Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Outline Cromer Shoal Chalk Beds (CSCB) Marine Conservation Zone (MCZ) Cable Specification, Installation and Monitoring Plan (CSIMP) (Revision B) (Tracked)

Revision B
Deadline 7
July 2023
Document Reference: 9.7.4
APFP Regulation: 5(2)(q)

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Title: **Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects** **DCO Document** **Outline Cromer Shoal Chalk Beds Marine Conservation Zone Cable Specification, Installation and Monitoring Plan (Revision B) (Tracked)**		
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Glossary of Acronyms

CBRA	Cable Burial Risk Assessment
CBS	Cable Burial Study
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CSCB	Cromer Shoal Chalk Beds
CSIMP	Cable Specification, Installation and Monitoring Plan
DCO	Development Consent Order
DEP	Dudgeon Offshore Wind Farm Extension Project
DEL	Dudgeon Extension Limited
DML	Deemed Marine Licence
DOW	Dudgeon Offshore Wind Farm
EIA	Environmental Impact Assessment
EIFCA	Eastern Inshore Fisheries and Conservation Authority
EMF	Electromagnetic Field
EPP	Evidence Plan Process
ES	Environmental Statement
ETG	Expert Topic Group
FLO	Fisheries Liaison Officer
FOCI	Features of Conservation Interest
HDD	Horizontal Directional Drilling
HVDC	High Voltage Direct Current
ICBS	Interim Cable Burial Study
IPMP	In Principle Monitoring Plan
JNCC	Joint Nature Conservation Committee
km	Kilometre
LAT	Lowest Astronomical Tide
m	Metre

MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MPA	Marine Protected Area
O&M	Operation and Maintenance
OOMP	Offshore Operation and Maintenance Plan
OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Information Report
SEL	Scira Extension Limited
SEP	Sheringham Shoal Offshore Wind Farm Extension Project
SLB	Simultaneous Lay and Burial
SOW	Sheringham Shoal Offshore Wind Farm
TOP	Top of Product
TWT	The Wildlife Trusts
UK	United Kingdom
UXO	Unexploded Ordnance

Glossary of Terms

Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension site as well as all onshore and offshore infrastructure.
DEP wind farm site	The offshore area of DEP within which wind turbines, infield cables and offshore substation platform/s will be located and the adjacent Offshore Temporary Works Area. This is also the collective term for the DEP North and South array areas.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the EIA and HRA for certain topics.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Horizontal directional drilling (HDD)	Trenchless technique used to install cables – in this case referring to the installation of the export cables at the landfall.
Infield cables	Cables which link the wind turbine generators to the offshore substation platform(s).
Landfall	The point at the coastline at which the offshore export cables are brought onshore and connected to the onshore export cables.
Offshore export cable corridor	This is the area which will contain the offshore export cables between offshore substation platform/s and landfall, including the adjacent Offshore Temporary Works Area.
Offshore export cables	The cables which would bring electricity from the offshore substation platform(s) to the landfall. 220 – 230kV.
Offshore substation platform	A fixed structure located within the wind farm site/s, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Offshore Temporary Works Area	An Offshore Temporary Works Area within the offshore order limits in which vessels are permitted to carry out activities during construction, operation and decommissioning encompassing a 200m buffer around the wind farm sites and a 750m buffer around the offshore cable corridors. No permanent

	infrastructure would be installed within the Offshore Temporary Works Area.
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substation. 220 – 230kV.
Onshore Substation	Compound containing electrical equipment to enable connection to the National Grid.
Sheringham Shoal Offshore Wind Farm Extension Project (SEP)	The Sheringham Shoal Offshore Wind Farm Extension site as well as all onshore and offshore infrastructure.
SEP wind farm site	The offshore area of SEP within which wind turbines, infield cables and offshore substation platform/s will be located and the adjacent Offshore Temporary Works Area.
The Applicant	Equinor New Energy Limited. As the owners of SEP and DEP, Scira Extension Limited and Dudgeon Extension Limited are the named undertakers that have the benefit of the DCO. References in this document to obligations on, or commitments by, 'the Applicant' are given on behalf of SEL and DEL as the undertakers of SEP and DEP.
UK	United Kingdom

1 Revision B Updates at Deadline 7

1. This document has been updated at Deadline 7 to:
   - Secure the Horizontal Directional Drilling (HDD) exit pit location within the Weybourne Channel (**Figure 1** and **Figure 2** and **Section 5.1.5**); and
   - Include Natural England Relevant Representation [RR-063] comments on this document and the Applicant's response (**Table 1**).

~~1~~2 Introduction

~~1.1~~2.1 Project Background

~~1.~~2. The Sheringham Shoal Offshore Wind Farm Extension Project (hereafter SEP) and Dudgeon Offshore Wind Farm Extension Project (hereafter DEP) are proposed extensions to the existing Sheringham Shoal (SOW) and Dudgeon (DOW) offshore wind farms (OWF). When operational, SEP and DEP combined would have the potential to generate renewable power for up to 785,000 United Kingdom (UK) homes from up to 23 wind turbines at SEP and up to 30 wind turbines at DEP.

~~2.~~3. As the owners of SEP and DEP, Scira Extension Limited and Dudgeon Extension Limited are the named undertakers that have the benefit of the Development Consent Order (DCO). References in this document to obligations on, or commitments by, 'the Applicant' are given on behalf of SEL and DEL as the undertakers of SEP and DEP.

~~3.~~4. SEP and DEP will be connected to shore by offshore export cables installed to the landfall at Weybourne, on the north Norfolk coast. There will be up to two export cables, installed in two separate trenches. Horizontal directional drilling (HDD) will be used for installation of the export cables at the landfall, from an onshore joint transition bay, under the intertidal zone to approximately 1,000m from the coastline. The export cable corridor passes through the Cromer Shoal Chalk Beds (CSCB) Marine Conservation Zone (MCZ).

~~1.2~~2.2 Purpose of this Document

~~4.~~5. Consideration of cable burial and remedial cable protection requirements (collectively part of the cable installation process) within a designated site is a key component of the environmental assessment. A specific challenge arises as a result of the need to undertake the assessments prior to detailed engineering studies and pre-construction surveys, which are typically undertaken between the point of consent and the commencement of construction. In turn, this challenge gives rise to the need for clarity on how and when such detailed information will become available and will be used, as well as how the works that will be undertaken will be controlled by the DCO. This enables greater confidence in the assessment assumptions made in relation to the nature and location of the proposed works. It also allows for the refinement of the proposals and mitigation measures based on the detailed information available pre-construction, as well as the latest guidance, advice and evidence at the time that the works are undertaken.

~~5.~~6. As conditioned in the draft Deemed Marine Licences (DMLs) of the **Draft DCO (Revision J)** (document reference 3.1) for the transmission assets (specifically the export cables), submission and approval of a CSCB MCZ Cable Specification, Installation and Monitoring Plan (CSIMP) prior to the commencement of works in the MCZ is required. As such, the purpose of this Outline CSCB MCZ CSIMP is to set out a framework for the information that will be required in the final CSCB MCZ CSIMP in accordance with the DML conditions. It provides information on the proposed cable installation methodologies and mitigation that may be adopted to minimise the impact on the CSCB MCZ as far as practicable. This information will be reviewed and updated in the final CSCB MCZ CSIMP once details from pre-construction surveys and detailed engineering studies are available.

~~1.2.1~~2.2.1 Draft Condition

~~6.~~7. The conditions within the draft DMLs secure submission and approval of a CSCB MCZ CSIMP as follows:

—(1) The licensed activities or any phase of those activities must not commence until the following (insofar as relevant to that activity or phase of activity) have been submitted to and approved in writing by the MMO, in consultation with Trinity House and the MCA—

- *A cable specification, installation and monitoring plan for the installation of cables within the Cromer Shoal Chalk Beds MCZ (in accordance with the outline Cromer Shoal Chalk Beds MCZ cable specification, installation and monitoring plan)*

~~2~~3 The Cromer Shoal Chalk Beds Marine Conservation Zone

~~7.~~8. The CSCB MCZ is located approximately 200m from the mean low water mark of the north Norfolk coast, projecting up to 10km offshore and extending from east of Weybourne to Happisburgh. It is situated to the south of the SEP and DEP wind farm sites, with the SEP and DEP offshore export cable corridor passing through the western area of the CSCB MCZ as it approaches landfall (**Figure 1**). The CSCB MCZ is designated for seven broadscale marine habitat features, two habitat features of conservation interest (FOCI) and one feature of geological interest (further details are available in the **Stage 1 CSCB MCZ Assessment (Revision B)** (document reference 5.6):

- Broadscale marine habitats:
  - High energy circalittoral rock;
  - Moderate energy circalittoral rock;
  - High energy infralittoral rock;
  - Moderate energy infralittoral rock;
  - Subtidal coarse sediment;
  - Subtidal mixed sediments; and
  - Subtidal sand.
- FOCI:

- Subtidal chalk; and
- Peat and clay exposures.

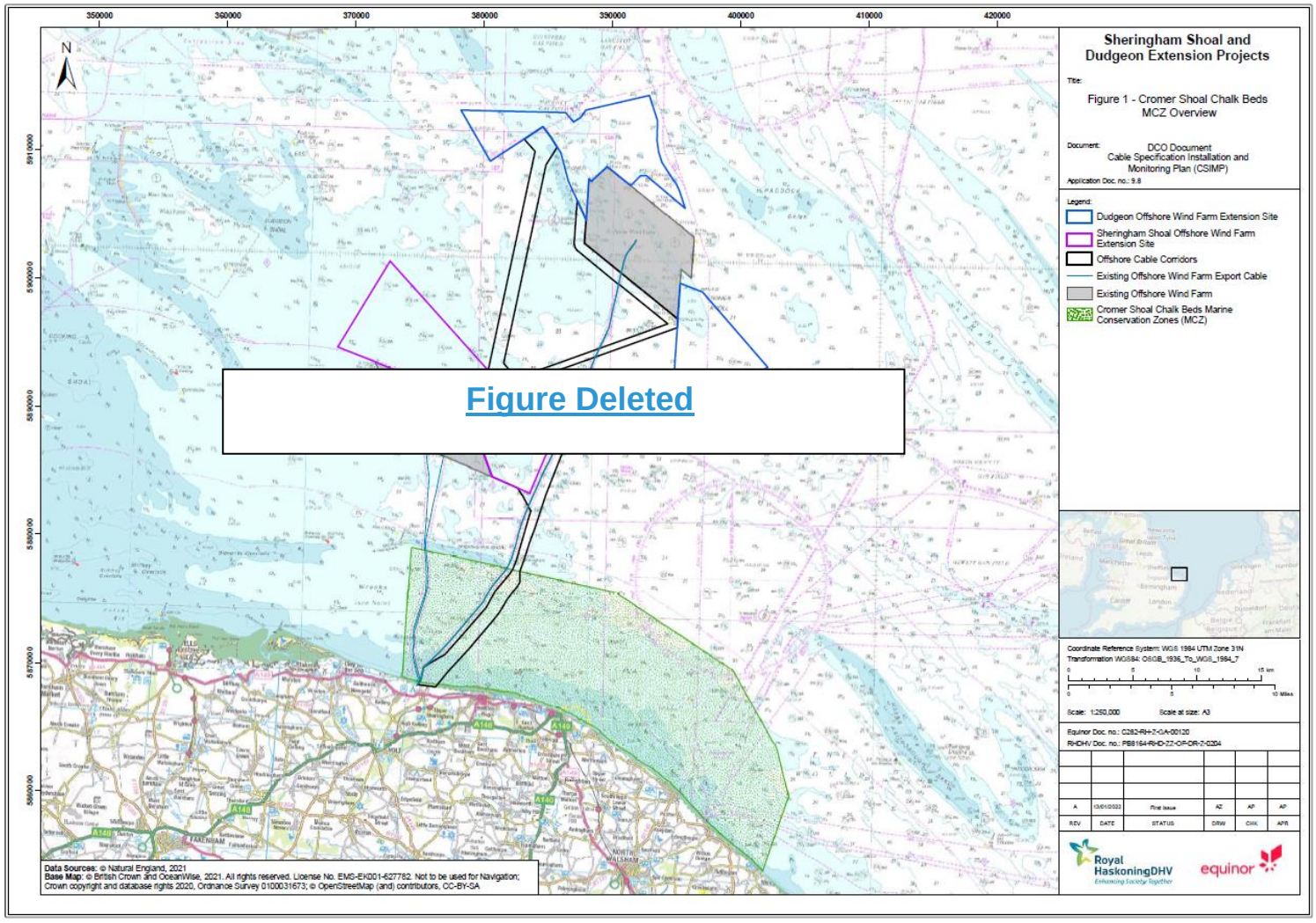
- Feature of geological interest:
  - North Norfolk Coast Assemblage of Subtidal Sediment Features and Habitats (subtidal) (combination of broadscale marine habitats and FOCI above).

~~8.~~9. Whereas broadscale marine habitats represent a range of similar habitats and associated species grouped together, FOCI are specific habitats and species that are known to be threatened, rare or declining in our seas. Protecting examples of broadscale habitats across the Marine Protected Area (MPA) network aims to ensure that the full range of marine biodiversity in our seas is conserved. FOCI species and habitats may be more sensitive to pressures and hence need targeted protection. The CSCB MCZ includes the best examples of subtidal chalk beds in the North Sea (subtidal chalk marine habitat FOCI), as well as subtidal exposures of clay and peat (peat and clay exposures marine habitat FOCI) (Natural England, 2018). The majority of the rest of the CSCB MCZ is designated for broadscale marine habitat features defined by different sea bed sediments.

~~9.~~10. A large area of infralittoral rock extends for almost the entire length of the site from east to west, but is generally restricted to shallow inshore waters (up to 10m depth) (**Figure 2**). This wide area of hard, stable substrate provides a suitable habitat for attached and mobile epifauna within a site dominated by gravel interspersed with finer sediments. Extending beyond this infralittoral rock into deeper water is a band of circalittoral rock with more epifauna and, as a result of less light penetration, a marked decrease in macroalgae (Green and Dove, 2015). Areas of infralittoral and circalittoral rock within the site are comprised of subtidal chalk, as well as other rock types. At the time the MCZ was designated, it was not possible to accurately differentiate between different types of rock by using geophysical data, therefore areas mapped as the subtidal chalk feature will overlap with areas mapped as the circalittoral and infralittoral rock features across the site.

~~10.~~11. Subtidal chalk occurs quite close to the intertidal zone, but extends further offshore in the southeast portion of the site. Further offshore, beyond the chalk beds, the site is dominated by subtidal coarse sediments, with a thin band of subtidal mixed sediments running from east to west (**Figure 2**). To the northwest, the coarse sediments transition to finer material, with a mixture of subtidal mud and sand. Further offshore, along the outer boundary of the site, isolated outcrops of clay occur on the sea bed.

~~11.~~12. This area of the southern North Sea is a dynamic environment with vast quantities of sediment constantly moved around the site by tides and currents (HR Wallingford *et al*., 2002), so these sediment distributions may be subject to change over time. New areas of chalk may become exposed and others become covered by sediment when there are tidal surges or storms (Joint Nature Conservation Committee (JNCC), 2004).



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Sheringham Shoal and Dudgeon Extension Projects

Title:

Figure 1.1 - Cromer Shoal Chalk Beds MCZ Overview

Document: DCO Document
Cable Specification Installation and Monitoring Plan (CSIMP)

Application Doc. no.: 9.8

Legend:

- Dudgeon Offshore Wind Farm Extension Project Wind Farm Site
- Sheringham Shoal Offshore Wind Farm Extension Project Wind Farm Site
- Offshore Cable Corridors
- Existing Offshore Wind Farm Export Cable
- Existing Sheringham Offshore Wind Farm Export Cable
- Offshore Temporary Work Area
- Existing Offshore Wind Farm
- Cromer Shoal Chalk Beds Marine Conservation Zones (MCZ)
- HDD Exit Location

Coordinate Reference System: WGS 1984 UTM Zone 31N
Transformation WGS84: OSGB_1936_To_WGS_1984_7

0 5 10 15 km
0 5 Miles

Scale: 1:250,000 Scale at size: A3

Equinor Doc. no.: C282-RH-Z-GA-00120
RHDHV Doc. no.: PB8164-RHD-ZZ-OF-DR-Z-0204

REV	DATE	STATUS	DRW	CHK	APR
C	06/07/2023	Third Issue	SB	PM	AP
B	21/07/2022	Second Issue	GC	AP	AP
A	13/01/2022	First Issue	AZ	AP	AP

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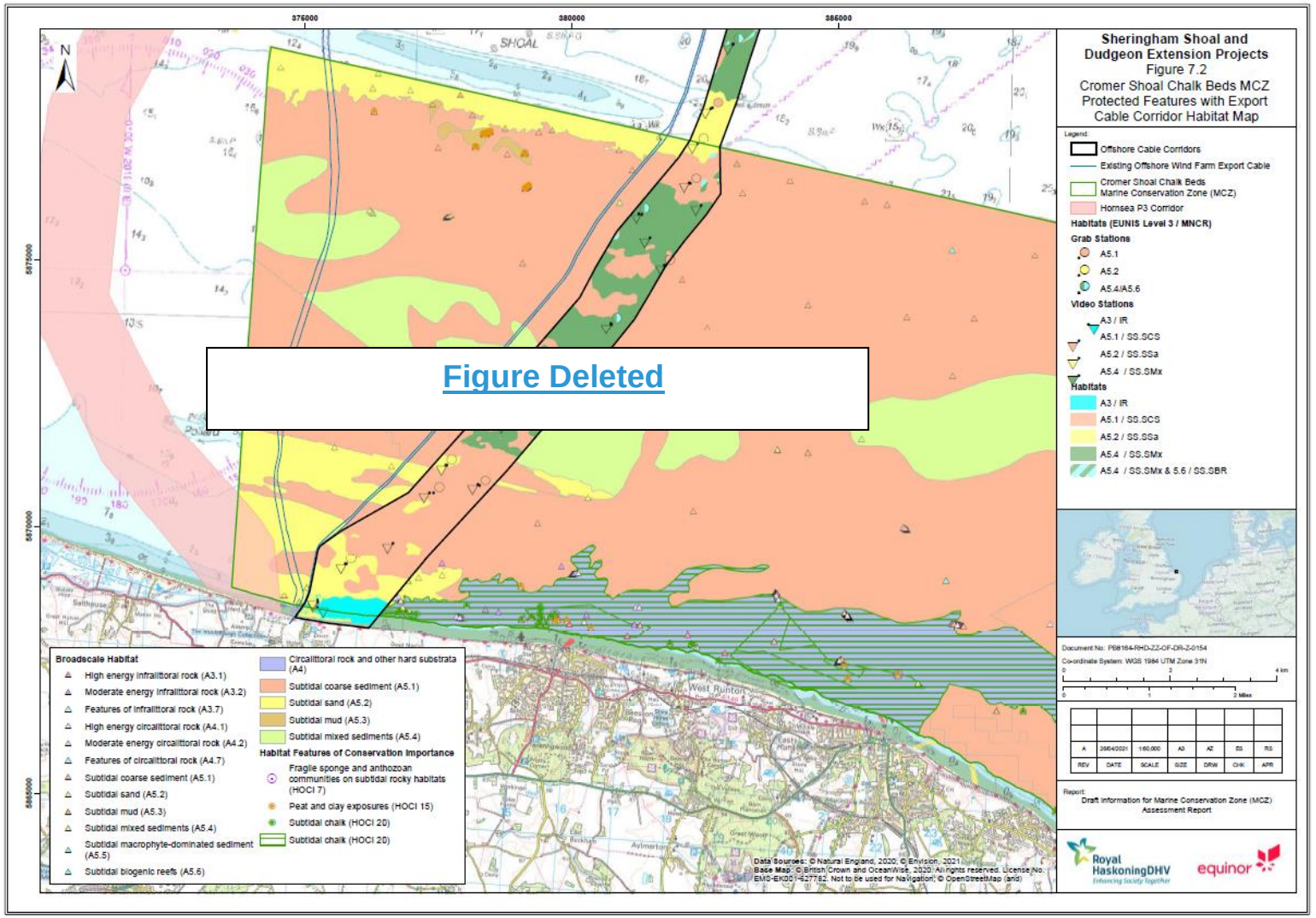
Figure Deleted
Sheringham Shoal and Dudgeon Extension Projects
Figure 7.2
Cromer Shoal Chalk Beds MCZ
Protected Features with Export Cable Corridor Habitat Map
Legend:
Offshore Cable Corridors
Existing Offshore Wind Farm Export Cable
Cromer Shoal Chalk Beds Marine Conservation Zone (MCZ)
Hornsea P3 Corridor
Habitats (EUNIS Level 3 / MNCR)
Grab Stations
A5.1
A5.2
A5.4/A5.6
Video Stations
A3 / IR
A5.1 / SS.SCS
A5.2 / SS.SSa
A5.4 / SS.SMx
Habitats
A3 / IR
A5.1 / SS.SCS
A5.2 / SS.SSa
A5.4 / SS.SMx
A5.4 / SS.SMx & 5.6 / SS.SBR
Broadscale Habitat
High energy infralittoral rock (A3.1)
Moderate energy infralittoral rock (A3.2)
Features of infralittoral rock (A3.7)
High energy circalittoral rock (A4.1)
Moderate energy circalittoral rock (A4.2)
Features of circalittoral rock (A4.7)
Subtidal coarse sediment (A5.1)
Subtidal sand (A5.2)
Subtidal mud (A5.3)
Subtidal mixed sediments (A5.4)
Subtidal macrophyte-dominated sediment (A5.5)
Subtidal biogenic reefs (A5.6)
Circalittoral rock and other hard substrata (A4)
Subtidal coarse sediment (A5.1)
Subtidal sand (A5.2)
Subtidal mud (A5.3)
Subtidal mixed sediments (A5.4)
Habitat Features of Conservation Importance
Fragile sponge and anthozoan communities on subtidal rocky habitats (HOCI 7)
Peat and clay exposures (HOCI 15)
Subtidal chalk (HOCI 20)
Subtidal chalk (HOCI 20)
Report:
Draft Information for Marine Conservation Zone (MCZ) Assessment Report
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Sheringham Shoal and Dudgeon Extension Projects

Title:

Figure 1.2 - Cromer Shoal Chalk Beds MCZ Protected Features

Document: DCO Document
Cable Specification Installation and Monitoring Plan (CSIMP)

Application Doc. no.: 9.8

370000 380000 390000 400000 410000

5880000 5870000 5860000 5850000

N

SHERINGHAM SHOAL

Wind Farm

Wrecks (see Note)

Cas (see Note)

Military Wreck (see Note)

Obstn

Blakeney Overfalls

Blakeney Point

Blakeney

Cley next the Sea

Morston

Wiveton

Salthouse

Newgate

Kelling

Langham

East Runton

Felbrigg

Crossdale Street

Northrepps

Upper Street

Gimingham

Roughton

Metton

Thorpe Market

Gunton Station

Gunton Hall

Alby Hill

Southrepps

Lower Street

Trunch

Paston

Happisburgh Common

Lessingham

Ingham

Ruston

Skeyton

A149

A140

B1436

B1156

B1150

Broadscale Habitat

- High energy infralittoral rock (A3.1)
- Moderate energy infralittoral rock (A3.2)
- Features of infralittoral rock (A3.7)
- High energy circalittoral rock (A4.1)
- Moderate energy circalittoral rock (A4.2)
- Features of circalittoral rock (A4.7)
- Subtidal coarse sediment (A5.1)
- Subtidal sand (A5.2)
- Subtidal mud (A5.3)
- Subtidal mixed sediments (A5.4)
- Subtidal macrophyte-dominated sediment (A5.5)
- Subtidal biogenic reefs (A5.6)
- Circalittoral rock and other hard substrata (A4)
- High energy circalittoral rock (A4.1)
- Subtidal coarse sediment (A5.1)
- Subtidal sand (A5.2)
- Subtidal mud (A5.3)
- Subtidal mixed sediments (A5.4)

Habitat Features of Conservation Importance

- Blue Mussel Beds (HOCI 1)
- Fragile sponge and anthozoan communities on subtidal rocky habitats (HOCI 7)
- Horse mussel (Modiolus modiolus) reefs (HOCI 9)
- Peat and clay exposures (HOCI 15)
- Ross worm (Sabellaria spinulosa) reefs (HOCI 16)
- Subtidal chalk (HOCI 20)
- Peat and clay exposures (HOCI 15)
- Subtidal chalk (HOCI 20)

Habitats (EUNIS Level 3 / MNCR)

Grab Stations	Video Stations	Habitats (EUNIS/MNCR)
A5.1	A3 / IR	A3 / IR
A5.2	A5.1 / SS.SCS	A5.1 / SS.SCS
A5.4	A5.2 / SS.SSa	A5.2 / SS.SSa
A5.4/A5.6	A5.4 / SS.SMx	A5.4 / SS.SMx
		A5.1 / SS.SCS
		A5.4 / SS.SMx & 5.6 / SS.SBR

Legend:

- Sheringham Shoal Extension Project Wind Farm Site
- Offshore Cable Corridors
- Marine Conservation Zone (MCZ)
- Offshore Temporary Work
- Existing Offshore Wind Farm
- Existing Offshore Wind Farm Export Cable
- Existing Sheringham Offshore Wind Farm Export Cable
- Hornsea P3 Corridor
- HDD Exit Location

Coordinate Reference System: WGS 1984 UTM Zone 31N
Transformation WGS84: OSGB_1936_To_WGS_1984_7

0 2 4 6 8 10 km
0 2 4 6 Miles

Scale: 1:150,000 Scale at size: A3

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A	13/01/2022	First Issue	AZ	AP	AP

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~~2.1~~3.1 Sea Bed Sediment Type

~~12.~~13. The bathymetry of the export cable corridor deepens from 0.0m lowest astronomical tide (LAT) at the landfall to about -24m LAT towards the boundary of the MCZ. Based on the interpretation of the SEP and DEP geophysical surveys (Gardline, 2020), the MCZ within the export cable corridor can be divided into four shore-parallel zones (Royal HaskoningDHV, 2020):

- The landward 500m of the cable corridor is outcropping chalk. This part of the corridor is likely to contain chalk at sea bed potentially sculped into complex geo-structures. The seaward boundary of the outcropping chalk is located in water depths of about -6m LAT at the western end to -9.5m LAT at the eastern end. The bathymetry of the seaward boundary gradually shallows from east to west. The area of the outcropping chalk within the corridor is about 812,000m^2.
- From 500m to 4.5km offshore along the export cable corridor, the sea bed is composed of alternating zones of gravelly sand/gravel and Holocene sand across a less complex bathymetry than further inshore. The gravelly sand/gravel is interpreted to be a lag deposit created by erosion of Pleistocene units (likely to have been mainly Bolders Bank Formation) that used to overlie the chalk. It is likely to be less than 1m thick with subcropping eroded chalk (although it is difficult to define the true thickness based on the geophysical data) and not mobile under existing tidal conditions. The Holocene sand is up to 3m thick and rests mainly on chalk and lag (apart from a deep infilled channel cut through the chalk to -17m LAT filled with Weybourne Channel deposits). Most of the sand surface is sculpted into megaripples, indicating mobility under existing tidal conditions. If the Holocene sand is mobile, gross migration is likely to be along an approximately east-west axis (given the crest orientations of the bedforms). The smoother bathymetry in this zone indicates that exposed chalk is absent and where it subcrops it is more regular in elevation.
- From 4.5km to about 9km from the coast along the export cable corridor is a gravelly sand or gravel sea bed, which is interpreted to form a thin layer (lag) overlying eroded chalk and Botney Cut Formation in the north. This wide zone is a continuation of the gravelly sand/gravel sea bed further landward which passes beneath the Holocene sands. The overlying mobile Holocene sands do not occur in this zone. The gradually sloping bathymetry suggests that the subcropping chalk surface in this zone is an eroded surface and is relatively flat and regular.
- In the seaward 2km of the cable corridor inside the MCZ is a field of megaripples, which extend further to the north as the bathymetry rises into Sheringham Shoal sand bank. Here, the chalk is locally covered with up to 2m of sand (and occasionally up to 6m).

~~2.2~~3.2 Sediment Transport Processes

~~13.~~14. A review of the sedimentary processes operating in the MCZ was undertaken in 2020 (Royal HaskoningDHV, 2020). This describes a range of sediment transport potentials across the stratigraphic units mapped along the SEP and DEP export cable corridor. The chalk and the Pleistocene geological units that fill channels in the chalk (e.g. Botney Cut Formation and Weybourne Channel Deposits) are noted as being static (and can only be eroded), whereas the surface of the Holocene sand is mobile under existing tidal conditions, and so can erode, transport and deposit depending on the physical processes. The mobility of the Holocene sand is supported by the existence of megaripples across its surface in places. This indicates that there is a possibility that movement of this sediment may result in exposure or burial of the underlying geological units. Given the thickness of the Holocene sands, it would only be possible for movement of the feather edges (where the sediment is thin and could all move), to generate new sea bed substrate. In areas where the sand is thicker, the movement of the surface layer would only result in exposure of further sand deeper in the sediment column.

~~14.~~15. Between the chalk or Pleistocene geological units and the sea bed or overlying Holocene sand is a layer of gravelly sand/sandy gravel. This coarse-grained layer is interpreted as a lag deposit created by erosion of Pleistocene units that were originally present on the sea bed (e.g. Bolders Bank Formation). The transport potential of this sediment layer is zero or very low.

~~2.3~~3.3 Summary of Consultation

~~15.~~16. Consultation on matters relating to the export cable installation and external cable protection requirements in the CSCB MCZ have been held through the Sea bed Expert Topic Group (ETG), which is attended by the Marine Management Organisation (MMO), Centre for Environment, Fisheries and Aquaculture Science (Cefas), Natural England, The Wildlife Trusts and the Eastern Inshore Fisheries and Conservation Authority (EIFCA). At the time of writing ETG meetings have been held in October 2019, June 2020, February 2021 and August 2021. These meetings have addressed the approach to scoping, data collection and evidence requirements in general, the results of the project characterisation surveys carried out in 2019 and 2020, Environmental Impact Assessment (EIA) and Stage 1 CSCB MCZ Assessment methodologies and the draft assessment outcomes.

~~16.~~17. A Preliminary Environmental Information Report (PEIR) was consulted on alongside a draft Information for MCZ Assessment Report in Q2 2021, as part of SEP and DEP's section 42 consultation. Comments were received from stakeholders in June 2021 and have been considered in the process of finalising the assessments and plans that have been submitted as part of the DCO application.

~~17.~~18. A draft version of the Outline CSCB MCZ CSIMP was made available to inform pre-application consultation with the Sea bed ETG. Feedback provided on the draft document is summarised in **Table 1**.

~~18.~~19. **Table 1** provides a summary of how the consultation responses received to date, of specific relevance to the CSIMP, have influenced the approach that has been taken. Details of the consultation relating to the **Stage 1 CSCB MCZ Assessment (Revision B)** (document reference 5.6) more generally is included in that document itself and is not repeated here. Full details of the consultation process are also presented in the **Consultation Report** [APP-029] which has been submitted alongside the DCO application.

Table 1: Summary of Key Consultation Responses Relating to the Development of the CSIMP

Consultee	Date	Comment Received	Project Response
ETG Meetings			
Natural England	June 2020 Sea bed ETG 2	Decommissioning Natural England welcomes consideration of remove of cable protection at the time of decommissioning and if removal could be achieved, then whilst the impacts would no longer be permanent, they would still last for the lifetime of the infrastructure (25 years) and potentially longer as a residual impact. Therefore, because this impact is lasting/long term and site recovery wouldn't be assured, Natural England's view is that reasonable scientific doubt would likely remain regarding the impact of the proposals on the conservation objectives for the site. Accordingly a precautionary approach is required. Please also be advised that if it is considered that certain types of cable protection could be modified to enable a greater success of recovery/removal at decommissioning, whilst reducing wider designated site impact, then we advise that this would need to be reflected in the DCO/DML to ensure this mitigation is secured.	The Applicant has committed to removal of any external cable protection in the MCZ at decommissioning, where it is required (see Section 5.4.5 and Appendix 3 Decommissioning Feasibility Study). Options for cable recoverability are reviewed within the Decommissioning Feasibility Study in **Appendix 3**. Therefore, habitat loss associated with external cable protection in the MCZ will be lasting but not permanent. Long term habitat loss is assessed in Section 8.2.2 of the Stage 1 CSCB MCZ Assessment (Revision B) (document reference 5.6).
Natural England, MMO	August 2021 Sea bed ETG 4	Consider the use of rock bags which do not use plastic material.	Initial market research has suggested that external cable protection systems may be available on the market that are manufactured from non-plastic material and would be recoverable where necessary after the lifetime of the wind farm. Selection of the appropriate system for use at SEP and DEP will be completed at the pre-construction stage once the requirements are better understood.
Section 42 Comments			
Natural England	June 2021	How will the Applicant secure the removal of protection at the time of decommissioning?	A condition, quoted in the first row of this table, is included in the draft DMLs for the transmission assets (specifically the export cables) that requires the submission and approval of a CSCB MCZ CSIMP, prior to the commencement of works in the MCZ.

Consultee	Date	Comment Received	Project Response
Natural England	June 2021	The impacts from cable protection should be noted as being 600m^2 per cable and 300m^2 per cable at the exit pit.	Table 2 presents the worst-case scenario for external cable protection in m^2.
Natural England	June 2021	Please be advised that whilst we welcome the use of bags for cable protection as these have been shown to be successfully decommissioned; we query what they will be made from as the use of plastics should be minimised in the marine environment.	Initial market research has suggested that external cable protection systems may be available on the market that are manufactured from non-plastic material and would be recoverable where necessary after the lifetime of the wind farm. Selection of the appropriate system for use at SEP and DEP will be completed at the pre-construction stage once the requirements are better understood.
Natural England	June 2021	External Cable protection. It is stated that the allowance for external cable protection will be minimised. Natural England would welcome further information how this will be achieved, for example by avoiding areas of hard substrate within the cable corridor.	Section 5 describes the mitigation that will be implemented to make reasonable endeavours to avoid the need for external cable protection within the MCZ. Cables would be buried where ground conditions and micro-siting of the export cables allow, to avoid areas where burial is more likely to be challenging and ensure the amount of external cable protection required is minimised. The Interim Cable Burial Study (ICBS) (Appendix 1) describes how the amount of external cable protection has been derived.
Natural England	June 2021	We note the Applicant considers the best option (para 69 [of the MCZA] from an engineering perspective is for cable protection in the transition zone at the HDD exit in the subtidal, 1000m from the coastline. However, Natural England's preference is not for cable protection to be taken forward, but for the option, as detailed in paragraph 68 [of the MCZA], where cables will be buried within the transition zone, at the HDD exit point within the MCZ. This will reduce habitat loss due to external cable protection by 50% of the WCS.	Noted. Burial is the preferred option. Both options are required in the project design envelope at this stage because the ability to avoid the need for external cable protection at the HDD exit pit cannot be confirmed until detailed engineering work has been completed. External cable protection will be used where burial cannot be achieved. Detailed design studies will confirm which methodology will be taken forward.
Natural England	June 2021	Natural England welcomes that techniques will be utilised to avoid persistent trenches to avoid any longer recovery of benthic habitats than necessary and would welcome specific details of the methodology to be utilised for this.	A non-displacement plough such as that used for installation of the DOW export cables (see Section 5.3.1.2) is the preferred

Consultee	Date	Comment Received	Project Response
			installation tool for SEP and DEP. Further details are provided in the ICBS (Appendix 1).
Natural England	June 2021	Can the Applicant provide evidence that the burial and repair required will be minimal, for example drawing on the level of maintenance or repair required for the existing DOW and SOW? By their nature, the operations resulting in temporary habitat loss and physical disturbance, both spatially and temporally, have the potential to hinder the conservation objectives of the site and therefore we cannot agree to the conclusion. This is particularly the case in mixed sediment areas.	The SOW and DOW export cables have not had to undergo any reburial or repair operations to date. However, the Applicant is aware that such works have been required for other North Sea OWFs in operation. Information from SOW and DOW has helped to inform the operation and maintenance (O&M) requirements for SEP and DEP, however an allowance for reburial and repair is required for contingency purposes during the lifetime of the wind farms.
Natural England	June 2021	Whilst Natural England supports the commitment to decommissioning for removal of external cable protection, any intention to remove buried infrastructure, such as cables, would result in further disturbance / temporary habit loss.	Noted. The appropriate course of action would be confirmed via separate consent and assessment at the time of decommissioning based on the latest available information and requirements.
The Wildlife Trusts (TWT)	June 2021	TWT welcome that a Cable Specification, Installation and Monitoring Plan for the MCZ (CSIMP) will be produced and look forward to reviewing a draft.	Noted.
TWT	June 2021	Is bundle lay possible with HVDC cables?	High voltage direct current (HVDC) cables are not being considered within the project design envelope for the SEP and DEP export cables.
TWT	June 2021	Rock bags: TWT would like to see evidence to support the use of rock bags as the cable protection method which will a) cause minimal habitat loss and b) can be confidently decommissioned. Are alternatives available?	See Appendix 3 Decommissioning Feasibility Study.
TWT	June 2021	TWT would welcome further information on the pinning of cables to the sea bed as an alternative to cable protection. We would like to explore this as an option alongside an anchoring and fishing exclusion zone to ensure the protection of the cable. TWT believes that Lynn and Lincs offshore wind farms have non-buried cables with marker buoys to identify the location to other sea users.	Unprotected surface laid cables, including pinning to the sea bed, is no longer included in the project design envelope. This is primarily due to snagging concerns with fishing vessels, as well as the additional disturbance to fishing activity through the presence of surface marker buoys.

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			The Applicant does not have the necessary authority to implement anchoring and fishing exclusion zones and this option is understood to not be supported by the MMO, Natural England or EIFCA.
EIFCA	June 2021	We think that the issue of potential effects from cables and EMF has been dismissed rather too lightly. This is especially the case for the cable corridor within the MCZ, where we note that *"….. there is unprotected surface lay of cable (which is proposed as an option within the Cromer Shoal MCZ). …."* (Chapter 14 Commercial Fisheries, section 327).	It should ~~shoul22houldd~~ be noted that unprotected surface laid cables, including pinning to the sea bed, is no longer within the project design envelope. Potential ecological effects on fish and/or shellfish from Electromagnetic Field (EMF) are addressed in Chapter 9 Fish and Shellfish Ecology of the Environmental Statement (ES) (document reference 6.1.9).
Comments on the Draft CSIMP			
MMO	March 2022	The MMO welcome the applicants commitment to micro-siting the export cable within the export cable corridor to avoid areas that are of higher risk of requiring subsequent intervention e.g., external cable protection. Furthermore, the MMO acknowledge the Applicant has committed to periodic inspections, associated repairs/reburial the removal of any external cable protection within the Marine Conservation Zone (MCZ) at decommissioning, this is also welcomed by the MMO.	Noted.
MMO	March 2022	The MMO note that the proposed HDD (Horizontal Directional Drilling) will take place under the beach and the Chalk reef, which mitigates impacts on a sensitive receptors near the coast (the Chalk reef). However, this relies on extensive up-to-date geophysical data in order to assess the impact on the benthic/sedimentological environmental and propose and gain approval for micro-siting deviations. The MMO consider lessons learned from the Sheringham and Dudgeon export cable installation operations will help reduce impacts to the environmental as well as risks to the project.	The route and landfall chosen have the advantage of being parallel to and nearby the existing DOW export cables. Since site surveys show that the soil characteristics are similar, this is considered to increase confidence and reduce risk.
MMO	March 2022	The MMO welcome the use of Horizontal Direct Drilling which will reduce impacts in key areas. The MMO do have concerns with the impacts of the break-out point and the need to create "trench	The use of rock bags at the HDD exit transition zone is described in Section 5.4.2. A full description of the project design envelope and associated worst-case scenarios, including

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		boxes" for each of the cables and request further information on how they will be created, maintained and in-filled.	of the works proposed at the HDD exit, is provided in Chapter 4 Project Description (Revision C) [REP5-021] of the SEP and DEP ES (document reference 6.1.4) and Section 5.6 of the Stage 1 CSCB MCZ Assessment (Revision B) (document reference 5.6).
MMO	March 2022	The MMO consider it would be beneficial to have sight of the 2019 survey of the Dudgeon OW and Sheringham Shoal OW cable routes for the micro-siting assessment.	Fugro (2020) and MMT (2019) survey reports have been shared with the MMO.
MMO	March 2022	The MMO consider it would be productive to see sections showing the Chalk reef and the HDD and the break out point in order to understand the interface between the Chalk reef and the sand/ gravel regions slightly further offshore	The HDD exit point is approximately 1,000m offshore in an area identified by the project characterisation surveys as sand, as shown on **Figure 2** (all refer to the Stage 1 CSCB MCZ Assessment (Revision B) (document reference 5.6) for details). The Applicant will confirm these details pre-construction using the results of the geophysical surveys that will be undertaken at the time.
MMO	March 2022	It is noted that the project plans on using rock bags to stabilise a cable in the short term. The accuracy of placement by contractors (Figure1) will allow very precise positions and hence low spatial impact footprints.	Noted.
MMO	March 2022	The Monitoring programme identified in section 1.7 is still relatively high level and I would need to see more specific details before signing off.	The Offshore In Principle Monitoring Plan (IPMP) (document reference 9.5) provides further details on the proposed monitoring for SEP and DEP.
MMO	March 2022	The MMO would like to see the Applicants proposals on relocating boulders along the route as it is not clear from the information how this will happen e.g. brought to a central repository of moved "off line"	Micro-siting around boulders is the preferred option. Where this is not possible, large boulders (in the order of 5m diameter and 1m height) will be relocated to an adjacent area of sea bed within the SEP and DEP boundaries where they do not present an obstacle to the works, and where possible to an area of sea bed with similar sediment type and avoiding any known sensitive habitats such as Annex I reef. Boulder clearance will be undertaken by subsea grab.
MMO	March 2022	It is noted that Section 1.5.2 provides information on the pre-construction surveys, which includes a baseline geophysical	Potential impacts on shellfish are considered in Chapter 9 Fish and Shellfish Ecology (document reference 6.1.9). It was agreed

Consultee	Date	Comment Received	Project Response
		survey of the export cable corridor, and baseline benthic surveys including grab sampling and seabed imagery within the export cable corridor. However, the MMO have found no mention of surveys related to shellfish, despite the major crab (Cancer pagurus) and lobster (Homarus gammarus) fisheries in the area. To inform a pre-construction assessment of these shellfish, potting surveys would need to be carried out, though the MMO note that the Eastern Inshore Fisheries and Conservation Authorities would be a good source of information.	with stakeholders through the EPP that sufficient publicly available information (including surveys from the existing wind farms) was available to undertake a robust assessment and, as a result, that site specific fish sampling surveys were not required. The Applicant has approached the EIFCA for potting survey data and has been informed whilst EIFCA do not carry out their own potting surveys, bio-sampling data are available within the crab and lobster stock assessments (EIFCA, 2022) which the Applicant will consider during any required pre-construction shellfish assessments.
Natural England	March 2022	Natural England advises that UXO clearance is a seabed preparation activity and therefore should be included the throughout the document as such e.g. in Table 2 and Para. 45	Noted.
Natural England	March 2022	It would be good if the conclusions of the Annexes could be brought through into the main body of the text as currently this only reflects what you will do and not the outcome of the assessments	A summary of the ICBS and CBRA are provided in **Section 4.**
Natural England	March 2022	Natural England notes at Para. 63 that cable repairs are anticipated every 10 years. However, that is not reflected by current OFTO applications for repairs.	As noted above, the SOW and DOW export cables have not had to undergo any reburial or repair operations to date, as such the Applicant considers that the worst-case assumptions are appropriate. The sea bed disturbance calculations for cable repairs and reburial are considered to be suitably precautionary to account for any potential increased frequency in repairs.
EIFCA	March 2022	Will boulders be removed completely or relocated within the site? What volume of boulders were removed / relocated during Sheringham Shoal and Dudgeon cable corridor clearance?	Micro-siting around boulders is the preferred option. Where this is not possible, large boulders (in the order of 5m diameter and 1m height) will be relocated to an adjacent area of sea bed within the SEP and DEP boundaries where they do not present an obstacle to the works, and where possible to an area of sea bed with similar sediment type and avoiding any known sensitive habitats such as Annex I reef. Boulder clearance will be undertaken by subsea grab.

Consultee	Date	Comment Received	Project Response
EIFCA	March 2022	We note the update to the project envelope in relation to surface laid cables, and accept this as a valid response in terms of the CSIMP. However, our wider concerns regarding EMS remain, we request that these concerns are given further consideration in the wider process.	EMF impact is assessed within **Chapter 9 Fish and Shellfish Ecology** (document reference 6.1.9).
EIFCA	March 2022	With reference to 'The offshore export cable corridor outside of the MCZ is 500m wide, but increases to 1,000m through the MCZ and widens further on approach to the landfall'. This additional export cable corridor width will cause additional disruption to existing fisheries, because there is a higher intensity of fishing closer to shore. We request disruption is minimised, for example by establishing and maintaining frequent dialogue with local fishery stakeholders, and if possible timing works to avoid busier fishing periods.	Potential impacts on commercial fishing receptors are assessed in Chapter 12 Commercial Fisheries (document reference 6.1.12). Consultation is ongoing with fisheries stakeholders.
EIFCA	March 2022	Subtidal chalk extent shown in Figure 2 and 1-1 is limited to the A4 circalittoral rock feature, this is not consistent with NE's latest feature advice which shows subtidal chalk (HOCI 20) to be much more extensive.[1]	It was agreed at Sea bed ETG 2 following presentation of evidence contained in Appendix 6.2 Sedimentary Processes in the Cromer Shoal Chalk Beds MCZ (document reference 6.32.6.2) that sea bed sediments in the offshore export cable corridor within the CSCB MCZ are static, with the exception of Holocene sand / subtidal sand, which is mobile under some conditions. Therefore, the potential for subtidal chalk to be exposed in the future is restricted to the subtidal sand areas identified by the geophysical survey. Further information on the extent of the subtidal chalk FOCI is available in Section 7 of the Stage 1 CSCB MCZ Assessment (Revision B) (document reference 5.6).

1 https://magic.defra.gov.uk/MagicMap.aspx?srs=WGS84&chosenLayers=mczIndex,mczfociPIndex,mczhociPIndex,mczbshPIndex,mczhociIndex,mczbshIndex,backdropDIndex,backdropIndex,europeIndex,vmlBWIndex,25kBWIndex,50kBWIndex,250kBWIndex,miniscaleBWIndex&box=1.08146734500002:52.801863036:1.60756515100002:53.068157605&useDefaultbackgroundMapping=false

Consultee	Date	Comment Received	Project Response
			In summary, survey data indicates that areas where there is potential for subtidal chalk to be exposed are of very limited extent within the offshore export cable corridor, and it is unknown if any such exposures would meet the criteria to be classified as the subtidal chalk habitat FOCI (e.g. criteria provided by Natural England for Hornsea Project Three (RPS, 2020), or how persistent they would be. Therefore the MCZA is based on the known locations of subtidal chalk restricted to the outcropping subtidal rock feature in the inshore area of the CSCB MCZ only.
EIFCA	March 2022	Will there be further consultation of the final CSIMP with engaged stakeholders in addition to the MMO and NE? This draft CSIMP includes several references to the ES which is not publicly available. Will there be further opportunity to comment when the ES is publicly available?	Following submission of the DCO application, EIFCA will have the opportunity to comment on any of the DCO application submission documents they so wish to respond to. In addition, this Outline CSCB MCZ CSIMP will be updated at the post consent stage in consultation with the MMO and other relevant consultees such as EIFCA.
EIFCA	March 2022	The document highlights the success of the of the existing Dudgeon and Sheringham export cable burials –and considers lessons learnt to increase confidence in likely future success with SEP and DEP cable burial. We agree with this approach and would request that this approach be replicated to support both coexistence and environmental aspects of the project.	Noted
EIFCA	March 2022	We request that the Applicants FLO liaise with the fishing industry to ascertain if they have or have had, any issues with the original cable installations and what lessons might be learnt to support successful coexistence with this project. We request notification of any fisheries reported issues both from current liaison and any issues previously reported since the original cables were installed	Noted.
EIFCA	March 2022	We request any relevant information regarding 'lessons learnt' from the original cable burials through chalk, including: How did the activity affect the water column and surrounding habitats and local species (particularly crabs and lobsters)? What was the zone of influence in terms of area and time? If there were negative	Effects from the cable installation works at both SOW and DOW have been investigated through post-construction monitoring campaigns (the most recent surveys being undertaken in 2020 at SOW (Fugro, 2020) and 2018 in the case of DOW (MMT, 2019)). As described in Section 5.3.1, post-construction

Consultee	Date	Comment Received	Project Response
		impacts to the surround species / habitats, is there anything that can be done to prevent repeating these impacts? In term of evidence supporting the reported successful burial of the original Dudgeon and Sheringham export cables (within the MCZ) –when were these export cables last inspected to support this understanding and when is the next inspection survey due? Is there a set timescale for repeat cable inspection monitoring or are there triggers such as severe weather events (or both)?	geophysical surveys at SOW showed that trenches remained on the sea bed after the completion of the works where chalk was encountered near the surface (not outcropping). However, video transect surveys undertaken in 2020 (Fugro, 2020) clearly demonstrated no difference in the epifaunal communities between these affected areas and adjacent areas of sea bed of similar sediment type, with the trenches not being particularly different in character to the natural variations in sea bed bathymetry found in this area. Persistent trenches were not observed in the case of DOW, which used a different installation technique. Regular geophysical surveys are undertaken at both SOW and DOW for asset integrity purposes (to ensure the cables remain buried) and, as such, would also be triggered by severe weather events. At SOW these have been every two years (most recently 2020 and 2022). At DOW these have been every four years with the most recent surveys undertaken in 2018 and 2022. The difference in frequency is in part due to the observed higher mobility of the sea bed at Sheringham Shoal, as well as differing requirements from the Offshore Transmission Owners for each OWF. Although these regular surveys are not required for marine licensing purposes (the applicable conditions have been discharged), the results are used to help inform the need and scope of any additional environmental monitoring that is undertaken.

Consultee	Date	Comment Received	Project Response
EIFCA	March 2022	What isn't clarified or quantity is the amount of chalk which will be permanently lost from the CSCB MCZ due to the cable burial process, we would defer to NE regarding how any permanent loss of chalk would impact the conservation objectives of the site.	The outcropping chalk feature in the nearshore will be avoided through the use of HDD – i.e. no loss. As described in Section 3.1, subcropping chalk may also be present. The gradually sloping bathymetry in this area suggests that the subcropping chalk surface is an eroded surface and is relatively flat and regular i.e. subcropping chalk is not akin to the rugose outcropping chalk feature in the nearshore for which the MCZ has been designated.
Relevant Representations [RR-063]			
Natural England	November 2022	"Standard Best Practice Mitigation: Adoption of the reburial hierarchy with external cable protection being last resort – all protects SEP and DEP Mitigation: Whilst reburial is mentioned in various documents the reburial hierarchy is not. An outline of the process for reburial should be included with the MCZ Cable Specification, Installation Plan and Monitoring Plan [APP- 291]."	Section 5.5.2 includes a protocol for export cable remedial reburial.
Natural England	November 2022	Natural England advises that prior to construction, sign off of this document should be required in consultation with the relevant SNCB	Condition 12(e) of Schedule 12 and 13 Draft DCO (Revision J) (document reference 3.1) secures provision for production of a CSCB MCZ Cable Specification and Installation Monitoring Plan in accordance with the Outline CSCB MCZ CSIMP (this

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			document) which is required to be approved by the MMO prior to commencement of the works.
Natural England	November 2022	Natural England advises that where there is shallow veneer this should be monitored and managed accordingly.	As described in the Offshore In-Principle Monitoring Plan (Revision C) [document reference 9.5], it is proposed that as the tasks outlined in Table 3 are progressed, the specific details and requirements for monitoring are discussed and agreed with Natural England and the MMO, once the detailed design, installation techniques and programme for SEP and DEP are confirmed. Consideration will be given to how monitoring within the MCZ can complement that undertaken for SOW and DOW rather than repeating what was undertaken for those projects. This approach would also apply to any related benthic ecology monitoring.
Natural England	November 2022	Natural England notes that the information included in Figure 2 and supporting text (1.3.1 para.12) doesn't reflect the more detailed information in 6.3.8.5 Figure 14 which we advise is amended given the purpose of this document.	The Applicant agrees and has updated Figure 2 to show the more detailed benthic characterisation based on project-specific data.

~~3~~4 Description of Proposed Cable Installation, Burial and Protection Works

~~3.1~~4.1 Realistic Worst-Case Scenario

~~19.~~20. **Table 2** summarises the worst-case scenario relating to the proposed cable installation, burial and protection works. A full description of the project design envelope and associated worst-case scenarios is provided in **Chapter 4 Project Description (Revision C)** [REP5-021] of the SEP and DEP ES (document reference 6.1.4) and **Section 5.6** of the **Stage 1 CSCB MCZ Assessment (Revision B)** (document reference 5.6).

~~20.~~21. Final details of the cable specification, cable protection and installation methods within the CSCB MCZ will be confirmed in the final CSCB MCZ CSIMP prior to the start of construction, once the detailed design details have been confirmed.

Table 2: Summary of the Realistic Worst-Case Scenario for Cable Installation, Burial and Protection Works

Impact	Parameter (quantities within MCZ and for SEP and DEP)
Construction	
Temporary physical disturbance	UXO clearance – informed by pre-construction surveys. Boulder clearance – 785m^2 (up to 20 boulders). Cable installation – 330,000m^2 (maximum potential disturbance width of 15m along 11km of export cable corridor within the MCZ). Vessel anchor placement during export cable installation – 1,320m^2 (up to 7 anchor lines along 11km route). HDD exit point works – 1,356m^2. **Total footprint of temporary disturbance in the MCZ from construction is therefore up to 0.333km^2.**
Operation	
Temporary physical disturbance	Cable repair, replacement and reburial – 360m2 per year (equating to 12,600m^2 over the 40 years operational lifetime)
Long term[2] habitat loss	HDD exit transition zone (2 cables) = 600m^2 External cable protection (2 cables) = 1,200m^2 Total footprint of long term habitat loss in the MCZ is therefore up to 1,800m^2 (0.0018km^2).
Decommissioning	
Temporary physical disturbance	Some or all of the offshore export cables may be removed. External cable protection including at the HDD exit transition zone will be removed.

[2] Due to the Applicant's commitment to remove external cable protection (including at the HDD exit) where necessary on decommissioning, habitat loss is assessed as long term (i.e. project lifetime) rather than permanent.

~~3.2~~4.2 Pre-construction Surveys

~~21.~~22. This section of the final CSIMP will provide details of the relevant pre-construction surveys that will be required to inform cable installation and cable protection in accordance with the **Offshore IPMP (Revision C)** (document reference 9.6). At this stage it is expected that for the CSCB MCZ this will include:

- Baseline geophysical survey (including Unexploded Ordnance (UXO) survey) of the export cable corridor; and
- Baseline benthic surveys including grab sampling and sea bed imagery within the export cable corridor.

~~22.~~23. In Q4 2021, the Applicant undertook a geotechnical survey (cone penetrometer testing and vibrocores), including within the export cable corridor as it passes through the MCZ. A survey of this type would usually be undertaken post-consent nearer to the point of construction but has been brought forward in this case in order to provide further information to inform the cable burial studies and the associated environmental considerations. Interpretation of the geotechnical survey results is ongoing. Details of the finalised export cable corridor and any necessary micro-siting within the CSCB MCZ will be provided in the final CSIMP, informed by the pre-construction surveys described above, including the 2021 geotechnical investigations. Information describing the potential for micro-siting of the export cables is provided in the **ICBS** (**Appendix 1**).

~~3.3~~4.3 Cable Burial Risk Assessment

~~23.~~24. For SEP and DEP the Applicant has also undertaken a Cable Burial Risk Assessment (CBRA) (PACE Geotechnics, 2020). As with the geotechnical survey described above, the CBRA would usually be undertaken following consent and prior to construction but has been brought forward in this case in order to provide information to inform the cable burial studies and the associated environmental considerations.

~~24.~~25. The **Export CBRA** is provided at **Appendix 2**. A summary of the key points from the CBRA as they relate to the CSIMP is as follows:

- The assessment considers sea bed geology and the external risks to the export cables including natural, anthropogenic and environmental events. It follows the guidance published by the Carbon Trust and takes into account various guidelines and standards including documents published by Carbon Trust and DNV-GL.
- The report finds that the external risks to the export cables are relatively low, with limited fishing activity and relatively light shipping traffic and no anchorages that might pose a hazard to cable integrity.

- Based on this assessment, a depth of lowering of 1.0m to Top of Product (TOP) is considered sufficient. If this is reduced to 0.6m in chalk, the external risk to the cables remains at a similar level owing to the greater strength of this soil type, which itself provides protection to the cables from external hazards. Therefore a target depth of lowering of 1.0m is proposed, with 0.6m or greater being acceptable in chalk.

~~25.~~26. The burial recommendations made by the **Export CBRA** (**Appendix 2**) have been considered in determining the requirement for external cable protection with respect to inadequately buried cables – see **Section 5.4.1** below for further details.

~~26.~~27. This section of the final CSIMP will be updated pre-construction in the event that there are any material changes to the CBRA at that time.

~~3.4~~4.4 Interim Cable Burial Study

~~27.~~28. An **Interim Cable Burial Study (ICBS)** (**Appendix 1**) as informed by the CBRA, BGS geological assessment and lessons learnt from the existing SOW and DOW, has been produced to identify the extent of the export cable within the MCZ that is likely to be able to be buried without the need for remedial external cable protection. This has been undertaken with consideration of the available geophysical, geotechnical and environmental information.

~~28.~~29. The ICBS also gives consideration to the suitability of different trenching tools. Both ploughs and mechanical trenchers are considered suitable. The preferred plough type is a Sea Stallion (a non-displacement plough), based on the aggressive share rake angle and its successful record on the nearby DOW export cables.

~~3.5~~4.5 Cable Installation Strategy

~~29.~~30. This section of the final CSCB MCZ CSIMP will detail the steps involved in the export cable installation process of relevance to the CSCB MCZ, once known, including:

- Cable corridor clearance (i.e. UXO, boulders and pre-lay grapnel run);
- Cable installation method statement; and
- Placement of external cable protection (where relevant).

~~30.~~31. The installation strategy will be informed by the review of burial tool capabilities included in the **Export CBRA** (**Appendix 2**), which will be updated as necessary pre-construction to identify any developments in the burial tool market. Details of any updates will be provided here, taking account of the latest site investigation data and any updates to the CBRA. The aim is to identify tools suitable for the specific burial requirements in the MCZ, and to define the key technical requirements (relating to tool design and burial capability) to be used for procurement of the export cable installation contract.

~~3.6~~4.6 Cable Protection Plan

~~31.~~32. There is the potential that the target burial depth will not be achieved along sections of the export cable corridor within the CSCB MCZ. Once the required information is available, this section of the final CSCB MCZ CSIMP will describe the following:

- Decision making process on burial and protection (this will detail, for example, how the post-burial surveys used to determine burial success will inform the need or otherwise for remedial burial works and/or external cable protection);
- Type of external cable protection to be used, including details of the alternative types considered;
- Locations where external cable protection may be needed;
- Installation method for the external cable protection to be used; and
- Consideration of risks to other sea users from the proposed works, e.g. snagging of fishing gear and vessel anchors.

~~4~~5 Mitigation

~~32.~~33. The Applicant is committed to mitigating potential effects on the CSCB MCZ and it will address this need through the adoption of the mitigation hierarchy i.e. avoid, minimise, mitigate and (where necessary) compensate. Two types of mitigation are used:

- Embedded mitigation, consisting of measures that are identified and adopted as part of the project design, which are included and assessed in the EIA; and
- Additional mitigation, consisting of measures that are identified during the EIA process to reduce or eliminate any predicted impacts, which are subsequently adopted by the Applicant as project commitments.

~~33.~~34. The agreed mitigation measures, which will be presented in the final CSCB MCZ CSIMP, will be refined and updated on the basis of the principles outlined in the sections below and the commitments summarised in **Table 4**. The final CSCB MCZ CSIMP will describe how the measures support the conclusion beyond reasonable scientific doubt that there is not a significant risk of hindering the achievement of the conservation objectives of the CSCB MCZ.

~~4.1~~5.1 Embedded Mitigation Measures

~~34.~~35. The following embedded mitigation measures have resulted in either the complete avoidance or minimisation of impacts from export cable installation in the MCZ.

~~4.1.1~~5.1.1 Minimisation of Length of Export Cable Corridor in the MCZ

~~35.~~36. The offshore cable corridor takes the shortest, most direct route possible from the SEP and DEP offshore sites to landfall, minimising the length of the export cable corridor in the MCZ. The route and landfall chosen have the additional advantage of being parallel to and nearby the existing DOW export cables. This increases confidence in the ability to successfully bury the SEP and DEP cables, since site surveys show that the soil characteristics are similar and the DOW export cables were installed without the need for external cable protection (refer to the **ICBS** (**Appendix 1**) for further details).

~~4.1.2~~5.1.2 Export Cable Corridor Width Through the MCZ

~~36.~~37. The offshore export cable corridor is up to approximately 2,500m wide but funnels out to up to approximately 3,200m on approach to the landfall and through the CSCB MCZ (**Figure 2**). However, the area within which the export cables will be installed is up to 1,000m wide, funnelling out to approximately 1,700m wide on approach to the landfall and through the CSCB MCZ. The greater width of offshore export cable corridor on approach to landfall is designed to provide greater flexibility in the detailed routeing/micro-siting of the export cable/s at the pre-construction stage. See **Section 5.2** for further details.

~~4.1.3~~5.1.3 Avoidance of Cable Crossings in the MCZ

~~37.~~38. The offshore cable corridor has been sited to completely avoid the need for any cable crossings (which necessitate the use of external cable protection) in the MCZ. This removes a source of potential long term or permanent habitat loss, which is one of the key impacts of concern in the MCZ.

~~4.1.4~~5.1.4 Avoidance of the Outcropping Chalk Feature in the Nearshore

39. HDD will be used to install the export cables at the landfall, with the HDD exit point located approximately 1,000m offshore in an area identified by the project characterisation surveys as sand (refer to the **Stage 1 CSCB MCZ Assessment** (document reference 5.6) for details). Therefore, there will be no direct impacts on the outcropping chalk feature in the nearshore.

5.1.5 HDD Exit Pit Location

~~38.~~40. As shown on **Figure 1** and **Figure 2**, the HDD exit pit will be located within the deep infilled channel cut through the chalk to 17m below the seabed, filled with Weybourne Channel deposits (also see **Appendix 6.3 Sedimentary Processes in the Cromer Shoal Chalk Beds MCZ** [APP-182] - visible on Figure 3.4), located across the export cable corridor from approximately 750m to 1.5km offshore. Given the depth of overlying sediment deposits there is no potential for exposure of chalk in this area (the depth of the excavation is only up to 1m) and impacts on sub-cropping chalk would be avoided.

~~4.2~~5.2 Mitigation through Micro-Siting

~~39.~~41. The Applicant is committed to micro-siting the export cables within the corridor where necessary in order to avoid areas that are considered to pose a challenge to successful burial and therefore being at a higher risk of requiring remedial works such as external cable protection. The pre-construction surveys identified in **Section 4.2**, including the results of the 2021 geotechnical investigations, will be used to inform final routing of the cables and any micro-siting requirements. This will help to increase the likelihood of successful cable burial and reduce the likelihood of external cable protection being required. As described above, the offshore export cable corridor is up to approximately 2,500m wide but funnels out to up to approximately 3,200m on approach to the landfall and through the CSCB MCZ to provide greater flexibility in the detailed routeing of the export cables at the pre-construction stage. Micro-siting opportunity is further enhanced by the inclusion of the offshore temporary works area by enabling, if required, installation of infrastructure up to the boundary of the permanent works area.

~~40.~~42. In order to support the DCO application and associated environmental assessments, the Applicant has investigated the feasibility of and the likelihood of successful micro-siting by using the geophysical data from the 2019 SEP and DEP characterisation surveys and further validated through reference to the as built data from the nearby DOW export cables. This exercise demonstrates that micro-siting can be used to optimise the route of the export cables to avoid those areas shown by the geophysical data to be more likely to be challenging for cable burial. Further details are provided in the **ICBS** (**Appendix 1**).

~~41.~~43. The final routing and any micro-siting requirements will be agreed with the MMO in consultation with Natural England prior to the start of construction.

~~4.3~~5.3 Cable Installation and Burial Mitigation

~~42.~~44. As discussed above, the commitments made by the Applicant significantly reduce potential impacts on the MCZ. Cables will be buried where the substrate allows burial to a target burial depth of 1.0m TOP, with 0.6m or greater being acceptable in chalk. Should this not be achieved, the necessary remedial action would be discussed with MMO and Natural England (see **Section 5.4**). Further reduced burial depths may be considered acceptable following completion of the pre-construction surveys and assessments, taking into account the overall risk assessment concluded in the CBRA. Cable burial depth requirements will be included in the cable burial contractor's contract. The possibility of accepting reduced burial depths will therefore reduce the likelihood of remedial works being required, including external cable protection.

~~43.~~45. The circumstances in which adequate cable burial would be deemed not possible and the approach if these circumstances are encountered will be agreed with the MMO in consultation with Natural England, prior to construction. The **ICBS** (**Appendix 1**) has been produced to consider the available geophysical, geotechnical and environmental information in order to identify the extent of export cable within the MCZ that is likely to be able to be buried without the need for external cable protection. This has identified that a target burial depth of 1.0m TOP is sufficient to obtain an acceptable level of protection along the export cable corridor and to achieve the required overall cable safety level. The actual required burial depth of the cables will vary along the route depending on the final selected cable corridor and soil conditions, which will be further assessed in the pre-construction phase.

~~44.~~46. A description of the cable installation process, including sea bed preparation and installation methods is provided in **Chapter 4 Project Description (Revision C)** [REP5-021] of the ES (document reference 6.1.4). The following will be undertaken in order to increase the chance of success of the installation and burial process:

1. Pre-construction surveys to confirm that the sea bed is clear of any obstructions prior to installation activities commencing;
2. UXO clearance informed by the results of pre-construction surveys. Micro-siting will be used to avoid UXO where possible;
3. Boulder clearance will be undertaken where it is considered necessary to optimise installation, for example to enable micro-siting of the cables to avoid areas where burial is expected to be more challenging. However, in line with Natural England advice, micro-siting will be undertaken preferentially over boulder clearance in order to avoid unnecessary sea bed disturbance;
4. A pre-lay grapnel run will be used to clear any obstacles such as discarded fishing gear or out of services cables from the cable corridor; and,
5. The most appropriate cable burial tool will be selected for the soil conditions – based on the available data and experience from the SOW and DOW export cable installation campaigns, this is expected to be a non-displacement plough.

~~45.~~47. Assessment of the SEP and DEP geophysical survey data has determined that sandwave levelling (pre-sweeping) is not required within the MCZ.

~~46.~~48. The final strategy and methodology will be informed by the pre-construction survey data and any further available evidence from other relevant projects and will be agreed with the MMO in consultation with Natural England.

~~47.~~49. The aim of the installation and burial strategy for the export cables in the MCZ is to bury the cables sufficiently to avoid or minimise the requirement for remedial works. This will be considered through the design and execution of the installation process, taking account of relevant knowledge regarding sea bed morphology and mobility.

~~48.~~50. **Table 3** outlines a scope of work that the Applicant will carry out in the development of the detailed plans for installation and burial of cables in the MCZ. This forms a comprehensive evidence base providing confidence that execution of the installation and burial strategy will meet the relevant burial requirements. In the case of SEP and DEP this uniquely benefits from the experience that the Applicant has in undertaking the SOW and DOW export cable installation campaigns, providing direct evidence that lessons learnt have been accounted for and that, in the case of DOW, similar design approaches, installation methods and tools have been used to achieve successful outcomes. Details of these lessons learnt are provided in **Section 5.3.1**.

Table 3: Proposed Scope of Work to Support Development of Detailed Plans for Cable Installation to Maximise the Chance of Burial Success for SEP and DEP

Task	Details
Lessons learnt from the SOW export cable installation	Identify key areas of success and under-performance, primary causes of any under-performance. Recommendations to maximise chance of success for SEP and DEP. See **Section 5.3.1** below.
Lessons learnt from the DOW export cable installation	
Learning from other projects	As above.
Pre-construction survey campaign	Detailed geophysical and geotechnical surveys to: Establish sub-sea bed (0-2m) soil conditions; Identify sea bed anomalies, debris, magnetic targets (UXO), fishing gear, out of service cables etc.; and Confirm sea bed mobility. Geotechnical survey brought forward to 2021 to inform consents process.
Export CBRA (**Appendix 2**)	Defining burial depths – update as required pre-construction to take account of latest information.
Cable Burial Study (CBS)	Likelihood of burial success based on geophysical, geotechnical and environmental information. Suitability of trenching tools. Informed by ICBS.
Burial tool capability study	Assess burial tools used on SOW and DOW and their performance and limitations. Included in CBRA and summarised in the ICBS and updated where necessary pre-construction to take account of latest tools available on the market.
Development of flowchart to map out the decision-making process for any unexpected events e.g. bad weather	To assist in dealing with unexpected events without compromising the success of the cable burial process.
Establish metocean design basis along the export cable corridor	To feed into the decision making process for unexpected events and the detailed design plan.
Prepare for potential cable repair	Contingency plan in the event of cable fault or damage during installation to minimise any further sea bed disturbance.
Contractor selection	Select experienced contractor with well proven vessel and burial tools.
Make use of Fisheries Liaison Officer (FLO) onboard cable installation vessel/s	To reduce the risk of fishing activities affecting the performance of the cable installation and burial works.

~~4.3.1~~5.3.1 Lessons Learnt from Previous Equinor Installation Campaigns

~~49.~~51. The following sections set out the key lessons learnt from the SOW and DOW export cable installation campaigns. These have been used to inform the scope of work set out in **Table 3**.

~~4.3.1.1~~5.3.1.1 SOW

~~50.~~52. Two SOW export cables were installed by single cable laying operation with post-lay burial. Cable routing was based on interpretations from geophysical and geotechnical surveys carried out at the time. Dealing with potential UXO required extensive UXO investigations and removal in order to find an acceptable cable corridor. The selected method for post lay burial was jetting. Burial difficulties were encountered across several locations through what is now designated as the CSCB MCZ. The selection of the burial tool by the contractor was undertaken late in the period prior to construction, with the consequence that well qualified field proven equipment was not able to be selected. This led to much trial and error when adjusting the tool swards during burial operations. The result was the need to undertake several remedial jetting passes at multiple locations in order to try and achieve the required burial depth. This process resulted in the formation of persistent trenches at some locations where the sea bed has been slow to recover its natural morphology in the post-installation period. Following the remedial passes of the jetting tool, the degree of cable protection (through burial) was accepted without the need for external cable protection. To date, no cable repair or remedial reburial works have been undertaken since the wind farm has been in operation.

~~4.3.1.2~~5.3.1.2 DOW

~~51.~~53. Installation of the two DOW export cables was performed by simultaneous laying and burial (SLB) with the non-displacement plough ‘Sea Stallion’, pulled by the cable vessel ‘Stemat Spirit’. The shallow draft vessel was of benefit with the initiation process at the shore end, which involved floating the cables before pulling them through the HDD ducts.

~~52.~~54. The two cables were installed by separate campaigns due to vessel loading capacity, taking account of the cable length to the wind farm of 40km. Each cable was laid in its total length, although one cable had to be cut for later repair due to uncertain cable integrity having been exposed to severe weather conditions. SLB operations are much slower than single cable laying onto the sea bed for post lay burial operations. As a result, the SLB operation is of a longer duration than a reliable weather forecast is available, hence a detailed flowchart has to be prepared to map out the decision-making process for any unexpected events.

~~53.~~55. However, other than the weather related incident, laying and burial operations were performed in line with expectations and burial depth met the target burial depth for the majority of the cable length (93% of the cable length had burial depth >1.0 m). At one location 3 to 4km from shore, subcropping chalk was encountered at about 0.3m below sea bed, resulting in a reduced burial depth in this area of 0.3m. This was accepted due to the burial depth being in solid ground conditions, which from a cable burial risk assessment perspective offers greater protection from damage from anchoring and fishing activity. No remedial cable protection (either through burial or with external protection) was performed. Post-construction surveys (e.g. MMT, 2019) do not show any exposed export cables, nor visibility of the trenched route on the sea bed. To date, no cable repair or remedial reburial works have been undertaken since the wind farm has been in operation.

~~4.4~~5.4 Cable Protection Mitigation

~~54.~~56. The Applicant is committed to minimising external cable protection in the CSCB MCZ and has sought to refine the quantities required through the measures outlined in the sections above. As such, external cable protection will only be used where deemed to be essential, in the instance that adequate burial is not possible for any section of the route through the MCZ.

~~55.~~57. Details of the types and maximum quantities of external cable protection are provided in **Chapter 4 Project Description (Revision C)** [REP5-021] of the ES (document reference 6.1.4). This includes the commitment to not using loose rock type systems in the MCZ.

~~56.~~58. The final details will be determined based on the results of the activities described in **Table 3** above. Prior to installation the need, type, sources, quantity, distribution and installation method will be agreed with the MMO in consultation with Natural England.

~~4.4.1~~5.4.1 Potential Unburied Cables due to Ground Conditions

~~57.~~59. External cable protection will only be considered if the planned cable protection methodology through burial fails to achieve an acceptable depth. As described above, despite a target burial depth of 1.0m (TOP), a reduced burial depth may still be accepted via the export cable installation contract. The CBRA will be updated where necessary prior to construction when all survey data have been interpreted. As a result, the length of external cable protection required for potential unburied cables is up to 100m per cable in the MCZ (6m wide with a total footprint of 1,200m^2).

~~58.~~60. Further details are provided in the **ICBS** (**Appendix 1**).

~~4.4.2~~5.4.2 HDD Exit Transition Zone

~~59.~~61. Where burial is not possible and the offshore export cables exit onto the sea bed from the HDD at the landfall, 100m of external cable protection may be placed in the transition zone along each of the cables, from the HDD duct sections on the sea bed to the start position for cable burial (3m wide with a total footprint of 600m^2). Rock bags are considered to be suitable for this purpose and, as explained above, loose rock will not be used in this location as it is within the MCZ.

~~4.4.3~~5.4.3 Export Cable Crossings

~~60.~~62. Not applicable – as described in **Section 5.1.3**, the need for any export cable crossings in the MCZ has been avoided through the site selection process. The existing DOW export cables will be crossed close to the proposed SEP array, outside of the MCZ.

~~4.4.4~~5.4.4 Total Quantity of External Cable Protection in the MCZ

~~61.~~63. The total quantity of external cable protection in the MCZ along the export cable corridor (including at the HDD exit) will not exceed 1,800m^2, based on the parameters described above.

~~4.4.5~~5.4.5 Decommissioning of External Export Cable Protection

~~62.~~64. Following a review of the supply chain, the Applicant has made a further commitment to decommission external export cable protection in the MCZ (see **Table 1**) at the end of the project life. Further detail on the methods for and feasibility of decommissioning is provided in **Appendix 3 Decommissioning Feasibility Study**. This includes consideration of the type of materials that will not degrade over the lifetime of the Projects, as well as the use of materials that are least harmful to the marine environment. This commitment ensures that there will be no permanent habitat loss as a result of external cable protection within the MCZ, further contributing to the ability to conclude beyond reasonable scientific doubt that there is not a significant risk of hindering the achievement of the conservation objectives of the CSCB MCZ.

~~4.5~~5.5 Operation and Maintenance Mitigation

~~63.~~65. During the lifetime of the Projects, periodic inspections will be undertaken of the burial status of the export cables. Where necessary, repairs and remedial reburial will be undertaken. This is summarised below, with full details presented in **Chapter 4 Project Description (Revision C)** [REP5-021] of the ES (document reference 6.1.4) and the **Outline Offshore Operations and Maintenance Plan (OOMP) (Revision C)** [REP3-058] (document reference 9.11).

~~4.5.1~~5.5.1 Export Cable Repairs

~~64.~~66. Based on current knowledge and technology, the estimated rate of cable failure for SEP and DEP is approximately one failure for every 1,000km of cable per year. On this basis, the assessment considers up to one export cable repair every 10 years in the MCZ.

~~65.~~67. Prior to construction, a protocol for undertaking repairs would be agreed with the MMO in consultation with Natural England through the final OOMP, which would be in accordance with the **Outline OOMP (Revision C)** [REP3-058] (document reference 9.11). Upon identifying a requirement to undertake a repair in the MCZ, the repair would be instigated in accordance with agreed OOMP protocol and the MMO and Natural England would be notified. The protocol for any subsequent repairs would then be reviewed (if necessary) and further agreed with the MMO and Natural England.

~~4.5.2~~5.5.2 Export Cable Remedial Reburial

~~66.~~68. In the event that cables become exposed due to the natural movement of the sea bed over the lifetime of the Projects, it may be necessary to undertake remedial reburial work to ensure that the cables are adequately protected and without the need to resort to the use of external cable protection measures such as rock placement. The need for reburial work will be informed by an ongoing programme of geophysical surveys (detailed in the **Offshore IPMP** (document reference 9.5) – see **Section 6** below) as well as the CBRA.

~~67.~~69. The estimated export cable reburial requirement at 10-year intervals is up to 0.1km per cable within the MCZ.

~~68.~~70. As with repairs, a protocol for undertaking reburial would be agreed with the MMO in consultation with Natural England, prior to construction. Upon identifying a requirement to undertake reburial in the MCZ, the MMO and Natural England would be notified. The protocol for any subsequent reburial would then be discussed and agreed with the MMO and Natural England.

~~69.~~71. In order to limit the amount of external cable protection located within the MCZ as far as possible, the Applicant has made the commitment to attempt to rebury any cables which do become exposed within the MCZ during operation prior to the installation of any external cable protection (**Chapter 4 Project Description (Revision C)** [REP5-021]).

~~4.5.3~~5.5.3 Operation and Maintenance Phase Export External Cable Protection

~~70.~~72. In the event that external cable protection is required during the O&M phase in areas not already subject to external cable protection (or in any area following a period of five years from the completion of construction), this would be the subject of a further marine licence application i.e. it is not included in the SEP and DEP DCO application or the scope of this outline or the final CSCB MCZ CSIMP.

~~4.6~~5.6 Summary of Mitigation Commitments in the CSCB MCZ

~~71.~~73. **Table 4** provides a summary of export cable mitigation commitments in the MCZ.

Table 4: Summary of Export Cable Mitigation Commitments in the MCZ

Pre-consent mitigation commitments	Current status	Final mitigation solution following completion of detailed design	Agreed with MMO in consultation with Natural England
Minimisation of length of export cable corridor in the MCZ	Embedded in the design through the selection of the shortest route with landfall at Weybourne	N/A	Yes
Export cable corridor width through the MCZ	Embedded in the design, widening from 500m to 1,000m through the MCZ and widening again at the approach to landfall	N/A	Yes
Avoidance of cable crossings in the MCZ	Embedded in the design – no crossings	N/A	Yes
Avoidance of the outcropping chalk feature in the nearshore	Embedded in the design through to the commitment to HDD at the landfall to an exit point approximately 1,000m offshore	N/A	Yes
Micro-siting	To be confirmed based on the pre-construction survey data and detailed design and agreed with the MMO in consultation with Natural England	To be confirmed	To be confirmed
CBRA and potential for reduced (<1.0 m) burial depth	Provided at **Appendix 2 Export CBRA**	To be updated pre-construction	To be confirmed
Pre-construction geophysical survey	Methodology to be agreed with MMO in consultation with Natural England	To be confirmed	To be confirmed
Pre-construction geotechnical survey – brought forward to help inform consenting process	Confirmed	Confirmed	To be confirmed
Boulder clearance and pre-lay grapnel run	Requirements to be confirmed based on the pre-construction survey data and detailed design and agreed with the MMO in consultation with Natural England	To be confirmed	To be confirmed
Cable burial tool selection (burial tool capability study) and contractor selection	Available as part of the **Export CBRA** (**Appendix 2**) and to be updated as necessary pre-construction	To be updated pre-construction	To be confirmed
Cable installation method to be agreed	To be confirmed based on the pre-construction survey data and detailed design and agreed with the MMO in consultation with Natural England	To be confirmed	To be confirmed

Pre-consent mitigation commitments	Current status	Final mitigation solution following completion of detailed design	Agreed with MMO in consultation with Natural England
Commitment to attempting remedial reburial techniques before external cable protection as a last resort	Use of external cable protection to be agreed with the MMO in consultation with Natural England	To be confirmed	To be confirmed
External cable protection requirement for unburied cables minimised to 100m per cable, evidenced by ICBS	Final requirement to be confirmed based on the pre-construction survey data and detailed design and agreed with the MMO in consultation with Natural England	To be confirmed	To be confirmed
Commitment to not using loose rock type systems in the MCZ	Details to be confirmed through detailed design process pre-construction and agreed with the MMO in consultation with Natural England	To be confirmed	To be confirmed
Commitment to decommission external export cable protection in the MCZ at the end of the project life, supported by decommissioning feasibility study	Further detail on the methods for and feasibility of decommissioning is provided in **Appendix 3 Decommissioning Feasibility Study**. Decommissioning requirements subject to agreement at the time.	To be confirmed	To be confirmed
Use of rock bag materials that are least harmful to the marine environment	Details to be confirmed through detailed design process pre-construction and agreed with the MMO in consultation with Natural England	To be confirmed	To be confirmed
Cable reburial – if cable becomes exposed at any point during operation, reburial will be attempted before any external cable protection is considered.	If external cable protection is required this would only be installed following the attainment of a separate marine license. As part of this licence the additional external cable protection would be subject to agreement with the MMO in consultation with Natural England.	To be confirmed	To be confirmed

~~5~~6 Proposed Monitoring

~~72.~~74. The **Offshore IPMP (Revision C)** (document reference 9.5) details the SEP and DEP monitoring commitments made by the Applicant. The monitoring requirements relating to the export cable corridor where it passes through the MCZ include:

- Geophysical survey including side scan sonar and multibeam bathymetry; and
- Benthic surveys including grab sampling and sea bed imagery.

~~73.~~75. Following the completion of similar monitoring programmes on SOW and DOW, as well as several other existing North Sea OWFs it is suggested that monitoring requirements should only be required to target any major evidence gaps and significant impacts.

~~74.~~76. The final details of the monitoring, including timeframes, will be agreed with the MMO in consultation with Natural England prior to construction.

~~6~~7 Summary

~~75.~~77. The environmental assessment of the cable installation process, particularly where the works are to be undertaken within a designated site, is confounded by the need to undertake assessments at the point of consent, often prior to the delivery of detailed engineering studies and pre-construction surveys. This gives rise to the need for clarity on how and when such detailed information will become available and will be used, as well as how the works will be controlled by the DCO.

~~76.~~78. As such, this Outline CSCB MCZ CSIMP demonstrates how the proposed export cable installation, burial and protection works in the CSCB MCZ will be controlled by the DCO, enabling greater confidence in the assumptions underpinning the assessments. It allows for the refinement of the proposals and mitigation measures based on the detailed information available pre-construction, as well as the latest guidance, advice and evidence at the time that the works are undertaken.

~~77.~~79. In the case of SEP and DEP, the Applicant has the benefit of previous export cable installation campaigns in the same area, from SOW and DOW. This experience has been used to help inform the proposals for SEP and DEP, together with a CBRA and geotechnical survey, both of which have been brought forward in the development programme to provide information to inform the consent related assessments.

~~78.~~80. Further to this, a range of embedded and additional mitigation measures have been identified to avoid, minimise and mitigate potential effects on the CSCB MCZ. As a result, the Applicant has identified, as confirmed in the **ICBS** (**Appendix 1**), that the export cables can be buried, by a similar ploughing method as used at DOW, to obtain an acceptable level of protection and to achieve the required overall cable safety level, therefore minimising the requirement for external cable protection for unburied cables to 100m per cable within the MCZ.

~~79.~~81. This Outline CSCB MCZ CSIMP will be updated prior to the start of construction to take account of the detailed route engineering studies and the preferred cable burial tool, and will confirm and/or action the mitigation commitments as described in this document. The final CSCB MCZ CSIMP will be submitted for approval by the MMO in accordance with the relevant transmission asset DML conditions.

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