

Outer Dowsing Offshore Wind Environmental Statement

Volume 3, Appendix 9.4: Marine Conservation Zone Assessment

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Table of Contents

Acronyms & Terminology	3
Abbreviations / Acronyms	3
Terminology	4
Reference Documentation	6
9 Marine Conservation Zone Assessment	7
9.1 Introduction	7
9.2 Embedded Mitigation Measures.....	12
9.3 MCZ Assessment Methodology.....	13
9.4 MCZ Screening.....	18
9.5 Conclusion.....	27
10 References	28

List of Tables

Table 9.1 Summary of consultation relating to MCZ designations	11
Table 9.2 Mitigation measures relevant to this MCZ assessment	12
Table 9.3: The MCZs qualifying features and distance from the Project.....	18
Table 9.4: Indirect Impacts on Ecological Receptors screened out from Stage 1 assessment	21
Table 9.5. Impacts that are considered for Stage 1	21

List of Figures

Figure 9.1: Project Offshore Order Limits and MCZs surrounding the Project array (indicated by the red line) and the secondary Zol and underwater noise Zol	9
Figure 9.2: Summary of the MCZ assessment process used by the MMO (MMO, 2013)	14

Acronyms & Terminology

Abbreviations / Acronyms

Abbreviation / Acronym	Description
ANS	Artificial Nesting Structure
cHPMA	Candidate Highly Protected Marine Area
DCO	Development Consent Order
DECC	Department of Energy & Climate Change, now the Department for Energy Security and Net Zero (DESNZ)
DESNZ	Department for Energy Security and Net Zero, formerly Department of Business, Energy and Industrial Strategy (BEIS), which was previously Department of Energy & Climate Change (DECC).
dML	Deemed Marine Licence
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
EMF	Electro Magnetic Field
EPP	Evidence Plan Process
ES	Environmental Statement
ETG	Expert Topic Group
FOCI	Feature of Conservation Interest
GT R4 Ltd	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group portfolio company), Gulf Energy Development and TotalEnergies
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
MCAA	Marine and Coastal Access Act
MCZ	Marine Conservation Zone
MDS	Maximum Design Scenario
MEEB	Measurement of Equivalent Environmental Benefit
MMO	Marine Management Organisation
MPA	Marine Protected Area
MPCP	Marine Pollution Contingency Plan
NSIP	Nationally Significant Infrastructure Project
ORCP	Offshore Reactive Compensation Platform
OWF	Offshore Windfarm
ES	Preliminary Environmental Information Report
PEMP	Project Environmental Management Plan
SEL	Sound Exposure Level
SNCB	Statutory Nature Conservation Body
SoS	Secretary of State
SPMP	Scour Protection Management Plan
SSC	Suspended Sediment Concentration
UK	United Kingdom
WTG	Wind Turbine Generator

Abbreviation / Acronym	Description
Zol	Zone of Influence

Terminology

Term	Definition
Array area	The area offshore within which the generating station (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling will be positioned.
Cumulative effects	The combined effect of the Project acting cumulatively with the effects of a number of different projects, on the same single receptor/resource.
deemed Marine Licence (dML)	A licence administered under the Marine and Coastal Access Act 2009. The licence set out within a Schedule within the Development Consent Order (DCO).
Development Consent Order	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Environmental Statement	The suite of documents that details the processes and results of the Environmental Impact Assessment (EIA).
Impact	An impact to the receiving environment defined as any change to its baseline condition, either adverse or beneficial.
Inter-array cables	Cables which connect the wind turbines to each other and to the offshore substation(s).
Marine and Coastal Access Act	The Marine Coastal Access Act 2009 is an act of the Parliament of the United Kingdom. The act introduced a revised system of marine management and licensing, including marine nature conservation.
Marine Conservation Zone	A Marine Conservation Zone (MCZ) is a type of marine nature reserve in UK waters. They were established under the Marine and Coastal Access Act (2009) and are areas designated with the aim to protect nationally important, rare, or threatened habitats and species.
Mitigation	Mitigation measures, or commitments, are commitments made by the project to reduce and/or eliminate the potential for significant effects to arise as a result of the project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
Outer Dowsing Offshore Wind (ODOW)	The Project.
The Offshore Export Cable Corridor (Offshore ECC)	The Offshore Export Cable Corridor (Offshore ECC) is the area within the Order Limits within which the export cables running from the array to landfall will be situated.
Order Limits	The area subject to the application for development consent, The limits shown on the works plans within which the Project may be carried out.
Preliminary Environmental	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory

Term	Definition
Information Report (PEIR)	consultation process during the pre-application phase.
Project Design Envelope	A description of the range of possible elements that make up the Project's design options under consideration, as set out in detail in the project description. This envelope is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
The Project	Outer Dowsing Offshore Wind (ODOW) including proposed onshore and offshore infrastructure
wind turbine generator (WTG)	A structure comprising a tower, rotor with three blades connected at the hub, nacelle and ancillary electrical and other equipment which may include J-tube(s), transition piece, access and rest platforms, access ladders, boat access systems, corrosion protection systems, fenders and maintenance equipment, helicopter landing facilities and other associated equipment, fixed to a foundation

Reference Documentation

Document Number	Title
5.1	Consultation Report
6.1.10	Fish and Shellfish Ecology
6.1.3	Project Description
6.1.6	Technical Consultation
6.1.7	Marine Physical Processes
6.1.9	Benthic Subtidal and Intertidal Ecology

9 Marine Conservation Zone Assessment

9.1 Introduction

9.1.1 Project Background

1. This report has been prepared for the purpose of providing evidence on whether the potential impacts of Outer Dowsing Offshore Windfarm ('the Project') could give rise to a significant risk of hindering the conservation objectives of any Marine Conservation Zones (MCZs). The report has been prepared as part of the suite of documents accompanying the Environmental Statement (ES) that has been produced by the Project.
2. GT R4 Limited (trading as Outer Dowsing Offshore Wind) hereafter referred to as the 'Applicant', is proposing to develop the Project. The array area of the Project will be located approximately 54km from the Lincolnshire coastline in the southern North Sea. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm), export cables to landfall, Offshore Reactive Compensation Platforms (ORCPs), onshore cables, connection to the electricity transmission network, ancillary and associated development and areas for the delivery of up to two Artificial Nesting Structures (ANS) and the creation of a biogenic reef (if these compensation measures are deemed to be required by the Secretary of State) (see Volume 1, Chapter 3: Project Description (Document Reference 6.1.3)).

9.1.2 Aims and Objectives









3. Specific consideration of MCZs is required for any Marine Licence, or any Development Consent Order (DCO) application containing deemed Marine Licences (dMLs). When considering such applications, decision makers have specific duties in respect of MCZs under section 126 of the Marine and Coastal Access Act (MCAA) 2009. Section 126 applies where:
 - A public authority has the function of determining an application (whenever made) for authorisation of the doing an act; and
 - The act is capable of affecting (other than insignificantly):
 - The protected features of an MCZ; and/or
 - Any ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependant.
4. This document has been produced as part of the Project's ES to provide evidence on whether the potential impacts of the Project give rise to a significant risk of hindering the achievement of the conservation objectives of MCZs. The following MCZs have been screened in for consideration based on the zones of influence identified for relevant features of those sites within the ES chapters presented in Volume 1 (Chapter 7: Marine Physical Processes (document reference 6.1.7); Chapter 9: Benthic Subtidal and Intertidal Ecology (document reference 6.1.9); and Chapter 10: Fish and Shellfish Ecology (document reference 6.1.10)):
 - Holderness Inshore MCZ;

- Holderness Offshore MCZ; and
 - Cromer Shoal Chalk Bed MCZ.
5. This document follows guidance published by the Marine Management Organisation (MMO) (2013) on how these assessments should be undertaken. The MCZ assessment has been undertaken based on the Project information provided in document 6.1.3.











9.1.3 Project Overview

6. This section provides a brief overview of the key components of the Project. A full description of the Project is provided in Volume 1, Chapter 3: Project Description (document reference 6.1.3).
7. All offshore elements will be installed within the offshore Order Limits including;
- Up to 100 Wind Turbine Generators (WTGs);
 - Up to four offshore small Offshore Substations (OSSs) or up to two large OSSs;
 - Up to one accommodation platform;
 - Up to two Offshore Reactive Compensation Platforms (ORCPs) within the ORCP area (within the offshore export cable corridor (hereafter referred to as the Offshore ECC)); and
 - Up to 377.42km of array cables, 124.75km of interlink cables (between platforms) and 440km of export cables).
 - Areas for the delivery of up to two Artificial Nesting Structures (ANS) and the creation of a biogenic reef (Figure 9.1) (if these compensation measures are deemed to be required by the Secretary of State) (see document 6.1.3 for full details).
8. The Project has been refined as it has moved through subsequent stages of design, consultation and the Environmental Impact Assessment (EIA) process culminating in the ES that accompanies this DCO application.
9. The final Project design will depend on factors including engineering ground conditions and environmental conditions that will be subject to the detailed pre-construction surveys, the Project economics and the approach to procurement of resources. This report considers a series of options that are encompassed within the Maximum Design Scenario (MDS) for each impact, defined by the Project Design Envelope. (Volume 2, Chapter 3: Project Description). The MDS has been defined within document 6.1.7 and document 6.1.9.

Legend

-  Array Area
-  Offshore Export Cable Corridor
-  ORCP Area
-  Artificial Nesting Structure Area
-  Biogenic Reef Restoration Area
-  Secondary Zone of Influence
-  Underwater Noise Impacts 50km Buffer
-  Marine Conservation Zones

Depth (m)

-  0 - 10
-  10 - 20
-  20 - 30
-  30 - 40
-  40 - 50
-  50 - 60
-  60 - 70
-  70 - 80
-  80 - 90
-  90 - 100

Coordinate System: WGS 1984 UTM Zone 31N


0 20 40 km

Scale: 1:650,000 A3 Page Size

Environmental Statement


Offshore Order Limits with Marine Conservation Zones

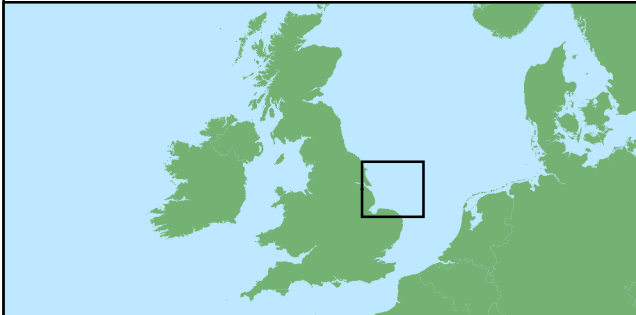
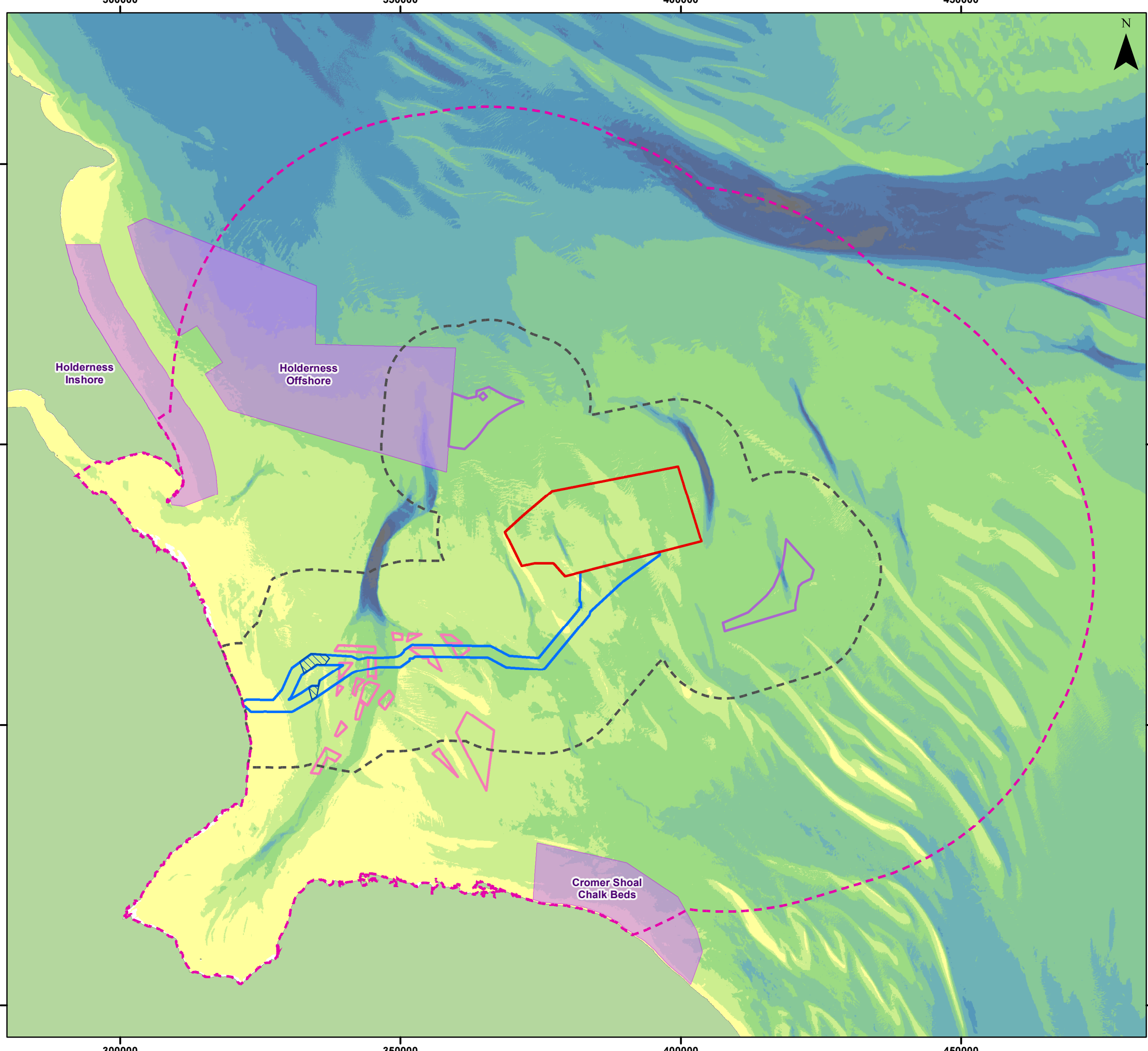
Figure 9.1

 OUTER DOWING OFFSHORE WIND

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Contains ESRI Basemapping;
EMDNet 2020 bathymetry

 GoBe



Document Path: Z:\GIS\GIS - Projects\0152 Outer Dowing EIA\GIS\Figures\ES\MCZ Assessment\ODOW_0152_MCZ_Fig9.1_Study Area MCZs v2.mxd

9.1.4 Document Structure

10. This MCZ assessment is structured as follows;

- Section 1: Introduction;
- Section 2: Consultation;
- Section 3: Embedded mitigation measures;
- Section 4: MCZ assessment methodology;
- Section 5: MCZ Screening;
- Section 6: Conclusion.

11. This MCZ assessment should be read alongside the following chapters (presented in Volume 1) and appendices (presented in Volume 3) of the ES, which are referred to and drawn upon throughout this document:

- Chapter 3: Project Description (document 6.1.3);
- Chapter 7: Marine Physical Processes (document 6.1.7);
- Chapter 8: Marine Water and Sediment Quality (document 6.1.8);
- Chapter 9: Benthic Subtidal and Intertidal Ecology (document 6.1.9); and
- Chapter 10: Fish and Shellfish Ecology (document 6.1.10); and
- Appendix 7.2: Physical Processes Modelling Report (document 6.3.7.2).

9.1.5 Consultation

12. Consultation is a key part of the DCO application process. Consultation regarding MCZs has been conducted through the Evidence Plan Process (EPP), Expert Topic Group (ETG) meetings, the EIA Scoping process (Outer Dowsing Offshore Wind, 2022) and Section 42 consultation on the PEIR which included a MCZ assessment, published in June 2023. An overview of the Project consultation process is presented within Volume 1, Chapter 6: Technical Consultation (document reference 6.1.6) and within the Consultation Report (document 5.1).

13. A summary of the key issues raised during consultation, specific to the MCZ designations, is presented in Table 9.1 below, together with how these issues have been considered in the EIA.

14. As part of the EIA process for the Project, consultation has been undertaken with various statutory and non-statutory authorities, through the agreed EPP (being used for the EIA process as well as for the Habitats Regulations Assessment). A formal Scoping Opinion was sought from the Secretary of State (SoS) following submission of the Scoping Report (Outer Dowsing Offshore Wind, 2022). The Scoping Opinion (The Planning Inspectorate, 2022) was issued in September 2022 by The Planning Inspectorate.

15. Section 42 responses were issued by consultees in July 2023, however there was no specific feedback on the MCZ assessment.

Table 9.1 Summary of consultation relating to MCZ designations

Date and consultation phase/type	Consultation and key issues raised	Section where comment addressed
Scoping Opinion (The Planning Inspectorate, 9 September 2022) Comment ID: 3.1.5	The ES should assess the potential significant effects of the Project on the Inner Silver Pit South candidate Highly Protected Marine Area (cHMPA). Further details can be found at: https://consult.defra.gov.uk/hpma/consultation-on-highlyprotected-marine-areas/	The Inner Silver Pit South cHMPA was not designated by Defra; therefore has not been considered further within this MCZ Assessment.
Scoping Opinion (The Planning Inspectorate, 9 September 2022)	The marine element of the export cable area of search may overlap with part of the Inner Silver Pit South cHPMA. Further information on the location of the cHPMA can be found at https://consult.defra.gov.uk/hpma/consultation-on-highlyprotected-marine-areas/ . The ES should include a full assessment of the direct and indirect effects of the development on the features of any cHPMA and should identify such mitigation measures as may be required in order to avoid, minimise, or reduce any adverse significant effects.	As outlined above, The Inner Silver Pit South cHMPA was not designated, therefore it has not been considered further within this MCZ Assessment.
Scoping Consultation (Natural England, 30 August 2022)	The Offshore Transmission assets of the development are adjacent to the following Marine Conservation Zones: Holderness Offshore MCZ The ES should consider including information on the impacts of this development on MCZ interest features, to inform the assessment of impacts on habitats and species of principle importance for this location. Further information on MCZs is available via the following link: http://publications.naturalengland.org.uk/category/1723382 Further information on the special interest features, the conservation objectives, and relevant conservation advice packages for designated sites is available on our website: https://designatedsites.naturalengland.org.uk/	The ES has considered information on the impacts of this development on the features of the Holderness Offshore MCZ, to inform the assessment of impacts on habitats and species of principle importance for this location, further detailed in document 6.1.9 and document 6.1.10 and the MCZ assessment methodology (Section 9.3). Based on this assessment, Holderness Offshore MCZ was therefore screened out of the Stage 1 assessment (as detailed in full in Section 9.4).

9.2 Embedded Mitigation Measures

16. Mitigation measures that were identified and adopted as part of the evolution of the project design (embedded into the project design) and that are relevant to the MCZ assessment are listed below. General mitigation measures, which would apply to all parts of the project, are set out first. Thereafter mitigation measures that would apply specifically to the MCZ assessment issues associated with the array and Offshore ECC are described separately.

Table 9.2 Mitigation measures relevant to this MCZ assessment

Project phase	Mitigation measures embedded into the project design
General	
Definition of development boundaries	The development boundary selection was made following a series of constraints analyses, with the array area and offshore ECC route selected to ensure the impacts on sensitive environmental receptors are minimised.
Construction and Decommissioning	
Pollution prevention	A Project Environmental Management Plan (PEMP) (for the construction and operation phases) and Decommissioning Plan (for the decommissioning phase) will be produced and followed. This will include a Marine Pollution Contingency Plan (MPCP) which will safeguard the marine environment in the event of accidental pollution occurring as a result of Project operations. Plans will also highlight key organisations and contact details in the event of a spill (e.g. Environment Agency, Marine Management Organisation, Natural England and the Maritime and Coastguard Agency (MCA)).
Marine Invasive Non-Native Species (INNS) control	Relevant best practice guidelines, Need, Policy and Legislative Context will be followed to minimise marine INNS introduction/spread. Any vessels used for the delivery of materials to site will adhere to industry legislation, codes of conduct and/or best practice to reduce the risk of introduction or spread of invasive non-native species.
Decommissioning Programme	Development of, and adherence to, a Decommissioning Programme.
Operation and Maintenance	
Project Design	A Scour Protection Management Plan (SPMP) and Cable Specification and Installation Plan (CSIP) will be developed which will consider the need for scour protection.
Electromagnetic Fields (EMF) and cable protection	Where possible, cables will be buried to reduce the impacts of EMF on sensitive receptors and minimise the requirement for additional cable protection.

9.3 MCZ Assessment Methodology

9.3.1 Guidance and Relevant Information

17. Guidance published by the MMO (2013) describes how MCZ assessments could be undertaken in the context of marine licensing decisions (note: there is no published guidance from the Planning Inspectorate or advice on MCZ assessments for DCO applications). These MMO guidelines recommend a staged approach to the assessment, with three sequential stages:
- Screening;
 - Stage 1 assessment; and
 - Stage 2 assessment.
18. Full details of each of these stages of the approach are detailed within the MMO (2013) guidance.
19. Where specific activities, impacts or MCZs and their features are screened into the MCZ assessment process, these are then considered within the Stage 1 assessment. Should a significant risk of the activity hindering the conservation objectives be identified within Stage 1, then specific impact receptor pathways need to be considered in Stage 2 assessment (Figure 9.2). Full details of each of these stages of the approach have been provided in the following sections.

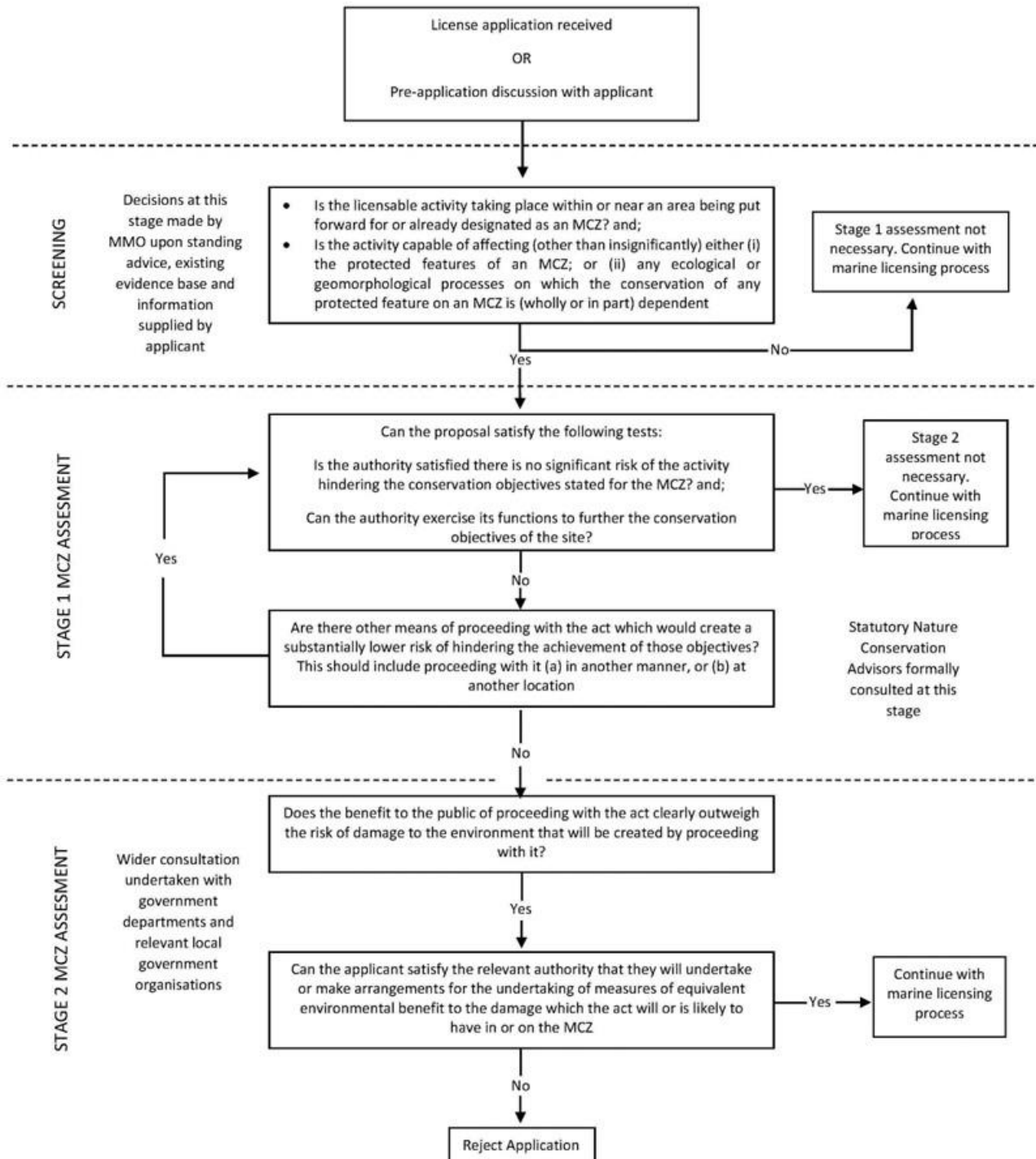


Figure 9.2: Summary of the MCZ assessment process used by the MMO (MMO, 2013)

9.3.2 Screening Methodology

20. The MMO (2013) guidelines specify that all marine licence applications need to be screened to determine if Section 126 should apply. The guidelines advise section 126 will apply if, through the course of screening, it is determined that:
- The licensable activity is taking place within or near an area being put forward or already designated as an MCZ; and
 - The activity is capable of affecting (other than insignificantly) either:
 - The protected features of an MCZ; or
 - Any ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependant.
21. To determine the "nearness" of an activity to an individual MCZ and its features, the MMO propose a risk-based approach. This includes applying an appropriate buffer zone to the MCZ features under consideration as well as a consideration of risks which lie in activities further removed from features.
22. In considering "insignificance", the likelihood of an activity causing an effect, the magnitude of the effect should it occur, and the potential risk any such effect may cause on either the protected features of an MCZ or any ecological or geomorphological process on which the conservation of any protected MCZ feature, wholly or in part, is dependant will be taken into account.
23. For the purposes of the Project MCZ Screening, MCZs considered within the assessment were identified based on proximity to the Project as follows:
- Sites with spatial overlap with the Project;
 - Sites within the study area defined as the Order Limits together with the secondary zone of influence (Zol) for individual technical disciplines.
24. The Project secondary Zol has been defined based on the expected maximum distance that sediment from within the Project array area and Offshore ECC might be transported on a single mean spring tide, in the flood and/or ebb direction. This area conservatively indicates the likely spatial extent over which measurable plume effects arising at anytime from anywhere within the Order Limits might be experienced, for specific distances from distance from the array area and from the Offshore ECC please see Table 9.3. This area defines the maximum distance suspended sediments disturbed by development activities might have an impact on benthic habitats, although the majority of suspended sediment is expected to be deposited much closer to the specific activity.

25. The Project has also considered a Zol for underwater noise which has been defined by the extents over which noise effect thresholds will be reached. This is determined through detailed underwater noise modelling (see Volume 3, Appendix 3.2: Underwater Noise Technical Report), based on the Maximum Design Scenario which relates to the greatest spatial and greatest temporal effects. Whilst the maximum modelled impact range from underwater noise (using the cumulative 186dB re1 μ Pa²s Sound Exposure Level (SEL) from piling activities for the Project) will be up to 28km from the array area, to ensure a precautionary approach, a 50km Zol for underwater noise impacts has been used to include potential behavioural impacts which are expected to occur over a larger distance (and for which there are no agreed thresholds).

9.3.3 Stage 1 Assessment Methodology

26. The Stage 1 assessment (if required) assesses the extent of the potential impact of the Project on the MCZs screened into the assessment. The MMO guidance (2013) sets out that Stage 1 assessment needs to consider whether the conditions in Section 126(6) of the MCAA can be met. Using information supplied by the Applicant, advice from the Statutory Nature Conservation Bodies (SNCBs) and any other relevant information, the relevant authority would determine whether:

- There is no significant risk of the activity hindering the achievement of the conservation objectives stated for the MCZ; and
- The relevant authority can exercise its functions to further the conservation objectives stated for the MCZ (in accordance with s.125(2)(a)).

27. If the condition in Section 126(6) cannot be met, the Stage 1 assessment also considers whether the condition in Section 127(7)(a) of the MCAA can be met, which requires the relevant authority to determine whether that:

- There are no other means of proceeding with the act which would create a substantially lower risk of hindering the achievement of the conservation objectives stated for the MCZ. This should include proceeding with it (a) in another manner, or (b) at another location.

28. In Stage 1, the conservation objectives for the MCZ features need to be considered. The conservation objectives for MCZ features are high level criteria describing the desired condition of the MCZ features. While conservation objectives for individual MCZs or certain features are often site-specific, the two overarching conservation objectives defined for MCZs are:

- To maintain a feature in favourable condition if it is already in favourable condition; or
- To bring a feature into favourable condition if it is not already in favourable condition.

29. When considering whether an activity can "further" (for instance, increase the likelihood that the current status of a feature would be maintained or improve) or "hinder" the conservation objectives of a site, the relevant authority considers the direct impact of an activity upon a feature as well as any applicable indirect impacts. An indirect impact may include, for example, changing the effectiveness of a site-specific management measure put in place to further its conservation objectives.

30. With respect to "other means", the Applicant should be able to demonstrate that the proposed approach to development reduces the risk such that the activity no longer has a significant risk of hindering the conservation objectives of the site. Where sufficient mitigation to reduce the predicted impacts to an acceptable level cannot be implemented and there are no other means that substantially lower the risk of hindering the achievement of conservation objectives, then a Stage 2 assessment would be required.
31. Volume 2, Chapter 9: Benthic Subtidal and Intertidal Ecology and Volume 2, Chapter 10: Fish and Shellfish Ecology present assessments of the impacts of the Project on the ecological marine environment with regards to benthic, fish and shellfish receptors. The definitions of the magnitude of impacts, sensitivity of receptors and the significance of effects on those receptors are defined within these chapters, respectively. These definitions have also been adopted for the purposes of this MCZ assessment, with the term 'effect' used to express the consequence of an impact. This is expressed as the 'significance of effect' and is determined by considering the magnitude of the impact alongside the sensitivity of the receptor or resource, in accordance with defined significance criteria as defined in the respective chapters and bringing forward the conclusions of the assessments from the relevant ES chapters.

9.3.4 Stage 2 Assessment Methodology

32. Stage 2 of the MCZ assessment (if required) considers whether the conditions in Sections 126(7)(b) and (c) of the MCAA can be met. From the approach suggested by the MMO (2013), the relevant authority will use information supplied by the Applicant with the licence application, advice from the SNCBs and any other relevant information to determine whether:
- the benefit to the public of proceeding with the proposed activity clearly outweigh the risk of damage to the environment that will be created by said activity; and, if so, then whether;
 - the Applicant can satisfy the relevant authority that they will make arrangements for the undertaking of measures of equivalent environmental benefit (MEEB) to the damage which the activity is likely to have on the MCZ. The above determinations will be addressed in sequence, that is, if the public benefit test is not passed then a consideration of MEEB would not be made as the application would be rejected.
33. In determining public benefit, benefits at a national, regional, or local level will be considered by the relevant authority. Applications for activities that are of solely private benefit do not qualify as delivering a benefit to the public.
34. Guidance from the MMO on what constitutes MEEB suggests that *"types of compensatory measures that might be considered under the Habitats Directive will also be appropriate to put forward here, although consideration will not be confined to those measures alone"* (MMO, 2013).

9.4 MCZ Screening

35. This section follows the MMO (2013) guidelines and uses a risk-based approach to determine the MCZs that could potentially be affected by the Project, including the implementation of benthic compensation areas and ANS structures. A precautionary approach has been taken within this report by considering all the potential designated features of the relevant MCZs, and the processes upon which they rely, prior to any screening out of MCZ sites or their protected features.

9.4.1 MCZs Relevant to the Project

36. In addressing the following point of the MCZ screening process "*the licensable activity is taking place within or near an area being put forward or already designated as an MCZ*", MCZs in the vicinity of the Project were identified.

37. Potential MCZs in the North Sea have been reviewed considering their proximity to the Project criteria, as detailed within Section 9.3, and a total of 3 MCZs are considered to have the potential to be affected by the Project:

- Holderness Offshore MCZ;
- Holderness Inshore MCZ; and
- Cromer Shoal Chalk Bed MCZ.

38. The locations of the MCZs are shown in Figure 9.1 in relation to the secondary Zol and the underwater noise Zol. The distance of the sites to the Project are presented in Table 9.3, as well as the Features of Conservation Interest (FOCI) and conservation objectives for each MCZ.

Table 9.3: The MCZs qualifying features and distance from the Project

Site	Qualifying Features	Conservation objectives	Distance from the Project and secondary Zol
Holderness Inshore MCZ (Defra, 2016a)	<ul style="list-style-type: none"> ▪ Intertidal sand and muddy sand ▪ Moderate energy circalittoral rock ▪ High energy circalittoral rock ▪ Subtidal coarse sediment ▪ Subtidal mixed sediment ▪ Subtidal sand ▪ Subtidal mud ▪ Spurn head (subtidal) 	Maintain in favourable condition	<ul style="list-style-type: none"> ▪ 50.4km from the array area 33km from the Offshore ECC, 41.8km from the ANS areas and 34.7km from the biogenic reef areas. ▪ Lies outside the suspended sediment and deposition Zol. ▪ Within the noise Zol but no designated noise sensitive features.
Holderness Offshore	<ul style="list-style-type: none"> ▪ Ocean quahog (<i>Artica islandica</i>) 	Recover to favourable condition	<ul style="list-style-type: none"> ▪ 14.4km from the array area, 29.9km from the Offshore ECC, 0.01km from the

Site	Qualifying Features	Conservation objectives	Distance from the Project and secondary Zol
MCZ (JNCC, 2020)	<ul style="list-style-type: none"> ▪ Subtidal coarse sediment ▪ Subtidal mixed sediment ▪ Subtidal sand 		<p>northern ANS area and 29km from the biogenic reef areas.</p> <ul style="list-style-type: none"> ▪ Lies outside the suspended sediment and deposition Zol for the array area, Offshore ECC, biogenic reef areas and southern ANS area. Lies within that for the northern ANS area. ▪ Lies within the underwater noise Zol (Ocean Quahog are given due consideration regarding the potential for disturbance from particle motion element of underwater noise).
Cromer Shoal Chalk Bed MCZ (Defra, 2016b)	<ul style="list-style-type: none"> ▪ Moderate energy infralittoral rock ▪ High energy infralittoral rock ▪ Moderate energy circalittoral rock ▪ High energy circalittoral rock ▪ Subtidal chalk ▪ Subtidal coarse sediment ▪ Subtidal mixed sediment ▪ Subtidal sand ▪ Peat and clay exposures ▪ North Norfolk Coast (subtidal) 	Maintain in favourable condition	<ul style="list-style-type: none"> ▪ 47.8km from the array area, 30.9km from the Offshore ECC, 44.85km from the ANSs and 13.0km from the biogenic reef areas. ▪ Lies outside the suspended sediment and deposition Zol. ▪ Within the noise Zol but no designated noise sensitive features.

9.4.2 Impacts Considered

39. To assess, whether *"the activity is capable of affecting (other than insignificantly) either (i) the protected features of an MCZ; or (ii) any ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependent"*, the conclusions of relevant ES sections were reviewed. Impacts that have the potential to affect designated MCZ features were identified as part of the EIA Screening (document 6.1.9 and document 6.1.10).

9.4.2.1 Direct Impacts

40. The offshore ECC, proposed array area, benthic compensation area and ANS do not directly overlap with any of the MCZs as mentioned above in Section 9.1 and 9.3. All direct impacts (for example temporary habitat loss or disturbance from seabed preparation activities, or permanent habitat loss from the placement of foundations, or scour protection) will occur within the offshore ECC and array area. Therefore, direct impacts have been screened out of any further assessment in this MCZ assessment.

9.4.2.2 Indirect impacts

41. Given the potential for indirect impacts from the Project, these are considered further.
42. The MMO guidance states that the MCZ assessment process requires impacts to be assessed, unless the impact is deemed insignificant (MMO, 2013).
43. Based on this, the Applicant will screen out impacts which can be concluded as having a negligible impact magnitude (in EIA terms) on features of an MCZ or are considered to present a sufficiently low risk to its protected features or the ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependent.
44. Indirect impacts that were assigned a 'negligible' magnitude in the ES assessment (Section 3.7 to 3.8 of document 6.1.9 and document 6.1.10) have therefore been screened out based on "insignificance" and are therefore not taken through to the Stage 1 assessment (Please see Table 9.4

Table 9.4: Indirect Impacts on Ecological Receptors screened out from Stage 1 assessment

Receptor: Benthic Ecology	Receptor: Fish and Shellfish
Construction and decommissioning	
Direct and indirect seabed disturbances leading to the release of sediment contaminants.	Direct and indirect seabed disturbances leading to the release of sediment contaminants.
Operation and Maintenance	
Increased risk of introduction or spread of marine INNS due to presence of infrastructure and vessel movements may affect benthic subtidal and intertidal ecology and biodiversity.	Changes in physical processes resulting from the presence of the OWF subsea infrastructure e.g., scour effects, changes in wave/tidal current regimes and resulting effects on sediment transport.
Changes in physical processes resulting from the presence of the OWF subsea infrastructure e.g., scour effects, changes in wave/tidal current regimes and resulting effects on sediment transport.	Underwater noise as a result of operational WTGs resulting in potential effects on fish and shellfish receptors.
Electromagnetic field (EMF) effects generated by cables.	Electromagnetic field (EMF) effects generated by cables.

Table 9.5. Impacts that are considered for Stage 1

Receptor: Benthic Ecology	Receptor: Fish and Shellfish
Construction and decommissioning	
Temporary increase in suspended sediment and sediment deposition	Temporary increase in suspended sediment and sediment deposition
Changes to geomorphological processes and subsequent impacts on geological features of an MCZ	Mortality, injury and behavioural changes resulting from underwater noise arising from construction activity

45. It should be noted that the impacts screened in Table 9.5 following the MCZ assessment as they were identified as having potential impacts (**minor significance**) on ecological receptors, please see document 6.1.9 and document 6.1.10 for further details.

9.4.2.3 Screening Assessment

Temporary Increase in Suspended Sediment Concentration (SSC) and Sediment Deposition

46. Indirect impacts from the Project, such as the effects of suspended sediments and subsequent deposition, are considered further for all MCZs, as described in Table 9.3 and shown in Figure 9.2. The secondary Zol conservatively indicates the likely maximum spatial extent over which measurable suspended sediment plume impacts arising at anytime from anywhere within the Order Limits be experienced.
47. Temporary localised increases in SSC and associated sediment deposition and smothering are expected from foundation and cable installation works (including trenchless technique installation) and seabed preparation works (including sandwave clearance). This assessment should be read in conjunction with Volume 3, Appendix 7.1: Physical Processes Technical Baseline (document 6.3.7.1), which provides the detailed offshore physical environment assessment (including project specific modelling of sediment plumes).
48. Sediment plumes caused by seabed preparation and construction activities are expected to be restricted to within a single tidal excursion from the point of release, which is captured by the Secondary Zol (Figure 9.2Figure 9.1). Sediment plumes are expected to quickly dissipate after cessation of the construction activities, due to settling and wider dispersion with the concentrations reducing quickly over time to background levels (i.e., within a couple of tidal cycles). Coarser sediments will be deposited close to the source (a few hundred meters), with fine sediments being transported further from the source (reducing exponentially from source).
49. The adjacent MCZ's do not overlap with the secondary Zol and therefore no pathway for effects associated with temporary Increase in SSC and sediment deposition exist from the array and Offshore ECC. The secondary Zol from the northern ANS area overlaps with the Holderness Offshore MCZ; however, the important consideration for this is the very small scale of proposed works for that area. Details on distances and the supporting evidence at each site is presented below.

Holderness Inshore MCZ

50. The Holderness Inshore MCZ is located 33km away at its nearest point (the offshore ECC) to the Project and so is beyond the secondary Zol. As a result, there is no expected impact or change to SSC nor a measurable sediment deposition within the MCZ. As such, there is no identified receptor-impact-pathway to this MCZ associated with construction, operation, or maintenance and decommissioning activities within the array area and offshore ECC. Therefore, an assessment of SSC and sediment deposition is screened out for the Holderness Inshore MCZ.

Holderness Offshore MCZ

51. The Holderness Offshore MCZ is located 14.4km away from its nearest point to the Project (array area) and 29.9km distance from the offshore ECC, therefore falls outside of the secondary Zol (which extends 12km from the array and 15km for the offshore ECC). As such, there is no identified receptor-impact-pathway to this MCZ associated with construction, operation, or maintenance and decommissioning activities within the array area and offshore ECC. Therefore, an assessment of SSC and sediment deposition is screened out for Holderness Offshore MCZ from the array area, Offshore ECC, southern ANS area and the biogenic reef creation areas.
52. The Holderness Offshore MCZ is adjacent (0.05km) to the northern ANS area and therefore falls within the secondary Zol. The proposed works at the ANS areas will be discrete, small scale activities, with any sediment deposition primarily remaining outside the MCZ, with only a small proportion of fine sediments being transported within the MCZ. Any fine sediment deposited within the MCZ will be resuspended and redistributed on each subsequent tidal cycle, to background levels within a few tidal cycles. As such, it is concluded that there is no potential for the increase in suspended sediment concentrations and sediment deposition from the construction of the ANSs in the northern ANS area affecting (other than insignificantly) the designated features or ecological or geomorphological processes of the Holderness Offshore MCZ. Therefore, an assessment of SSC and sediment deposition is also screened out for Holderness Offshore MCZ from the ANS areas.

Cromer Shoal Chalk Bed MCZ

53. The Cromer Shoal Chalk Bed MCZ is located 30.9km away from its nearest point to the array, Offshore ECC and ANS areas, and as such lies outside of the secondary Zol. It is located 13.0km from the biogenic reef area, however this is not anticipated to result in changes to SSC and deposition from the proposed works. Therefore, an assessment of SSC and sediment deposition is screened out for the Cromer Shoal Chalk Bed MCZ.

Mortality, Injury and Behavioural Changes Resulting from Underwater Noise Arising from Construction Activity

54. Indirect impacts from the Project, such as the effects of underwater noise, are considered with regards to ocean quahog feature of the Holderness Offshore MCZ. This assessment should be read in conjunction with document 6.1.10, which provides the detailed underwater noise assessment with regard to fish and shellfish receptors. None of the features of the Holderness Inshore MCZ or Cromer Shoal Chalk Bed MCZ are sensitive to underwater noise and therefore these sites are not screened in for this impact.
55. The underwater noise Zol as shown in Figure 9.1 conservatively indicates the maximum potential range of impact from underwater noise from construction activities (such as pile driving for the installation of foundations) in the array area.

Holderness Offshore MCZ

56. The Holderness Offshore MCZ is designated for the ocean quahog, a bivalve mollusc found in sandy substrates throughout the North Sea. The site is located 14.4km from the Project array area and adjacent (0.05km) to the northern ANS, and within the underwater noise ZoIs from the Project. Ocean quahog do not possess a swim bladder, and on this basis are considered primarily sensitive to particle motion rather than sound pressure (Popper and Hawkins, 2018). Pile driving is recognised as a source of particle motion, which could potentially result in disturbance of ocean quahog as a feature of the Holderness Offshore MCZ.
57. Impacts from particle motion are likely to occur locally to the source (Hazelwood and Macey, 2016), with studies having demonstrated the rapid attenuation of particle motion with distance (Mueller-Blenkle *et al.*, 2010), it is therefore considered unlikely that there will be any more than a highly localised effect. Taking into consideration the distance of the Holderness Offshore MCZ from the array area which presents the greatest impact from underwater noise for the Project and the northern ANS area being outside the MCZ (i.e. no direct impact), the construction of the ANSs being relatively small scale (compared to the array area) and the limited propagation of particle motion effects, there are not anticipated to be any significant effects from underwater noise on ocean quahog as a feature of the Holderness Offshore MCZ, and therefore an assessment of impacts from underwater noise impacts is screened out for the Holderness Offshore MCZ.

Geomorphological Process

Holderness Inshore MCZ

58. It is noted the Spurn Head (subtidal) geological feature is identified as a designated feature of the Holderness Inshore MCZ.
59. The Holderness Inshore MCZ and Spurn Head feature are located outside of the secondary ZoI, and therefore will not be sensitive to the impacts associated with all phases of the project. This is primarily because there will be no direct impacts upon the site and therefore there is no pathway for any activities to physically interact with this feature and alter any of the geomorphological processes. Similarly, for indirect impacts as described above, such as SSC and deposition, due to the distance from the offshore ECC (33km) it is unlikely that such indirect effects would have a significant effect upon the geological features.
60. It is therefore concluded that the geological feature (Spurn Head, subtidal) of the Holderness Inshore MCZ is screened out for the potential impacts from changes in geomorphological processes during all phases of the Project.

Holderness Offshore MCZ

61. North Sea glacial tunnel valleys are designated as a geological feature of the Holderness Offshore MCZ. The Holderness Offshore MCZ, and the geological feature are located outside of the secondary ZOI of the array area, Offshore ECC and southern ANS area and doesn't overlap with the northern ANS area, and therefore will not be sensitive to the impacts associated with all phases of the project. This is primarily because there will be no direct impacts upon the site and therefore there is no pathway for any activities to physically interact with this feature and alter any of the geomorphological processes. Similarly, for indirect impacts as described above, such as SSC and deposition, due to the distance from the offshore ECC (30km) and the array area (14km) and the small scale of any works within the northern ANS area it is unlikely that such indirect effects would have a significant effect upon the geological features.
62. It is therefore concluded that the geological feature (North Sea glacial tunnel valleys) of the Holderness Offshore MCZ is screened out for the potential impacts from changes in geomorphological processes during all phases of the Project.

Cromer Shoal Chalk Beds MCZ

63. The Cromer Shoal Chalk Beds MCZ contains the designated features "North Norfolk Coast (subtidal)". The site and this geological feature are located outside of the secondary ZOI from the array area, offshore ECC and ANS areas, with works in the biogenic reef areas not expected to result in any measurable changes in SSC and deposition, and therefore will not be sensitive to the impacts associated with all phases of the Project. This is primarily because there will be no direct impacts upon the site and therefore there is no pathway for any activities to physically interact with this feature and alter any of the geomorphological processes. Similarly, for indirect impacts as described above, such as SSC and deposition, due to the distance from the offshore ECC (30.9km) it is highly unlikely that such indirect effects would have a significant effect upon the geological features.
64. It is therefore concluded that the geological feature (North Norfolk Coast (subtidal)) of the Cromer Shoal Chalk Beds MCZ is screened out for the potential impacts from changes in geomorphological processes during all phases of the Project.

Screening Conclusions

65. Any impacts which have been concluded as having a negligible impact magnitude (in EIA terms) on receptors (including features of an MCZ) within document 6.1.9 and document 6.1.10 have been screened out by the Applicant (as outlined in paragraph 43 *et seq*). These impacts are considered to present a sufficiently low risk to its protected features or the ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependent. From the ES chapter (document 6.1.9 and document 6.1.10) these include:
- Direct and indirect seabed disturbances leading to the release of sediment contaminants;
 - Increased risk of introduction or spread of marine INNS due to presence of infrastructure and vessel movements may affect benthic subtidal and intertidal ecology and biodiversity;
 - Changes in physical processes resulting from the presence of the OWF subsea infrastructure e.g., scour effects, changes in wave/tidal current regimes and resulting effects on sediment transport;
 - EMF effects generated by cables; and
 - Underwater noise as a result of operational WTGs resulting in potential effects on fish and shellfish receptors.
66. To reiterate, and as stated above, all impacts that are considered "direct impacts," have also been screened out due to the lack of impact pathway and these include:
- Temporary habitat disturbance;
 - Permanent habitat loss/alteration; and
 - Colonisation of hard substrates.
67. Indirect sedimentary impacts upon the Holderness Inshore MCZ, Holderness Offshore MCZ and Cromer Shoal Chalk Beds MCZ have been screened out, as the sites lie outside the secondary Zol and there are no receptor-impact-pathway to these sites associated with construction, operation, or maintenance activities from the array area, Offshore ECC, southern ANS area and biogenic reef creation areas and the insignificant impacts predicted from the northern ANS area to the Holderness Offshore MCZ and from the biogenic reef areas to the Cromer Shoals MCZ. Similarly, due to the avoidance of direct overlap, it is unlikely that such indirect effects would have a significant effect upon the geological features within a site.
68. The Holderness Offshore MCZ, in which ocean quahog are a feature, lies within the underwater noise Zol, however, impacts from underwater noise on ocean quahog have been screened out due to the localised nature of the impact (from particle motion), and no overlap between the MCZ and the Project.
69. Given the above findings it is concluded that progressing to a Stage 1 assessment for the identified MCZs will not be required for the Project.

9.5 Conclusion

70. This MCZ assessment has been produced to provide the necessary information to allow the relevant regulator to meet their specific duty for MCZs as outlined in section 126 of the MCAA (2009). This MCZ assessment utilised information set out in the relevant parts of the ES, to provide the necessary information on the impacts of the Project to inform the MCZ assessment process.
71. The first stage in the assessment process was Screening to identify those MCZs that had the potential to be affected by the Project. The Screening concluded that none of the potential impacts considered would affect any of the identified MCZs, and all impacts were therefore screened out and therefore, a further assessment was not required for this MCZ Assessment.
72. In summary, this MCZ assessment demonstrates that there is no significant risk of the Project hindering the achievement of the conservation objectives stated for each of the MCZs considered to have the potential to be affected by the Project.

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