps in this area. However, whilst uncertainty around the potential impacts remain it will not be possible to advise beyond reasonable scientific doubt that impacts on sandeel as a contributing factor to the AEoI conclusions for FFC SPA, SNS SAC and Dogger Bank SAC can be excluded. We therefore advise that consideration should be given to ways that beneficial management for sandeel abundance and availability could be incorporated into proposals for compensatory measures and as such factored into the strategic compensation MPA designation considerations. We advise that this should be made a stipulation of benthic compensation requirements for this project that will need to be addressed/delivered at the project level or by Defra as part of the strategic benthic compensation	N/A		Please see the Applicants responses regarding potential effects on prey species in RR-039: E3 and RR-039: E4 above.

2.7 Responses to Appendix F Marine Mammals

Table 2.7.1 Applicants' responses to Natural England's Appendix F Marine Mammals

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: F 1	N/A	The Environmental Statement (ES) and Report to Inform appropriate Assessment (RIAA) show an overreliance on the conclusions drawn from population modelling to rule out Adverse Effects on Site Integrity (AEoI). Natural England supports that the Applicant has assessed the impacts from the project using multiple tools such as Effective Deterrence Range (EDR), dose response and population modelling. However, whilst multiple assessments have been done, the conclusions have largely been based on the results of the population modelling. We acknowledge that population modelling is a useful tool to understand and add context to the impacts at a population level, however it is just a tool and should not be solely relied on. This is particularly the case where EDR and dose response assessments are showing a significant impact from the project alone and in-combination with other plans and projects, whilst the modelling shows lower impacts. We advise that the final conclusion should not solely be based on population modelling, consideration should also be given to the other assessments.	Natural England advise that the EIA assessment should be updated based on the highest predicted impact values, for all receptors and pathways. Where a significant impact cannot be ruled out, additional mitigation, such as the use of Noise Abatement Systems (NAS), should be explored to avoid or reduce impacts.		It should be noted that the different approaches to the assessments in sections 11.6.1.2 and 11.7.3 **Chapter 11 Marine Mammals** [APP-095] and sections 8.3.6.6.1.3; section 8.3.7.6.1.3 and section 8.3.8.6.1.2 of the **RIAA Habitats Regulations Assessment (HRA) Part 3 of 4** [APP-047] were provided to inform the worst case outputs used within the Interim Population Consequence of Disturbance (iPCoD) modelling rather than to assign significance. The Effective Deterrence Range (EDR) and dose response curve method tended to predict the greatest number of disturbed animals per pile. If the significance of effect is solely based on EDRs or dose response curve, this highlights the short term disturbance only, therefore not considering any long term effects, or animals returning to the area after piling. Studies such as Benhemma-Le Gall *et al.* (2024)[50] and others presented in section 11.6.1.2.1 of **Chapter 11 Marine Mammals** [APP-095] found that harbour porpoises and other marine mammals return to the area after piling and the current EDRs and dose response curves are potentially highly precautionary. It was the highest number of animals disturbed and the potential number of animals exposed to auditory injury (PTS) that were used as input parameters in the iPCoD modelling. In this way, the iPCoD modelling was used to understand the significance of the worst case related to disturbance and PTS numbers to the populations of relevance over the whole construction period and in the long term. In the case of disturbance, it was deemed that iPCoD gives the best potential to understand the likely consequences of disturbance to the populations in question. In relation to this, a change request is currently being prepared by the Applicants which amends some of the design parameters that feed into this assessment. The ExA was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request relates to the removal of an intertidal Horizontal Directional Drill (HDD) exit from the Projects' Design Envelope, the removal of the Electrical Switching Platform (ESP) from the Offshore Export Cable Corridor, reductions in the number of offshore platforms and overall reductions in cable lengths within the Array Areas. The proposed change request will be

[50] Benhemma-Le Gall, A., Hastie, G.D., Brown, A.M., Booth, C.G., Graham, I.M., Fernandez-Betelu, O., Iorio-Merlo, V., Bashford, R., Swanson, H., Cheney, B.J., Abad Oliva, N. & Thompson, P.M. (2024). Harbour porpoise responses to the installation of XXL monopiles without noise abatement; implications for noise management in the Southern North Sea. PrePARED Report, No. 004. August 2024

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
					supported by a **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the Environmental Statement (ES) and the Report to Inform Appropriate Assessment (RIAA). This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts.
RR-039: F 2	N/A	Natural England is concerned that the maximum Permanent Threshold Shift (PTS) injury ranges for piling and UXO clearance are too large to be effectively mitigated by the methods proposed in the ES and Marine Mammal Mitigation Protocol (MMMP) (for example, using Marine Mammal Observers, Passive Acoustic Monitoring and Acoustic Deterrent Devices (ADD)). Currently, the maximum injury range would require ADDs to be used for 134 and 145 minutes to deter minke whale and harbour porpoise, respectively. However, it is not advised to use ADDs for longer than 80 minutes as they can be less effective over longer ranges and it would also cause excessive disturbance. There is therefore a ~65 minute period where injury could occur which currently appears to be unmitigated.	Natural England advise that the Applicant needs to demonstrate how the full PTS impact range will be mitigated to ensure no injury is caused to marine mammals. Alternatively, the PTS impact range needs to be reduced to ensure ADDs can effectively deter animals from the zone of injury. This could be achieved my reducing the maximum hammer energy in the Project envelope, or by committing to the use of mitigation such as NAS to reduce the sound at source.		The Applicants acknowledge this comment. The Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.
RR-039: F 3	N/A	The Applicant has not committed to using noise abatement (NAS) as mitigation at this stage. Owing to concerns regarding the current over-reliance on the SIP process and securing additional mitigation post-consent to manage in-combination impacts to the Southern North Sea Special Area of Conservation (SNS SAC), Natural England cannot rule out AEoI on the SNS SAC. Further detail regarding our concerns on the SIP process and challenges of securing mitigation post-consent can be found in Annex F1.	Natural England strongly advises the Applicant to commit to using noise abatement as mitigation, should driven or part-driven piles be used during construction. We advise that this should be committed to in the Outline Marine Mammal Mitigation Protocol and Site Integrity Plan, and that the effect of NAS in reducing noise impacts are included in the assessment.		The Applicants are considering the use of NAS as mitigation for underwater noise and a section on the potential use of NAS in response to the Marine Management Organisation's (MMO's) relevant representation will be added to the **Outline Marine Mammal Mitigation Protocol (MMMP) (Revision 2)** [document reference: 8.25] and submitted in late November 2024. The use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.
RR-039: F 4	N/A	Natural England does not agree with the conclusion of no AEoI for the Humber Estuary SAC and Berwickshire North Northumberland Coast SAC.	Natural England advise that the assessment conclusions should be updated based on the highest predicted impact values, for all receptors and pathways. Where an AEoI cannot be ruled out, additional mitigation should be explored to avoid or reduce impacts.		It should be noted that the different approaches to the assessments were provided for information, rather than to assign significance, and the worst case outputs were used within the iPCoD modelling. The EDR and dose response curve method tended to predict the greatest number of disturbed animals per pile. It was these related disturbance numbers that were used as input parameters in the iPCoD modelling. In this way, the iPCoD modelling was used to understand the significance of the worst case related disturbance numbers to the populations of relevance over the whole construction period and in the long term. In the case of disturbance, it was deemed that iPCoD gives the best potential to understand the likely

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
					consequences of disturbance to the populations in question. Based on this the Applicants maintain there would be no AEoI for the Humber Estuary SAC and the Berwickshire and North Northumberland Coast SAC.
RR-039: F 5	N/A	The current Worst-Case Scenario (WCS) for the maximum number of piles that could be installed per day is stated as four for all build out scenarios (isolation, concurrent and sequential) with a maximum of two installed simultaneously. However, these maximums do not appear to be secured in the DCO/deemed Marine License (dML). As each Project is subject to a separate dML and could be under separate ownership in the future, consideration needs to be given to how these maximums will be secured across the two projects in the DCO/dML.	Natural England advise that clarity is needed on how the WCS for the maximum number of piles that will be installed concurrently and/or simultaneously within a 24-hour period across the two arrays will be secured in the dMLs for the separate Projects.		The Applicants acknowledge this comment and will make appropriate updates to the dMLs to reflect the comments made by Natural England.
RR-039: F 6	N/A	For the HRA, the Applicant suggests that if there were no significant impacts identified for potential prey species in their respective assessments then there would be no significant impacts on marine mammal receptors. Natural England disagrees with this. The assessments undertaken in the Fish and Shellfish chapter only consider impacts at a regional population level, and the HRA has only considered direct construction impacts to fish species rather than the indirect effects of permanent spawning habitat loss.	Natural England advise that an understanding of the relative importance of the site as a foraging area, and potential for any impacts on prey abundance and distribution is critical in framing the predicted impacts that can be quantified. Further assessment is therefore needed to understand how more localised impacts on fish and shellfish might influence prey availability for marine mammals. See Appendix E for detailed comments on the indirect effects assessment.		As outlined in **Chapter 10 Fish and Shellfish Ecology** [APP-091] a worst case scenario associated with the development of the Projects determines a loss of habitat of 4.19km² across the Offshore Development Area, comprising both the Array Areas (2.05km²) and the Offshore Export Cable Corridor (2.14km²). The Applicants consider this to be minor because of the wide foraging ranges of marine mammals and that they can move to another area to find prey, the significance was assessed as negligible or minor adverse, therefore Not Significant in EIA terms. The impact has been assessed in sections 8.35.2.9.1 and 8.3.5.3.9 in the **RIAA HRA Part 3 of 4** [APP-047]. It should be noted that the Applicants are in the process of preparing a change request relating to the relevant design parameters. The ExA was notified of the Applicants' intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. Of relevance to this matter is the proposed reduction in the number of platforms and overall reduction in cable lengths within the Array Areas. The change request will be supported by a **Project Change Request – Environmental Assessment Update** [document reference: C1.1], which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. Impacts upon prey are considered in the Plan Level HRA (RIAA Appendix I Marine Mammal Array Assessment Part 2; The Crown Estate, 2022[35]) under the following pressures P1 Habitat Loss / Gain, P2 Direct Physical Damage and P3 Indirect Physical Damage. The HRA concludes that:

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
					The effect of this habitat loss will be to reduce the area available for foraging and also the extent of habitat for species which form prey. However, all marine mammal species forage widely within the marine environment and the predicted loss of habitat represents a very small proportion of the foraging habitat available. Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. Damage to physical habitats could affect prey species, or benthic communities upon which these are dependent. However, all marine mammal species forage widely within the marine environment and the predicted loss of habitat represents a very small proportion of the foraging habitat available. Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. The Habitats Assessment (Appendix J) notes that indirect physical damage cannot be quantified at present but some effects are expected. Based on evidence presented in Appendix J which suggests that such effects will be relatively localised and generally accounted for within areas attributed to habitat loss it is considered that the scale of effects will not be significant in the context of possible impacts upon supporting habitats for marine mammals. Any impact on marine mammal features is, therefore, considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. Although the overall effect of habitat loss will be to reduce the area available for foraging and the extent of habitat for prey species, habitat loss effects will be negligible given the small proportion of habitat occupied by the structures compared to the large foraging ranges of the protected features, as indicated by the distances used in relation to screening. Similarly, although offshore wind structures may provide new foraging opportunities for some species (e.g. Clausen *et al.* 2021[27]; Russell *et al.* 2014[37]) habitat gain effects are expected to be negligible in the context of foraging ranges.
Project Parameters - Document(s) Used: [APP-071] 7.05 ES Chapter 5 – Project Description; [APP-095] 7.11 ES Chapter 11 – Marine Mammals					
RR-039: F 7	7.05, 7.11	The project parameters for marine mammals have been clearly defined.	N/A		The Applicants welcome agreement with Natural England on this point.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: F 8	7.11 – Table 11-3	The Applicant has committed to no concurrent monopile installation between the Offshore Export Cable Corridor (OECC) and the Project array areas; however, it is unclear if there could be concurrent pin pile installation in the OECC with monopile installation in the array areas.	Natural England advise that clarity is needed on the WCS for concurrent piling between the ECC and array areas.		The worst case scenario assessed in **Chapter 11 Marine Mammals** [APP-095] was for two concurrent monopiles (four sequential) in the Array Areas or three concurrent jacket pin piles (12 sequential) in both the Array Areas and the Offshore Export Cable Corridor. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Projects Design Change – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the removal of the ESP. Therefore, if the intended change is accepted by the ExA, piling along the Offshore Export Cable Corridor would be removed from all construction scenarios. Should this change not be accepted, no piling of any type will occur along the Offshore Export Cable Corridor at the same time as piling within the Array Areas. Therefore, no concurrent piling of any kind will occur between the Offshore Export Cable Corridor and piling activities within the Array Areas.
RR-039: F 9	7.11 – Table 11-1	The WCS for the maximum number of piles that could be installed per day is stated as four for all build out scenarios (isolation, concurrent and sequential). We understand this to mean that in a concurrent or sequential scenario, a maximum of four piles could be installed **across the two arrays**, rather than within each array. This could be achieved through two piles being installed in each array in a 24-hour period, or three being installed in one array and one in the other, or four in one array if no piling is undertaken at the other. As each Project is subject to a separate deemed Marine License (dML) and could be under separate ownership in the future, consideration needs to be given to how this maximum will be secured in the DCO/dML, as the maximum number of piles that can be installed per array will be dependent on piling activity occurring in the other array.	Natural England advise that clarity is needed on how the WCS for the maximum number of piles to be installed in 24 hours across the two arrays will be secured in the dMLs for the separate Projects.		The worst case scenario for the installation of monopiles where the Projects are built concurrently was assessed in **Chapter 11 Marine Mammals** [APP-095] for two concurrent monopiles in both Array Areas, with two sequential piles at each Array Area, totalling four monopiles in 24 hours. The Applicants acknowledge this comment and will make appropriate updates to the dMLs to reflect the comments made by Natural England.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: F 10	7.11 – Table 11-1	The WCS for maximum piles installed per day assumes two simultaneous monopile events for all build out scenarios. As a maximum of four piles could be installed within a day, we understand this to mean that a maximum of two of those four could be piled simultaneously. In a concurrent or sequential build out scenario this could be two within a single array, or one in each array, with the remaining two piles (up to the maximum of four) piled at different times. See comment F9 for implications of securing this in the dML.	Natural England advise that clarity is needed on the WCS for simultaneous piling across the two arrays in a concurrent build out scenario, and how the dMLs for the separate Projects secure this. Within the DCO, Natural England advise a separate condition is created to encompass this activity and all of the scenarios involved with the maximum number of piles that will be installed.		The concurrent piling would consist of two sequential monopiles per Array Area, one installation in each Array Area at the same time. The Applicants acknowledge this comment and will make appropriate updates to the dMLs to reflect the comments made by Natural England.
RR-039: F 11	7.11	Natural England are concerned that the Maximum Design Parameters (MDP) for the Project, and therefore the WCS assessed, cannot be fully mitigated by the Applicant's current proposals.	Natural England advise that the MDP should be revised down, or additional mitigation committed to, to avoid adverse impacts to marine mammal receptors. See F18.		The Applicants acknowledge that the Maximum Design Parameters have been assessed as a worst case scenario as a precautionary measure. The Projects' final design could incorporate different installation methods or foundation parameters that could be used, and which would have lesser impacts on marine mammals. If the Maximum Design Parameters do not change, the Applicants acknowledge that there needs to be effective and appropriate mitigation measures in place to ensure no auditory injury (PTS) to marine mammals and is committed to this requirement. The potential mitigation measures that the Projects could utilise will be presented in section 3.1.9 of the updated **Outline Marine Mammal Mitigation Protocol (MMMP)** (Revision 2) [document reference: 8.25] and will be confirmed in the final MMMP post consent with the Projects' final design parameters. The Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.
Baseline Characterisation - Document(s) Used: [APP-095] 7.11 Environmental Statement. Volume 7. Chapter 11 – Marine Mammals.					
RR-039: F 12	N/A	Natural England consider the survey data collected is sufficient.	N/A		The Applicants welcome agreement with Natural England on this point.
RR-039: F 13	N/A	Natural England do not have any significant issues with this part of the application that have not been addressed in other comments	N/A		The Applicants acknowledge this comment.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: F 14	7.11-11.4.6	Natural England supports the Applicant's approach to use the highest density estimate for each marine mammal species.	To note		The Applicants welcome agreement with Natural England on this point.
Environmental Impact Assessment - Document Used: [APP-095] 7.11 ES Chapter 11 – Marine Mammals; [APP-101] 7.11.11.5 Appendix 11-5 Cumulative Effects Assessment Screening; [APP-102] 7.11.11.6 Appendix 11-6 Unexploded Ordnance Clearance Information and Assessment; [APP-099] 7.11.11.3 ES Appendix 11-3 Underwater Noise Modelling Report; [APP-249] 8.25 Outline Marine Mammal Mitigation Protocol; [APP-250] 8.26 In Principle Site Integrity Plan for the Southern North Sea Special Area of Conservation					
RR-039: F 15	7.11	Natural England agrees with the impact pathways included in the assessment.	N/A		The Applicants welcome agreement with Natural England on this point.
RR-039: F 16	7.11-11.7.3.1.1, Table 11-109, 11.5.2.1	Natural England does not agree to scoping out PTS from the Cumulative Effects Assessment (CEA). Natural England is not satisfied that the mitigation outlined in the ES and MMMP is sufficient to minimise the risk of injury for all PTS impact ranges. Additionally, although other projects will use mitigation measures to reduce the risk of injury on marine mammals, because marine mammals spend the majority of their time underwater, mitigation cannot guarantee that no animals will be at risk of PTS and therefore PTS needs to be included into the CEA screening.	Natural England advise that PTS should be scoped into the Cumulative Effects Assessment.		The Applicants acknowledge that with the current Maximum Design Parameters, additional mitigation measures may be needed to fully mitigate the risk of PTS. The Applicants acknowledge that there needs to be effective and appropriate mitigation measures in place to ensure no auditory injury (PTS) takes place from the Projects and is committed to this requirement. Other projects would also need effective mitigation measures in place to ensure there is no PTS, therefore with all projects using mitigation measures to eliminate PTS, there would be no potential Cumulative Effects of PTS. As a precautionary approach, PTS numbers were included in the population modelling for the cumulative assessment, so while not looked at individually, the potential impact has been given consideration in the significance of effect at a cumulative level. The Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.
RR-039: F 17	7.11.11.3	Natural England have reviewed the Underwater Noise Modelling Report and have no comments to make. However, we defer to Cefas for detailed comments on the methodology undertaken.	To note.		The Applicants acknowledge this comment.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: F 18	7.11 - Table 11-23, 11.6.1.2.2.5, para 368 & 371 8.25 - 3.1.4	The maximum predicted PTS impact range for a single pile installation (worst case – cumulative exposure of monopile installation at maximum hammer energy) is 13 km for harbour porpoise and 26 km for minke whales. These distances are too large to effectively be mitigated by Acoustic Deterrent Devices (ADDs). It would take a harbour porpoise 145 minutes and minke whales 134 minutes to swim to a distance where they are no longer at risk of PTS. Many ADDs are not effective to these distances and therefore, even if the duration of ADD was planned to be >145 minutes, they might not effectively deter animals from the injury risk zone. This duration of ADD activation also has the potential to cause excessive disturbance. We support the Applicant using a maximum ADD duration of 80 minutes, however this will not be long enough for harbour porpoise and minke whale to flee the PTS injury zone. Further, if a European Protected Species (EPS) licence for injury is applied for, the Regulator would need to be satisfied that all possible methods to reduce injury to EPS species have been explored and actioned, this would include using NAS.	Natural England advise that the Applicant needs to demonstrate how the full PTS impact range will be mitigated to ensure no injury is caused to marine mammals. Alternatively, the PTS impact range needs to be reduced to ensure ADDs can effectively deter animals from the zone of injury within 80 minutes (maximum PTS range will need to be 7.2 km for harbour porpoise and 15.6 km for minke whale). This could be achieved my reducing the maximum hammer energy in the Project envelope, or by committing to the use of NAS to reduce the sound at source.		The Applicants acknowledge this request. In response to the MMO's relevant representation [PDA-013] a section on the potential use of NAS as mitigation will be added into the **Outline MMMP (Revision 2)** [document reference: 8.25], which will be submitted in late November 2024. The Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.
RR-039: F 19	7.11 - 11.5.9.1	Natural England welcomes the Applicant's commitment to restrict piling in the offshore export cable corridor during the SNS SAC winter season (1st August-31st March), thereby ensuring that there will be no impacts from the Project on the SNS SAC winter area. We note that this has been secured in the DCO.	N/A		The Applicants welcome Natural England's agreement on the commitment to restrict piling in the Offshore Export Cable Corridor. With the proposed changes to the Projects' Design Envelope as described in RR-039: F 1, all piling in the Offshore Export Cable Corridor would be removed. If the change request is accepted by the ExA, reference to a piling restriction in the Development Consent Order (DCO) in relation to the SNS SAC would be removed.
RR-039: F 20	8.25 - 2.2.3, Table 11-6-5	The predicted maximum injury zone for some UXO clearance events is larger than the area for many ADDs to effectively deter marine mammals from.	Natural England advise that the planned ADD durations are provided to demonstrate that the maximum injury zone for UXO clearance can be mitigated. If this is not possible, additional mitigation or methods to reduce the sound at source should be investigated.		The Applicants are considering additional mitigation methods and acknowledge that there needs to be effective and appropriate mitigation measures in place to minimise the risk of potential auditory injury (PTS).
RR-039: F 21	8.25 - 3.1.1	Natural England supports increasing the Monitoring Area (MA) to ensure it is greater than the maximum predicted impact range for PTS.	Natural England advise that consideration should be given to how this zone can be effectively monitored to ensure all marine mammals can be detected. This may require using more marine mammal observers (MMObs) and		The Applicants welcome agreement with Natural England on this point. The monitoring area would be greater than the maximum predicted impact range for PTS and will be monitored with the use of MMObs and Passive Acoustic Monitoring (PAM) which is stated in the **Outline MMMP**

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			implementing stricter limits on workable weather conditions. The MMMP should be updated as needed.		[APP-249] and will be updated in late November 2024 following responses to the MMO's and Natural England's relevant representations.
RR-039: F 22	8.25 - 2.2.2, 3.1.1	Natural England recommends the MA is monitored for a minimum of 30 minutes prior to the ADD activation to reduce the risk of injury to marine mammals from the ADD.	Natural England advise that the outline MMMP is updated.		The Applicants agree with Natural England's comment. This will be clearly stated in the updated **Outline MMMP (Revision 2)** [document reference: 8.25], which will be submitted in late November 2024.
RR-039: F 23	8.25 -3.1.3, 3.1.6, 3.1.7	Natural England advise that piling should not commence (or recommence) in poor visibility or hours of darkness where Marine Mammal Observers (MMOb) cannot be used. There are limitations to Passive Acoustic Monitoring (PAM) so it should be used as well as, rather than instead of MMOb to optimise the ability to detect marine mammals and provide the best mitigation. This is in accordance with the JNCC PAM guidance (JNCC, 2023[51]).	Natural England advise that the outline MMMP is updated.		The JNCC PAM guidance (2023), states that PAM can be used during hours of darkness: 'PAM should be used when environmental conditions prevent visual observations by the marine mammal observer (MMObs); in some circumstances, it may also be needed to supplement visual observations (i.e. both methods are employed at the same time'; 'However, it is acknowledged it is the only method regularly used at night'. If the Projects require piling in poor visibility or at nighttime, a suitable method of PAM will be utilised to ensure full coverage of the monitoring area which is in line with the JNCC PAM guidance (2023). The JNCC PAM Guidance (2023) will be referenced in the **Outline MMMP (Revision 2)** [document reference: 8.25] which will be submitted in late November 2024.
RR-039: F 24	7.11-11.6.1.1.7 - para 268, Table 11-142 11.6.1.1.8 - para 274.	Natural England does not agree that the mitigated impacts of Permanent Threshold Shift (PTS) from piling are minor adverse - negligible for all marine mammals. These conclusions are hinged on mitigation outlined in the MMMP. Although the mitigation procedures outlined in the MMMP will help reduce the chance of marine mammals being injured by underwater noise from piling, marine mammals spend most of their time underwater and therefore it is not always possible to ensure all animals are outside of injury zone. Furthermore, the proposed mitigation is not currently sufficient to fully mitigate the predicted PTS impacts. The most effective method to ensure the impacts from underwater noise caused by piling are reduced for marine mammals is to reduce the sound at source, this could be by modifying the design envelope (e.g. reducing the maximum hammer energy) or by using Noise Abatement Systems.	Natural England advise that NAS is committed to at this stage to minimise the impacts from piling.		In table 11-41 of **Chapter 11 Marine Mammals** [APP-095] the significance of effect was minor adverse for permanent changes in hearing sensitivity (PTS) from single and cumulative piling of monopiles and jacket pin piles (without mitigation) for bottlenose dolphin, common dolphin, and white beaked dolphin, and harbour seal (harbour seal for the Projects in isolation only) for the Projects. For harbour porpoise, minke whale and grey seal the significance of effect was assessed as major adverse for the Projects in Isolation and together for cumulative PTS ranges for single and sequential piling of monopiles and jacket pin piles. The Applicants consider that as the residual effect equates to a minor adverse significance in the Projects' assessment with a pre-piling search using trained MMObs and PAM will provide the best chance of ensuring marine mammals are outside the initial injury zone. The use of acoustic deterrent devices (ADD) will also deter animals and will reduce the impact. The residual effect past the range of the ADD used for mitigation is likely to reduce the significance of effect. However additional methods that will be presented in the **Outline MMMP (Revision 2)** [document reference: 8.25] (submitted in late November 2024) such as sound reduction at the source may be utilised to reduce the significance of effect. The mitigation

[51] JNCC (2023). JNCC guidance for the use of Passive Acoustic Monitoring in UK waters for minimising the risk of injury to marine mammals from offshore activities. JNCC, Peterborough.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
					requirements will be dependent on the final project design and determined at the post-consent stage in the finalisation of the MMMP and prior to the Marine Wildlife Licence application. In addition, the Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.
RR-039: F 25	7.11-11.6.1.2.2.2 – para 332, Table 11-42	Natural England is concerned about the impact of piling at the Offshore Export Cable Corridor (OECC) on grey seals. There are a high number of grey seals in the OECC area owing to the proximity of the Donna Nook Haul-out site, and it has been reported that the number of seals using the site is declining (SCOS, 2023[52]).	Natural England advise that the Applicant commits to changing the design envelope (e.g. foundation bases with lower construction noise, reduced hammer energy) or the use of NAS to reduce the sound at source.		The Applicants acknowledge that piling in the Offshore Export Cable Corridor has the potential to disturb a high number of grey seals in the Humber Estuary SAC without the correct mitigation measures in place. Additional mitigation methods that will be listed in section 3.1.9 of the **Outline MMMP (Revision 2)** [document reference: 8.25] (submitted in late November 2024) may be required to reduce the number of grey seal to be disturbed at Donna Nook haul out site in the Humber Estuary SAC. The mitigation requirements will be dependent on the final project design and determined at the post-consent stage in the final MMMP. The Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted to the ExA in early January 2025 following targeted consultation. The proposed change request will be supported by a **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES) and the RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. The change proposed of relevance to this comment is the removal of the ESP from the Projects' Design Envelope. Should the proposed change be

[52] SCOS (2023). Scientific Advice on Matters Related to the Management of Seal Populations: Interim Advice 2023. Natural Environment Research Council Special Committee on Seals. Available from: https://www.smru.standrews.ac.uk/scos/scos-reports/

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					accepted by the ExA piling along the Offshore Export Cable Corridor would no longer be required. Therefore, piling from the Projects would cause no direct impact on the Donna Nook haul out site if the ESP was removed.
RR-039: F 26	7.11 - Table 11-111	The number of individual harbour porpoise potentially disturbed during single piling at DBS East, DBS West and both projects together is high, with up to 12.53% of the North Sea Management Unit (MU) disturbed. We consider this should result in an impact score of Major Adverse (Medium sensitivity and high number of animals disturbed), however the Applicant has concluded the impact as Minor Adverse (not significant) solely from the results of the interim Population Consequences of Disturbance model (iPCoD) population modelling. Although iPCoD is useful to predict long term impacts, we highlight that it is just a modelling tool and therefore cannot be relied on in isolation.	Natural England advise that the EIA assessment should be updated based on the highest predicted impact values, for all receptors and pathways. Where a significant impact cannot be ruled out, the mitigation hierarchy should be explored to reduce the potential impacts.		The Applicants acknowledge Natural England's comment, the 12.53% of the North Sea (NS) MU is from cumulative piling effects in section 11.7.3.1.1.2.1.1.in **Chapter 11 Marine Mammals** [APP-095] and not from single piling at the Projects. The different approaches taken by the Applicants to assess disturbance due to cumulative impacts from other wind farms was based on known disturbance ranges for marine mammals and dose-response curve assessments from relevant Preliminary Environmental Information Report (PEIR) / ES chapters, which have been used to determine the worst-case possible disturbance effect from piling. The quantitative assessment presented in Table 11-111, section 11.7.3.1.1.2.1.1 of **Chapter 11 Marine Mammals** [APP-095]; shows the magnitude for harbour porpoise is high using the EDR / dose response approaches. These numbers are calculated with the worst case assumption that all offshore wind farms (OWFs) will be piling on the same day, and 9.58% of the effect is from other OWFs in the NS MU. However, the Applicants consider that this is over precautionary as it is highly unlikely that all OWFs could be concurrently piling at exactly the same time. Brown *et al.* (2023)[53] highlights that the approach used to produce the current 26km EDR likely overestimates the response of harbour porpoise because it does not account for underlying seasonal variation during baseline and piling periods. In addition, findings in the latest PrePARED report looking at harbour porpoise response to piling at Ocean Winds Moray West OWF found evidence of an EDR of 10km (for monopiles) providing a strong case for reducing the current 26km EDR for unabated impact piling of monopiles (Benhemma-Le Gall *et al.* 2024[50]) and further evidence that the current EDR is over precautionary. The worst-case or highest numbers for cumulative disturbance and PTS from the OWF projects (as identified through review of their relevant ES / PEIR chapters) have been applied to the population modelling which is the basis of the assessment of significance. The iPCoD model is the most appropriate tool to assess the potential long term impacts of disturbance as it considers the consequences of disturbance or injury that might result from the construction of offshore windfarms. The Applicants still consider that use of iPCoD is the best approach to understanding the significance of effect. The model requires detailed demographic information and an

[53] Brown, A.M., Ryder, M., Klementisová, K., Verfuss, U.K., Darias-O'Hara, A.K., Stevens, A., Matei, M., Booth, C.G.(2023). An exploration of time-area thresholds for noise management in harbour porpoise SACs: literature review and population modelling

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					understanding of the relationship between days of disturbance and individual survival and reproduction rates (Sinclair *et al.* 2020[54]) by taking the worst case numbers of disturbance to model a thousand scenarios, and look at population effects on an annual and longer term basis. Therefore, it is considered to be the most appropriate tool to assess cumulative disturbance, so the level of significance of effect remains the same. In addition, the Applicants will ensure the residual effect will be minor adverse for the Projects with the implementation of the final SIP post-consent.
RR-039: F 27	7.11 - Table 11-116	The number of grey seals disturbed during single piling at DBS East, DBS West and both projects together is high, with up to 30.62% of the South-East (SE) England MU disturbed. Using the number of animals potentially disturbed, the magnitude of impact is high, resulting in an impact score of moderate (significant); however, the impact concluded by the Applicant is negligible based on results from the iPCoD modelling.	Natural England advise that the EIA assessment should be updated based on the highest predicted impact values. Where a significant impact cannot be ruled out, the mitigation hierarchy should be explored to reduce the potential impacts.		The quantitative assessment presented in Table 11-116 in section 11.7.3.1.1.2.1.6 of **Chapter 11 Marine Mammals** [APP-095] shows the magnitude for grey seal for cumulative piling effects is high using the EDR / dose response approaches. These numbers are calculated with the worst case assumption that all OWFs will be piling on the same day, and 10.198% and 5.83% of the effect is from other OWFs in the SE England MU and wider MU respectively. However, the Applicants consider that this is over precautionary as it is highly unlikely that all OWFs could be concurrently piling at exactly the same time. The 25km EDR for grey seal is also likely to be over precautionary because it stems from a single study on harbour seal response to OWFs. This study did not account for variations in piling characteristics or the effects of bathymetry on sound propagation. Consequently, the displacement distance of grey seal could vary significantly across sites (Madsen *et al.* 2006[55], Russell *et al.* 2016[56]). Likewise, the dose response curve is based on the behavioural response of harbours seal rather than grey seal. The Applicants maintain the position that the iPCoD model is the most appropriate tool to assess the potential impacts of disturbance as it considers the consequences of disturbance or injury (using the worst case numbers from the OWF projects as identified through review of their relevant ES / PEIR chapters) that might result from the construction of offshore windfarms and therefore the level of significance of effect remains the same.

[54] Sinclair, R. R., Sparling, C. E., & Harwood, J. (2020). Review Of Demographic Parameters And Sensitivity Analysis To Inform Inputs And Outputs Of Population Consequences Of Disturbance Assessments For Marine Mammals. Scottish Marine and Freshwater Science, 11(14), 74. https://doi.org/10.7489/12331-1

[55] Madsen, P.T., Wahlberg, M., Tougaard, J., Lucke, K. and Tyack, P., 2006. Wind turbine underwater noise and marine mammals: implications of current knowledge and data needs. Marine ecology progress series, 309, pp.279-295.

[56] Russell, D.J.F (2016). Movements of grey seal that haul out on the UK coast of the southern North Sea. Report for the Department of Energy and Climate Change (OESEA-14-47).

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: F 28	7.11-1.6.6.3	Natural England supports the Applicant's commitment to a joint industry project or site-based monitoring project, and requests to be consulted on future marine mammal monitoring plans.	To note.		The Applicants welcome Natural England's support for marine mammal monitoring and will look forward to future consultations.
HRA - Document Used: [APP-047] 6.1 RIAA HRA Part 3 of 4 - Annex II Marine Mammals					
RR-039: F 29	6.1-8.3.5.5.1.1	Natural England does not agree with the Applicant screening out PTS from the assessment on the basis of it being screened out from the Cumulative Effects Assessment.	Natural England advise that PTS should be screened into the assessment. See comment F16.		When considering cumulative impacts all projects are required to mitigate PTS to ensure there is no risk of PTS to marine mammals, therefore there would be no Cumulative Effects of PTS. For this reason, PTS has been screened out of the CEA and in-combination assessments. In addition, PTS numbers were incorporated into the population modelling, therefore the potential impact of PTS has been given consideration in the significance of effect at a cumulative level.
RR-039: F 30	N/A	Natural England do not have any significant issues with this part of the application that have not been addressed in other comments.	To note.		The Applicants acknowledge this comment.
RR-039: F 31	N/A	Natural England do not have any significant issues with this part of the application that have not been addressed in other comments.	To note.		The Applicants acknowledge this comment.
RR-039: F 32	6.1-8.3.6.3.2.1.2	Natural England agrees that using ADDs for 145 minutes has the potential to cause excessive disturbance and supports the Applicant using 80 minutes maximum ADD duration; however, if ADD duration will be a maximum of 80 minutes, it will not be long enough for harbour porpoise to flee the injury zone.	See comment F18		The residual effect past the range of the ADD used for mitigation is likely to be a minor significance of effect. The mitigation requirements for the use of ADD will be dependent on the final project design and determined at the post-consent stage in the finalisation of the MMMP and prior to the EPS Licence application. The Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.
RR-039: F 33	General	The conclusions for the RIAA illustrate that the noise thresholds for the SNS SAC would be significantly breached by the Project in combination with other noisy activities. Additional mitigation will therefore likely be needed to avoid an Adverse Effect on Site Integrity (AEoI), however Natural England is concerned that the current approach to implementing Site Integrity Plans (SIPs) for piling impacts to	Natural England strongly advise that the Applicant commit to the use of specific mitigation measures including noise abatement om the Outline SIP and MMMP at this stage, which may be removed at a later date if the revised SIP/MMMP demonstrate they are not		The finalisation of the MMMP for piling and EPS licencing applications post-consent will consider the latest policy on NAS at the time. The Applicants note that potential mitigation options, including NAS, will be listed within the **Outline MMMP (Revision 2)** [document reference: 8.25] and **In Principle SIP for the Southern North Sea SAC (Revision 2)**

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		the Southern North Sea SAC does not allow sufficient time for mitigation methods, such as NAS, to be procured by the Applicant prior to construction should they be required. This increases the risk that an AEoI cannot be avoided. Natural England therefore strongly advise the Applicant to commit to using noise abatement as mitigation at this stage, should driven or part-driven piles be used during construction. Noise abatement systems are proven to reduce the level of noise generated by piling and its propagation through the marine environment. As the noise levels are reduced at or close to the source, the range and area over which noise-related impacts occur will be reduced significantly. In March 2024, MMO and Defra announced the expectation that all offshore wind pile driving activity in English waters should demonstrate that they have utilised best endeavours to deliver noise reductions through the use of primary and/or secondary noise mitigation methods in the first instance from January 2025. This was announced through a workshop and through follow-up materials. Natural England expect that the majority of piling from 2025 onwards will not be able to go ahead without noise abatement in place, for the following reasons: The overall level of noise in the Southern North Sea SAC is increasing due to increasing levels of offshore wind construction and other noisy marine Natural England therefore strongly advise the Applicant to commit to using noise abatement as mitigation at this stage, should driven or part-driven piles be used during construction. Noise abatement systems are proven to reduce the level of noise generated by piling and its propagation through the marine environment. As the noise levels are reduced at or close to the source, the range and area over which noise-related impacts occur will be reduced significantly. In March 2024, MMO and Defra announced the expectation that all offshore wind pile driving activity in English waters should demonstrate that they have utilised best endeavours to deliver noise reductions through the use of primary and/or secondary noise mitigation methods in the first instance from	required. We advise that the effect of noise abatement systems in reducing noise impacts should be included in the submitted assessments. Please see Annex F1 for Natural England's additional guidance on the use/procurement of NAS and the SIP process.		[document reference: 8.26] in response to the MMO's relevant representation, both will be submitted in late November 2024). It should be noted that the Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		January 2025. This was announced through a workshop and through follow-up materials. Natural England expect that the majority of piling from 2025 onwards will not be able to go ahead without noise abatement in place, for the following reasons: The overall level of noise in the Southern North Sea SAC is increasing due to increasing levels of offshore wind construction and other noisy marine activities taking place. Therefore, it will be increasingly difficult to determine no AEoI from cumulative noise disturbance. Projects that do not use noise abatement systems risk contributing to cumulative noise disturbance that could exceed the daily and seasonal thresholds for significant disturbance leading to AEoI, and therefore may not be able to construct as planned. In addition, the large-scale piling campaigns for offshore wind projects risk causing injury and disturbance offences to marine mammals of European Protected Species (EPS), therefore developers typically apply for a wildlife licence to exempt them from an offence under the regulations. A licence can only be granted where the regulator is satisfied that the required legislative tests are met, such as that there is no other satisfactory alternative. We expect it to be increasingly difficult for projects to demonstrate that noise abatement is not a satisfactory alternative. Projects that do not use noise abatement therefore risk not meeting the legislative test needed to be granted a wildlife licence.			
RR-039: F 34	6.1-8.3.5.6	Natural England does not agree with the conclusion of no AEoI for the SNS SAC. The seasonal and daily disturbance thresholds are significantly breached for all scenarios (DBS East, DBS West and both projects together) in combination with other noise activities: • Daily spatial threshold: 57.6% - 65.4% • Seasonal threshold: 33.2% - 35.4% Unless the Applicant commits to mitigation measures which substantially reduces the noise caused by construction (for example alternative foundation design, reduced hammer energy or the use of NAS), the project is at risk of causing AEoI on the SNS SAC.	Natural England advise that the Applicant should commit to mitigation measures which substantially reduce the noise caused by construction (for example alternative foundation design or the use of NAS) in order to conclude no AEoI for the SNS SAC.		With the use of appropriate mitigation and the suggested management measures included and that will be updated in section 9 of the **In Principle SIP for the Southern North Sea SAC (Revision 2)** [document reference: 8.26], it is likely that an adverse effect on the integrity of the SNS SAC will be avoided. This document will be submitted in late November 2024. DML conditions are included within the **Draft DCO** [APP-027] which require the undertaker to submit a detailed SIP to the MMO for approval post-consent prior to piling activities taking place within the SNS SAC. This will present accurate information on the in combination scenario with other noisy activities and include appropriate mitigation based on this scenario. It should be noted that the Applicants are considering the use of NAS as mitigation for underwater noise, and the use of it will be dependent on the final project design and determined at the post-consent stage. NAS is being included within the Projects' procurement strategy as an optional

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
					element to allow it to be called upon should it be required based on the final design parameters.
RR-039: F 35	6.1-Table 8-65, Table 8-89	Natural England cannot agree to the conclusion of no AEoI on grey seals in the Humber Estuary SAC. The Applicant's assessment suggests that more than 9% of the Humber Estuary SAC grey seal population has the potential to be impacted by disturbance from piling (monopile or jacket pin pile) in the OECC. Population modelling has indicated there will be no population level implications of piling at the OECC on the Humber Estuary SAC which the Applicant has based their conclusion on; however, whilst population modelling is useful, it is just one tool for assessment. Natural England does not agree to basing the conclusion on the population modelling alone, and as the assessment outlined in Table 8-65 indicates AEoI, this should be considered as the worst-case scenario. Additionally, the SCOS Report 2023 has identified the number of seals using Donna Nook haul out site, situated within the Humber Estuary SAC is declining (SCOS, 20232) and so a conservative approach should be applied to minimise this decline further.	Natural England advise that the assessment conclusions should be updated based on the highest predicted impact values, for all receptors and pathways. Where an AEoI cannot be ruled out, additional mitigation should be explored to avoid or reduce impacts. Natural England also refer the Applicant to assessments undertaken by other project's making landfall in the area, such as Hornsea Four, who were able to rule out AEoI on grey seals. It is currently unclear why the impacts of Dogger Bank South are predicted to be higher than Projects with cable routes closer to the Humber Estuary SAC.		The Applicants uphold that there would be no AEoI on grey seals in the Humber Estuary SAC as concluded in the **RIAA HRA Part 3 of 4** [APP-047]. Table 8-65 of the **RIAA HRA Part 3 of 4** [APP-047] noted that there could be an adverse effect on site integrity due to piling in the Offshore Export Cable Corridor for the ESP, with up to 9.23% of the Humber Estuary SAC grey seal population potentially being disturbed. Results from the population modelling in section 8.3.6.3.2.1.1 of the **RIAA HRA Part 3 of 4** [APP-047] showed that that were be no adverse effect on the Humber Estuary SAC grey seal population. The EDR and dose response curve method tended to predict the greatest number of disturbed animals per pile. This informed the disturbance numbers that were used as input parameters in the iPCoD modelling. In this way, the iPCoD modelling was used to understand the significance of the worst case related disturbance numbers to the populations of relevance over the whole construction period and in the long term. In the case of disturbance, it was deemed that iPCoD gives the best potential to understand the likely consequences of disturbance to the populations in question. Based on this, the Applicants maintain there would be no AEoI for the Humber Estuary SAC. However, the Applicants are in process of preparing a change request relating to a number of design parameters. The ExA was notified of the Applicants intention to make this change request on the 8th October 2024 (**Change Notification Letter** [PDA-012]). It is expected that the change request will be submitted in early January 2025 following targeted consultation. The change request will be supported by the **Project Change Request 1 – Environmental Assessment Update** [document reference: C1.1] which will describe any resultant changes to the assessment conclusions presented in the ES and RIAA. This information will be consulted upon with relevant stakeholders prior to the submission of the change request in early January. All the changes are expected to be positive i.e. reducing or removing impacts. The change proposed of relevance to this comment is the removal of the ESP from the Offshore Export Cable Corridor and reduction in number of offshore platforms. Therefore, if the intended change is accepted by the ExA, piling along the Offshore Export Cable Corridor would be removed from all construction scenarios. This would further reduce the level of disturbance on the Humber Estuary SAC grey seal population.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: F 36	6.1-Table 8-139, Table 8-143	Natural England cannot agree to the conclusion of no AEoI on grey seals in the Berwickshire North Northumberland Coast (BNNC) SAC. The Applicant's assessment suggests that more than 5% (and therefore a significant number) of the BNNC SAC grey seal population could be disturbed by piling at DBS West and OECC in isolation and together using the dose response approach. Therefore, there is a potential AEoI on the BNNC SAC. We acknowledge that population modelling has indicated there will be no population level implications of piling on the BNNC SAC which the Applicant has based their conclusion on; however, whilst population modelling is very useful, it is just one tool for assessment and the other assessments undertaken must also be considered. Natural England therefore does not agree with the Applicant's conclusion, and since one assessment indicates AEoI, this should be considered as the worst-case scenario.	Natural England advise that the assessment conclusions should be updated based on the highest predicted impact values, for all receptors and pathways. Where an AEoI cannot be ruled out, additional mitigation should be explored to avoid or reduce impacts.		The Applicants maintain the position that the iPCoD model is the best method to assess for long term disturbance and therefore upholds the position that there is no AEoI to the Berwickshire North Northumberland Coast SAC grey seal population as outlined in the **RIAA HRA Part 3 of 4** [APP-047]. However, as mentioned above (RR-039: F 35) the Applicants are in process of preparing a change request relating to a number of design parameters. The change proposed of relevance to this comment is the removal of the ESP from the Offshore Export Cable Corridor and reduction in number of offshore platforms. Therefore, if the intended change is accepted by the ExA, piling along the Offshore Export Cable Corridor would be removed from all construction scenarios. This would reduce the level of disturbance on the Berwickshire North Northumberland Coast SAC grey seal population.
RR-039: F 37	6.1-8.3.5.2.9, 8.3.5.3.9, 8.3.5.5.4	Indirect Effects Natural England disagree that it can be concluded that there is no risk of AEoI to marine mammal SAC features as a result of impacts on prey species, solely due to impacts being ruled out at EIA scale. Consideration has also only been given to temporary construction impacts on prey in the RIAA, rather than the indirect effects of permanent spawning habitat loss that will also occur.	Please see Appendix E for our detailed comments on the indirect effects assessment.		For indirect effects to marine mammals, please see the Applicants' response to RR-039: F 6.
RR-039: Annex F1.1	N/A	Annex F1: Natural England standard advice on SIPs for North Sea Offshore Wind Summary Natural England is concerned that the current approach to implementing Site Integrity Plans (SIPs) for piling impacts to the Southern North Sea SAC from offshore wind development does not allow sufficient time for mitigation methods, such as Noise Abatement Systems (NAS) to be procured by the Applicant prior to construction, should they be required, therefore increasing the risk that an Adverse Effect on Site Integrity cannot be avoided. We strongly advise that the Applicant commit to the use of specific mitigation measures at this stage, which may be removed at a later date if the revised SIP demonstrates they are not required. Further detail regarding our concerns around SIPs can be found in F33.	N/A		The Applicants acknowledge this comment and are considering additional mitigation methods such as NAS to reduce the impact area, should this be required once the final project design is available post-consent. This means NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: Annex F1.2	N/A	Detailed advice The submission of an In-Principle Site Integrity Plan (SIP) offers the opportunity for developers to demonstrate to the ExA/Competent Authority that avoiding AEoI will be possible through appropriate management and mitigation but deferring the ultimate determination to the MMO in the pre-construction phase of the project. It is then anticipated that the SIP will be updated and finalised close to the time (within 1 year) of construction when the extent of noisy activities impacting the designated site in any given season is better known and therefore able to be assessed. This enables the MMO to review the impact of a much-refined, much more realistic worst-case scenario and confirm that the applied for works will not result in an AEoI on the SNS harbour porpoise SAC in-combination with other plans and projects. Whilst this approach carries risk and uncertainty for all parties, it has been accepted as the most pragmatic way forward at this time.	N/A		The Applicants acknowledge this comment.
RR-039: Annex F1.3	N/A	Whilst recognising the potential utility of SIPs to manage in-combination noise impacts, Natural England is not confident that the current approach to SIP implementation will prevent impact thresholds for significant disturbance from being exceeded in the Southern North Sea SAC. Our concerns are as follows: • The SIP approach inevitably defers detailed Habitats Regulations Assessment questions to subsequent decisions. To be a robust approach going forward, it is essential that a comprehensive review be conducted by MMO once the revised piling SIP is submitted to ensure any potential Adverse Effect on Site Integrity of the SAC can be confidently ruled out. There have been instances recently where SIPs have been signed off contrary to Natural England's advice regarding uncertainty in the assessment conclusions. • The final SIP may identify necessary mitigation measures at a time that final project design and financial investment decisions have already been made. As a result, certain mitigation options may no longer be feasible on financial or design grounds e.g. use of alternatives to impact piling; use of pin piles instead of monopiles; use of noise abatement systems; seasonal or other timing restrictions. In particular, feedback from	N/A		The Applicants acknowledge this comment. During the finalisation of the SIP, the Applicants welcome consultation with the MMO and Natural England on the potential in-combination considerations and how to account for other activities that may occur in the SNS SAC summer area at the same time as the Projects but have no licence applications. The Applicants acknowledge that with the current Maximum Design Parameters, the mitigation measures which will be listed in section 5.1 of the updated **In Principle SIP for the Southern North Sea SAC (Revision 2)** [document reference: 8.26] would have to be sufficient to keep the in-combination assessment under the spatial thresholds and acknowledges that there needs to be effective and appropriate mitigation measures in place and is committed to this requirement. It should be noted that the Applicants are considering additional mitigation methods listed in the updated section 9 of the **In Principle SIP for the Southern North Sea SAC (Revision 2)** [document reference: 8.26] which will be submitted in late November 2024. Other mitigation methods such as NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters post-consent. All mitigation methods will be confirmed in the final SIP post-consent to ensure the SNS SAC summer thresholds are not exceeded.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		developers is that by the time that revised SIPs are submitted to MMO for consideration, it is too late to procure Noise Abatement Systems (NAS) should they be required. • The consequence of this is that piling for offshore wind developments can account for substantial parts of the daily and/or seasonal thresholds which SIPs operate to, which in turn may constrain the ability of subsequent projects to not exceed the thresholds. Other industries and activities typically have shorter lead-in times for their licences, meaning their applications are submitted closer to or during the SNS SAC season (summer/winter) they will impact. This means that offshore wind piling SIPs may therefore be signed off in advance of up-to-date information on other projects that may act in-combination being available. An inaccurate revised in-combination assessment may lead to the need for mitigation not being identified at the time of the offshore wind piling SIP and a risk of AEoI being identified too late for appropriate mitigation to then be put in place. • The management measures implemented through SIPs thus far have been limited to co-ordination measures to ensure that activities on a given day do not exceed the daily thresholds. This measure does not reduce the risk of exceeding the seasonal thresholds. Indeed, the seasonal threshold in the Southern North Sea SAC was almost exceeded in summer 2022 and 2023, and there is considerable concern around 2024. The most robust measure to reduce the contribution to the seasonal disturbance is to reduce the impact to the SAC from the project; however, such measures have not yet been implemented through SIPs. Accordingly Natural England has low confidence in appropriate measures being secured to ensure the seasonal threshold is not exceeded. • In any event, the number of offshore wind projects due to undertake piling in the SNS SAC from now to 2030 means that the disturbance impact thresholds are likely to be exceeded by offshore wind piling alone without further mitigation and management. Other industries or activities will only increase this risk, particularly given the aspirations for a range of developments in the southern North Sea (oil and gas, carbon capture and storage etc.).			

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: Annex F1.4	N/A	Given the concerns raised above, we strongly advise that the Applicant commits to specific mitigation measures at this stage, particularly the implementation of NAS, rather than relying on the SIP identifying the requirement for them. Taking this approach would minimise the risk of an Adverse Effect on Site Integrity as far as possible, with the outcome of the revised SIP determining pre-construction if the mitigation measures are still necessary or can be removed. We consider that relevant mitigation options are available to the Applicant and would be happy to engage further with them on the merits of this approach.	N/A		The Applicants note that potential mitigation options, including NAS, will be listed within the **Outline MMMP (Revision 2)** [document reference: 8.25] and **In Principle SIP for the Southern North Sea SAC (Revision 2)** [document reference:8.26], which will be submitted in late November 2024. The Applicants are considering additional mitigation methods such as NAS to reduce the impact area, should this be required once the final project design is available post-consent. This means NAS is being included within the Projects' procurement strategy as an optional element to allow it to be called upon should it be required based on the final design parameters.

2.8 Responses to Appendix I Terrestrial Ecology and Ornithology

Table 2.8.1 Applicants' responses to Natural England's Appendix I Terrestrial Ecology and Ornithology

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
RR-039: I 1	N/A	Air quality impacts to designated sites have been assessed using JNCC decision making thresholds. However, Natural England does not currently accept the use of this document. We therefore advise that the modelling that has been undertaken for the pollutants should be tested against NE's thresholds for impacts due to air emissions from traffic, as detailed in the guidance document NEA001.	Natural England advise that the assessment of air quality impacts to international and national designated sites should be undertaken using the thresholds included in Natural England's published guidance document, NEA001.		This has been addressed separately in **Annex A Technical Note: Comparison of Approaches using the Natural England Guidance NEA001 and JNCC Guidance (for NE RR Appx I)**. As discussed with Natural England in a stakeholder meeting on 30th October 2024, Natural England concur with the findings of the technical note. During the meeting, Natural England requested that **the Report to Inform Appropriate Assessment (RIAA) Habitats Regulations Assessment (HRA) - Part 2 of 4 – Annex I Offshore Habitats and Annex II Migratory Fish (Revision 2)** [APP-046] is updated to reflect the findings of the technical note. The **RIAA Part 2 of 4 – Annex I Offshore Habitats and Annex II Migratory Fish (Revision 2)** [APP-046] will be submitted prior to the start of examination.
Project Parameters - Document(s) Used: [APP-071] 7.5 ES Chapter 5 - Project Description					
RR-039: I 2	General	The project parameters are clearly defined for onshore.	N/A		The Applicants acknowledge this comment.
RR-039: I 3	General	The appropriate worst-case scenario for the project has been assessed.	N/A		The Applicants acknowledge this comment.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
Baseline Characterisation					
RR-039: I 4	General	Natural England considers the baseline characterisation to be appropriate.	N/A		The Applicants acknowledge this comment.
HRA - Document Used: [APP-045] 6.1 RIAA HRA Part 1 of 4 – Introduction and Terrestrial Ecology [APP-049] 6.1.1 Appendix A - Habitats Regulations Assessment Screening [APP-149] 7.18.18.7 ES Appendix 18-7 - Ornithology Overwintering Report Part 1 of 3 [APP-150] 7.18.18.7 ES Appendix 18-7 - Ornithology Overwintering Report Part 2 of 3 [APP-151] 7.18.18.7 ES Appendix 18-7 - Ornithology Overwintering Report Part 3 of 3 [APP-208] 7.26 ES Chapter 26 - Air Quality					
RR-039: I 5	N/A	Natural England agree that all relevant sites and features have been screened into the assessment.	N/A		The Applicants acknowledge this comment.
RR-039: I 6	7.26 - Table 26-20 to 26-26; Section 26.4.3.3.7.3 -para 137	Humber Estuary SPA, SAC and Ramsar - Air quality impacts due to construction traffic, vessel movements and Non-Road Mobile Machinery (NRMM) Table 26-20 – 26-26 of 7.26 includes an assessment of the potential for construction traffic associated with the project to lead to air quality impacts on designated sites. Natural England (NE) notes that impacts to designated sites have been identified using JNCC decision making thresholds (paragraph 137). However, we do not currently accept the use of the thresholds presented in this document. We therefore advise that the modelling that has been undertaken for the pollutants should be tested against Natural England's thresholds for impacts due to air emissions from traffic, as detailed in the guidance document NEA001. Where there is an exceedance of the significance threshold, the potential impacts to notified habitats should be assessed within the Applicant's HRA.	Natural England has actively engaged with the Applicant regarding the approach to the air quality assessment. We understand that the Applicant is currently updating the assessment following advice provided through our Discretionary Advice Service (DAS) for submission into the Examination. Natural England will provide further comment on this matter when the updated assessment has been provided.		This has been addressed separately in **Annex A Technical Note: Comparison of Approaches using the Natural England Guidance NEA001 and JNCC Guidance (for NE RR Appx I)**. As discussed with Natural England in a stakeholder meeting on 30th October 2024, Natural England concur with the findings of the technical note. During the meeting, Natural England requested that **the RIAA HRA - Part 2 of 4 – Annex I Offshore Habitats and Annex II Migratory Fish (Revision 2)** [APP-046] is updated to reflect the findings of the technical note. The **RIAA HRA -Part 2 of 4 – Annex I Offshore Habitats and Annex II Migratory Fish (Revision 2)** [APP-046] will be submitted prior to the start of examination.
RR-039: I 7	7.26 - General	Humber Estuary SPA, SAC and Ramsar - Air quality impacts due to construction traffic, vessel movements and Non-Road Mobile Machinery (NRMM) During the construction phase it is currently unknown where the vessels will be located while they are stationary in port. To provide further information on the potential for air quality	Natural England advise that if the operational port is in the Humber Estuary SAC/SPA, that provision of a Port Management Plan is secured in the DCO to be submitted pre construction, taking		As noted in **Technical Note: Applicants response to Natural England's Section 42 Consultation Responses on Chapter 26 Air Quality** [document number 005127222], the Applicants have excluded the assessment of onshore air quality effects resulting from offshore vessels associated with offshore construction, operation, and decommissioning. The Local Air Quality Management Technical Guidance (LAQM TG22) provides screening

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		impacts, we advise that it would be useful to show the potential alternate routes that could be taken by vessels, in addition to consideration of the size of the vessels, this could be detailed via an outline Port Management Plan.	into account air quality impacts and vessel management.		criteria for the requirement for detailed assessment of vessel emissions. These are as follows: • More than 5,000 large ship movements per year, with relevant exposure within 250m of the berths and main areas of manoeuvring • More than 15,000 large ship movements per year, with relevant exposure within 1km of the berths and main areas of manoeuvring In a worst case scenario, the maximum number of vessel return trips generated during the construction of the Projects (7,512) would be spread over the minimum five-year offshore construction period. Therefore, the mean average maximum number of vessel return trips required per year for construction (1,502) and operation (473) are well below the screening criteria included in LAQM TG22 (Defra, 2022). Notwithstanding this, not all vessel movements generated during the construction and operation of the Projects would complete the same route (i.e., transit in/out along the Humber Estuary) nor would all vessels be in close proximity to sensitive habitats. Therefore, the number of vessels with the potential to impact on any one terrestrial ecological site would be significantly lower than the total number of vessels detailed above. For example, the landfall cable installation vessel will have a maximum of three return trips. The air quality impact from vessel emissions on designated ecological sites is therefore considered to be not significant. This includes the impact from vessel emissions on the Humber Estuary Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar and Site of Special Scientific Interest (SSSI). The Planning Inspectorate agreed with this approach, as stated in the **Scoping Opinion** [APP-232] that this matter may be scoped out of the Environmental Statement (ES) on the basis that the main source of emissions would be exhaust emissions from vessels, and due to the nature and location of the offshore components of the Proposed Development associated vessel movements would only generate a small increase in emissions in all phases, which is unlikely to result in significant effects to land based human and ecological receptors.
RR-039: I 8	7.26 - Section 26.6.1.2.1	Humber Estuary SPA, SAC and Ramsar - Air quality impacts due to construction traffic, vessel movements and Non-Road Mobile Machinery (NRMM) We note that NRMM will be used for application of trenchless crossing techniques, and there can be air quality impacts associated with this. However, provided there are no designated sites within 200m of one of the temporary construction compounds associated with this work, NE would	N/A		As referenced in section 26.5.3.1.2 of **Chapter 26 Air Quality** [APP-208], Table 26-26 highlights the designated sites within 200m of the Onshore Development Area, however, of these locations there are no Temporary Construction Compounds (TCCs) within 200m. Whilst there are no TCCs within 200m of a designated site, as referenced in **Chapter 26 Air Quality Appendix 26-1 Air Quality Consultation Responses** [APP- 210] the exact location that NRMM will be operational

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		agree this matter can be resolved and further assessment of impacts from this source is not required.			within the Onshore Development Area is unknown, including the precise locations of Horizontal Directional Drilling (HDD) compounds. For the purpose of clarity, the Applicants wish to highlight that it may be the case that HDD compounds may be located within 200m of designated sites e.g. Bentley Moor Wood Ancient Woodland. As detailed within section 26.6.1.2.3 of **Chapter 26 Air Quality** [APP-208], given that the source of NRMM emissions would be temporary and short-term during construction only, and controlled by the embedded mitigation measures detailed in Table 26-3 of the ES Chapter, the effect of NRMM emissions on local air quality are expected to be **not significant**. As referenced in the **Outline Code of Construction Practice (OCoCP)** [APP-234], during construction, TCCs would need to consider their distance from sensitive receptors, such as ecologically designated sites and residential areas and ensure that appropriate controls are in place. Air quality measures within the OCoCP [APP-234] (section 6.8.2) require that, when siting NRMM within the working area, consideration is given to locating generators and plant at the greatest distance from receptors in order to reduce the potential for air quality impacts. No further assessment of air quality impacts from TCCs is required.
RR-039: I 9	7.26 - Section 26.3	Humber Estuary SPA, SAC and Ramsar - Air quality impacts due to construction traffic, and Non-Road Mobile Machinery (NRMM) For the use of back-up generators, the location of which are currently undecided at this stage, we advise potential for impacts could be addressed through application of an appropriate distance separation buffer to designated sites, to be demonstrated and secured within the outline Code of Construction Practice.	Natural England advises the outline Code of Construction Practice is updated to include separation buffers for the use of back-up generators.		As noted in **Chapter 26 Air Quality Appendix 26-1 Air Quality Consultation Responses** [APP- 210], details of the number and capacity of back-up generators are not yet known; however, any local air quality impact is very unlikely to be significant. Given their purpose, such plant operate very infrequently, although need to be regularly tested, but typically this is for a short time, on a periodic basis, such as weekly or monthly. Generators which have a thermal input rating greater than 1MWth will require an operational Environmental Permit. Emergency standby generators which are tested <50 hours/year are exempt from the 'Specified Generator' requirements, but they are still classed as 'Medium Combustion Plants'. The new units would be considered in aggregate capacity, according to the rated thermal input not electrical output. Depending on various factors including the location, a Standard Rules Permit may be available. The Applicants will apply for and have in place the requisite Permit(s), which if required, would consider any potential impacts upon ecological sites, for its back-up power provision at the appropriate time. Given the controls that are in place through the implementation of mitigation measures captured within the **OCoCP** [APP-234], and the requirement for back-up generators to obtain an Environmental Permit (if necessary) the Applicants are not proposing to include a set separation distance buffer to designated sites in the Code of Construction Practice

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
					(CoCP), but will ensure that works close to designated sites are minimised, as detailed in paragraphs 252 and 256 of the **OCoCP** [APP-234].
RR-039: I 10	General	We consider that the appropriate plans and projects have been included in the in-combination assessment.	N/A		The Applicants acknowledge this comment.
RR-039: I 11	7.18.18.7	Humber Estuary SPA and Ramsar - Disturbance and/or loss to functionally linked land (FLL) Natural England agrees with the conclusion of no AEoI for this impact pathway. Natural England has reviewed the Overwintering Bird Report (dated 30/09/2023), submitted as Environmental Statement Appendix 18-7, and section 5.4.2 of the RIAA which details the Functionally Linked Land Assessment. Based on the information provided, Natural England is satisfied that the survey effort is sufficient to rule out impacts to functionally linked land in this case because: The desktop survey did not identify any records of any SPA bird species within the 'potential FLL' or in the immediate vicinity. The surveys did not identify any SPA bird species in significant numbers. The distance from the Humber Estuary SPA is circa 10km. The proposed development within 10km of the Humber Estuary SPA are temporary works only.	N/A		The Applicants acknowledge this comment.
Assessment of SSSI impacts - Document Used: [APP-208] 7.26 ES Chapter 26 - Air Quality [APP-149] 7.18.18.7 ES Appendix 18-7 - Ornithology Overwintering Report Part 1 of 3 [APP-150] 7.18.18.7 ES Appendix 18-7 - Ornithology Overwintering Report Part 2 of 3 [APP-151] 7.18.18.7 ES Appendix 18-7 - Ornithology Overwintering Report Part 3 of 3 [APP-160] 7.19.19.1 ES Appendix 19-1 - Geology and Land Quality Consultation Responses					
RR-039: I 12	7.26 – Table 20-26	Air quality impacts due to vehicle movements during construction - Burton Bushes SSSI Natural England agrees that traffic impacts to Burton Bushes SSSI can be scoped out following the clarification that the number of traffic movements, alone and in combination, will not be in exceedance of NE's impact thresholds as provided in guidance document NEA001 (Table 20-26, ES Chapter 26).	N/A		The Applicants would like to clarify the appropriate Table reference should be Table 26-26 of **Chapter 26 Air Quality** [APP-208] Table 1 of Annex A - Technical Note: Comparison of Approaches using the Natural England Guidance and Joint Nature Conservation Committee (JNCC) Guidance specifies Burton Bushes SSSI is screened out when using both the JNCC and NEA001 criteria. The technical note was discussed with

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		We also note that NRMM will be used for application of trenchless crossing techniques, and there can be air quality impacts associated with this. However, provided there are no designated sites within 200m of one of the temporary construction compounds associated with this work, we would agree this matter can be resolved and further assessment of impacts from this source is not required.			Natural England in a stakeholder meeting on 30th October 2024, in which Natural England concurred with the findings of the technical note. As referenced in section 26.5.3.1.2 of **Chapter 26 Air Quality** [APP-208], Table 26-26 highlights the designated sites within 200m of the Onshore Development Area, however, of these locations there are no TCCs within 200m. As referenced in the **OCoCP** [APP-234], during construction, TCCs would need to consider their distance from sensitive receptors, such as ecologically designated sites and residential areas and ensure that appropriate controls are in place. No further assessment of air quality impacts from TCCs is required.
RR-039: I 13	7.26 - Table 26-20 to 26-26; Section 26.4.3.3.7.3	Humber Estuary SSSI - Air quality impacts due to vehicle movements, vessel movements and NRMM With regards to air quality impacts due to vehicle movements, vessel movements and NRMM, our comments are as above for Humber Estuary SPA, SAC and Ramsar (see comments I6 to I9).	Natural England will provide further comment on this matter when the updated assessment has been provided.		Please refer to responses RR-039: I 6 to RR-039: I 9.
RR-039: I 14	7.18.18.7	Humber Estuary SSSI - Disturbance and loss to functionally linked land Our advice on this impact pathway is as advised for the Humber Estuary SPA and Ramsar – see comment I11.	N/A		The Applicants acknowledge this comment.
RR-039: I 15	7.19.19.1	Withow Gap SSSI - Damage to the geological feature during installation of the cable route Following the choice of the northern landfall point outlined in the DBS Flood Risk and Geology Expert Topic Group meeting on 7th December 2023, Natural England is satisfied that the proposed works are unlikely to impact Withow Gap SSSI due to their distance from the site.	N/A		The Applicants acknowledge this comment.
Other Onshore Related Matters - Document Used: [APP-140] 7.18 ES Chapter 18 - Terrestrial Ecology and Ornithology [APP-169] 7.21 ES Chapter 21 - Land Use					
RR-039: I 16	General	Natural England has adopted standing advice for protected species, which includes guidance on survey and mitigation measures. Natural England is not providing bespoke advice on the protected species information provided in the ES for this project.	Requirements for mitigation have not been assessed by Natural England at this stage. However, we welcome that the requirement to obtain a protected species licence has been secured within		The Applicants are engaged in this process and will continue to consult with Natural England during the examination period in regard to obtaining a Letter of No Impediment (LONI) for bats and badgers

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		A separate protected species licence from Natural England or Defra may be required. Applicants should refer to the guidance at Wildlife licences: when you need to apply to check to see if a mitigation licence is required. Applicants can also make use of Natural England's charged service Pre Submission Screening Service for a review of a draft wildlife licence application. Natural England can then review a full draft licence application to issue a Letter of No Impediment (LONI) which explains that based on the information reviewed to date, that it sees no impediment to a licence being granted in the future should the DCO be issued. See Advice Note Eleven, Annex C – Natura England and the Planning Inspectorate | National Infrastructure Planning for details of the LONI process.	the DCO in Schedule 2, part 1 (requirement 23).		
RR-039: I 17	7.18 - Section 18.4.5.3	Protected species – Great crested newt It is stated in Section 18.4.5.3 that ponds that did not contain any water but retained evidence of having previously been a pond were classified as 'Dry' and great crested newt (GCN) considered absent. While it was highly likely GCN were not present when the pond was dry, ponds that dry out occasionally make them more suitable for GCN as it kills any fish and other potential predators. Consideration should be given to further survey of the pond to determine if it has permanently dried out or if it was an occasional drying event and whether GCN are present.	Natural England is aware that the Applicant will be applying to use the District Level Licencing (DLL) scheme for this development. Our advice is as stated in the above comment (I16).		A District Level Licence for great crested newts has been applied for and the Impact Assessment & Conservation Payment Certificate (IACPC) has been accepted and countersigned by Natural England. The IACPC can now be used for formal planning purposes.
RR-039: I 18	7.18.18.10 - General	Natural England has not undertaken a detailed assessment of the metric calculations provided within 7.18.18.10. However, we have provided general advice on incorporation of Biodiversity Net Gain (BNG) within NSIP proposals below. The Environment Act 2021 includes NSIPs in the requirement for BNG. The biodiversity gain objective for NSIPs is defined as at least a 10% increase in the pre-development biodiversity value of the on-site habitat. The biodiversity baseline should include all land contained within the site's red line boundary and proposals can be iteratively refined over time and throughout detailed design. We encourage developers to:	We welcome the commitment to delivering BNG on this project. We note that the Schedule 2, Part 1, requirement 32 of the DCO secures the completion of a BNG strategy prior to any commencement of works. Natural England would welcome the opportunity to be consulted on this document. Biodiversity gains should ideally be secured for a minimum of 30 years and be subject to adaptive management and monitoring. We would also recommend a minimum of 10% BNG is secured in the DCO wording.		The Applicants have committed to delivering a no net loss outcome and Biodiversity Net Gain (BNG) gain, where possible as outlined in **Appendix 18-10 Biodiversity Net Gain Strategy** [APP-157]. The baseline includes all land contained within the Order Limits and the Applicants have committed to updating the BNG Strategy with the detailed design prior to commencement of construction. The BNG Strategy has been developed using the Statutory Biodiversity Metric, Annex A and Annex **B of Appendix 18-10 Biodiversity Net Gain Strategy** [APP-157]. The Applicants approach to the BNG Strategy was discussed with Natural England in a stakeholder meeting on 30th October 2024, in which Natural England confirmed they were satisfied with the strategy and encouraged the Applicants to achieve 10% net gain. Natural England confirmed they had no further comments at present.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		• develop their BNG proposals in adherence with well-established BNG principles. • use the latest version of the Defra biodiversity metric, adhering to the metric guidance.			
RR-039: I 19	7.21 - Section 21.4.3.2 and general	It should be noted that the 2000 Ministry of Agriculture, Fisheries and Food (MAFF) guidance has now been superseded by the Good Practice Guide for Handling by the Institute of Quarrying (2021). Natural England supports the provision of supervision measures relevant to soil management and handling of soils; we advise this role should be held by competent soil specialist and secured in the OLEM. Natural England advises that soil surveyors should be named with a list of qualifications and experience on the Agricultural Land Classification (ALC) survey submitted as part of the DCO. Natural England supports this approach and the commitment to provide a final Soil Management Plan (SMP) prior to construction. Natural England advises that all soils should only be handled in a dry and friable condition, and it is expected that soil handling will be confined to the drier summer period (April through September) to minimise risk of soil damage. This would minimise the need to recondition soils, which requires additional space and time. This is particularly important for land to be restored to agricultural use. Soil handling methods should normally be as specified as in the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Natural England welcomes the inclusion of toolbox talks. We welcome the inclusion of stop notices for specific weather events, however where soils are to be placed into long term storage, we would advise that soil handling should normally be avoided during October to March inclusive, irrespective of soil moisture conditions, because it will generally not be possible to establish green cover over winter to help dry out soils and protect them from erosion. We welcome use of the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009) to guide soil management during construction. Alongside this there should also be a commitment for BMV agricultural temporality required for the development to be returned to its original ALC grade. This includes areas such as field scale ecological mitigation areas and borrow pits where	Natural England advise production of the final SMP should be secured within the DCO wording. We advise that the outline SMP should be updated with the recommendations listed here as needed.		The Outline Soil Management Plan (OSMP), Appendix A of the **OCoCP** [APP-234] will be updated to reference the Good Practice Guide for Handling by the Institute of Quarrying (2021). The Applicants acknowledge Natural England's support of the approach to prepare a final Soil Management Plan (SMP) prior to construction and will update the wording in paragraph 80 of the OSMP Appendix A of the **OCoCP** [APP-234] to confirm that a competent soil specialist will undertake Regular inspections in line with the detailed SMP and to monitor compliance. The additional Agricultural Land Classification (ALC) survey results issued to the Planning Inspectorate on the 8th October 2024 in the **Soil Resource Assessment Survey Results** [PDA-015] will be appended to the updated OSMP Appendix A of the **OCoCP** [APP-234]. In addition, details of the soil surveyors and a list of qualifications and experience on the ALC survey submitted will be added. Although the Applicants have stated the period of March to October in section 4.4 of the OSMP Appendix A of the **OCoCP** [APP-234], the time periods are to be taken as indication only and would be led by assessment of soil conditions by a competent soil specialist. If conditions were too wet at the beginning and end of this period in March and October, soil handling would cease. Further clarification will be added to the updated OSMP. The Applicants agree that topsoil handling for long term storage needs to allow sufficient time for green cover to establish prior to the winter and seeding needs to take place no later than September to allow establishment. This will be clarified in the updated OSMP. The Applicants can confirm that soils will be returned to their to original configuration, reinstatement would return soils, including their Best and Most Versatile (BMV) status to the original functionality, following an appropriate managed aftercare period, as set out in section 4.7 of the OSMP Appendix A of the **OCoCP** [APP-234]. An update will be added in section 4.7.1 of the OSMP to make that clear. The Applicants can confirm that inspections would be undertaken monthly as a minimum and a schedule confirmed in the SMP, when the Contractor and soil specialists have been appointed. This will also be clarified in paragraph 80 of the updated OSMP.

I.D.	Ref	Relevant Representation	Natural England's Recommendations to Resolve Issues	Risk	Applicants' Comment
		reinstatement to the physical characteristics of 'best and most versatile' quality may also be required. Natural England requests clarification on the frequency of inspections to be undertaken by the soil specialists to ensure soil is being managed in line with the detailed Soil Management Plan. In all cases topsoil and subsoil must be separately handled to avoid mixing. Where soils are stored, the different soil types will need to be kept separated in the storage bunds. This should be reflected in the SMP accompanied with a detailed soil balance. Where continuous bunds are used dissimilar soils shall be separated by a third material. Natural England welcome the intention to re-use surplus topsoil and subsoil in landscaping. An overarching soil budget should be presented which sets out the total soil excavated (split by soil type) and the total soil restored (split by soil type) to clearly demonstrate that all soil resources are being re-used on site.			Where different soil types are identified they will be kept separated the SMP will include the volume of each soil type and details of differing subsoil materials. This will be confirmed in the updated OSMP. An overarching soil budget can be included in the SMP, prior to construction when the Contractor and soil specialists have been appointed. At the Substation Zone where the Permanent above ground infrastructure is being constructed, it may not be possible to reuse all material on site, but it will be considered wherever possible and appropriate. This will be confirmed in the updated OSMP. The Applicants propose to submit an updated OSMP Appendix A of the **OCoCP** [APP-234], Revision 2 in late November 2024. Requirement 19 of the **Draft Development Consent Order (DCO)** [APP-027] states that '*No phase of the onshore works may commence until a code of construction practice (which must accord with the outline code of construction practice) for that phase has been submitted to and approved by the relevant planning authority following consultation as appropriate with the Environment Agency, Natural England and, if applicable, the MMO. The production of the final SMP should be secured within the DCO wording.*' The OSMP forms Appendix A of the **OCoCP** [APP-234], which states in Table 3-1 that the OSMP will be refined as part of the detailed CoCP(s) approved under DCO requirement 19, upon appointment of a Principal Contractor(s) and Agricultural Liaison Officer. Paragraph 225 also states that '*The OSMP will be a live document and will be further updated ahead of and during construction and will become the detailed Soil Management Plan (SMP). The SMP will be adhered to by the Principal Contractor(s) and its subcontractors to minimise potential degradation impacts to soil associated with the Projects.*' The Applicants do not therefore consider that the wording in the DCO needs to be amended.

Annex A Technical Note: Comparison of Approaches using the Natural England Guidance NEA001 and JNCC Guidance (for NE RR Appx I)

DBS Offshore Wind

RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Technical Note: Comparison of Approaches using the Natural England Guidance NEA001 and JNCC Guidance

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1 Comparison of Approaches using Natural England Guidance NEA001 and Joint Nature Conservation Committee Guidance for the Assessment of Road Traffic Emissions on Designated Ecological Sites for Dogger Bank South Offshore Wind Farms

1.1 Introduction

1. This document provides a comparison in support of the use of the Joint Nature Conservation Committee (JNCC) approach for assessing road traffic emissions on designated ecological sites for Dogger Bank South (DBS) East and West Offshore Wind Farms, collectively known as DBS Offshore Wind Farms (herein 'the Projects or Project'). This is in response to Natural England's (NE's) consultation response, dated 24th May 2024 regarding the Technical Note submitted to NE (dated 5th April 2024, Document Number: 005127222) detailing the Applicants' response to NE's Section 42 Consultation Responses and assessment of potential air quality impacts on ecological receptors within the Dogger Bank South Offshore Wind Farms Air Quality Chapter **(Chapter 26 Air Quality** [APP-208]**).**

2. This document deals specifically with responding to NE's position on the topic of 'Air quality emission thresholds for traffic movements (construction)', which states:

   'Natural England (NE) note the Applicant has produced an air quality screening assessment and has used the JNCC Decision Making Thresholds project to identify potential impacts to designated sites. However, we advise that NE do not currently accept the use of this document due to uncertainty on what assumptions have been built into the modelling. The report requires further review before use by other projects and may only be applicable in certain circumstances. We therefore advise that the modelling that has been undertaken for the pollutants should be tested against NE's thresholds for impacts due to air emissions from traffic, as detailed in the guidance document NEA001'

3. This technical note:

- Describes the methodology used for the road traffic emissions dispersion modelling study undertaken in line with NE's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations NEA001 (herein referred to as NEA001) (Natural England, 2018).
- Presents a comparison analysis between the results of the road traffic emissions assessment on designated sites using dispersion model outputs following the guidance document NEA001 (Natural England, 2018) and the results of the approach used in the ES **Chapter 26 Air Quality** [APP-208] herein referred to as the JNCC approach (Chapman and Kite, 2021a and 2021b).
- For additional context, presents a comparison of the NEA001 dispersion model approach against the JNCC approach along 200m transects, perpendicular to either side of a main road, in order to graphically present the differences in outputs between the two approaches along a continuous transect.

4. This Technical Note should be read in conjunction with 'Technical Note: Applicants' Response to Natural England's Section 42 Consultation Responses dated 25th November 2022', submitted 5th April 2024 (document reference 005127222) and **Chapter 26 Air Quality** [APP-208] of the Environmental Statement.

1.2 Methodology

1.2.1 Scenarios

5. The scenarios assessed are as per those detailed in **Chapter 26 Air Quality** [APP-208] of the Environmental Statement (ES). This technical note focusses on the 'Concurrent' Scenario (both DBS East and DBS West are built at the same time) as this scenario results in greater construction traffic flows than the 'In-isolation' Scenario. Therefore, this represents a 'worst case' scenario for the purposes of this technical note. Results of the 'In-isolation' scenario are included in **Appendix A**.

1.2.2 Road Traffic Data

6. The traffic data used in the assessment is the same as that detailed in the Environmental Statement **Appendix 26-3 Air Quality Assessment Traffic Data** [APP-212].

1.2.3 JNCC Approach

7. Details of the JNCC approach are presented in Section 26.4.3.3.7 of **Chapter 26 Air Quality** [APP-208].

1.2.4 Screening

8. All road links within the traffic and transport study area were screened against the criteria outlined in NEA001, as described below:

- A change of daily traffic flows of 1,000 Annual Average Daily Traffic (AADT) or more; and/or
- A change in Heavy Duty Vehicle (HDV) flows of 200 AADT or more.

9. Ecologically designated sites were screened to select those within 200m of the road links that triggered the above screening criteria.

10. The designated ecological sites that were screened into the assessment (i.e. within 200m of screened in road links) using NEA001 were compared against the designated sites screened in using the JNCC approach. This is presented in **Table 1**.

11. It should be noted that the NEA001 guidance "*describes how Natural England advises competent authorities on the assessment of plans and projects (as required by the Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations')) likely to generate road traffic emissions to air which are capable of affecting European Sites.*" The "*guidance does not specifically cover nationally significant sites such as Sites of Special Scientific Interest (SSSIs), which are covered by a different regulatory framework. However, the general principles for air quality assessment outlined here for European Sites are likely to be equally relevant for this and other designations.*" Non-European Sites have been included in this technical note in addition to European Sites in order to provide comparison with all sites considered when using the JNCC approach in the ES.

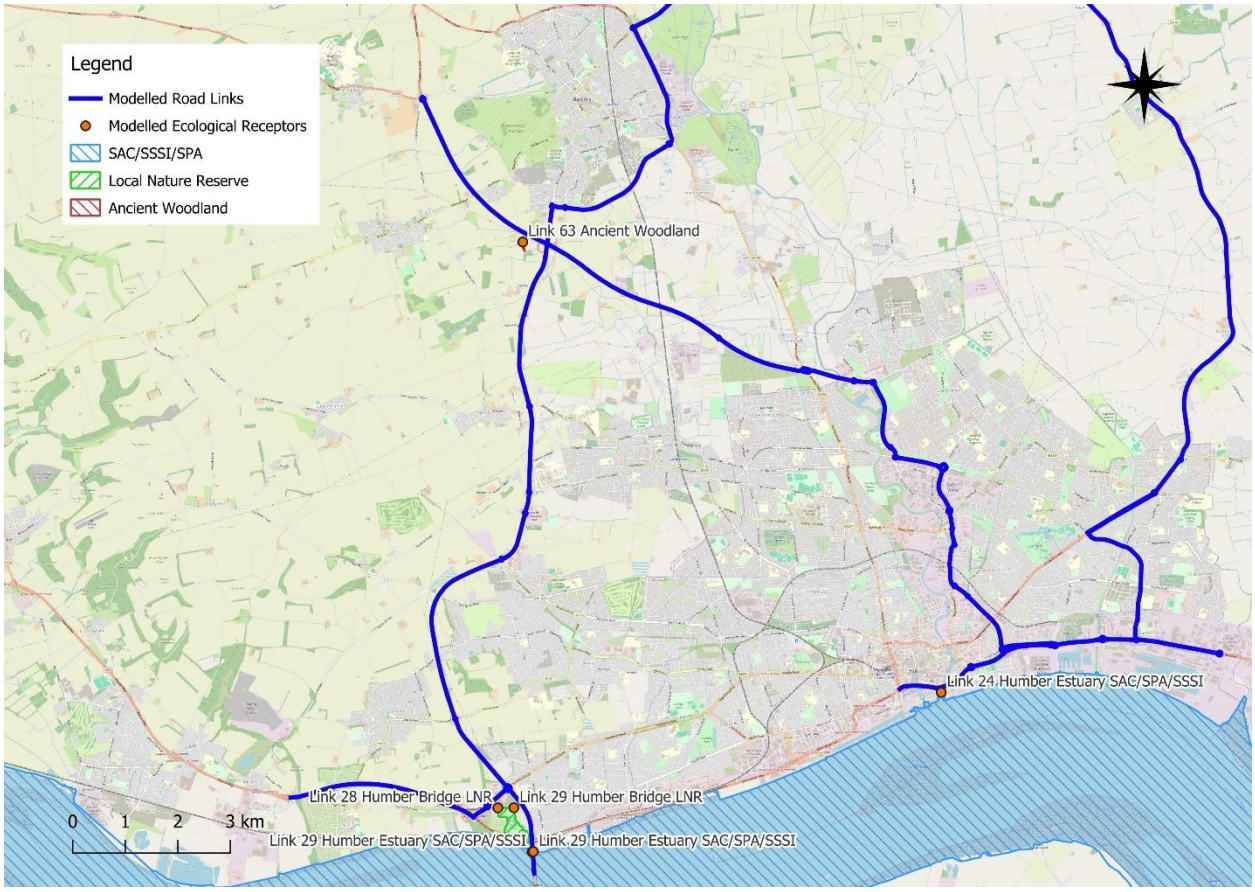
Table 1: Designated ecological sites screened in using the NEA001 and JNCC approaches

Link	Designated Ecological Site		Screened in for Further Assessment – JNCC	Screened in for Further Assessment – NEA001
	Site Type	Name		
4	Site of Special Scientific Interest (SSSI)	Skipsea Bail Mere	No*	No*
5	SSSI	Skipsea Bail Mere	No*	No*
6	SSSI	Skipsea Bail Mere	No*	No*
24	Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar Site and SSSI	Humber Estuary	Yes	Yes
28	Local Nature Reserve (LNR)	Humber Bridge	Yes	Yes
29	SAC, SPA, Ramsar and SSSI	Humber Estuary	Yes	Yes
62	SSSI	Burton Bushes	No	No
	Ancient Woodland (AW)	Burton Bushes	No	No
63	AW	Bentley Moor Wood	Yes	Yes

*As not sensitive to air quality impacts.

12. **Table 1** shows that the same designated ecological sites were screened in for further assessment using both the JNCC approach criteria and the NEA001 criteria. These sites include the Humber Estuary SAC, SPA, Ramsar and SSSI, Bentley Moor Wood AW and the Humber Bridge LNR. Assessed receptors are show in **Figure 1**.

Figure 1: Assessed ecological receptor locations



1.2.5 Dispersion Model

13. The Atmospheric Dispersion Modelling System for Roads (ADMS-Roads) v5.0.1.3 was used to predict annual average pollutant concentrations of nitrogen oxides (NOx) and ammonia (NH_3) as a result of traffic emissions both with and without the Projects at receptor points within the screened in designated ecological sites.

14. The traffic data, meteorological data and surface roughness conditions used were as per those detailed in section 26.4.3.3.5 of **Chapter 26 Air Quality** [APP-208].

1.2.6 Emissions Factors

15. Defra's Emissions Factors Toolkit (EFT) (v12.0.1) (Defra, 2021b) was used to derive emission rates for NOx. The EFT does not provide vehicle emission factors for NH_3. Therefore, to enable quantification of the impact of NH_3 from road traffic, the Air Quality Consultants tool 'Calculator for Road Emissions of Ammonia (CREAM) V1A' was used to provide NH_3 emission factors for inclusion within the model (Air Quality Consultants, 2020b).

1.2.7 Modelled Receptor Locations

16. At each identified designated site, a receptor transect was added, starting at the closest point(s) within the site to the road(s) which trigger the screening criteria (the 'screened in' road links) and extending perpendicularly from the road to a distance of (up to) 200m from the screened in road edge. Beyond 200m of the road edge, impacts are considered to be insignificant as sufficient dilution and dispersion of pollutants will occur across this distance to the point at which any effects will be not significant (Institute of Air Quality Management (IAQM), 2020).

1.2.8 Backgrounds, Critical Levels and Critical Loads

17. Background concentrations and deposition rates considered in the ecological assessment are presented in **Table 26-29** of **Chapter 26 Air Quality** [APP-208]. Critical Levels (CLe) for NOx (30 μgm^{-3}) and NH_3 (1 μgm^{-3} or 3 μgm^{-3}) and Critical Loads (CL) for nutrient nitrogen and acid deposition considered in the assessment are presented in **Table 26-27** of **Chapter 26 Air Quality** [APP-208].

1.2.9 Model Post Processing

18. Model verification was undertaken following the method detailed in Section 26.4.3.3.5.6 Model Verification of **Chapter 26 Air Quality** [APP-208] and two separate NOx adjustment factors were applied to represent the difference in local conditions within the City of Hull and the East Riding of Yorkshire.

19. In order to calculate deposition from NOx, the modelled NOx road contribution was converted to NO_2 using the NOx to NO_2 calculator (v8.1) (Defra, 2020c), in accordance with Defra guidance (Defra, 2022b).

20. The NO_2 and NH_3 concentrations were then processed following IAQM guidance on the assessment of air quality impacts on designated nature conservation sites (IAQM 2020) and Air Quality Advisory Group 'technical guidance on detailed modelling approach for an appropriate assessment for emissions to air' (AQTAG06 2014) to determine nutrient nitrogen deposition and acid deposition at each modelled transect point. Deposition velocities and conversion factors used in the assessment are presented in **Table 2**.

Table 2: Deposition velocities and conversion factors for NO_2 and NH_3

Pollutant	Deposition velocity – grassland ms^{-1}	Deposition velocity – Woodland ms^{-1}	Conversion factor to kg N ha^{-1} $year^{-1}$	Conversion factor to keq ha^{-1} $year^{-1}$
NO_2	0.0015	0.003	95.9	6.84
NH_3	0.02	0.03	260	18.5

1.2.10 Assessment Criteria

21. The same assessment criteria were used as per **Chapter 26 Air Quality** [APP-208].

1.3 Project Specific Modelling Results

22. **Table 3** - **Table 10** present the contribution of the Concurrent Scenario 'Project-alone' and 'In-combination' (i.e., Project traffic, 2022 to 2026 traffic growth plus cumulative projects and committed development traffic). In the result tables below, 'PC' refers to the 'Process Contribution', which is the increase (or decrease) caused by project traffic. PC values in exceedance of 1% of the Critical Level or Load, i.e., those which cannot be considered to be insignificant, are shown in bold text.

23. 'PEC' is the 'Predicted Environmental Concentration', which is the Project PC plus the background concentration or deposition rate (as appropriate). PEC values in exceedance of 100% of the Critical Level or Load are shown in in bold text.

24. The NEA001 dispersion model approach results for each pollutant are compared against the results of the JNCC approach, as provided in Section 26.6.1.3.2.2 of **Chapter 26 Air Quality** [APP-208].

1.3.1 Nitrogen Oxides (NOx)

25. The NEA001 dispersion model approach PC and PEC for NOx are presented in **Table 3** and **Table 4,** respectively, along with a comparison with the results in **Chapter 26 Air Quality** [APP-208] as to whether any material changes in significance would be expected.

Table 3: Concurrent Scenario – JNCC approach compared to maximum NEA001 dispersion model approach PC of Project-generated/In-combination NOx from traffic on designated ecological site features. Values in exceedance of 1% of the Critical Level (CLe) are shown in bold.

Link	Designated Ecological Site		JNCC Approach			NEA001 Dispersion Model Approach		Approach with Higher Conc.	Difference		
	Site Type	Name	Distance From Road Link (m)	Conc. µgm-3	% of CLe	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe	Comparison with Chapter 26 Air Quality [APP-208]
Project-alone (i.e., Concurrent Scenario) Contribution											
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	0.13	0.42%	0.06	0.22%	JNCC	0.07	0.20%	Both approaches show that there is not the potential for significant effects. No material change from Environmental Impact Assessment (EIA).
28	LNR	Humber Bridge	150	0.08	0.26%	0.10	0.33%	NEA001 dispersion model	0.02	0.07%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	0.08	0.28%	0.01	0.03%	JNCC	0.07	0.25%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
29	LNR	Humber Bridge	35	0.08	0.25%	0.01	0.05%	JNCC	0.07	0.20%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
63	AW	Bentley Moor Wood	162	*	*	0.13	0.44%	*	*	*	NOx impacts screened out when using the JNCC approach. NEA001 dispersion model approach predicts that there is not the potential for significant effects.
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)											
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	0.69	**2.31%**	0.24	0.80%	JNCC	0.45	1.51%	JNCC approach shows the potential for significant effects, NEA001 dispersion model approach does not. This would remove a potential significant effect from the EIA.
28	LNR	Humber Bridge	150	0.30	**1.01%**	0.34	**1.14%**	NEA001 dispersion model	0.04	0.13%	Both approaches show that there is the potential for significant effects. No material change from EIA.
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	0.70	**2.33%**	0.04	0.13%	JNCC	0.66	2.20%	JNCC approach shows the potential for significant effects, NEA001 dispersion model approach does not. This would remove a potential significant effect from the EIA.
29	LNR	Humber Bridge	35	0.64	**2.12%**	0.07	0.22%	JNCC	0.57	1.90%	JNCC approach shows the potential for significant effects, NEA001 dispersion model approach does not. This would remove a potential significant effect from the EIA.
63	AW	Bentley Moor Wood	162	*	*	0.42	**1.40%**	*	*	*	NOx impacts screened out when using the JNCC approach. NEA001 dispersion model approach predicts that there is the potential for significant effects.

* The increase in AADT did not exceed the distance based screening criteria detailed in the JNCC guidance and therefore was not screened in for further assessment.

Table 4: Concurrent Scenario - JNCC approach compared to maximum NEA001 dispersion model approach PEC of NOx from traffic on designated ecological site features (including background concentrations). Values in exceedance of 100% of the CLe are shown in bold.

Link	Site Type	Designated Ecological Site		JNCC Approach		NEA001 Dispersion Model Approach		Approach with Higher Conc.	Difference		
		Name	Distance From Road Link (m)	Conc. µgm-3	% of CLe	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe	Comparison with Chapter 26 Air Quality [APP-208]
Project-alone (i.e., Concurrent Scenario) Contribution											
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	22.07	73.56%	22.01	73.35%	JNCC	0.06	0.21%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
28	LNR	Humber Bridge	150	13.75	45.85%	13.78	45.92%	NEA001 dispersion model	0.03	0.07%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	14.21	47.37%	14.14	47.13%	JNCC	0.07	0.24%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
29	LNR	Humber Bridge	35	14.20	47.35%	14.14	47.14%	JNCC	0.06	0.21%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
63	AW	Bentley Moor Wood	162	*	*	10.03	33.43%	*	*	*	NOx impacts screened out when using the JNCC approach. NEA001 dispersion model approach predicts that there is not the potential for significant effects.
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)											
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	22.63	75.45%	22.18	73.39%	JNCC	0.45	1.52%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
28	LNR	Humber Bridge	150	13.98	46.59%	14.02	46.73%	NEA001 dispersion model	0.04	0.14%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	14.83	49.42%	14.17	47.23%	JNCC	0.66	2.19%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
29	LNR	Humber Bridge	35	14.77	49.22%	14.19	47.31%	JNCC	0.58	1.91%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
63	AW	Bentley Moor Wood	162	*	*	10.32	34.39%	*	*	*	NOx impacts screened out when using the JNCC approach. NEA001 dispersion model approach predicts that there is not the potential for significant effects.

* The increase in AADT did not exceed the distance based screening criteria detailed in the JNCC guidance and therefore was not screened in for further assessment.

26. **Table 3** shows that the NEA001 dispersion model approach NOx concentrations were predicted to be lower than those from the JNCC approach at both receptor locations at the Humber Estuary SAC/SPA/Ramsar/SSSI, and at the Humber Bridge LNR receptor located closest to road link 29. This same trend in pollutant concentrations is observed across both the Projects alone and in-combination for both the In-isolation **(Appendix A)** and Concurrent assessment scenarios. Higher concentrations were reported by the NEA001 dispersion model approach than by the JNCC approach for only one receptor location – the receptor located at Humber Bridge LNR, southeast of road link 28 in the Concurrent Scenario both alone and in-combination.

27. The difference between NEA001 dispersion model approach and JNCC approach NOx PCs at the link 28 Humber Bridge LNR receptor point was negligible. The NEA001 dispersion model approach predicted 0.02 μgm^{-3} and 0.04 μgm^{-3} higher concentrations than the JNCC approach in the Project-alone and in-combination scenarios, respectively. These differences can be attributed to the modelled contribution of the roundabout approximately 162m east, upwind from the receptor point. The JNCC approach assumes a perpendicular distance from a linear road source, as demonstrated in the idealised scenario in section 1.4. However, the NEA001 dispersion model approach will account for the additional influence of the Link 28 roundabout within 200m of the receptor. The roundabout has a high traffic flow (33,487 AADT) which is enough to account for these differences in concentrations.

28. For the link 28 Humber Bridge LNR receptor, both approaches predict an increase of less than 1% of the Critical Level from Project-alone traffic, and when in-combination traffic is considered, both approaches predict increases marginally greater than 1% of the Critical Level. However, as shown in **Table 4**, both approaches predict the PEC to be well below (<75% of) the Critical Level (46.59% and 46.73% respectively). Therefore, despite an in-combination PC impact marginally greater than 1% of the Critical Level, the PEC impacts are considered to be not significant. This conclusion aligns with that of **Chapter 26 Air Quality** [APP-208].

29. **Table 3** shows that the Bentley Moor Wood AW in-combination increases in AADT did not exceed the distance-based screening criteria used in the JNCC approach and therefore was not brought forward for further assessment in **Chapter 26 Air Quality** [APP-208]. This site exceeded the NEA001 in-combination AADT and HDV screening criteria and therefore was included in the NEA001 dispersion model approach. The NEA001 dispersion model approach predicted a Project-alone impact of less than 1% (0.44%) of the NOx Critical Level and an in-combination impact of marginally greater than 1% (1.40%) of the Critical Level. Therefore, there may be the potential for significant effects. However, the total NOx PEC does not exceed the Critical Level (34.39%). Therefore, despite a PC impact marginally greater than 1% of the Critical Level, the PEC is well below (<75% of) the Critical Level. As such, the impact is considered to be not significant. This conclusion aligns with that of **Chapter 26 Air Quality** [APP-208].

30. When compared to **Chapter 26 Air Quality** [APP-208], there were no material changes to the outcome of the assessment in relation to the NOx Critical Level, except for:

    a. Link 24 Humber Estuary receptor in-combination PC;

    b. Link 29 Humber Estuary receptor in-combination PC; and

    c. Link 29 Humber Bridge receptor in-combination PC.

    Where it was predicted that there would be a removal of the potential for significant effects when using the NEA001 dispersion model approach instead of the JNCC approach. These findings were the same when considering the In Isolation Scenario.

1.3.2 Ammonia (NH_3)

31. The NEA001 dispersion model approach PC and PEC for NH_3 are presented in **Table 5** and **Table 6**, respectively, along with a comparison with the results in **Chapter 26 Air Quality** [APP-208] as to whether any material changes in significance would be expected.

32. For the Humber Estuary SAC/SPA/Ramsar/SSSI and Humber Bridge LNR, the relevant Critical Level for NH_3 is the upper Critical Level of 3 μgm^{-3}, as advised by the project ecologist.

Table 5: Concurrent Scenario – JNCC approach and maximum NEA001 dispersion model approach PC of Project-generated/In-combination NH_3 from traffic on designated ecological site features. Values in exceedance of 1% of the CLe are shown in bold.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach			Approach with Higher Conc.	Difference			
	Site Type	Name	Distance From Road Link (m)	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe			Conc. µgm-3	% of lower CLe	% of upper CLe	Comparison with Chapter 26 Air Quality [APP-208]
					% of lower CLe	% of upper CLe		% of lower CLe	% of upper CLe					
Project-alone (i.e., Concurrent Scenario) Contribution														
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	0.003	-	0.12%	0.010	-	0.34%	NEA001 dispersion model	0.007	-	0.22%	When considering the more stringent NH_3 Critical Level, the NEA001 dispersion model approach shows the potential for significant effects whereas the JNCC approach does not. This would add a potential significant effect to the EIA. However, only the less stringent Critical Level for NH_3 needs to be considered at this location, therefore there would be no material change from the EIA because both approaches show that there is not the potential for significant effects.
28	LNR	Humber Bridge	150	*	*	*	0.011	-	0.38%	*	*	-	*	NH_3 impacts screened out when using the JNCC approach. The NEA001 dispersion model approach predicts that there is not the potential for significant effects.
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	0.002	-	0.07%	0.001	-	0.04%	JNCC	0.001	-	0.03%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
29	LNR	Humber Bridge	35	*	*	*	0.002	-	0.06%	*	*	-	*	NH_3 impacts screened out when using the JNCC approach. The NEA001 dispersion model approach predicts that there is not the potential for significant effects.
63	AW	Bentley Moor Wood	162	*	*	*	0.006	0.61%	0.20%	*	*	*	*	NH_3 impacts screened out when using the JNCC approach. The NEA001 dispersion model approach predicts that there is not the potential for significant effects.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach			Approach with Higher Conc.	Difference			
	Site Type	Name	Distance From Road Link (m)	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe			Conc. µgm-3	% of lower CLe	% of upper CLe	Comparison with Chapter 26 Air Quality [APP-208]
					% of lower CLe	% of upper CLe		% of lower CLe	% of upper CLe					
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)														
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	0.019	-	0.63%	0.036	-	**1.20%**	NEA001 dispersion model	0.017	-	0.57%	When considering the less stringent NH_3 Critical Level, the NEA001 dispersion model approach shows the potential for significant effects whereas the JNCC approach does not. However, both approaches show that there is the potential for significant effects when the more stringent NH_3 Critical Level is considered. However, only the less stringent Critical Level needs to be considered at this location, therefore there would be a material change from the EIA and a potential significant effect would be added.
28	LNR	Humber Bridge	150	*	*	*	0.038	-	**1.27%**	*	*	-	*	NH_3 impacts screened out when using the JNCC approach. The NEA001 dispersion model approach predicts that there is the potential for significant effects.
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	0.018	-	0.59%	0.005	-	0.17%	JNCC	0.013	-	0.42%	When considering the more stringent NH_3 Critical Level, the JNCC approach shows the potential for significant effects whereas the NEA001 dispersion model approach does not. However, both approaches show that there is not the potential for significant effects when the less stringent NH_3 Critical Level is considered. As the less stringent NH_3 Critical Level is applicable at this site, there would be no material change from the EIA.
29	LNR	Humber Bridge	35	*	*	*	0.008	-	0.27%	*	*	-	*	NH_3 impacts screened out when using the JNCC approach. The NEA001 dispersion model approach predicts that there is not the potential for significant effects.
63	AW	Bentley Moor Wood	162	*	*	*	0.018	**1.83%**	0.61%	*	*	-	*	NH_3 impacts screened out when using the JNCC approach. When the NEA001 dispersion model approach was used, it was predicted that there is the potential for significant effects when the more stringent NH_3 Critical Level is applied.

* The in-combination increase in AADT did not exceed the distance based screening criteria detailed in the JNCC guidance and therefore was not screened in for further assessment.

Table 6: Concurrent Scenario – JNCC approach and maximum NEA001 dispersion model approach PEC of NH_3 from traffic on designated ecological site features (including background concentrations). Values in exceedance of 100% of the Critical Level (CLe) are shown in bold.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach			Approach with Higher Conc.	Difference			
	Site Type	Name	Distance From Road Link (m)	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe			Conc. µgm-3	% of lower CLe	% of upper CLe	Comparison with Chapter 26 Air Quality [APP-208]
					% of lower CLe	% of upper CLe		% of lower CLe	% of upper CLe					
Project-alone (i.e., Concurrent Scenario) Contribution														
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	1.703	-	56.78%	1.710	-	57.00%	NEA001 dispersion model	0.007	-	0.22%	As only the less stringent Critical Level is applicable at this site, both approaches show that there is not the potential for significant effects. No material change from EIA.
28	LNR	Humber Bridge	150	*	-	*	1.841	-	61.38%	*	*	-	*	NH_3 impacts screened out when using the JNCC approach. The NEA001 dispersion model approach predicts that there is not the potential for significant effects.
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	1.802	-	60.07%	1.801	-	60.04%	JNCC	0.001	-	0.03%	As only the less stringent Critical Level is applicable at this site, both approaches show that there is not the potential for significant effects. No material change from EIA.
29	LNR	Humber Bridge	35	*	-	*	1.832	-	61.06%	*	*	-	*	NH_3 impacts screened out when using the JNCC approach. The NEA001 dispersion model approach predicts that there is not the potential for significant effects.
63	AW	Bentley Moor Wood	162	*	*	*	1.916	**191.61%**	63.87%	*	*	*	*	NH_3 impacts at Bentley Wood were screened out when using the JNCC approach. When the NEA001 dispersion model approach was used, it was predicted that there is the potential for significant effects when the more stringent NH_3 Critical Level is applied.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach			Approach with Higher Conc.	Difference			
	Site Type	Name	Distance From Road Link (m)	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe			Conc. µgm-3	% of lower CLe	% of upper CLe	Comparison with Chapter 26 Air Quality [APP-208]
					% of lower CLe	% of upper CLe		% of lower CLe	% of upper CLe					
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)														
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	1.719	-	57.30%	1.736	-	57.86%	NEA001 dispersion model	0.017	-	0.56%	As only the less stringent Critical Level is applicable at this site, both approaches show that there is not the potential for significant effects. No material change from EIA.
28	LNR	Humber Bridge	150	*	-	*	1.868	-	62.27%	*	*	-	*	NH_3 impacts screened out when using the JNCC approach. The NEA001 dispersion model approach predicts that there is not the potential for significant effects.
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	1.818	-	60.59%	1.805	-	60.17%	JNCC	0.013	-	0.42%	As only the less stringent Critical Level is applicable at this site, both approaches show that there is not the potential for significant effects. No material change from EIA.
29	LNR	Humber Bridge	35	*	-	*	1.838	-	61.27%	*	*	-	*	NH_3 impacts screened out when using the JNCC approach. The NEA001 dispersion model approach predicts that there is not the potential for significant effects.
63	AW	Bentley Moor Wood	162	*	*	*	1.928	**192.83%**	64.28%	*	*	*	*	NH_3 impacts at Bentley Wood were screened out when using the JNCC approach. When the NEA001 dispersion model approach was used, it was predicted that there is the potential for significant effects when the more stringent NH_3 Critical Level is applied.

* The in-combination increase in AADT did not exceed the distance based screening criteria detailed in the JNCC guidance and therefore was not screened in for further assessment.

33. **Table 5** shows that in the Concurrent Scenario, Project-alone and in-combination contributions the NEA001 dispersion model approach predicted:

- Higher NH_3 concentrations at the road link 24 Humber Estuary SAC/SPA/Ramsar/SSSI receptor;
- Lower NH_3 concentrations at the link 29 Humber Estuary SAC/SPA/Ramsar/SSSI receptor; and
- The potential for significant effects in relation to NH_3 at Bentley Moor Wood AW.

when compared to the JNCC approach. This is also the case for the In Isolation Scenario (**Appendix A**).

34. As shown in **Table 4** and **Table 5**, the difference in Project-alone NH_3 PCs at the two Humber Estuary SAC/SPA/Ramsar/SSSI receptor locations between the two approaches are small and are of the order of 0.007 μgm^{-3} and 0.001 μgm^{-3}, respectively. As detailed in **Chapter 18 Terrestrial Ecology and Ornithology** [APP-140] impacts arising from potential changes to air quality at the Humber Estuary SAC/SPA/Ramsar/SSSI refer only to a localised area of 22.9 ha of mudflats along the River Hull, adjacent to the A15 and A63 trunk road, which represents 0.36% of the habitat available within the designated site. Given that the total area of mudflats in the Humber Estuary SAC/SPA/Ramsar/SSSI is approximately 6,420 ha, the temporary impact of the Projects on this habitat via the contribution to road traffic air pollutant emissions is considered to be **minor adverse**.

35. For the link 28 Humber Bridge LNR receptor, the JNCC approach screens out NH_3 impacts. The NEA001 dispersion model approach predicts an increase of less than 1% of the Critical Level from Project-alone traffic, but when in-combination traffic is considered, the NEA001 dispersion model approach predicts increases marginally greater than 1% of the Critical Level (1.27%). However, as shown in **Table 6**, the NEA001 dispersion model approach predicts the PEC to be well below (<75% of) the Critical Level (62.27%). Therefore, despite an in-combination PC impact marginally greater than 1% of the Critical Level, the PEC impact is considered to be not significant.

36. There is the potential for a significant effect to occur at Bentley Moor Wood in relation to NH_3. Impacts in relation to NH_3 at this site were screened out when using the JNCC approach. When assessed using the NEA001 dispersion model approach, the increase to the lower Critical Level for NH_3 is 1.83% when assessed in-combination. When the PEC is considered, the increase to the lower Critical Level for NH_3 is 191.61% when assessed as the Project-alone and 192.83% when assessed in-combination. Given that the NEA001 dispersion model approach predicts PC exceedances of 1% of the lower Critical Level and PEC exceedances of the lower Critical Level, and given that the site is high sensitivity because it is designated for ancient semi-natural woodland and deciduous woodland priority habitat, impacts are considered to be **moderate adverse**. It should be noted that background levels of NH_3 are already in exceedance of the lower Critical Level at Bentley Moor Wood AW.

37. It should also be noted that NH_3 concentrations fluctuate greatly due to meteorological factors. NH_3 data from the UK Eutrophying & Acidifying Network (UKEAP) national NH_3 monitoring network shows high spatial variability of the annual average concentration across a range of sites. The normal variation in NH_3 concentrations throughout a year can be more than 1 µg/m^3 (100% of the Critical Level) throughout the year (UKEAP 2023). Therefore, limited interpretation can be made because NH_3 concentrations can fluctuate by more than the lower Critical Level throughout the course of a year.

38. The small differences between the NH_3 concentrations predicted by both approaches show that they are in good agreement and that discrepancies between them are smaller than annual fluctuations observed across the UKEAP monitoring network.

39. When compared to the EIA, there were no material changes to the outcome of the assessment in relation to the NH_3 Critical Level, except for:

    a. Link 24 Humber Estuary receptor in-combination PC (less stringent Critical Level) – where it was predicted that there would be an addition of the potential for significant effects when using the NEA001 dispersion model approach when compared to the JNCC approach. This finding was the same when considering the In Isolation Scenario.

    b. Link 63 Bentley Moor Wood in-combination PC, and Project-alone and in-combination PEC (more stringent Critical Level) – where it was predicted that there would be an addition of the potential for significant effects when using the NEA001 dispersion model approach when compared to the JNCC approach. This finding was the same when considering the In Isolation Scenario.

1.3.3 Nutrient Nitrogen and Acid Deposition

40. The NEA001 dispersion model approach PC and PEC for nutrient nitrogen and acid deposition are presented in **Table 7** - **Table 10**.

Table 7: Concurrent Scenario – JNCC approach and maximum NEA001 dispersion model approach PC of Project-generated/In-combination nutrient nitrogen deposition rates from traffic on designated ecological site features. Values in exceedance of 1% of the Critical Load (CL) are shown in bold.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach			Approach with Higher Concentration	Difference			
	Site Type	Name	Distance From Road Link (m)	Deposition Rate kg N ha^{-1} yr^{-1}	% of CL		Deposition Rate kg N ha^{-1} yr^{-1}	% of CL			Deposition Rate kg N ha^{-1} yr^{-1}	% of lower CL	% of upper CL	Comparison with Chapter 26 Air Quality [APP-208]
					% of lower CL	% of upper CL		% of lower CL	% of upper CL					
Project-alone (i.e., Concurrent Scenario) Contribution														
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
63	AW	Bentley Moor Wood	162	0.05	0.46%	0.30%	0.07	0.68%	0.45%	NEA001 dispersion model	0.02	0.22%	0.15%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)														
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
63	AW	Bentley Moor Wood	162	0.18	**1.75%**	**1.17%**	0.21	**2.06%**	**1.37%**	NEA001 dispersion model	0.03	0.31%	0.20%	Both approaches show that there is the potential for significant effects. No material change from EIA.

NC - No comparable habitat with established Critical Load estimate available.

Table 8: Concurrent Scenario – JNCC approach and maximum NEA001 dispersion model approach PEC nutrient nitrogen deposition rates from traffic on designated ecological site features (including background deposition rates). Values in exceedance of 100% of the Critical Load (CL) are shown in bold.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach			Approach with Higher Concentration	Difference			
	Site Type	Name	Distance From Road Link (m)	Deposition Rate kg N ha^{-1} yr^{-1}	% of CL		Deposition Rate kg N ha^{-1} yr^{-1}	% of CL			Deposition Rate kg N ha^{-1} yr^{-1}	% of lower CL	% of upper CL	Comparison with Chapter 26 Air Quality [APP-208]
					% of lower CL	% of upper CL		% of lower CL	% of upper CL					
Project-alone (i.e., Concurrent Scenario) Contribution														
63	AW	Bentley Moor Wood	162	30.29	**302.86%**	**201.90%**	30.31	**303.08%**	**202.05%**	NEA001 dispersion model	0.02	0.22%	0.15%	Both approaches show that the PEC is greater than the Critical Load. No material change from EIA.
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)														
63	AW	Bentley Moor Wood	162	30.42	**304.15%**	**202.77%**	30.45	**304.46%**	**202.97%**	NEA001 dispersion model	0.03	0.31%	0.20%	Both approaches show that there is the potential for significant effects. No material change from EIA.

Table 9: Concurrent Scenario – maximum NEA001 dispersion model approach PC of Project-generated/In-combination acid deposition rates from traffic on designated ecological site features.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach			Approach with Higher Concentration	Difference			
	Site Type	Name	Distance From Road Link (m)	Deposition Rate keq ha^{-1} yr^{-1}	% of CL		Deposition Rate keq ha^{-1} yr^{-1}	% of CL			Deposition Rate keq ha^{-1} yr^{-1}	% of lower CL	% of upper CL	Comparison with Chapter 26 Air Quality [APP-208]
					% of lower CL	% of upper CL		% of lower CL	% of upper CL					
Project-alone (i.e., Concurrent Scenario) Contribution														
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
63	AW	Bentley Moor Wood	162	0.003	0.03%	0.03%	0.005	0.04%	0.04%	NEA001 dispersion model	0.002	0.01%	0.01%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)														
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	72	NS	NS	NS	NS	NS	NS	NC	NS	NS	NS	NS
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	30	NS	NS	NS	NS	NS	NS	NC	NS	NS	NS	NS
63	AW	Bentley Moor Wood	162	0.012	0.11%	0.11%	0.015	0.13%	0.13%	NEA001 dispersion model	0.003	0.02%	0.02%	Both approaches show that there is not the potential for significant effects. No material change from EIA.

* NS – Habitat Not Sensitive to Acid Deposition

Table 10: Concurrent Scenario – JNCC approach and maximum NEA001 dispersion model approach PEC acid deposition rates from traffic on designated ecological site features (including background concentrations).

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach			Approach with Higher Concentration	Difference			
	Site Type	Name	Distance From Road Link (m)	Deposition Rate keq ha^{-1} yr^{-1}	% of CL		Deposition Rate keq ha^{-1} yr^{-1}	% of CL			Deposition Rate keq ha^{-1} yr^{-1}	% of lower CL	% of upper CL	Comparison with Chapter 26 Air Quality [APP-208]
					% of lower CL	% of upper CL		% of lower CL	% of upper CL					
Project-alone (i.e., Concurrent Scenario) Contribution														
63	AW	Bentley Moor Wood	162	2.134	19.41%	19.41%	2.135	19.43%	19.43%	NEA001 dispersion model	0.001	0.02%	0.02%	Both approaches show that there is not the potential for significant effects. No material change from EIA.
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)														
63	AW	Bentley Moor Wood	162	2.143	19.49%	19.49%	2.143	19.51%	19.51%	NEA001 dispersion model	0.002	0.02%	0.02%	Both approaches show that there is not the potential for significant effects. No material change from EIA.

* NS – Habitat Not Sensitive to Acid Deposition

41. Assessment of nutrient nitrogen and acid deposition was undertaken at one location, Bentley Moor Wood AW, as presented in **Table 26-48** and **Table 26-49** of **Chapter 26 Air Quality** [APP-208]. As shown in **Table 7 – Table 10** the NEA001 dispersion model approach predicts a higher PC than the JNCC approach by:

- 0.02 kg N ha^{-1} yr^{-1} for nutrient nitrogen deposition for Project-alone;
- 0.03 kg N ha^{-1} yr^{-1} for nutrient nitrogen deposition for in-combination;
- 0.002 keq ha^{-1} yr^{-1} for acid deposition for Project-alone; and
- 0.003 keq ha^{-1} yr^{-1} for acid deposition for in-combination.

42. Similarly, the NEA001 dispersion model approach predicts a higher PC than the JNCC approach for the DBS East or DBS West In Isolation Scenario (**Appendix A**).

43. For nutrient nitrogen, deposition rates predicted by both approaches are above the 1% Critical Load threshold for the Projects traffic in-combination with traffic growth and cumulative traffic at Bentley Moor Wood AW. This indicates that further assessment on designated sites should be considered when either approach is used. **Chapter 18 Terrestrial Ecology** [APP-140] states that for the JNCC approach, the increase to the lower and upper Critical Load for nutrient nitrogen deposition is only 1.8% and 1.2% respectively, which is not considered a significant increase. Given that the NEA001 dispersion model approach predicts similar values, 2.1% and 1.4% respectively and that the site is high sensitivity as it is designated for ancient semi-natural woodland and deciduous woodland priority habitat, impacts are considered to be **moderate adverse**.

44. It should also be noted that background levels of nitrogen deposition are already in exceedance at Bentley Moor Wood AW.

45. For acid deposition at the Bentley Moor Wood AW, the difference for the Project-alone and in-combination predicted deposition rates is 0.002 keq ha^{-1} yr^{-1} and 0.003 keq ha^{-1} yr^{-1} equating to 0.01% and 0.02%, respectively, of both the upper and lower Critical Loads. A difference of this magnitude is expected to have minimal impact on the designated site. Using either approach, acid deposition as a result of in-combination traffic does not exceed 1% of the Critical Load, and therefore, acid deposition impacts on the Bentley Moor Wood AW are considered to be not significant. This conclusion aligns with that of **Chapter 26 Air Quality** [APP-208].

46. When compared to the EIA, there were no material changes to the outcome of the assessment in relation to the nutrient nitrogen and acid deposition Critical Loads.

1.3.4 Summary

47. When comparing the results of the two approaches, the conclusions of **Chapter 26 Air Quality** [APP-208] remain broadly the same, with most of the same relevant sites requiring further ecological assessment, with the following exceptions:

- the Humber Estuary SAC/SPA/Ramsar/SSSI adjacent to road link 24 requires further assessment in relation to NH_3 when the NEA001 dispersion model approach is considered and not when the JNCC approach is considered;
- Bentley Moor Wood AW has the potential for **moderate adverse** significant effects in relation to NH_3 when the NEA001 dispersion model approach is considered and not when the JNCC approach is considered; and
- the Humber Estuary SAC/SPA/Ramsar/SSSI adjacent to road link 24 and 29, and the Humber Bridge LNR adjacent to road link 29 do not require further assessment in relation to NOx when the NEA001 dispersion model approach is considered but do require further assessment when the JNCC approach is considered.

48. It is important to note, that while both approaches predict some in-combination PC impacts in excess of 1% of the relevant Critical Level and/or Load at some sites, only a small percentage of impacts at sites are due to contributions from Project-generated traffic. Regardless of the approach used, the contribution from Project-alone traffic does not result in PC impacts in excess of 1% of any of the relevant Critical Levels and Loads.

49. The approaches are generally in good agreement – how closely the approaches agree varies depending on receptor location and pollutant. At receptors where the NEA001 dispersion model approach predicted higher concentrations or deposition rates, additional impacts are expected to be minimal (given either the site sensitivity or the fact that the site is already predicted to experience air pollutant related adverse impacts) and regardless of the approach used, the effects of Project-generated traffic on designated ecological sites during construction will be short-term, transient and temporary. The impact of other in-combination plans and projects, for example traffic generated as a result of residential and employment developments associated with regional Local Plan allocations, would be experienced over a significantly longer duration. In some instances, the JNCC approach predicted higher concentrations and in other instances the NEA001 dispersion model approach predicted higher concentrations/ deposition rates. In order to address this, a further comparison was made between the two approaches. This is presented in section 1.4.

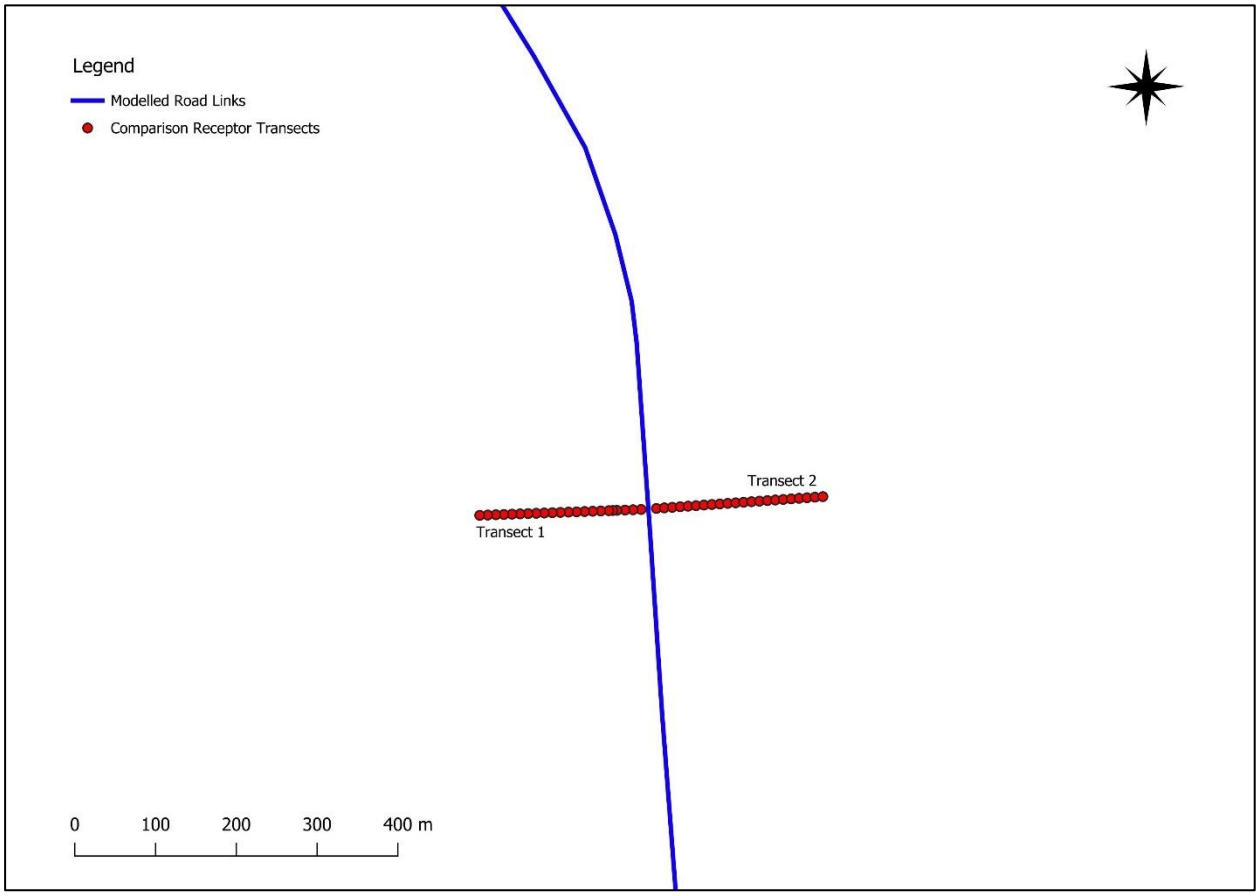
1.4 Methodology Comparison Modelling Results

50. An indicative ecological assessment was undertaken to provide a full comparison of the results predicted using the NEA001 dispersion model approach and the JNCC approach for each pollutant assessed (NOx, NH_3, nutrient nitrogen deposition, and acid deposition). For the purpose of this comparison, an idealised scenario was set up. A 200m transect was included either side of a modelled road link to ensure any variations in concentrations from prevailing wind directions was accounted for. The area used for the purpose of the comparison is shown in **Figure 2** and a summary of the road link assessed is detailed below:

- The road selected was a 2-way dual carriageway road modelled as a single road link.

- Traffic is flowing northbound and southbound.
- The receptor transects lie to the east and west.
- The road was modelled at om height.
- There is limited influence from other road links as they are greater than 200m away from the transects.

Figure 2: Receptor transects for NEA001 dispersion model approach and JNCC approach comparison



51. Traffic data from the Concurrent Scenario was used to offer a direct comparison of the outputs for each of the approaches.

52. Predicted concentrations of NOx, NH_3, and deposition rates of nutrient nitrogen and acid across both transects for each approach are shown in **Plate 1** – **Plate 12**.

Plate 1: NOx concentrations for the NEA001 dispersion model approach and JNCC approach at Transect 1

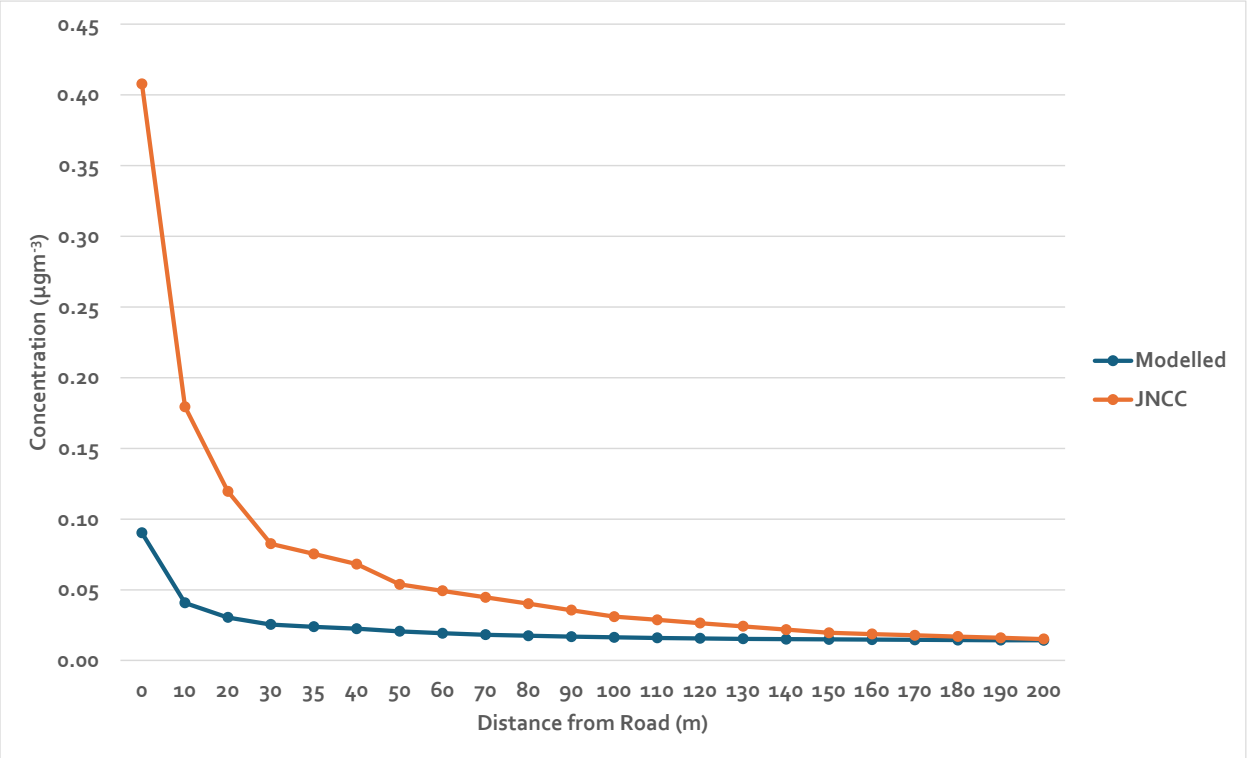


Plate 2: NOx concentrations for the NEA001 dispersion model approach and JNCC approach at Transect 2

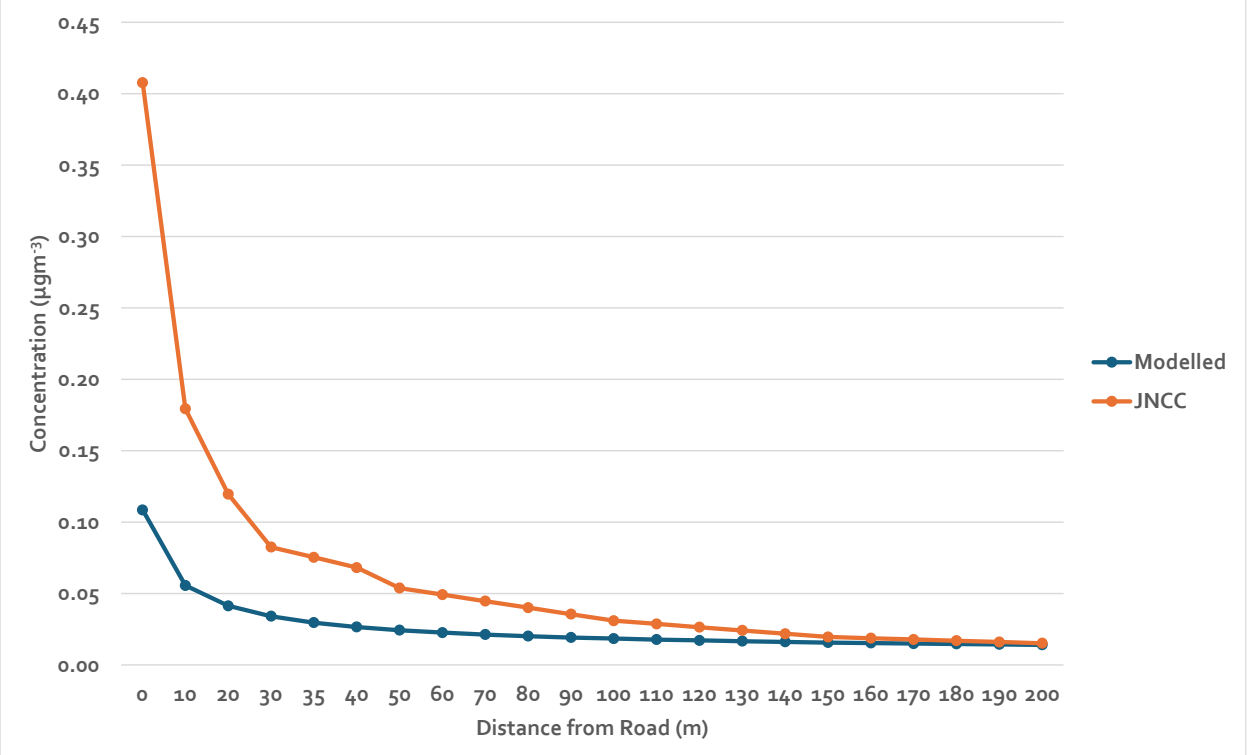


Plate 3: NH_3 concentrations for the NEA001 dispersion model approach and JNCC approach at Transect 1

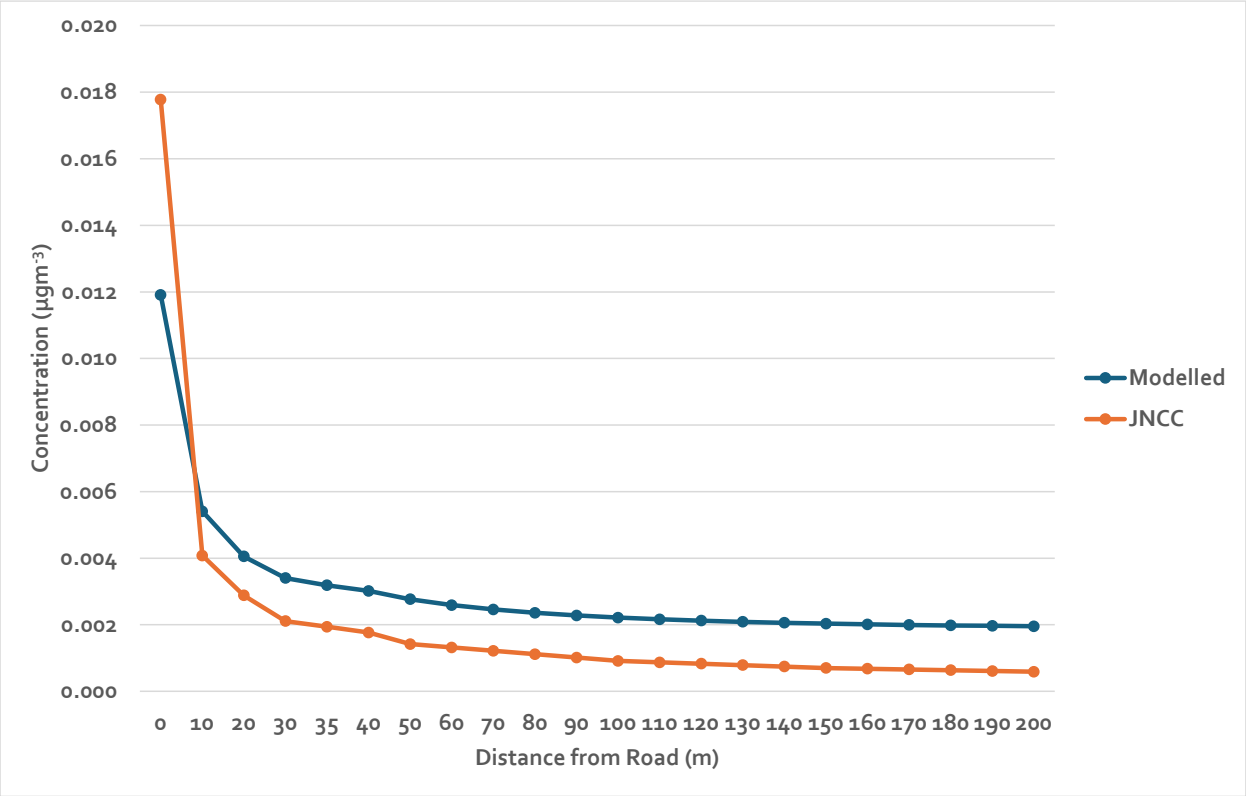


Plate 4: NH_3 concentrations for the NEA001 dispersion model approach and JNCC approach at Transect 2

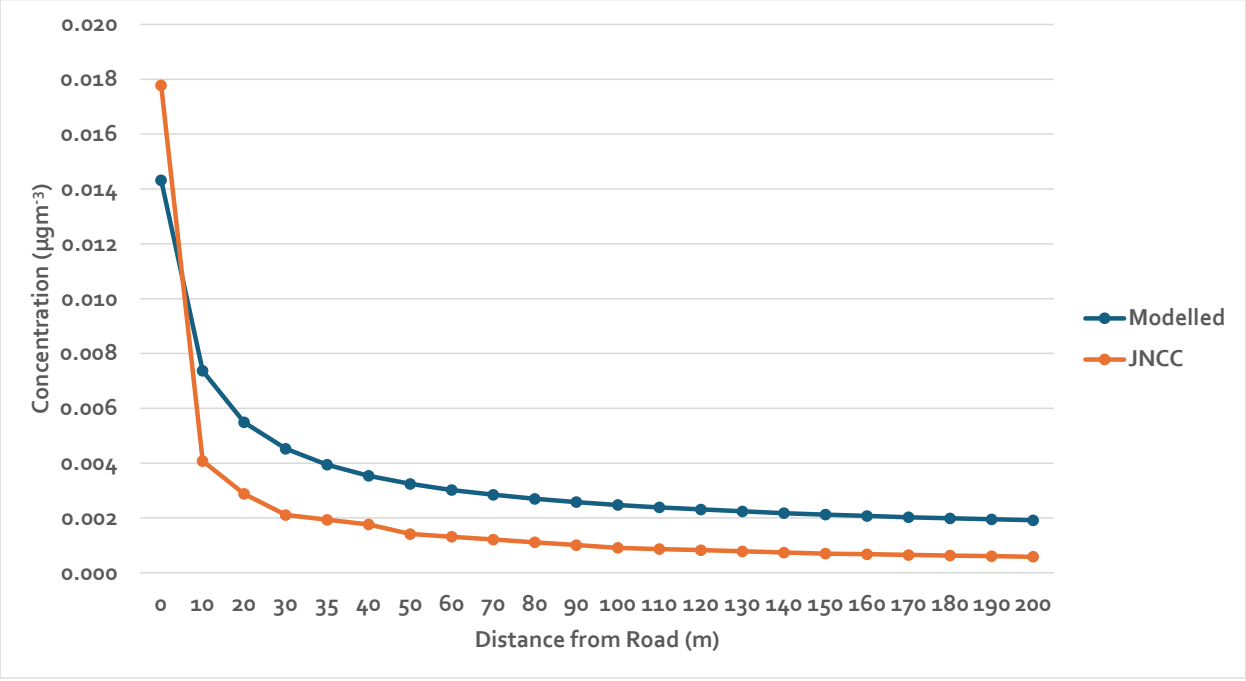


Plate 5: Nutrient nitrogen deposition rates for the NEA001 dispersion model approach and JNCC approach at Transect 1 – Grassland

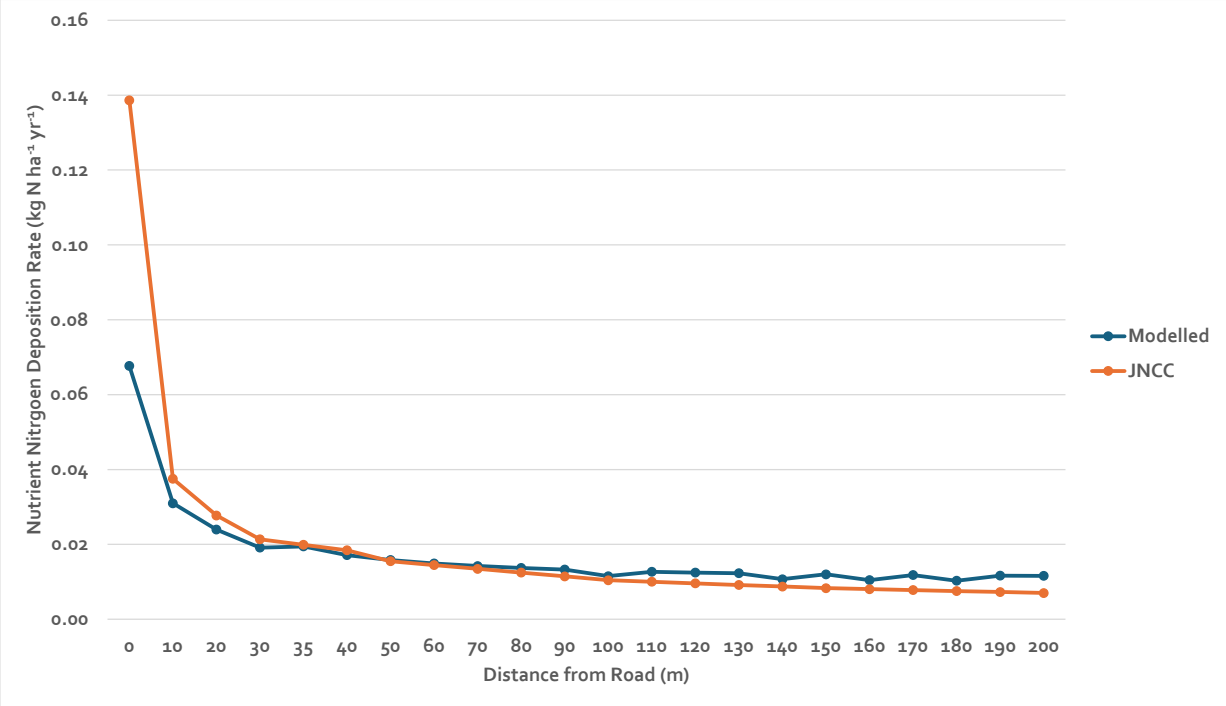


Plate 6: Nutrient nitrogen deposition rates for the NEA001 dispersion model approach and JNCC approach at Transect 1 – Woodland

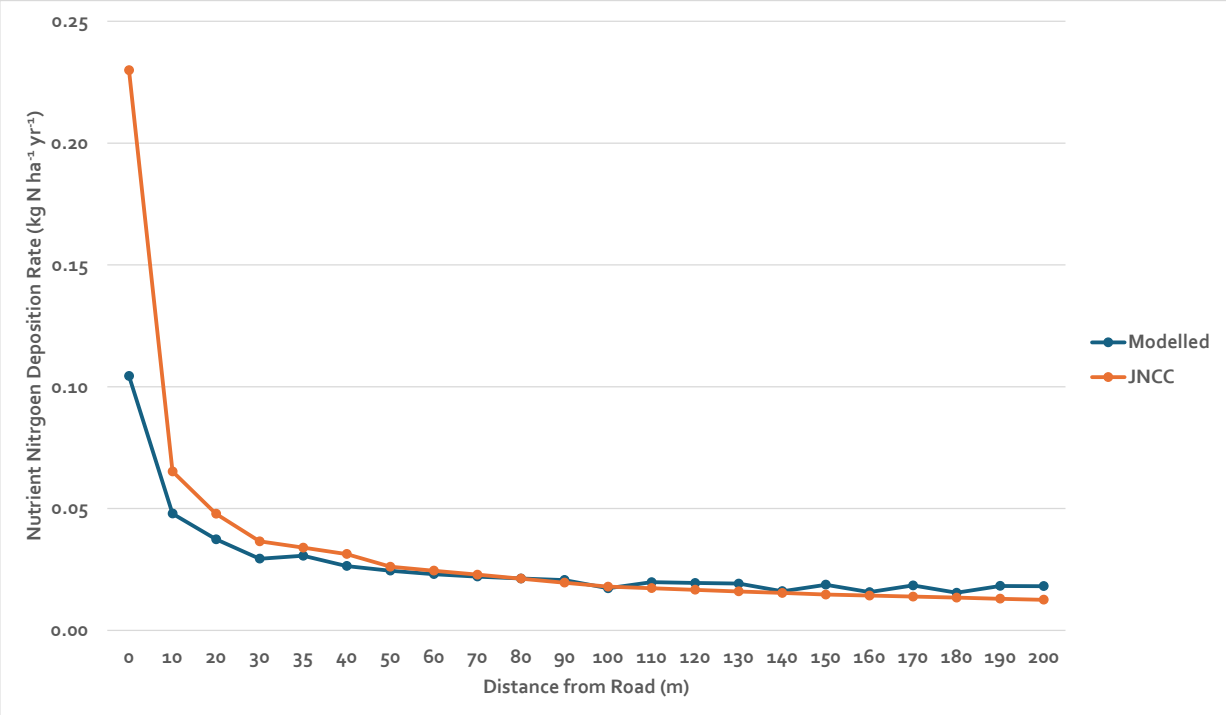


Plate 7: Nutrient nitrogen deposition rates for the NEA001 dispersion model approach and JNCC approach at Transect 2 – Grassland

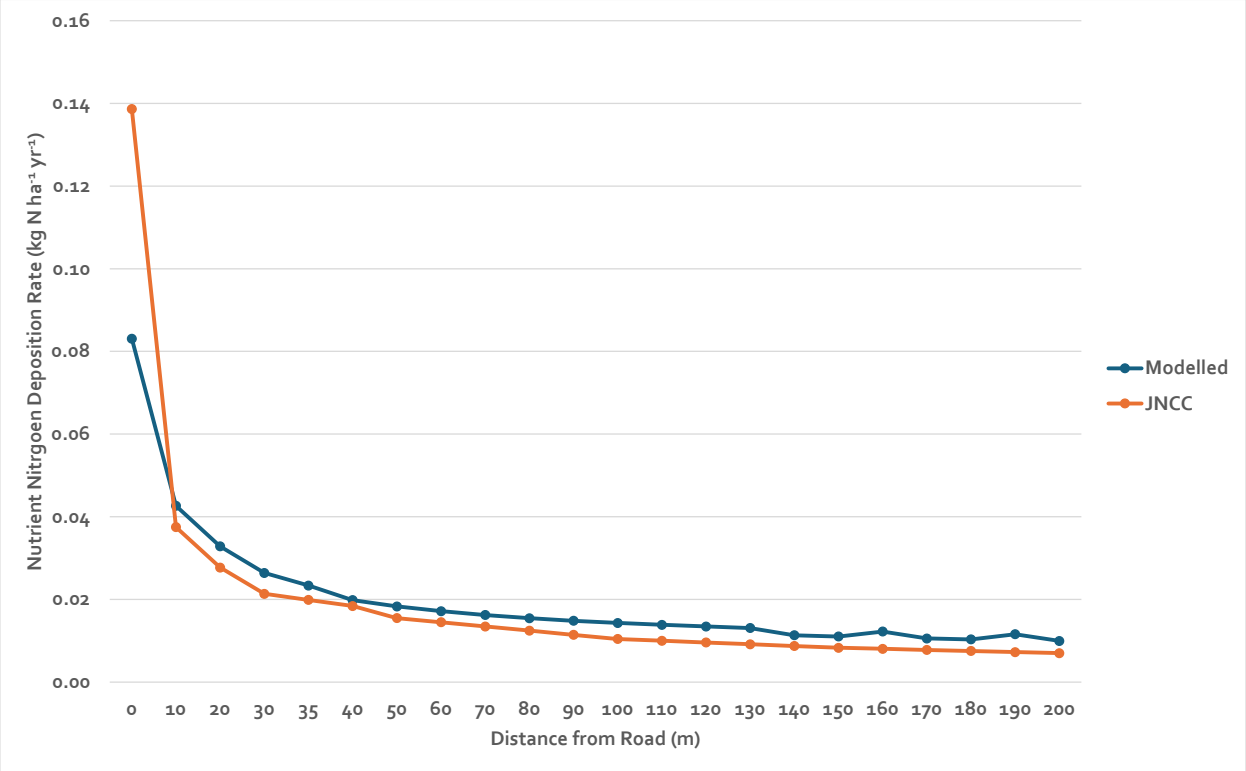


Plate 8: Nutrient nitrogen deposition rates for the NEA001 dispersion model approach and JNCC approach at Transect 2 – Woodland

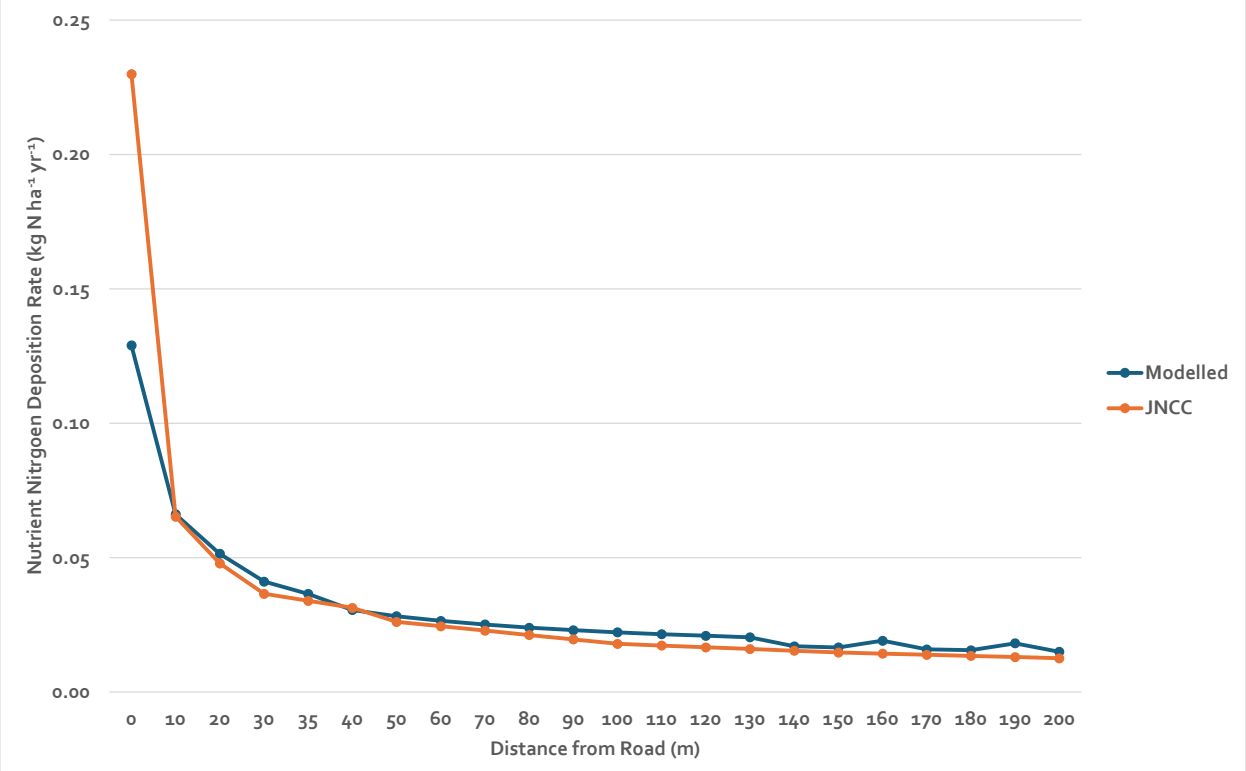


Plate 9: Acid deposition rates for the NEA001 dispersion model approach and JNCC approach at Transect 1 – Grassland

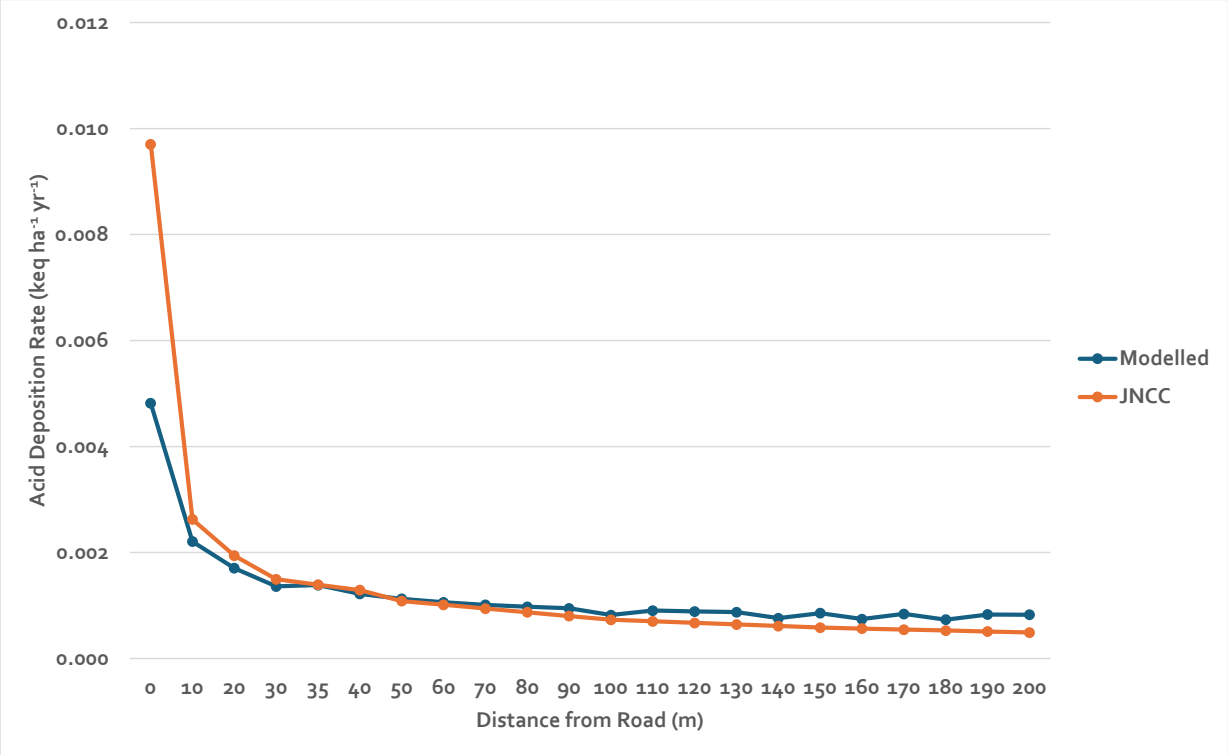


Plate 10: Acid deposition rates for the NEA001 dispersion model approach and JNCC approach at Transect 1 – Woodland

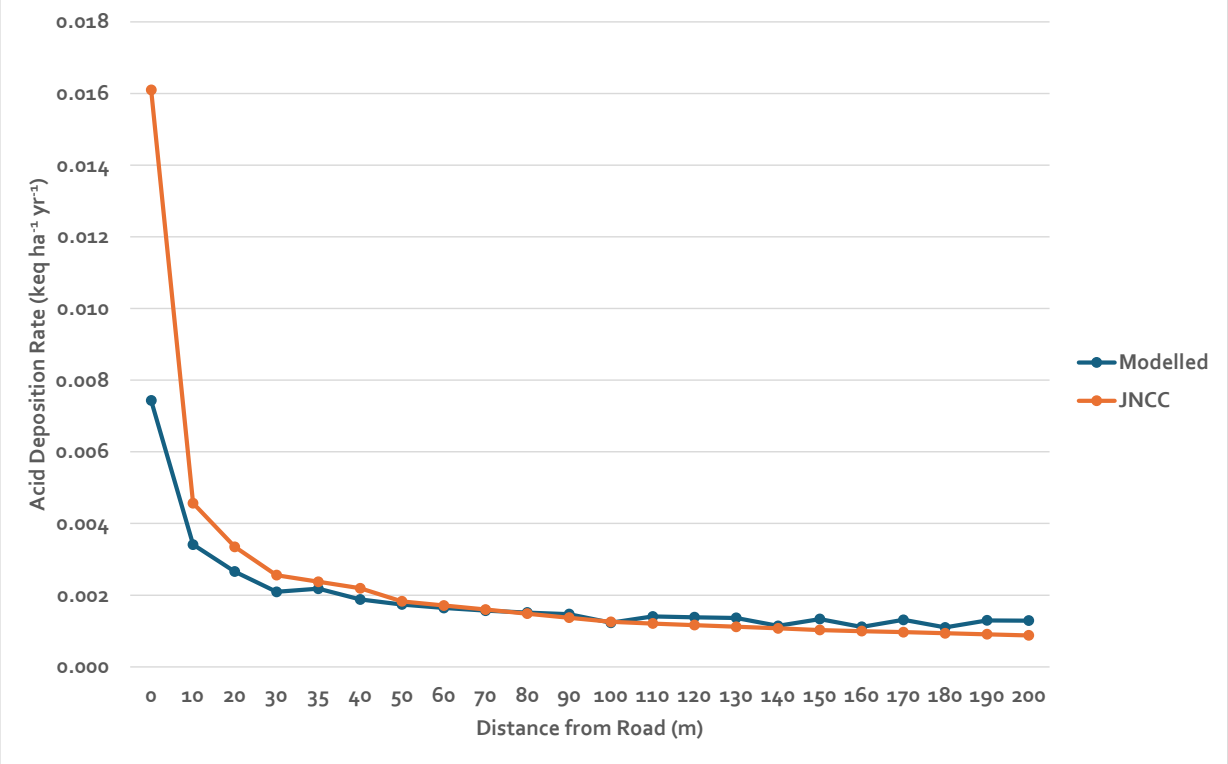


Plate 11: Acid deposition rates for the NEA001 dispersion model approach and JNCC approach at Transect 2 – Grassland

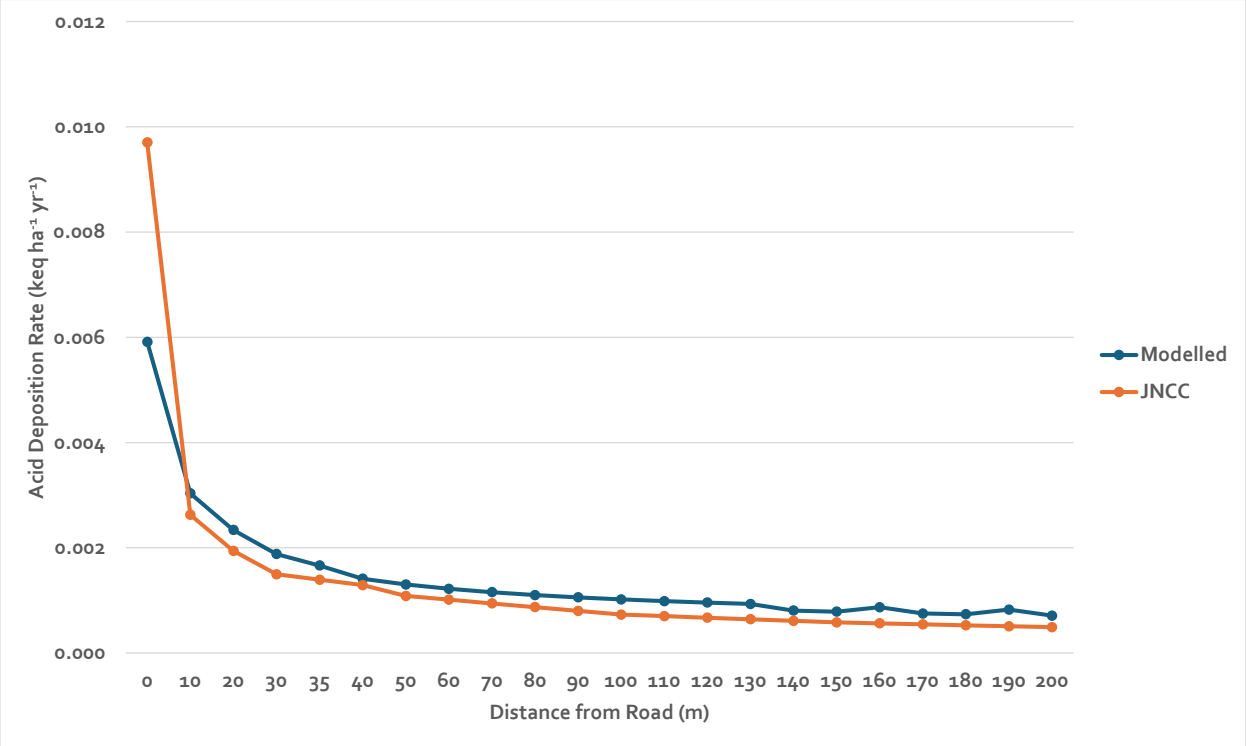
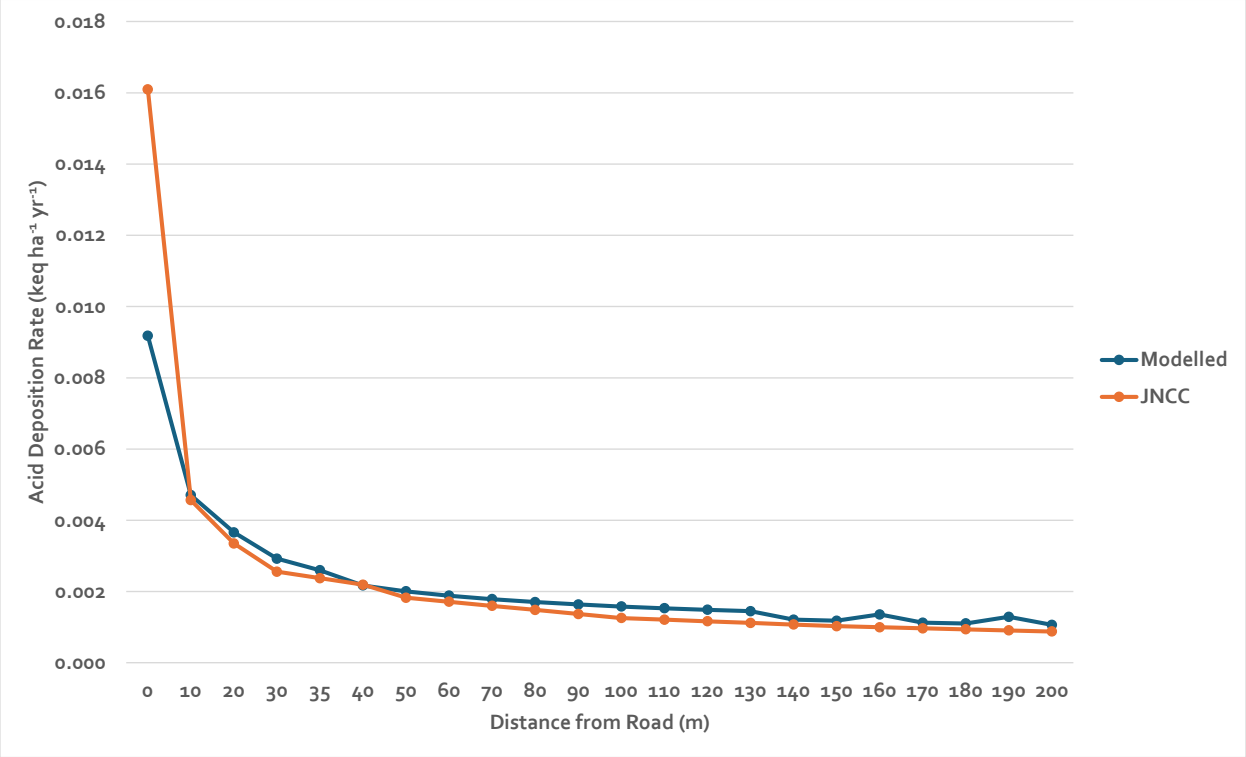


Plate 12: Acid deposition rates for the NEA001 dispersion model approach and JNCC approach at Transect 2 – Woodland



53. For NOx, the JNCC approach predicted higher concentrations than the NEA001 dispersion model approach for receptor locations closer to the assessed road link. This trend was observed to continue up to a distance of approximately 150m from the road edge where, at this distance, the concentrations predicted by both approaches converged and the difference between them was negligible.

54. Concentrations of NH_3 predicated by the JNCC approach were higher than those predicted by the NEA001 dispersion model approach at the road edge of the assessed road link. However, beyond 10m from the road edge, NEA001 dispersion model approach concentrations were consistently around 0.0015 $\mu g.m^3$ higher than those predicted by the JNCC approach. This equates to 0.2 % to 0.1 % of the most and least stringent NH_3 Critical Levels (1 $\mu g.m^{-3}$ and 3 $\mu g.m^{-3}$ respectively).

55. For nutrient nitrogen and acid deposition, it was found that for Transect 1 the deposition rates were predicted to be higher using the JNCC approach up to 50m from the road edge, beyond which the NEA001 dispersion model approach results were found to be higher.

56. For Transect 2, nutrient nitrogen and acid deposition rates were predicted to be higher when using the JNCC approach at the road edge, but the NEA001 dispersion model approach predicted higher deposition rates at distances beyond this. This is different to the finding for Transect 1 and is most likely attributable to the fact that the JNCC approach does not incorporate site specific meteorological data (rather it incorporates a variety of meteorological conditions from the datasets upon which it is based), whereas in the NEA001 dispersion model approach Transect 2 is downwind of the prevailing wind direction from the road source and Transect 1 is upwind of the prevailing wind direction from the road source. Therefore, more pollution is carried to Transect 2 in the NEA001 dispersion model approach than to Transect 1.

57. The differences in predicted nutrient nitrogen deposition rates between the NEA001 dispersion model approach and the JNCC approach 10m or further from the road edge were:

- A maximum of 0.007 kg N ha^{-1} yr^{-1} for grassland/ short vegetation habitats along Transect 1 (occurred at 10m from the road edge, where the JNCC approach predicted a higher deposition rate than the NEA001 dispersion model approach);
- A maximum of 0.017 kg N ha^{-1} yr^{-1} for woodland habitats along Transect 1 (occurred at 10m from the road edge, where the JNCC approach predicted a higher deposition rate than the NEA001 dispersion model approach);
- A maximum of 0.005 kg N ha^{-1} yr^{-1} for grassland/ short vegetation habitats along Transect 2 (occurred at 10m from the road edge, where the NEA001 dispersion model approach predicted a higher deposition rate than the JNCC approach); and
- Maximum of 0.005 kg N ha^{-1} yr^{-1} for woodland habitats along Transect 2 (occurred at 190m from the road edge, where the NEA001 dispersion model approach predicted a higher deposition rate than the JNCC approach).

58. The differences in predicted acid deposition rates between the NEA001 dispersion model approach and the JNCC approach beyond 10m from the road edge were:

- A maximum of 0.0004 keq ha^{-1} yr^{-1} for grassland/ short vegetation habitats along Transect 1 (occurred at 10m from the road edge, where the JNCC approach predicted a higher deposition rate than the NEA001 dispersion model approach);
- A maximum of 0.0010 keq ha^{-1} yr^{-1} for woodland habitats along Transect 1 (occurred at 10m from the road edge, where the JNCC approach predicted a higher deposition rate than the NEA001 dispersion model approach);
- A maximum of 0.0004 keq ha^{-1} yr^{-1} for grassland/ short vegetation habitats along Transect 2 (occurred at 10m from the road edge, where the NEA001 dispersion model approach predicted a higher deposition rate than the JNCC approach); and
- A maximum of 0.0004 keq ha^{-1} yr^{-1} for woodland habitats along Transect 2 (occurred at 190m from the road edge, where the NEA001 dispersion model approach predicted a higher deposition rate than the JNCC approach).

59. Overall, when comparing the results for all four pollutants, it is considered that the JNCC approach and NEA001 dispersion model approach are in good agreement beyond 10m from the road edge.

60. The purpose of this idealised comparison is to provide a like for like indication of the concentrations and deposition rates predicted for each approach. The same pattern is not observed across all transects in the assessment presented in section 1.3 because external factors such as additional nearby road links can contribute to predicted concentrations in the NEA001 dispersion model approach, whereas the JNCC approach does not consider additional nearby road links.

61. It is acknowledged that the NEA001 dispersion model approach results above can offer a more detailed insight into localised conditions as it can be influenced by factors such as meteorological data (as can be seen in the comparison between nutrient nitrogen and acid deposition rates between Transect 1 and Transect 2), surface roughness, vehicle speeds and other nearby road link contributions. However, the JNCC approach is still considered robust in nature because it is based on a combination of monitored measurements and verified detailed modelling which "*can be considered more certain than many modelling-based results*"

1.5 Conclusions

62. This document deals specifically with responding to NE's position on the topic of 'Air quality emission thresholds for traffic movements (construction)' (see section 1.1). This technical note provides a comparison of the JNCC approach and NEA001 dispersion model approach, for assessing air quality impacts as a result of construction traffic at ecological receptors.

63. For the assessment of NOx at ecological sites, the JNCC approach predicted higher concentrations than the NEA001 dispersion model approach at both Humber Estuary SAC/SPA/Ramsar/SSSI receptor locations and at one of the two Humber Bridge LNR locations.

64. At the Humber Bridge LNR transect point closest to link 28, the NEA001 dispersion model approach predicted minimally higher NOx concentrations. This could be attributed to the localised influence of the roundabout 162m east from the receptor. The increase in concentration would have minimal impact upon the site. The conclusions of both approaches align with those presented in **Chapter 26 Air Quality** [APP-208], i.e., impacts from road traffic NOx were considered to be not significant.

65. For NH_3, the JNCC approach predicted higher concentrations than the NEA001 dispersion model approach at one receptor location and the NEA001 dispersion model approach predicted higher concentrations than the JNCC approach at the other receptor location. Differences between the predicted concentrations between the approaches were minimal and well within observed annual fluctuations.

66. The JNCC approach screened out NH_3 impacts at Bentley Moore Wood AW, however the NEA001 dispersion model approach predicted in-combination exceedances of the Critical Level. Further analysis showed that the impacts associated with this would be **moderate adverse** and therefore significant. It should be noted that potential significant effects were not predicted for the Project-alone PC and that background levels of NH_3 are already in exceedance of the lower Critical Level at Bentley Moor Wood AW.

67. For nutrient nitrogen and acid deposition, there was an insufficient number of assessed receptor locations to make any meaningful comparisons of the NEA001 dispersion model approach results with the previous JNCC approach results. The NEA001 dispersion model approach predicted higher deposition rates for nutrient nitrogen and the difference in predicted acid deposition rates was negligible.

68. When comparing the approaches for the Concurrent Scenario in relation to the EIA, it was found that using the NEA001 dispersion model approach instead of the JNCC approach would:

    a. Remove the potential for significant effects in relation to the NOx PC at three receptor locations when in-combination effects are considered;

b. Add the potential for significant effects in relation to the NH_3 PC at one receptor location when in-combination effects are considered; and

c. Add the potential for **moderate adverse** significant effects at one receptor location in relation to the NH_3 PC when in-combination effects are considered and in relation to the NH_3 PEC when Project-alone and in-combination effects are considered.

69. Overall, if the NEA001 dispersion model approach was used instead of the JNCC approach, the potential for significant effects in relation to the NOx PC at the three receptor locations would be removed completely and would indicate that no further assessment is required. However, for NH_3, the potential for significant effects at two receptor locations would be added and would therefore indicate that further assessment is required.

70. It is important to note, that while both approaches predict some in-combination impacts in excess of 1% of the relevant Critical Level and/or Load at some sites, only a small percentage of impacts at sites are due to contribution from Project-generated traffic. Regardless of the approach used, the contribution from Project-alone traffic does not result in impacts in excess of 1% of any of the relevant Critical Levels and Loads.

71. To investigate further, additional assessment was undertaken to assess the concentrations and deposition rates predicted by the two approaches up to 200m from the roadside. It was found that in some instances the JNCC approach predicted higher concentrations and/ or deposition rates and in some instances the NEA001 dispersion model approach predicted higher concentrations and/ or deposition rates. The JNCC approach and NEA001 dispersion model approach demonstrated good agreement, with differences between the predicted concentrations/ deposition rates being small.

72. Both approaches demonstrate the conclusions of **Chapter 26 Air Quality** [APP-208] remain broadly the same, with most of the same ecological site receptor locations requiring further assessment.

73. For the Humber Estuary SAC/SPA/Ramsar/SSSI adjacent to road link 24, where the NEA001 dispersion model approach found the potential for significant effects in relation to NH_3 and the JNCC approach did not, further assessment by the ecologist found that this effect would be **minor adverse** and therefore not significant. For Bentley Moor Wood AW adjacent to road link 63, the NEA001 dispersion model approach found the potential for significant effects in relation to NH_3 whilst the JNCC approach had screened this out. Based on the NEA001 dispersion model approach results, further assessment of the impact of NH_3 on Bentley Moor Wood, a receptor of high sensitivity, found that this effect would be **moderate adverse** and therefore significant. This receptor had already been identified as having **moderate adverse** significant effects in relation to nutrient nitrogen deposition in **Chapter 18 Terrestrial Ecology** [APP-140], therefore this conclusion remains unchanged. For the Humber Estuary SAC/SPA/Ramsar/SSSI adjacent to road link 24 and 29 and the Humber Bridge LNR adjacent to road link 29 it was found that further assessment was no longer required in relation to NOx when comparing the NEA001 dispersion model approach against the JNCC approach.

74. Therefore, this indicates that the findings of the Environmental Statement **Chapter 26 Air Quality** [APP-208] can still be considered conservative and robust. When directly comparing the results across all assessed ecological sites, the approaches were found to be in good agreement.

1.6 References

Air Quality Advisory Group, 2014, AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air. [Accessed July 2024].

Centre for Ecology and Hydrology (CEH) (2024). Air Pollution Information System. [Accessed August 2024]

Chapman & Kite (2021a). Guidance on Decision-Making Thresholds for Air Pollution. JNCC Report No.696 (Main Report), JNCC, Peterborough, ISSN 0963-8091. Air Quality Consultants Ltd. 2021. [Accessed August 2024]

Chapman & Kite (2021b). Decision-Making Thresholds for Air Pollution. JNCC Report No. 696 (Technical Report), JNCC, Peterborough, ISSN 0963-8091. [Accessed August 2024]

Department for the Environment Food and Rural Affairs (Defra) (2020a). Background Mapping data for local authorities – 2018. [online] Defra. Available at: https://uk-air.defra.gov.uk/data/laqm-background-home [Accessed August 2024]. [Accessed July 2024].

Defra (2022c). NOx to NO2 calculator (v8.1) [Accessed July 2024].

Defra (2021). Emission Factor Toolkit, v12.0 [Accessed July 2024].

Defra (2022b). Local Air Quality Management Technical Guidance (TG22) [Accessed July 2024].

Defra (2023) UKEAP 2022 annual report. [Accessed August 2024]

East Riding of Yorkshire Council (2023) Air Quality Annual Status Report. [Accessed July 2024]

Hull City Council (2023). Air Quality Annual Status Report [Accessed July 2024]

IAQM (2020). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.1. May 2020. [Accessed July 2024].

Natural England (2018). Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001), Version: June 2018. [Accessed July 2024].

Natural England (2024). Priority Habitats Inventory (England). [Accessed July 2024].

RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited (2024). Dogger Bank South Offshore Wind Farms Environmental Statement Volume 7. Chapter 26 – Air Quality. [Accessed July 2024]

Appendix A DBS East or DBS West In Isolation JNCC Approach and NEA001 Dispersion Model Approach Results

Table 11: DBS East or DBS West In-isolation – JNCC approach compared to maximum NEA001 dispersion model approach PC of Project-generated/In-combination NOx from traffic on designated ecological site features. Values in exceedance of 1% of the CLe are shown in bold.

Link	Designated Ecological Site			JNCC Approach		NEA001 Dispersion Model Approach	
	Site Type	Name	Feature Name or Critical Load Class	Conc. µgm-3	% of CLe	Conc. µgm-3	% of CLe
Project-alone (i.e., DBS East or West In-isolation)							
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	0.09	0.30%	0.05	0.16%
28	LNR	Humber Bridge	Broadleaved deciduous woodland	*	*	0.07	0.24%
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	0.07	0.23%	0.01	0.03%
29	LNR	Humber Bridge	Broadleaved deciduous woodland	0.06	0.21%	0.01	0.04%

Link	Designated Ecological Site			JNCC Approach		NEA001 Dispersion Model Approach	
	Site Type	Name	Feature Name or Critical Load Class	Conc. µgm-3	% of CLe	Conc. µgm-3	% of CLe
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	*	*	0.10	0.35%
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)							
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	0.66	**2.19%**	0.22	0.74%
28	LNR	Humber Bridge	Broadleaved deciduous woodland	*	*	0.32	**1.06%**
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	0.69	**2.29%**	0.04	0.12%
29	LNR	Humber Bridge	Broadleaved deciduous woodland	0.63	**2.09%**	0.06	0.21%
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	*	*	0.39	**1.30%**

* The in-combination increase in AADT did not exceed the distance based screening criteria detailed in the JNCC guidance and therefore was not screened in for further assessment.

Table 12: DBS East or DBS West In-isolation – JNCC approach compared to maximum NEA001 dispersion model approach PEC of NOx from traffic on designated ecological site features (including background concentrations).

Link	Designated Ecological Site			JNCC Approach		NEA001 Dispersion Model Approach	
	Site Type	Name	Feature Name or Critical Load Class	Conc. µgm-3	% of CLe	Conc. µgm-3	% of CLe
Project-alone (i.e., DBS East or West In-isolation)							
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	22.03	73.44%	21.99	73.29%
28	LNR	Humber Bridge	Broadleaved deciduous woodland	*	*	13.75	45.83%
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	14.20	47.33%	14.14	47.12%
29	LNR	Humber Bridge	Broadleaved deciduous woodland	14.19	47.31%	14.14	47.13%
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	*	*	10.00	33.33%

Link	Designated Ecological Site			JNCC Approach		NEA001 Dispersion Model Approach	
	Site Type	Name	Feature Name or Critical Load Class	Conc. µgm-3	% of CLe	Conc. µgm-3	% of CLe
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)							
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	22.60	75.33%	22.16	73.87%
28	LNR	Humber Bridge	Broadleaved deciduous woodland	*	*	13.99	46.64%
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	14.81	49.38%	14.17	47.22%
29	LNR	Humber Bridge	Broadleaved deciduous woodland	14.75	49.18%	14.19	47.30%
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	*	*	10.29	34.29%

* The in-combination increase in AADT did not exceed the distance based screening criteria detailed in the JNCC guidance and therefore was not screened in for further assessment.

Table 13: DBS East or DBS West In-isolation – JNCC approach compared to maximum NEA001 dispersion model approach PC of Project-generated/In-combination NH_3 from traffic on designated ecological site features. Values in exceedance of 1% of the Critical Level (CLe) are shown in bold.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe	
					% of lower CLe	% of upper CLe		% of lower CLe	% of upper CLe
Project-alone (i.e., DBS East or West In-isolation)									
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	0.002	-	0.08%	0.007	-	0.24%
28	LNR	Humber Bridge	Broadleaved deciduous woodland	*	-	*	0.008	-	0.28%
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	0.002	-	0.06%	0.001	-	0.04%
29	LNR	Humber Bridge	Broadleaved deciduous woodland	*	-	*	0.001	-	0.05%
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	*	*	*	0.005	0.46%	0.15%

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe	
					% of lower CLe	% of upper CLe		% of lower CLe	% of upper CLe
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)									
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	0.018	-	0.60%	0.033	-	**1.10%**
28	LNR	Humber Bridge	Broadleaved deciduous woodland	*	-	*	0.035	-	**1.17%**
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	0.018	-	0.58%	0.005	-	0.16%
29	LNR	Humber Bridge	Broadleaved deciduous woodland	*	-	*	0.008	-	0.26%
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	*	*	*	0.017	**1.68%**	0.56%

* The in-combination increase in AADT did not exceed the distance based screening criteria detailed in the JNCC guidance and therefore was not screened in for further assessment

Table 14: DBS East or DBS West In-isolation – JNCC approach compared to maximum NEA001 dispersion model approach PEC of NH_3 from traffic on designated ecological site features (including background concentrations). Values in exceedance of 100% of the Critical Level (CLe) are shown in bold.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe	
					% of lower CLe	% of upper CLe		% of lower CLe	% of upper CLe
Project-alone (i.e., DBS East or West In-isolation)									
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	1.70	-	56.75%	1.71	-	56.91%
28	LNR	Humber Bridge	Broadleaved deciduous woodland	*	-	*	1.84	-	61.28%
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	1.80	-	60.06%	1.80	-	60.04%
29	LNR	Humber Bridge	Broadleaved deciduous woodland	*	-	*	1.83	-	61.05%
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	*	*	*	1.91	**191.46 %**	63.82%

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Conc. µgm-3	% of CLe		Conc. µgm-3	% of CLe	
					% of lower CLe	% of upper CLe		% of lower CLe	% of upper CLe
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)									
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	1.72	-	57.26%	1.73	-	57.77%
28	LNR	Humber Bridge	Broadleaved deciduous woodland	*	-	*	1.87	-	62.17%
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	1.82	-	60.58%	1.80	-	60.16%
29	LNR	Humber Bridge	Broadleaved deciduous woodland	*	*	*	1.84	-	61.26%
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	*	*	*	1.93	**192.68 %**	64.23%

* The in-combination increase in AADT did not exceed the distance based screening criteria detailed in the JNCC guidance and therefore was not screened in for further assessment.

Table 15: DBS East or DBS West In-isolation – JNCC approach compared to maximum NEA001 dispersion model approach PC of Project-generated/In-combination nutrient nitrogen deposition rates from traffic on designated ecological site features. Values in exceedance of 1% of the Critical Load (CL) are shown in bold.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Deposition Rate kg N ha^{-1} yr^{-1}	% of CL		Deposition Rate kg N ha^{-1} yr^{-1}	% of CL	
					% of lower CL	% of upper CL		% of lower CL	% of upper CL
Project-alone (i.e., DBS East or West In-isolation)									
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	NC	NC	NC	NC	NC	NC
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	NC	NC	NC	NC	NC	NC
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	0.04	0.38%	0.26%	0.05	0.53%	0.36%

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Deposition Rate kg N ha^{-1} yr^{-1}	% of CL		Deposition Rate kg N ha^{-1} yr^{-1}	% of CL	
					% of lower CL	% of upper CL		% of lower CL	% of upper CL
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)									
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	NS	NC	NC	NC	NC	NC
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	NS	NC	NC	NC	NC	NC
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	0.17	**1.68%**	**1.12%**	0.19	**1.92%**	**1.28%**

* NC - No comparable habitat with established Critical Load estimate available

Table 16: DBS East or DBS West In-isolation – JNCC approach compared to maximum NEA001 dispersion model approach PEC nutrient nitrogen deposition rates from traffic on designated ecological site features (including background deposition rates). Values in exceedance of 100% of the Critical Load (CL) are shown in bold.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Deposition Rate kg N ha^{-1} yr^{-1}	% of CL		Deposition Rate kg N ha^{-1} yr^{-1}	% of CL	
					% of lower CL	% of upper CL		% of lower CL	% of lower CL
Project-alone (i.e., DBS East or West In-isolation)									
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	30.28	**302.78%**	**201.86%**	30.29	**302.93%**	**201.96%**
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)									
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	30.41	**304.08%**	**202.72%**	30.43	**304.32%**	**202.88%**

Table 17: DBS East or DBS West In-isolation – JNCC approach compared to maximum NEA001 dispersion model approach PC of Project-generated/In-combination acid deposition rates from traffic on designated ecological site features.

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Deposition Rate keq ha^{-1} yr^{-1}	% of CL		Deposition Rate keq ha^{-1} yr^{-1}	% of CL	
					% of lower CL	% of upper CL		% of lower CL	% of lower CL
Project-alone (i.e., DBS East or West In-isolation)									
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	NS	NS	NS	NS	NS	NS
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	NS	NS	NS	NS	NS	NS
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	0.003	0.02%	0.02%	0.004	0.03%	0.03%

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Deposition Rate keg ha^{-1} yr^{-1}	% of CL		Deposition Rate keg ha^{-1} yr^{-1}	% of CL	
					% of lower CL	% of upper CL		% of lower CL	% of lower CL
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)									
24	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	NS	NS	NS	NS	NS	NS
29	SAC, SPA, Ramsar, SSSI	Humber Estuary	Mudflats and sandflats not covered by seawater at low tide*	NS	NS	NS	NS	NS	NS
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	0.012	0.11%	0.11%	0.014	0.12%	0.12%

* NS – Habitat Not Sensitive to Acid Deposition

Table 18: DBS East or DBS West In-isolation – JNCC approach compared to maximum NEA001 dispersion model approach PEC acid deposition rates from traffic on designated ecological site features (including background concentrations).

Link	Designated Ecological Site			JNCC Approach			NEA001 Dispersion Model Approach		
	Site Type	Name	Feature Name or Critical Load Class	Deposition Rate keq ha^{-1} yr^{-1}	% of CL		Deposition Rate keq ha^{-1} yr^{-1}	% of CL	
					% of lower CL	% of upper CL		% of lower CL	% of lower CL
Project-alone (i.e., DBS East or West In-isolation)									
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	2.13	19.41%	19.41%	2.13	19.42%	19.42%
In-combination (i.e., Project-generated traffic, 2022-2026 traffic growth and cumulative projects traffic)									
63	AW	Bentley Moor Wood	Broadleaved deciduous woodland	2.14	19.49%	19.49%	2.14	19.51%	19.51%

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