

**The Great Grid Upgrade**

Eastern Green Link 5 (EGL 5)

# Preliminary Environmental Information Report

Volume 2

Part 3

Appendix 18.D Marine Conservation Zone

Stage 1 Assessment

Document Reference: EGL5-NGET-CONS-XX-RP-YL-066

May 2026

nationalgrid

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# Eastern Green Link (EGL) 5

## Document control

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### Document Properties

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<b>Title</b>	Appendix 18.D Stage 1 Marine Conservation Zone Assessment
<b>Published Document Ref</b>	EGL5-NGET-CONS-XX-RP-YL-066
<b>Data Classification</b>	Public

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# 18.D. Marine Conservation Zone Stage 1 Assessment

## 18.D.1. Introduction

### Project Background

- 18.D.1.1. This Marine Conservation Zone (MCZ) assessment has been prepared in support of a Development Consent Order (DCO) application by National Grid Electricity Transmission plc (NGET, the 'Applicant') to the Planning Inspectorate, for the Eastern Green Link 5 (EGL 5) Project (herein 'the Project'). The EGL 5 Project comprises a 2 gigawatt (GW) High Voltage Direct Current (HVDC) system linking Peterhead in Scotland and Lincolnshire in England.
- 18.D.1.2. The Applicant owns and manages the national high-voltage electricity transmission system throughout England and Wales. The Applicant holds the Transmission Licence for England and Wales and is thus obligated to develop and maintain an efficient, co-ordinated and economical system of electricity transmission and to facilitate competition in the generation and supply of electricity, as set out in the Electricity Act 1989.
- 18.D.1.3. For the purposes of seeking the necessary consents, the Project has been split into different 'Schemes' i.e., English Onshore Scheme, English Offshore Scheme, Scottish Onshore Scheme and Scottish Offshore Scheme. These terms are outlined in **Volume 1, Part 1, Chapter 1: Introduction** of the Preliminary Environmental Information Report (PEIR). This application does not seek consent for the Scottish elements of the scheme, which will be subject to a separate consenting process, see **Volume 1, Part 1, Chapter 4: Description of the Project** of the PEIR. This assessment is written with specific regard to the English Offshore Scheme which will be consented by way of a Deemed Marine Licence (DML) included within the DCO. The English Offshore Scheme comprises all elements of the Project from Mean High Water Springs (MHWS) at the Anderby Creek Landfall to the marine boundary between English and Scottish adjacent waters.
- 18.D.1.4. The key elements of the English Offshore Scheme are up to 423 km of subsea HVDC cable from the Anderby Creek Landfall, Lincolnshire, England to where it meets the boundary between English and Scottish adjacent waters. The subsea cable system would consist of two HVDC cables and a fibre optic cable for control and monitoring purposes. The English Offshore Scheme would be buried in the seabed, except where it crosses other existing subsea assets (e.g., pipelines and cables) or where ground conditions prevent full burial. In these locations external cable protection would be deposited to protect the English Offshore Scheme. Cable burial is the primary protection strategy, and reasonable endeavours will be made to achieve post-lay burial even in variable or difficult seabed conditions. External cable protection measures will only be used where burial is not practicable.

## Aim of this Report

- 18.D.1.5. The aim of the report is to seek agreement from the Marine Management Organisation (MMO) and the Statutory Nature Conservation Bodies (SNCBs) (Natural England and the Joint Nature Conservation Committee (JNCC) on the findings of this Stage 1 Assessment. In particular, the report seeks agreement on the conclusions of the screening assessment and on the scope, content and adequacy of the report.
- 18.D.1.6. The Applicant has undertaken a MCZ Screening Assessment, which is presented in **Volume 2, Appendix 18.C: Marine Conservation Zone (MCZ) Assessment Screening** of the PEIR. This report has been prepared during the pre-application stage to accompany and inform the PEIR. Screening determines whether a MCZ is required to be taken forward to Stage 1 of the assessment, based on a review of the nature, scale, duration and location of the proposed activities in relation to the protected features and conservation objectives of the site. A site may be screened out where it can be clearly demonstrated, on the basis of available information, that the proposed works will not give rise to any pathway for interaction or any likely significant effect on the MCZ, either alone or in combination with other plans or projects. Conversely, a site will be screened in where there is a credible pathway for effect, where uncertainty remains, or where a likely significant effect on site features or conservation objectives cannot be ruled out at the screening stage, necessitating progression to Stage 1 of the assessment. The Stage 1 Assessment considers the potential effects of the scheme across all relevant project phases, including construction, operation and maintenance, and, where applicable, decommissioning.
- 18.D.1.7. The screening process identified one site, which had the potential to be impacted. This site is the Holderness Offshore MCZ. Upon further analysis as part of the screening process, it was concluded that impact pathways for the English Offshore Scheme are capable of affecting (other than insignificantly) the protected features of the Holderness Offshore MCZ, or the ecological or geomorphological processes on which the protected features are dependent and that a Stage 1 Assessment should be carried out.
- 18.D.1.8. A MCZ Assessment is required under the Marine and Coastal Access Act 2009 where a Project has the potential to affect the integrity to conservation objectives of a MCZ. The purpose of the MCZ Assessment is to assess whether the proposed activities could hinder the ability of the MCZ to achieve its conservation objectives and where necessary, to identify appropriate mitigation measures.
- 18.D.1.9. This Stage 1 Assessment considers whether the English Offshore Scheme presents any significant risk to achieving the conservation objectives of this site. It is important to note that this Stage 1 Assessment is a 'likelihood' of risk rather than a 'certainty' of risk. The assessment of that risk is made in reference to the individual characteristics and environmental conditions of the site concerned.
- 18.D.1.10. If it is established that in isolation the English Offshore Scheme has the potential to hinder the conservation objectives (i.e., the general management approach for the protected features) of the Holderness Offshore MCZ, it will be progressed to a Stage 2 Assessment and the potential for in-combination effects will not be considered until that next stage. However, where a source-receptor pathway has been established which will not lead to the hinderance of the conservation objectives on its own, consideration is then given to whether it could lead to hindrance of the conservation objectives in-combination with a similar source-receptor pathway from

another plan or project. If the potential in-combination effects would result in the hinderance of the conservation objectives, the English Offshore Scheme would be progressed to a Stage 2 MCZ Assessment.

## Structure of this Report

18.D.1.11. This report is structured into the following sections:

- Section 18.D.1: (this Appendix): Introduction to the report;
- Section 18.D.2: Project Description (outlines the key aspects of the Project relevant to the Stage 1 MCZ Assessment);
- Section 18.D.3: Legislative Context;
- Section 18.D.4: Screening Conclusion;
- Section 18.D.5: Stage 1 Assessment; and
- Section 18.D.6: Stage 1 Conclusion.

## 18.D.2. Project Description

### English Offshore Scheme

18.D.2.1. A full project description of the English Offshore Scheme is reported in **Volume 1, Part 1, Chapter 4: Description of the Project** of the PEIR, with significant levels of detail provided in **Volume 2, Part 3, Appendix 18.C: Marine Conservation Zone (MCZ) Assessment Screening** of the PEIR. This section provides a short summary of the Project.

18.D.2.2. The English Offshore Scheme extends from MHWS where the English Offshore Scheme makes landfall at Anderby Creek on the Lincolnshire coastline to the border between English and Scottish adjacent waters. The location and extent of the English Offshore Scheme draft Order limits are shown within **Volume 3, Part 1, Figure 1-1: Project Location and draft Order Limits**. The English Offshore Scheme would comprise the construction of:

- Up to 423 km of subsea HVDC cables from the Anderby Creek Landfall to the border between English and Scottish adjacent waters. The subsea cable system would consist of two bundled HVDC cables and a fibre optic cable for control and monitoring purposes; and
- Associated cable protection such as rock, concrete mattresses, sand / rock / grout bags.

### English Offshore Scheme Parameters

18.D.2.3. The key components of the English Offshore Scheme are described in **Table 18.D-1**, with a focus on project activities that will interact with the Holderness Offshore MCZ. In accordance with the Rochdale Envelope approach, the parameters listed in **Table 18.D-1** represent the worst-case scenario (WCS).

Table 18.D-1 Summary of Offshore key maximum design parameters within Holderness Offshore MCZ

Parameter	Maximum design parameter
Maximum cable length of English Offshore Scheme.	423 km
Total length of cable route through the Holderness Offshore MCZ.	4.8 km
Maximum cable trench width.	1.5 m
Maximum cable trench depth.	3.5 m (1.5 m average)
Maximum width of seabed disturbance from seabed preparation and cable burial (includes boulder clearance, pre-lay grapnel run, cable burial).	30 m
Maximum area of seabed disturbance from seabed preparation and cable burial within Holderness Offshore MCZ.	144,000 m <sup>2</sup>
Maximum width of cable protection.	16 m
Maximum length of cable protection within Holderness Offshore MCZ.	4.8 km
Maximum area of cable protection within Holderness Offshore MCZ.	76,800 m <sup>2</sup>

### 18.D.3. Legislative Context

- 18.D.3.1. Section 126 (2) of the Marine and Coastal Access Act 2009 (MCAA) requires that applicants seeking to undertake an activity within the marine environment must satisfy the Competent Authority that there is no significant risk of the proposed activity hindering the achievement of the conservation objectives stated for the MCZ. At present, three Highly Protected Marine Areas (HPMAs) have been designated in UK waters as a type of MCZ under the MCAA. Additionally, as the Project extends to the boundary between English and Scottish waters, any Nature Conservation Marine Protected Areas (NCMPA) that could be impacted by the English Offshore Scheme must also be considered under the MCAA.
- 18.D.3.2. There are three stages to the MCZ assessment process, with the outcome of each stage informing whether the assessment progresses to the next stage. The three stages are as follows:
- **Screening:** The process of identifying whether section 126 (2) should apply to the project. Screening identifies whether the licensable activity is taking place within or near to an MCZ / HPMA / NCMPA; and identifies whether the activity is capable of affecting (other than insignificantly) either the protected features of the MCZ or the ecological or geomorphological processes on which the protected features are dependent.
  - **Stage 1 assessment:** This stage considers whether there is a significant risk of the licensable activity hindering the achievement of the conservation objectives stated for the MCZ / HPMA. If it is determined that there is significant risk of the licensable activity hindering the achievement of the conservation objectives stated, then the Stage 1 Assessment will progress to a Stage 2 Assessment. It will be necessary to consider whether there are other means of proceeding which could create a substantially lower risk, this could be done either as part of the

Stage 1 Assessment (if significant risks are identified) or it may be more appropriate as part of the Stage 2 Assessment.

- **Stage 2 assessment:** This stage looks at whether there are benefits to the public of proceeding with the project that clearly outweigh the damage to the environment and what measures the applicant will take to provide equivalent environmental benefit to compensate for the damage which the project will have on the MCZ / HPMA.

18.D.3.3. Section 126 applies where a public authority is determining an application for consent and the proposed activity is capable of affecting, other than insignificantly, either the protected features of a Marine Conservation Zone or any ecological or geomorphological processes on which those features depend. In line with MMO guidance (Ref 18.D.1), this determination is informed primarily by the geographical relationship between the proposed activity and the MCZ, including proximity and any functional linkage, together with the nature, scale and duration of the proposed activities and the plausible impact pathways by which effects could arise.

18.D.3.4. The initial screening process determined that the English Offshore Scheme is capable of affecting either the protected features or the ecological or geomorphological processes on which the protected features are dependent on for the Holderness Offshore MCZ. As a result, this designated site has been 'screened in' for further evaluation in the second stage of the process, the Stage 1 Assessment.

18.D.3.5. The MCZ Assessment is undertaken by the Competent Authority, which in this instance is the Secretary of State, based on information provided by the Applicant, in the form of an MCZ Assessment Report (this report).

## 18.D.4. Screening Conclusions

18.D.4.1. The Applicants MCZ Screening assessment (**Volume 2, Appendix 18.C: Marine Conservation Zone (MCZ) Assessment Screening** of the PEIR) reached the following conclusions:

- No HPMA was screened in for Stage 1 Assessment for the English Offshore Scheme;
- The Holderness Offshore MCZ was screened in for Stage 1 Assessment for the English Offshore Scheme; and
- No NCMPAs were screened in for Stage 1 Assessment for the English Offshore Scheme.

18.D.4.2. **Volume 3, Part 3, Figure 4-1: Designated Sites Screened into Stage 1 Assessment** shows the location of the relevant MCZs in relation to the draft Order Limits for the English Offshore Scheme.

## 18.D.5. Stage 1 Assessment

### Holderness Offshore MCZ

- 18.D.5.1. The English Offshore Scheme draft Order Limits overlap with the Holderness Offshore MCZ for 4.8 km, and lie within water depths of 20 m to 50 m. The protected features of the Holderness Offshore MCZ are subtidal coarse sediment, subtidal mixed sediment, subtidal sand, the Silver Pit (a North Sea glacial tunnel valley) and ocean quahog (*Arctica islandica*). The occurrence of these features within the site are presented in **Volume 3, Part 3, Figure 5-1: Holderness Offshore MCZ**. A detailed description of the Holderness Offshore MCZ and the conservation objectives for this site is provided below.
- 18.D.5.2. The initial MCZ Screening identified the potential for source-receptor pathways between the protected features of the Holderness Offshore MCZ and the following four impacts:
- Temporary habitat loss / seabed disturbance;
  - Permanent habitat loss;
  - Water flow (tidal current) changes, including sediment transport considerations; and
  - Temporary increase and deposition of suspended sediments.

### Site Description

- 18.D.5.3. Holderness Offshore MCZ is located approximately 11 km offshore from the Holderness coast in the southern North Sea region. The Holderness Offshore MCZ boundary is intersected by the English Territorial Seas limit and overlaps with part of the western area of the Southern North Sea Special Area of Conservation (SAC) (Ref 18.D.2). The water depths in the MCZ range from 15 m to 50 m and the MCZ covers an area of 1,176 km<sup>2</sup>. In addition to the above stated protected features of the site, the Holderness Offshore MCZ is also a spawning and nursery ground for a number of fish species, including lemon sole (*Microstomus kitt*), plaice (*Pleuronectes platessa*) and European sprat (*Sprattus sprattus*).
- 18.D.5.4. The site is dominated by EUNIS habitat A5.1: subtidal coarse sediment, covering an area of 1,070.48 km<sup>2</sup>. Of this, 2.76 km<sup>2</sup> is present within the draft Order Limits; this is equivalent to 0.26 % of the habitat within the site.
- 18.D.5.5. Subtidal coarse sediments include coarse sand, gravel, pebbles, shingle and cobbles which are often unstable due to strong tidal currents and high energy wave action; this tidal energy prevents large volumes of finer sand and mud from settling within these habitats. Fauna associated with subtidal coarse sediments includes: brittlestars, amphipods, polychaetes, bivalves and burrowing anemones (Ref 18.D.3).
- 18.D.5.6. Project-specific data as shown in from within the MCZ revealed a dominance of gravel within the subtidal coarse sediment feature that overlaps with the draft Order Limits. Grab samples ST103 and ST105 as shown in **Volume 3, Part 3, Figure 5-2: Holderness Offshore MCZ and Grab Sample Locations (ST103, ST105)** comprised of 48.08 % and 56.22 % gravel, respectively, and were categorised as 'Granule' on the Wentworth scale. Sand contributed 45.82 % and 37.29 % of the

total sediment composition at stations ST103 and ST105, respectively, and fines contributed <6.5 % at both stations.

- 18.D.5.7. Macrofauna data demonstrated the presence of infauna and epifauna common of coarse sediment habitats. Infauna included a variety of polychaete worms, brittlestars, amphipods, gastropods, bivalves and crustacea such as hermit crabs, nut crabs and long-clawed porcelain crabs. Epifauna included Bryozoa, Hydrozoa, anemones and barnacles. At ST105, the wrinkled barnacle (*Balanus crenatus*) was the most dominant species, with 271 individuals recorded. A total of 494 species across 66 taxa were recorded at ST105.
- 18.D.5.8. Within the Holderness Offshore MCZ, there are several patches of A5.4: subtidal mixed sediment, with the largest patch located in the centre of the MCZ. Another patch lies over the northern tip of the Silver Pit, which is located in the southeast corner of the site. Subtidal mixed sediment covers an area of 81.59 km<sup>2</sup> within the site; of this, 2.17 km<sup>2</sup> is present within the draft Order Limits. This is equivalent to 2.66% of the habitat in the site.
- 18.D.5.9. Subtidal mixed sediments comprise a heterogeneous mixture of mud, sand, gravel, pebbles and shell fragments. These habitats occur where hydrodynamic conditions, such as moderate tidal streams and wave action, are sufficient to prevent fine sediments from fully settling, but not strong enough to winnow out all finer particles. As a result, mixed sediments are patchy and spatially variable, supporting a diverse and often species-rich benthic community. Fauna typically associated with subtidal mixed sediments includes polychaete worms, amphipods, bivalves, tube building worms, sea cucumbers, brittlestars and various burrowing or tube dwelling crustaceans (Ref 18.D.4).
- 18.D.5.10. Small patches of A5.2: subtidal sand, covering a total area of 21.24 km<sup>2</sup>, are located within the site and are predominately situated near the periphery of the site. The draft Order Limits do not overlap with subtidal sand within the MCZ.
- 18.D.5.11. Subtidal sands consist predominantly of medium to fine sand fractions that are typically well-sorted due to persistent tidal currents and wave action. These habitats occur in areas where hydrodynamic energy is sufficient to prevent the accumulation of silt and mud, resulting in mobile seabed conditions with limited stability. Despite this mobility, subtidal sand habitats support a characteristic assemblage of infaunal and epifaunal species adapted to shifting substrates. Typical fauna associated with subtidal sands include polychaete worms, amphipods, burrowing bivalves, and various crustaceans capable of rapid burrowing (Ref 18.D.5).
- 18.D.5.12. Tunnel valleys are geological features, characterised as seabed depressions formed by the occurrence of subsea glacial erosion and sediment backfill below the edges of sea surface glacial coverings (Ref 18.D.6). The Silver Pit is situated to the southeast of the Holderness Offshore MCZ and is approximately 50 m deep. It spans an area of 19.09 km<sup>2</sup> within the site, of which 2.795 km<sup>2</sup> lies within the draft Order Limits; equivalent to 14.6 % of the feature. Subtidal coarse and mixed sediments overlie the Silver Pit.
- 18.D.5.13. The ocean quahog is a burrowing species which has been found in a range of sediments, from coarse clean sand to muddy sand, in a range of depths typically from 4 m - 482 m deep. Ocean quahog are thought to have a high sensitivity to physical loss of habitat, it is therefore important to conserve the extent and distribution of supporting habitats to provide the best chance of any potential settlement for new recruits and to retain existing individuals (Ref 18.D.7).

18.D.5.14. It is acknowledged that, whilst ocean quahog was not recorded in the EGL 5 environmental survey grab samples collected within the Holderness Offshore MCZ, grab sampling methods are spatially limited, and ocean quahog may be present where grab samples were not located. This assumption is further evidenced by the occurrence of mixed and coarse sediments within the draft Order Limits, sediment types known to be inhabited by ocean quahog. However, it is important to note ocean quahog shows preferential habitation of mud and muddy sand habitats (Ref 18.D.7).

## Conservation Objectives

18.D.5.15. The conservation objectives for the Holderness Offshore MCZ are that the protected features:

- So far as already in favourable condition, remain in such condition; and
- So far as not already in favourable condition, be brought into such condition, and remain in such condition.

18.D.5.16. The conservation objectives for the individual protected features within the Holderness Offshore MCZ are outlined in **Table 18.D-2**. The protected features of the Holderness Offshore MCZ are assessed against the identified pressures below.

Table 18.D-2 Holderness Offshore MCZ conservation objectives

Protected features	Conservation objectives
<p>Subtidal coarse sediment, Subtidal mixed sediments, Subtidal sand.</p>	<p>Supplementary advice (Ref 18.D.8) sets the following objectives for the sedimentary broadscale habitats:</p> <ul style="list-style-type: none"> <li>• Extent and distribution: Recover;</li> <li>• Structure and function: Recover; and</li> <li>• Supporting processes: Maintain</li> </ul> <p>With respect to subtidal coarse sediment, subtidal sand and subtidal mixed sediments within the site, this means that:</p> <ul style="list-style-type: none"> <li>• Its extent is stable or increasing; and</li> <li>• Its structures and functions, its quality, and the composition of its characteristic biological communities (which includes a reference to the diversity and abundance of species forming part of or inhabiting that habitat) are such as to ensure that it remains in a condition which is healthy and not deteriorating.</li> </ul> <p>Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery. Any alteration to that feature brought about entirely by natural processes is to be disregarded.</p>
<p>Ocean quahog Species of Conservation Importance.</p>	<p>Supplementary advice (Ref 18.D.8) sets the following objectives for ocean quahog:</p> <ul style="list-style-type: none"> <li>• Extent and distribution: Recover;</li> <li>• Structure and function: Recover; and</li> </ul>

Protected features	Conservation objectives
North glacial valley (Silver Pit).	<p data-bbox="373 259 890 293">• Supporting processes: Recover.</p> <p data-bbox="373 320 1321 353">With respect to the ocean quahog within the MCZ, this means that:</p> <ul data-bbox="384 365 1474 472" style="list-style-type: none"> <li>• The quality and quantity of its habitat and the composition of its population in terms of number, age and sex ratio are such as to ensure that the population is maintained in numbers which enable it to thrive.</li> </ul> <p data-bbox="373 495 1474 602">Any temporary reduction of numbers is to be disregarded if the population is sufficiently thriving and resilient to enable its recovery. Any alteration to that feature brought about entirely by natural processes is to be disregarded.</p> <p data-bbox="268 629 1474 696">With respect to the North Sea glacial tunnel valley within the MCZ, this means that:</p> <ul data-bbox="384 707 1474 898" style="list-style-type: none"> <li>• Its extent, component elements and integrity are maintained;</li> <li>• Its structure and functioning are unimpaired; and</li> <li>• Its surface remains sufficiently unobscured for the purposes of determining whether the conditions in paragraphs (1) and (2) are satisfied.</li> </ul> <p data-bbox="373 920 1474 1025">Any obscurement of that feature brought about entirely by natural processes is to be disregarded. Any alteration to that feature brought about entirely by natural processes is to be disregarded.</p>

## Stage 1 Assessment Methodology

- 18.D.5.17. The Stage 1 Assessment considers whether the English Offshore Scheme presents any significant risk to achieving the conservation objectives of the Holderness Offshore MCZ. This Stage 1 Assessment is a 'likelihood' of risk rather than a 'certainty' of risk. The assessment of that risk is made in reference to the individual characteristics and environmental conditions of the MCZ concerned.
- 18.D.5.18. If it is established that in isolation the English Offshore Scheme has the potential to inhibit the conservation objectives (i.e. the general management approach for the protected features) of the site in question, it will be progressed to a Stage 2 Assessment, and the potential in-combination effects will not be considered by this Stage 1 Assessment.
- 18.D.5.19. Where a source-receptor pathway has been established which will not lead to the hinderance of the conservation objectives on its own, consideration is given to whether the English Offshore Scheme could in-combination with a similar source-pathway-receptor from another plan or project lead to a hinderance of the conservation objectives. If the in-combination effects result in the hinderance of the conservation objectives, it will be progressed to a Stage 2 Assessment.

## Assessment

- 18.D.5.20. The assessment considers the following five impact pathways:
- Temporary habitat loss / seabed disturbance;
  - Permanent habitat loss;

- Water flow (tidal current) changes, including sediment transport considerations;
- Temporary increase and deposition of suspended sediments; and
- In-combination effects.

18.D.5.21. These impact pathways were identified within **Volume 2, Appendix 18.C: Marine Conservation Zone (MCZ) Assessment Screening** of the PEIR.

### **Temporary habitat loss / seabed disturbance**

#### **Subtidal Coarse Sediment**

- 18.D.5.22. Within this habitat, seabed preparation activities including boulder clearance and Pre Lay Grapnel Run (PLGR) would be required as well as cable burial. Approximately 56 % of the draft Order Limits within the Holderness Offshore MCZ lies within this habitat; 2,688 m of cable. The WCS for seabed disturbance within this broadscale habitat is 80,640 m<sup>2</sup>; equivalent to 0.008% of the habitat within the MCZ.
- 18.D.5.23. Collie *et al.* (1997) (Ref 18.D.9) reported that abrasion and disturbance of coarse gravels and sands caused a reduction in the abundance and biomass of organisms and a reduction in species diversity, when compared to undisturbed areas. It was further reported that undisturbed sites contained more epifauna and fragile organisms, such as small polychaetes and brittle stars compared to the disturbed sites. However, thick-shelled bivalves, hermit crabs and gastropods were unaffected by disturbance. The mobile infauna present within coarse sediment habitats may not be able to relocate as sediments are displaced but recolonise swiftly once cable construction, operation and maintenance and decommissioning activities are complete. Sessile epifauna present are likely to become damaged from construction activities, such as boulder clearance whereby cobbles can be rotated causing the smothering and crushing (Ref 18.D.10).
- 18.D.5.24. The seabed present within the Holderness Offshore MCZ is an unstable, dynamic environment, experiencing moderate wave energy (Ref 18.D.8). This suggests the sessile organisms within these coarse sediment habitats are subject to and can tolerate a natural level of seabed disturbance. The dynamic nature of the habitat and temporary nature of the activities required for the English Offshore Scheme suggests there would be very little change from baseline conditions during cable construction, operation and maintenance and decommissioning and the effects of temporary habitat loss / seabed disturbance would be short term. Mobile fauna present within these habitats can temporarily relocate as sediment is displaced but return once construction or decommissioning activities have finished.
- 18.D.5.25. Coarse sediment is the most dominant habitat within the Holderness Offshore MCZ, forming 91% of the seabed present within the site. Thus, a temporary impact to coarse sediments within a small footprint of 80,640 m<sup>2</sup> within the draft Order Limits would not significantly adversely affect the wider distribution of these habitats across the MCZ. **Therefore, the effect of temporary habitat loss / seabed disturbance to subtidal coarse sediment will not hinder the conservation objectives for recovery of this feature.**

### Subtidal Mixed Sediment

- 18.D.5.26. Within this habitat seabed preparation activities including boulder clearance and PLGR would be required as well as cable burial. Approximately 44 % of the draft Order Limits within the MCZ lies within this habitat; 2,112 m of cable. The WCS for seabed disturbance within this broadscale habitat is 63,630 m<sup>2</sup>; equivalent to 0.08% of the habitat within the MCZ.
- 18.D.5.27. As for coarse sediments, the characterising species within the mixed sediment feature are tolerant of seabed disturbance, being subject to moderate wave energy (Ref 18.D.4).
- 18.D.5.28. Mixed sediment forms 6.9% of the seabed present within the site. Thus, a temporary impact to mixed sediments within a small footprint of 63,630 m<sup>2</sup> within the draft Order Limits would not significantly adversely affect the wider distribution of these habitats across the MCZ. **Therefore, the effect of temporary habitat loss / seabed disturbance to subtidal mixed sediment will not hinder the conservation objectives for recovery of this feature.**

### Ocean quahog

- 18.D.5.29. The WCS footprint of temporary habitat loss across the Holderness Offshore MCZ is 144,000 m<sup>2</sup>. This is equivalent to 0.01 % of the area of the site and demonstrates the limited impact to the wider distribution of ocean quahog individuals and habitat within the MCZ. Furthermore, as discussed in Section 18.D.5.24, strong seabed currents were recorded to be present within the site suggesting, if ocean quahog is present within the overlapping area, they have a demonstrated tolerance for seabed disturbance. Whilst ocean quahog is long-lived and slow growing, following construction activities, there will be limited, if any, maintenance work required for the lifetime of the Project within the MCZ, thereby avoiding repeat disturbance of the same area. **Therefore, the effect of temporary habitat loss / seabed disturbance will not hinder the conservation objectives for recovery of the ocean quahog feature.**

### Permanent Habitat Loss

- 18.D.5.30. A maximum footprint of 76,800 m<sup>2</sup> of permanent habitat loss from cable protection will occur within the MCZ as a result of the English Offshore Scheme; equivalent to approximately 0.007 % of the whole site.
- 18.D.5.31. More specifically, 43,008 m<sup>2</sup> of permanent habitat loss will occur within subtidal coarse sediments and 33,792 m<sup>2</sup> within subtidal mixed sediments. Within the aforementioned footprint, 15,092 m<sup>2</sup> of that remedial cable protection within subtidal coarse and mixed sediments also overlapping with the Silver Pit.

### Subtidal Coarse Sediment

- 18.D.5.32. Approximately 2,520 m of the cable route within subtidal coarse sediment is at high risk of inadequate cable burial with the remainder of at low risk of inadequate cable burial, both due to the presence of loose sand overlying clay. However, for the WCS, it has been assumed that the full route length within the habitat would require cable protection. The WCS assumes that 43,008 m<sup>2</sup> of cable protection is required within areas of subtidal coarse sediment within the MCZ; this is equivalent to 0.004 % of the subtidal coarse sediment habitats present within the MCZ.

- 18.D.5.33. Cable protection would only be installed where considered necessary for the safe operation of the English Offshore Scheme. This includes the repair of cables due to accidental damage, where depth of lowering is not achieved and at infrastructure crossings. In sites designated for benthic features, cable protection materials will be selected to match the environment (e.g., when cables are installed in areas of cobbles or other natural rock features, rock of similar grade as the receiving environment should be used as an alternative to the current normal approach of using terrestrially sourced granite) where feasible.
- 18.D.5.34. A review of literature by Wallingford (2025) (Ref 18.D.11) reports that external rock protection is colonised by primary and secondary users, with amphipods, hydroids and anemones demonstrating colonisation of artificial rock protection within subtidal habitats in the North Sea. Primary colonisers, such as tubeworms and hydroids, initially colonise the artificial rock; these are then displaced between 2 - 4 years later by secondary colonisers, such as anemones, which can dominate the artificial rock for up to 11 years post construction. Additionally, the rock protection provides additional hard substrate for mobile demersal megafauna such as lobsters and crabs, including the interstitial space. This evidence suggests the introduction of hard substrate may result in increased biodiversity and faunal abundance within the subtidal coarse sediment habitat. Some of the sessile species present within the broadscale habitat, such as the beadlet anemone and the Dahlia anemone, may eventually colonise artificial rock structures whilst the crustacea present within the habitat may utilise the structure for shelter.
- 18.D.5.35. In relation to the conservation objectives, the change is minor and will not affect the structure, function, quality, and composition of associated biological communities. There will be localised changes to the biological communities within the direct footprint of rock cable protection as the coarse sediment habitat has been lost, however these areas will be isolated pockets of change. When considering the wider context of this protected feature the health of biological communities associated with these habitats will not deteriorate, due in part to the very small area affected. **Therefore, the effect of the small-scale permanent habitat loss to subtidal coarse sediment will not hinder the conservation objectives for overall recovery of this feature within the MCZ.**

#### Subtidal Mixed Sediment

- 18.D.5.36. Preliminary review of geophysical and geotechnical data has identified approximately 900 m of the cable route within subtidal mixed sediment is at high risk of inadequate cable burial due to the presence of loose sand overlying clay. However, for the WCS, it has been assumed that the full route length within the habitat would require cable protection. The WCS assumes 33,792 m<sup>2</sup> of cable protection is required within areas of subtidal mixed sediment within the MCZ; equivalent to 0.04 % of the subtidal mixed sediment habitats present within the MCZ.
- 18.D.5.37. As identified for coarse sediment above in paragraph 18.D.5.34 *et seq*, cable protection will increase the local biodiversity and faunal abundance, with epifaunal species of the mixed sediment habitat potentially taking possession of the structures.

- 18.D.5.38. In relation to the conservation objectives, the change is minor and will not affect the structure, function, quality, and composition of associated biological communities. There will be localised changes to the biological communities within the direct footprint of rock cable protection as the mixed sediment habitat has been lost, however these areas will be isolated pockets of change. When considering the wider context of this protected feature the health of biological communities associated with these habitats will not deteriorate. **Therefore, the effect of the small-scale permanent habitat loss to subtidal mixed sediment will not hinder the conservation objectives for overall recovery of this feature within the MCZ.**

#### Silver Pit

- 18.D.5.39. Preliminary review of geophysical and geotechnical data identified that the potential areas of cable protection needed within the MCZ overlap the North Sea glacial tunnel valley for approximately 995 m. The maximum footprint of the external cable protection within the feature would be 15,920 m<sup>2</sup>; equivalent to a loss of 0.08 % of the feature. It is anticipated that this impact may have the capacity to affect the habitats overlying the geomorphological feature but will not impact the feature itself which is not sensitive to habitat loss as a result of cable protection.
- 18.D.5.40. While it is acknowledged that there would be a loss of 0.08 % of the habitats overlying the North Sea glacial tunnel valley, this protected feature is in favourable condition, and the primary feature would not be directly lost. This is also applicable for the structure, function, quality, and composition of associated biological communities. There will be localised changes to the biological communities within the direct footprint of external cable protection as habitat has been lost, however these areas will be isolated pockets of change that do not impact the geomorphological feature itself which underlies sedimentary habitats. When considering the wider context of the Protected Feature, the North Sea glacial tunnel valley will not deteriorate. **Therefore, the effect of permanent habitat loss to the North Sea glacial tunnel valley will not hinder the conservation objectives for maintenance of this feature.**

#### Ocean Quahog

- 18.D.5.41. Ocean quahog is an infaunal species. The addition of remedial rock protection within the Holderness Offshore MCZ would remove the sedimentary habitat required by the species.
- 18.D.5.42. However, the WCS footprint of permanent habitat loss across the Holderness Offshore MCZ is 76,800 m<sup>2</sup>. This is equivalent to 0.007 % of the area of the site and demonstrates the limited impact to the wider distribution of ocean quahog individuals and habitat within the MCZ. **Therefore, the effect of permanent habitat loss to the supporting habitats for ocean quahog will not hinder the conservation objectives for recovery of this feature.**

## Water flow (tidal current) changes, including sediment transport considerations

### Subtidal Coarse Sediment

- 18.D.5.43. Holderness Offshore MCZ is an unstable, dynamic environment, experiencing moderate wave energy at the seabed (Ref 18.D.8). Where cable protection is required, the resultant small changes to depths will only result in small magnitude and very localised changes in water flow immediately surrounding the cable protection (**Volume 1, Part 3, Chapter 17: Coastal and Marine Physical Processes**). A report by ABPmer (2024) suggests any scour that may occur will be localised and the effect considered negligible with little detectable change from baseline conditions (Ref 18.D.12). Scour in sandy and muddy environments tends to be far more extensive because these finer sediments are easily mobilised and can be rapidly eroded and redistributed by hydrodynamic forces. In contrast, coarse and mixed sediments resist erosion, meaning scour develops more slowly, more locally, and with a much smaller overall footprint. **Therefore, the effect of water flow (tidal current) changes to Subtidal Coarse Sediment will not hinder the conservation objectives for recovery of this feature.**

### Subtidal Mixed Sediment

- 18.D.5.44. As outlined in paragraph 18.D.5.43, any changes in wave action and sediment transport are expected to be very localised. The Subtidal Mixed Sediment feature comprises sands and gravels that are already subject to regular natural disturbance and reworking. Any scour that may develop is expected to remain limited in extent and negligible in effect, with no detectable deviation from baseline conditions beyond the immediate installation area. **Therefore, the effect of water flow (tidal current) changes to Subtidal Mixed Sediment will not hinder the conservations objectives for recovery of this feature.**

### Silver Pit

- 18.D.5.45. The North Sea glacial tunnel valley is a large, resilient geomorphological feature shaped by strong seabed currents and natural sediment transport processes. Small-scale changes associated with cable protection limited to minor alterations in seabed elevation will only influence water movement immediately around the protection and will not extend to a scale capable of modifying the valley's form or behaviour. **Therefore, the effect of water flow (tidal current) changes to the North Sea glacial tunnel valley will not hinder the conservations objectives for the maintenance of this feature**

### Ocean quahog

- 18.D.5.46. A review of MarLIN sensitivity information indicates that ocean quahog is not sensitive to changes in water flow at the relevant benchmark levels, reflecting high resistance to hydrological pressures (Ref 18.D.13). Given this lack of sensitivity, changes in local flow regimes resulting from the proposed development are not expected to give rise to adverse effects on quahog populations. **Therefore, the effect of Water flow (tidal current) changes to Ocean quahog will not hinder the conservations objectives for recovery of this feature.**

## Temporary increase and deposition of suspended sediments

### Subtidal Coarse Sediment

- 18.D.5.47. Due the dominance of infaunal species, coarse sediment habitats demonstrate low sensitivity to increased Suspended Sediment concentrations (SSCs) and smothering. For example, grab samples collected within the Holderness Offshore MCZ recorded the presence of the Bryer's nut crab (*Ebalia tumefacta*), the catworm (*Nephtys spp.*) and the ross worm (*Sabellaria spinulosa*); each species having their own adaptations to tolerate increased SSC and smothering.
- 18.D.5.48. Bryer's nut crab can temporarily relocate during periods of increased turbidity and to avoid smothering from sediment deposition but can return once cable construction and decommissioning is completed within the area. Catworms, meanwhile, can migrate through up to 60 cm of mud and 90 cm of sand (Ref 18.D.14) to avoid injury from increased sediment deposition; Powilleit *et al.* (2009) demonstrated that *Nephtys hombergii* can successfully migrate 40 cm through deposited sediment at velocities of up to 20 cm / day (Ref 18.D.15).
- 18.D.5.49. Ross worms are tube building polychaetes that thrive in areas of increased SSC. Ross worms require a supply of suspended sediment sufficient for feeding and tube formation activities. Additionally, this polychaete can tolerate 5 cm of smothering for several weeks, suggesting a high adaptability to light sediment deposition. For example, Last *et al.* (2011) demonstrated that ross worm can survive for up to 32 days buried in depths of 2 cm, 5 cm and 7 cm of sand (Ref 18.D.16).
- 18.D.5.50. Contrary to this, the oval venus (*Timoclea ovata*) is a suspension feeding, infaunal bivalve recorded to be present within the MCZ and typically occurs in areas with low concentrations of suspended sediments where organic particle sorting is unnecessary. Thus, has adapted to only have a small mid-gut with tiny palps and may struggle to sort organic materials during periods of increased suspended sediments (Ref 18.D.17).
- 18.D.5.51. High levels of suspended sediment and smothering may interrupt feeding or respiration of sessile epifauna by clogging feeding and respiratory apparatus, respectively. Increased SSCs may also result in the production of pseudofaeces at energetic cost to the individual. These effects could result in decreased growth and reproductivity. However, the horse mussel (*Modioulus spp.*) and the wrinkled barnacle (*Balanus crenatus*), present within grab samples in the Holderness Offshore MCZ, have a demonstrated tolerance to increased SSCs and smothering.
- 18.D.5.52. The horse mussel is recorded to tolerate interval increases in suspended sediment, and is adapted to reject excess silt or particulates, allowing for immediate recoverability. Increases in organic suspended particulates may increase food availability (Ref 18.D.18). The wrinkled barnacle is recorded to be generally tolerant of moderate siltation but demonstrates intolerance to excessive siltation. However, Keny & Rees (1994) observed heavy colonisation of the wrinkled barnacle at a site that was dredged for gravel within 7 months (Ref 18.D.19). This suggests high recoverability by the species (Ref 18.D.20).

- 18.D.5.53. Project specific data (as per **Volume 1, Part 3, Chapter 17: Coastal and Marine Physical Processes**) suggests very coarse sand and gravels will settle back into the trench. Sand particles ranging between very coarse sand and fine sand will settle within 15 m of the trench and will cause light smothering of <5 cm outside of this immediate area. The maximum distance from trenching activities where suspended sediment concentrations exceed 10 mg / l in coarse sediment habitats within the English Offshore Scheme is 8.8 km at KP 10 and is < 4 mg / l beyond KP 46. Suspended sediment concentrations exceed 10 mg / l for a maximum distance of 2.8 km from Trial Suction Hopper Dredging (TSHD) activities. Once deposited, fine sediment plumes can cause light smothering of up to 2 mm on the seabed.
- 18.D.5.54. The change in suspended sediment concentrations will be brief, and any smothering will be insufficient to change the character of the habitat. Additionally, this moderate high tidal energy environment will result in continued resuspension and redistribution of finer sediments, as well as re-working of coarser sediments on the seabed, following completion of works. As such, any smothering will be short-term, which is therefore unlikely to adversely affect the species typical of this habitat. **Therefore, the effects of Temporary increase and deposition of suspended sediments to subtidal coarse sediments will not hinder the conservations objectives of this feature.**

#### Subtidal Mixed Sediment

- 18.D.5.55. The sediments present within the subtidal mixed sediment habitats within the MCZ are sand and gravel. Coarse sediment plumes from trenching activities settle from the water column within the draft Order Limits and can cause light smothering of <5 cm. Increased suspended sediment can clog the feeding apparatus and gill filaments of suspension feeders, such as bivalves, reducing respiration and feeding (Ref 18.D.21); however, bivalves can burrow into the sediment and anemones can retract their tentacles to avoid periods of increased turbidity. Additionally, mobile fauna present within subtidal mixed sediment, such as crabs, can temporarily relocate during periods of increased turbidity and to avoid smothering from sediment deposition.
- 18.D.5.56. The change in suspended sediment concentrations will be brief, and any smothering will be insufficient to change the character of the habitat. Additionally, this moderate high tidal energy environment will result in continued resuspension and redistribution of finer sediments, as well as re-working of coarser sediments on the seabed, following completion of works. As such, any smothering will be short-term, which is therefore unlikely to adversely affect the species typical of this habitat. **Therefore, the effects of Temporary increase and deposition of suspended sediments to subtidal mixed sediments will not hinder the conservations objectives to recover this feature.**

## Subtidal Sand

- 18.D.5.57. Coarse sediment plumes from trenching activities settle from the water column within the draft Order Limits and can cause light smothering of <5 cm. For TSHD activities, coarse sediment will settle within the draft Order Limits and cause light smothering of <5 cm (from one pass of the TSHD). Suspended fine sediments can travel up to 17.5 km from trenching activities and 11.7 km from TSHD activities. This sediment will settle on the subtidal sand habitat within the MCZ, potentially causing light smothering of <5 cm thickness. The subtidal sands are subject to moderately high current strengths, which is likely to remove all light smothering (<5 cm) from sediment deposition. The species present have low sensitivity to light smothering, with bivalve species able to migrate through up to 50 cm of sediment easily. It is not anticipated that a temporary increase and deposition of suspended sediment will have an adverse effect on the subtidal sand habitats within the MCZ. **Therefore, the effects of Temporary increase and deposition of suspended sediments to subtidal sand will not hinder the conservations objectives for recovery of this feature.**

## In-combination Effects

- 18.D.5.58. The Hornsea Project Four (export cable corridor) (Ref 18.D.22) and EGL 3 cable (Ref 18.D.23) are situated 13.31 km and 0.2 km from the English Offshore Scheme, respectively. As temporary and permanent habitat loss and changes in waterflow are restricted to within the MCZ, Hornsea Project Four and EGL 3 are only assessed in-combination with the English Offshore Scheme for the impact of a temporary increase and deposition of suspended sediments.
- 18.D.5.59. Two planned subsea cable projects which intersect the MCZ were identified through review of the Planning Inspectorate portal and the MMO Marine Case Management System Public Register; Ossian Offshore Wind Farm Transmission Infrastructure and EGL 4. The EGL 4 Project overlaps the Holderness Offshore MCZ for approximately 8.7 km (Ref 18.D.24).
- 18.D.5.60. Without routing details, Ossian Offshore Wind Farm Transmission Infrastructure cannot be assessed in-combination at this stage. Ossian publications will be monitored and engagement will be undertaken, and if information becomes available, Ossian will be included in the MCZ Stage 1 Assessment prior to the DCO application. If not available, it would be the responsibility of the applicant for the Ossian Offshore Wind Farm Transmission Infrastructure project to determine the in-combination effects when they undertake their assessments.
- 18.D.5.61. Although existing built projects form part of the environmental baseline, it is recognised that those constructed after the designation of the MCZ represent additional pressures that have contributed to incremental change within the site. While the individual effects of these post-designation projects may have been considered insignificant at the time, their presence means that the English Offshore Scheme must be assessed in-combination with them to ensure the conservation objectives to maintain or recover the extent, distribution, structure and function of the protected features are not hindered.

- 18.D.5.62. The In-combination assessment is therefore undertaken only where a credible project-alone impact pathway has been identified for the English Offshore Scheme at Stage 1, and considers the cumulative interaction of the Scheme with other relevant post-designation activities to determine whether, collectively, there is a risk of hindering the achievement of the MCZ’s conservation objectives to maintain or recover the extent, distribution, structure and function of the protected features.
- 18.D.5.63. All other pre-designation projects are considered part of the baseline with respect to the condition of the features and are not included in the assessment of in-combination effects.

**Permanent habitat loss**

- 18.D.5.64. As outlined in paragraph 18.D.5.25, 76,800 m<sup>2</sup> (0.007 %) of the Holderness Offshore MCZ will experience permanent habitat loss as a result of the English Offshore Scheme. The full extent of infrastructure within the Holderness Offshore MCZ is not fully known, however an estimate based on assumptions has been provided in **Table 18.D-3**. Any additional permanent habitat loss from remedial rock protection could hinder the conservation objectives of the protected features of the site.
- 18.D.5.65. The Rough AD and AP platform structures will be removed during decommissioning between 2026 - 2028 (Ref 18.D.25) and are therefore not considered in this assessment as the habitat will be able to recover once these structures are removed.

**Table 18.D-3 The assumed footprint of existing and planned infrastructure since the designation of the Holderness Offshore MCZ**

<b>Infrastructure name</b>	<b>Status</b>	<b>Data source</b>	<b>Assumed footprint</b>
Viking Link Interconnector	Active		The Viking Link Rock Marine Licence (which can be viewed under the MCMS case reference MLA/2017/00106) states that rock berms would be approximately 6.5 m wide. The worst-case scenario is that throughout the Project’s lifetime, rock protection would be required along the entire length of the cable route within the MCZ. As the cable route intersects with the MCZ for approximately 17.03 km, the total impacted area could be <b>0.111 km<sup>2</sup></b> .
Tolmount 20 in gas export pipeline.	Active	KIS-ORCA (Ref 18.D.26)	The data set identified 2 pipelines within the MCZ, constructed post designation. However, for these 2 pipelines, there was no information regarding whether the pipelines were buried or surface laid. Therefore, the worst-case scenario has been assumed that the pipelines are surface laid. Collectively, the 2 pipelines intersect the MCZ for approximately 24.7 km. Assuming an average impact zone of 1 m (0.5 m either side of the surface pipeline) the total permanent impacted area is indicatively <b>0.0247 km<sup>2</sup></b> .
Tolmount 3 in methanol pipeline (piggybacked to 20 in gas export).	Active		

Infrastructure name	Status	Data source	Assumed footprint
Infrastructure crossings.			Using a Geographic Information System, three potential crossings were identified for the existing infrastructure. Two crossings where the Viking Link Interconnector intersects the West Sole to Easington 16 in and 24 in gas pipelines and one crossing where Cleeton CP to Dimlington 36 in gas export line and the Tolmount 20 in gas export pipeline and piggybacked 3 in methanol pipeline intersect. Assuming that the crossing parameters are similar to that of the English Offshore Scheme (100 m x 10 m), collectively the total permanent impacted area could be <b>0.003 km<sup>2</sup></b> .
Eastern Green Link 4.	Planned	EGL 3 and EGL 4 PEIR. <b>Volume 2, Part 3, Appendix 17.B: Marine Conservation Zone (MCZ) Stage 1 Assessment</b> (Ref 18.D.27)	The worst-case installation footprint for permanent habitat loss stated within the EGL 3 and EGL 4 MCZ Stage 1 Assessment within the Holderness Offshore MCZ was <b>0.068 km<sup>2</sup></b> .
<b>Total assumed footprint</b>			<b>0.207 km<sup>2</sup></b>

18.D.5.66. It should be noted that communications with Viking Link have indicated that to date (February 2026) the project has not required the consented quantity of cable protection. Even so, this assessment takes a precautionary approach and assumes that all of the cable protection consented for Viking Link would eventually be installed within the MCZ. In-combination with the English Offshore Scheme, the footprint of permanent loss since site designation as set out in **Table 18.D-3** has therefore been estimated to be 0.284 km<sup>2</sup> or 0.027 % of the MCZ.

#### Subtidal Coarse Sediment

18.D.5.67. It has been noted that the Stage 1 MCZ Assessment for Viking Link conducted by the MMO, concluded that the deposit of cable protection within the MCZ could not affect the features of subtidal coarse sediment, providing the mitigation measures were appropriately secured. The mitigation measures secured through the Viking Link Marine Licence have been adopted as part of the following English Offshore Scheme design measures:

- Cable protection would only be installed where considered necessary for the safe operation of the English Offshore Scheme. This includes the repair of cables due to accidental damage, where depth of lowering is not achieved and at infrastructure crossings.

- In sites designated for benthic features, cable protection materials will be selected to match the environment (e.g., when cables are installed in areas of cobbles or other natural rock features, rock of similar diameter as the receiving environment should be used as an alternative to the current normal approach of using terrestrially sourced granite, where feasible).

18.D.5.68. As identified for the project-alone assessment in paragraph 18.D.5.34 *et seq*, cable protection will increase the local biodiversity and faunal abundance, with epifaunal species of the coarse sediment habitat potentially colonising the structures. Even considering the additional footprint of lost habitat from other plans, projects and activities, the footprint remains small in the context of the MCZ and the availability of the habitat within the site.

18.D.5.69. In relation to the conservation objectives, the change is minor and will not affect the structure, function, quality, and composition of associated biological communities. There will be localised changes to the biological communities within the direct footprint of rock cable protection as the mixed sediment habitat has been lost, however these areas will be isolated pockets of change. When considering the wider context of this protected feature the health of biological communities associated with these habitats will not deteriorate.

18.D.5.70. Given the naturally mixed and heterogeneous nature of coarse sediments within the MCZ, **the effect of in combination permanent habitat loss to subtidal coarse sediment will not hinder the conservations objectives for overall recovery of this feature within the MCZ.**

#### Subtidal Mixed Sediment

18.D.5.71. Given the naturally variable composition of mixed sediments and the small scale of additional rock protection, in-combination effects remain negligible. Minor losses of soft sediment are insignificant relative to the total habitat area, and infaunal species can relocate. **Therefore, the effect of in combination permanent habitat loss to subtidal mixed sediment will not hinder the conservations objectives for overall recovery of this feature within the MCZ.**

#### Silver Pit

18.D.5.72. The project-alone assessment concluded that the very small, localised footprint of cable protection would not affect the structure, hydrodynamics or sediment regime of the Silver Pit glacial channel system. For the in-combination assessment, it is noted that the planned EGL 4 cable is planned to cross this MCZ feature. Given the overlapping footprints remain spatially limited and the conservation object to maintain this feature. It is concluded that the spatially limited footprint will not significantly compromise the ecological functions that sustain this feature.

18.D.5.73. No mechanisms are identified through which such small-scale additions could compromise the ecological processes that sustain the Silver Pit feature. **Therefore, the effect of in-combination permanent habitat loss to the North Sea glacial tunnel valley will not hinder the conservations objectives for overall maintenance of this feature within the MCZ.**

## Ocean Quahog

- 18.D.5.74. The in-combination area of soft sediment loss from cable protection is very small (0.027 %) relative to the available habitat and does not meaningfully reduce the extent of suitable sediment for the species.
- 18.D.5.75. Although some individuals may be displaced, the footprint does not create fragmentation or represent a pressure capable of influencing population viability. Sediment composition at the wider habitat scale remains unchanged. **Therefore, the effect of in-combination permanent habitat loss to ocean quahog will not hinder the conservations objectives for overall recovery of this feature within the MCZ.**

## Temporary increase and deposition of suspended sediment

### Subtidal Coarse Sediment

- 18.D.5.76. The project-alone assessment concluded that trenching related increases in suspended sediment and light, temporary deposition within this area is short-lived, highly localised, and insufficient to alter habitat character or function. In considering in-combination effects, only activities that generate suspended sediment, such as dredging, trenching, or seabed preparation would have the potential to act cumulatively with the English Offshore Scheme. However, such activities are infrequent, spatially limited, and typically generate only minor, short-duration increases in turbidity that fall well within natural variability for this moderate-to-high tidal-energy environment. As a result, there is no plausible mechanism by which the assessed projects within the MCZ could produce cumulative suspended sediment concentrations or smothering beyond those already assessed. **Therefore, the effect of in-combination temporary increases in suspended sediment to subtidal coarse sediments will not hinder the conservations objectives for overall recovery of this feature within the MCZ.**

### Subtidal Mixed Sediment

- 18.D.5.77. As set out in previous assessment for subtidal coarse sediment habitats (paragraph 18.D.5.76), the project-alone suspended sediment plume was predicted to be short-lived and confined to the immediate working area, with light deposition insufficient to alter habitat character. For subtidal mixed sediments, although sensitivity is slightly higher due to the presence of finer material and a greater proportion of suspension-feeding fauna, the same pattern of rapid plume dispersion and limited deposition applies under the prevailing moderate-to-high tidal energy conditions. **Therefore, the effect of in-combination temporary increases in suspended sediment to subtidal mixed sediments will not hinder the conservations objectives for overall recovery of this feature within the MCZ.**

### Subtidal Sand

- 18.D.5.78. Subtidal sand within the MCZ is naturally mobile and its typical fauna are adapted to episodic increases in turbidity and light deposition under a moderate–high energy regime. At the pressure benchmark relevant to construction plumes, the sensitivity of subtidal sand to short-term increases in suspended sediment is low with high resistance (Ref 18.D.27). Any temporary reductions in feeding efficiency for suspension feeders are expected to be brief and reversible.

18.D.5.79. There is no spatial overlap between mapped subtidal sand habitat and the English Offshore Scheme. For in-combination effects, the only relevant activities would be occasional maintenance of existing infrastructure or new construction activities, capable of generating minor, short-duration turbidity pulses. Given their infrequent and highly localised nature, the energetic hydrodynamic setting, and the low sensitivity of subtidal sand to this pressure, there is no credible mechanism for significant or prolonged increases in suspended sediment to impact this feature. **Therefore, the effect of in-combination temporary increases in suspended sediment to subtidal sands will not hinder the conservations objectives for overall recovery of this feature within the MCZ.**

## 18.D.6. Stage 1 Conclusion

18.D.6.1. This assessment was undertaken to determine whether the English Offshore Scheme has the potential to pose a significant risk to the designated features or conservation objectives of relevant MCZs, in accordance with the requirements of s126 of the MCAA 2009. Stage 1 of the assessment comprised a screening exercise to identify MCZs with the potential to be affected by the scheme, resulting in one MCZ being taken forward for further consideration. The Stage 1 assessment considered five potential impact pathways associated with the construction, O&M and, where relevant, decommissioning phases of the scheme, based on the current design envelope and reasonable worst-case assumptions. The assessment concluded that none of these impact pathways are considered likely to result in significant effects on the designated features or conservation objectives of the MCZs considered. On this basis, it has been concluded that the conditions of s126 of the MCAA 2009, as determined under Stage 1 of the MCZ assessment process, will be met and that there is no likely significant risk to any of the identified designated features or conservation objectives of the sites as a result of the English Offshore Scheme.

18.D.6.2. The impacts of temporary habitat loss / seabed disturbance, permanent habitat loss water flow changes and temporary increase and deposition of suspended sediments, as a result of the English Offshore Scheme, were assessed against the conservation objectives for the Holderness Offshore MCZ. This assessment concludes that there is no significant risk of these impacts, in-isolation or in-combination with other planned projects within / surrounding the MCZ, of hindering the achievement of the conservation objectives stated and a Stage 2 MCZ Assessment will not be required.

18.D.6.3. The assessment conclusions for each protected feature within the Holderness Offshore MCZ is summarised in **Table 18.D-4**.

Table 18.D-4 Summary of the Stage 1 MCZ assessment conclusions

Site name	Protected feature	Potential impact	Assessment conclusion
Holderness Offshore MCZ.	• North Sea glacial tunnel valley.	• Temporary habitat loss / seabed disturbance.	The English Offshore Scheme will not hinder the conservation objectives of any protected feature alone or in-combination with another projects.
	• Subtidal coarse sediments.	• Permanent habitat loss.	

Site name	Protected feature	Potential impact	Assessment conclusion
	<ul style="list-style-type: none"> <li>Subtidal sediments.</li> <li>Subtidal sand.</li> <li>Ocean quahog.</li> </ul>	mixed <ul style="list-style-type: none"> <li>Water flow (tidal current) changes, including sediment transport considerations.</li> </ul>	
	<ul style="list-style-type: none"> <li>Subtidal sediments.</li> <li>Subtidal sediments.</li> <li>Subtidal sand.</li> </ul>	coarse mixed <ul style="list-style-type: none"> <li>Temporary increase in deposition of suspended sediments.</li> </ul>	and of The English Offshore Scheme will not hinder the conservation objectives of any protected feature alone or in-combination with another projects.

## 18.D.7. Bibliography

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