Miljøministeriet
Kystdirektoratet

Ansøgning om tilladelse til anlæg på søterritoriet

Dette ansøgningsskema benyttes ved ansøgning om tilladelser til etablering, renovering og udvidelse af anlæg på søterritoriet.

Husk at læse vejledningen på side 6, før skemaet udfyldes.
Eventuelle spørgsmål til ansøgningsskema og vejledning rettes til Kystdirektoratet på tlf. 99 63 63 63 eller via e-mail kdi@kyst.dk.

Bemærk: En ansøgning kan først behandles, når alle nødvendige oplysninger foreligger.

Til Kystdirektoratets notater:

Dato for modtagelse:		*Journal nr.:*	
Projekttype:		*Sagsbehandler:*	

A. Oplysninger om ejere af den eller de matrikler, hvor anlægget opføres

Navn
Arelion DENMARK A/S

Adresse
Arelion Denmark A/S *Industrivej 15* *6830 Nørre Nebel* *Denmark*

Lokalt stednavn	Postnr.	By
	6830	*Nørre Nebel*

Telefon nr.	Mobil nr.	E-mail
+45 28 27 97 68		preben.hauge@arelion.com

B. Evt. repræsentant (entreprenør, rådgiver eller lignende)

Navn
Environmental Resources Management Ltd. (ERM)

Adresse
2nd Floor Exchequer Court 33 St Mary Axe London United Kingdom EC3A 8AA

Lokalt stednavn	Postnr.	By
	EC3A 8AA	London

Telefon nr.	Mobil nr.	E-mail
+44 20 3206 5200		erm.aurora.uk@erm.com

C. Offentliggørelse af oplysninger

Ansøger giver ved underskrift tilladelse til, at ansøgningsmaterialet må offentliggøres på Kystdirektoratets hjemmeside www.kyst.dk. I henhold til persondataloven vil personfølsomme oplysninger, eller andre oplysninger friholdt for aktindsigt, uanset denne accept ikke blive offentliggjort.

Dato	Underskrift
09/01/2026	Johan Ottosson (Jan 9, 2026 13:57:48 GMT+1)

D. Anlæggets placering

Adresse

Aurora is a planned subsea fibre optic telecommunication cable (hereafter referred to as the Aurora Project, or the subsea cable) linking the United States (US) and Denmark, with a total estimated length of 7,269 km. The subsea cable will be installed in the Danish Exclusive Economic Zone (EEZ) and Territorial Seas (TS). There will be one landing in Blaabjerg, Denmark. At the landing site the subsea cable will cross the beach and be connected to a Beach Manhole (BMH). Please see description and maps under point E below.

Postnr.

Location Description	Latitude	Longitude
Enter Danish EEZ	056° 39.4882' N	005° 14.8003' E

By	Kommune
The landing site will be at a recreational green undeveloped area on a land strip forming a barrier between the North Sea and Ringkøbing Fjord.	Ringkøbing Skjern Municipality

Enter Danish TS	056° 06.2293' N	007° 44.6706' E		
Existing HDD duct exit point (seaward)	055° 55.5962' N	008° 08.2037' E		
Existing HDD duct entry point (landward)	055° 55.3710' N	008° 09.0800' E		
Existing BMH	055° 55.3720' N	008° 09.1080' E		

Matrikel nr. og ejerlavsbetegnelse

Ejerlav: Nr. Nebel By, Nr. Nebel
Matrikelnr.: 0043l
BFE nr.: 8328064
Kommunekode: 0573
BBR nr.: 099273

E. Beskrivelse af anlægget i sin helhed

Kan evt. uddybes i bilag

Bemærk: Nødvendige bilag skal også vedlægges, se rubrik I

Note: A full Environmental Impact Assessment (EIA) Screening Report for the subsea cable installation activities from the Danish TS, up to the BMH is attached as Appendix A to the application. Further details on the Project Description can be found in Section 3 of the report.

Project Proponent / Applicant
The project proponent and application for the Denmark segment of the subsea cable will be Arelion.

Contact information:
Preben Hauge
Industrivej 15, 6830 Nørre Nebel, Denmark
preben.hauge@arelion.com
+45 28 27 97 68
Alcatel Submarine Networks (ASN) has been awarded the contract to design, build and install the subsea cable. Environmental Resources Management Limited (ERM) have been contracted by ASN to obtain the necessary permits for installation of the subsea cable within Danish waters and for the planned subsea cable landing point at Blaabjerg in Denmark.

Enquiries and contact related to the permitting should be through the consultants:

ERM
Clare Robertson
2nd Floor Exchequer Court, 33 St Mary Axe, London, United Kingdom EC3A 8AA
erm.aurora.uk@erm.com
+44 20 3206 5200

Project Description
Note: A full project description is provided in Section 3 of Appendix A: EIA Screening Report, Denmark

The Aurora Project
The subsea cable type to be used is an OALC4 cable, which is a resilient subsea cable type designed specifically for repeatered systems. A 'repeatered system' is a subsea cable typically longer than 350-400 km. To prevent the optical signal deteriorating from the point of origin to the destination, the signal is boosted approximately every 75 km using a repeater. The subsea cable itself will have a maximum diameter of 37.5 mm.

The subsea cable is insulated with high-density polyethylene; the insulation also provides abrasion resistance. In shallow water (normally <1,000 m water depth), the fibre unit and insulation sheath are protected by galvanised steel wires and layers of black polypropylene yarn for additional protection against external threats (known as armouring). The entirety of the subsea cable within Danish waters will be fitted with armoured protection.

Reason for Installation of the Aurora Project
The Aurora Project will connect between the landing in Blaabjerg, Denmark and Manasquan, New Jersey in the United States (US). The subsea cable will support the needs of the web-scale providers that underpin today's international cloud industry. The route will enable connectivity for global carriers, cloud-based networks, data centres, information technology (IT) companies and the global media. There is increasing demand for high-capacity connectivity linking to Northern Europe, and the Aurora Project will facilitate this in combination with existing fibre optic routes. The subsea cable will deliver a reliable and resilient connection to support the rise of the European digital economy. It will therefore benefit the socio-economic conditions within Denmark.

The Subsea Cable Route
The subsea cable route has been designed by route engineers at ASN to be the optimum route for the subsea cable, taking into consideration technical, environmental and stakeholder constraints. The subsea cable route has been

engineered to avoid potential hazards, reduce impact to seabed users such as disruption to marine resources and operations, and secure long-term protection of the subsea cable.

The subsea cable route and Project design have been developed and refined through two (2) main stages:

- A Cable Route Study – detailed review of all factors affecting the routing of the subsea cable, including physical, environmental, socio-economic, and regulatory aspects; and
- A Cable Route Survey – surveys of the inshore and deep-water sections of the route.

The whole offshore subsea cable route is presented in Figure 1 below, with a detailed image of the landing in Blaabjerg, Denmark presented in Figure 2 below. There will be approximately 180 km of the subsea cable running through the Danish EEZ, entering from the north-west; and approximately 33 km of the subsea cable running through Danish TS. The subsea cable route will also traverse through both United Kingdom (UK) and Norwegian waters.

The proposed landing site at Blaabjerg, Denmark is a recreational green undeveloped area on a land strip forming a barrier between the North Sea and Ringkøbing Fjord. The land strip is a large expanse of heather and heathland surrounded by dunes. Significantly, the Aurora Project will maximise use of existing infrastructure from a previous (decommissioned) subsea cable landing in order to minimise onshore installation activity and potential for environmental and socio-economic impacts. This includes re-use of the Horizontal Directional Drilling (HDD) duct and BMH at Blaabjerg. The existing HDD exit point (seaward) is around 150 m from the shore, while the HDD entry point (landward) is approximately 29 m from the existing BMH. This will allow the subsea cable to be installed at the landing site at Blaabjerg while minimising the Aurora Project installation activities within proximity of the Natura 2000 sites and / or environmentally sensitive areas. A solitary beach house is around 30 m north of the landfall area and the area may be used for horseback riding as there is a horse-riding centre around 300 m east of the landfall site.

The landing site is close to, but is not shown to overlap with, the Natura 2000 site no. DK00CY163 (Habitats Directive Site - Ringkøbing Fjord og Nymindestrømmen also called SAC62), DK00CX043 (Bird Directive Site - Ringkøbing Fjord). The area is designated to protect different dune types and beach meadow among other habitats and has been considered in the EIA Screening Report.

The proposed BMH location may be in proximity of several protected habitat types: beach meadow, decalcified fixed dunes with *Empetrum nigrum*, fixed coastal dunes with herbaceous vegetation ("grey dunes")', and grassland.

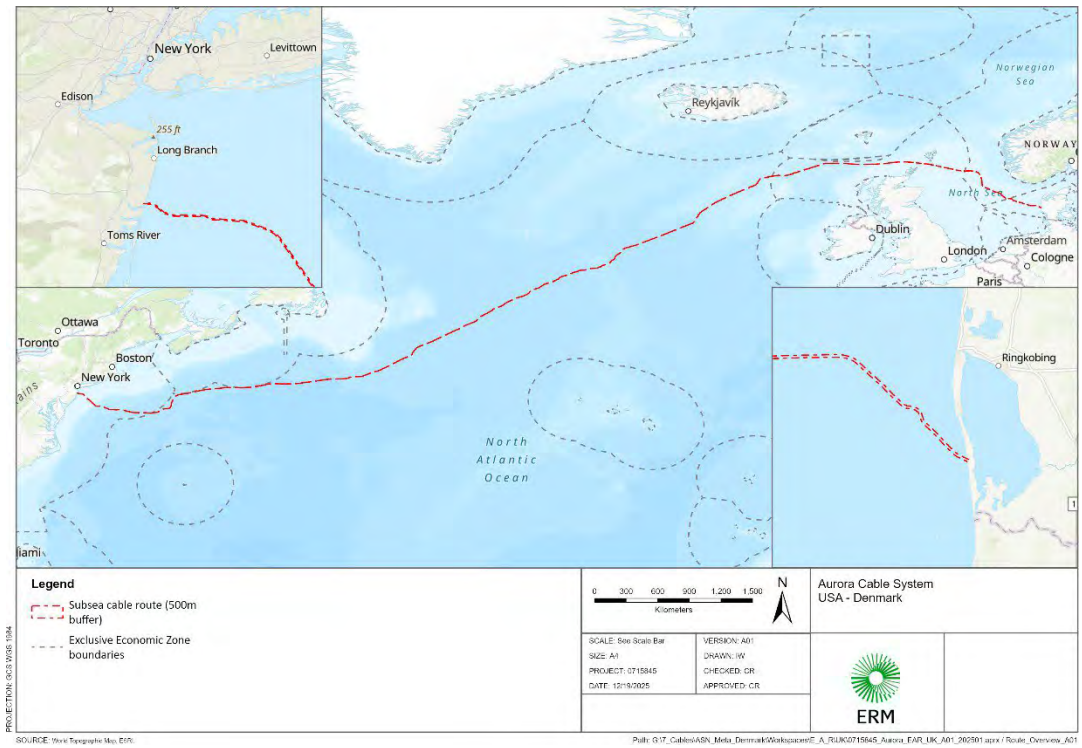


Figure 1 Overview of Aurora Project from US to Denmark

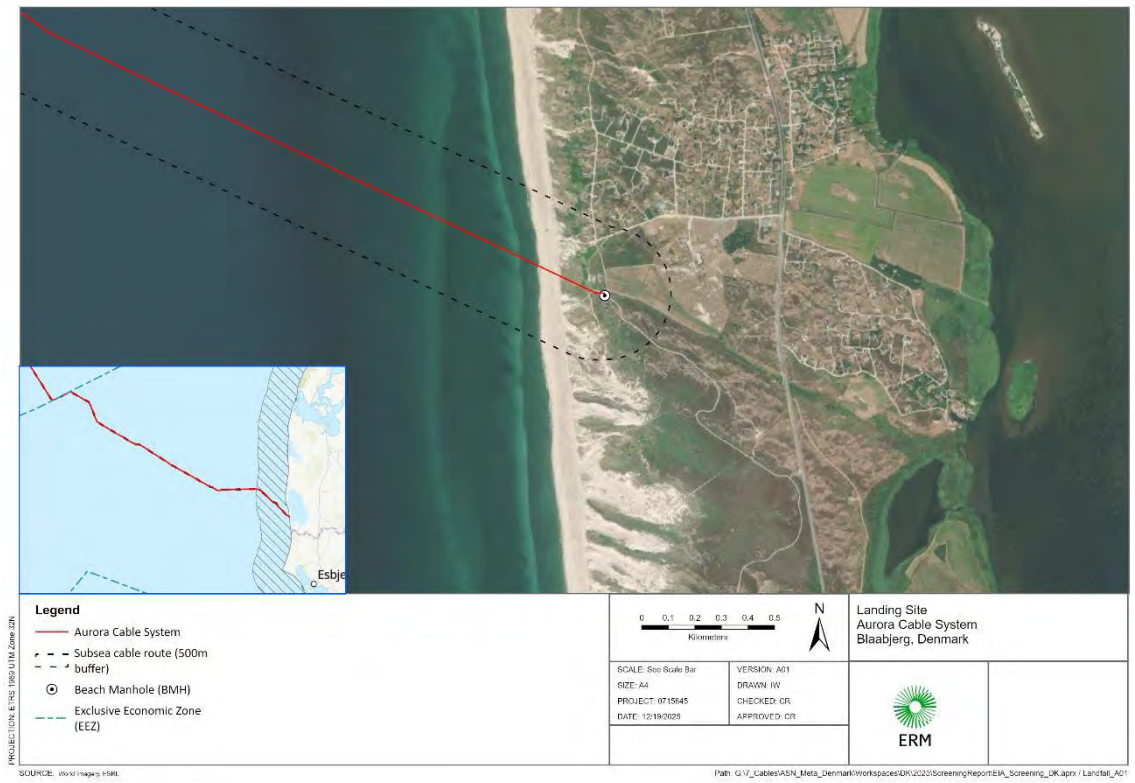


Figure 2 Blaabjerg Landing Site: Subsea Cable, Denmark

Asset Crossings

There will be one (1) crossing in Danish waters (in the EEZ) for the Aurora Project (shown in Figure 3 below). To support crossing agreements with existing infrastructure asset owners, the Aurora Project is proposing rock placement for protection of the existing asset in Danish waters. Rock placement protection will be utilised at one (1) pipeline crossing in the Danish EEZ, where this is required by the asset owner. The co-ordinates of the pipeline crossing and proposed rock placement are in Table 1 below. Rock placement is required at this crossing both pre- and post-installation of the subsea cable over the pipeline.

System Name	Latitude			Longitude			Water Depth (m)	Timing for Rock Placement
Europipe II	056°	22.9583'	N	006°	17.2681'	E	41	Pre-installation and post-installation

Table 1 Location of pipeline crossing and rock placement in the Danish EEZ

The location of the pipeline crossing and rock placement in the Danish EEZ is shown in Figure 3 below.

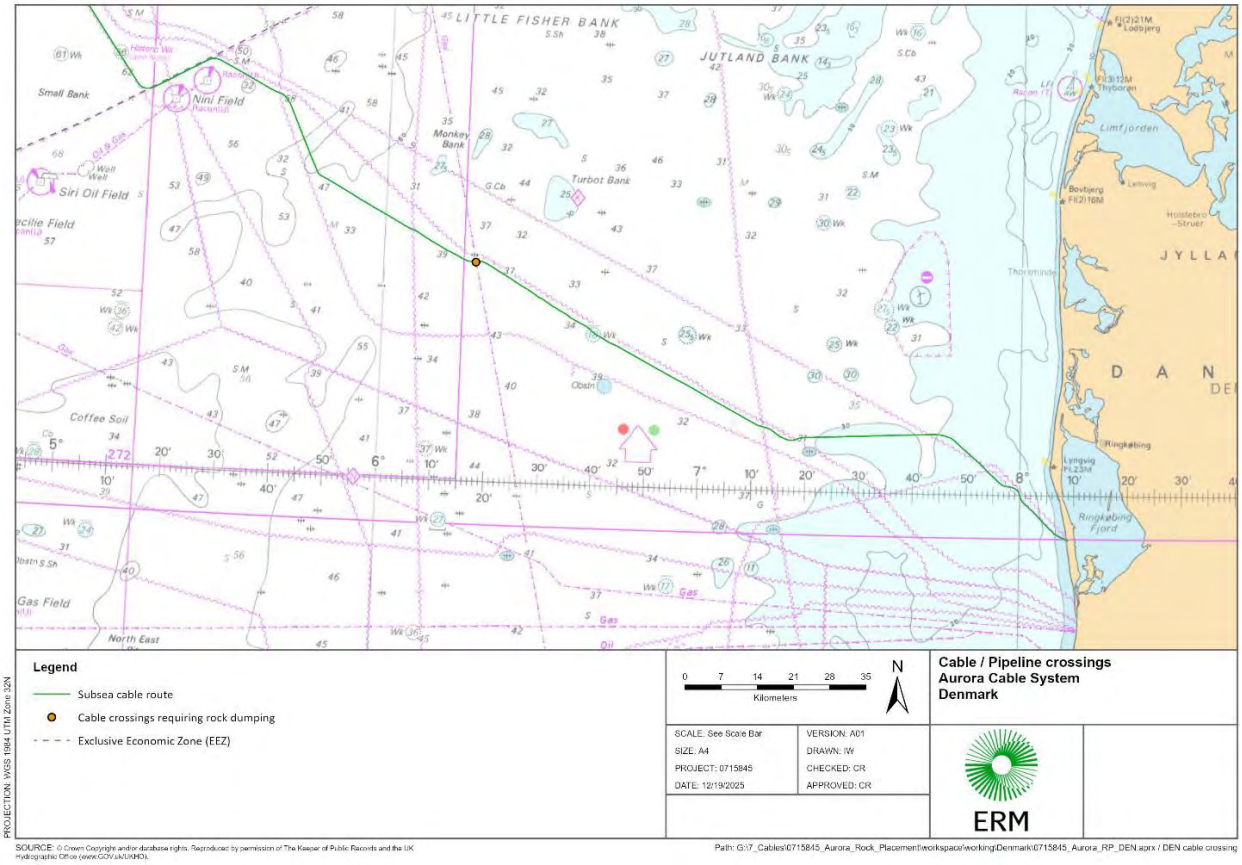


Figure 3 Location of pipeline crossing in Danish EEZ

Freshly crushed Norwegian granite will be utilised for the rock placement activities to minimise contamination risks for environmentally sensitive areas of the seabed. For pre-installation rock placement, it is expected that 1"-5" or 1"-3" rock mix will be used. Rock material produced for offshore installation generally follows the EN-13383-1 'Armourstone – Part1: Specification' regarding material quality requirements. This standard specifies that the material "*shall not contain any foreign matter in a quantity that will cause damage to the structure or the environment in which it is used*". The proposed rock type is 1-5" size filter rock layer, used in areas where 100-year storm conditions would be applied to wave break forces.

The subsea cable will be protected by a recognised high-density synthetic material approximately 25 mm thick, to provide further separation at the crossing location between the Aurora Project and top of the pipeline. This additional separation will prevent direct metallic contact between the subsea cable armour and steel pipeline.

The proposed parameters of the rock placement activities for the Aurora Project are shown below in Table 2 below, as well as the area footprint and quantities. Figure 4 and 5 provide an indicative cross-section profile and plan view of the pre-installation and post-installation rock placement activities on a flat seabed.

Parameter	Units	Value
Rock Placements and Protection		
Number of Pre-Installation Rock Placement	No.	1
Number of Post-Installation Rock Placement	No.	1

Bottom Rock Berm Profile at Pre-Installation Rock Placement*	m	Length: 28.8 to 30 Height: 0.6 to 2 Width: 4.8 to 12
Top Rock Berm Profile at Post-Installation Rock Placement*	m	Length: 44 to 50 Height: 0.8 to 1 Width: 4.8 to 6
Height*	m	Pre-installation: 0.6 to 2 Post-installation: 0.8 to 1 **Total 1.4 to 3**
Slope	-	1:3
Type of Deposit Material	-	Norwegian granite
Size of Deposit Material	mm	Pre-installation: 25 to 125 Post-installation: 45 to 180
Volume of Rock (total)*	m^3	Pre-installation: 82.94 to 720 Post-installation: 168.96 to 300
Length of Separation Product	m	100
Seabed		
Number of Vessels	No.	1
Affected Seabed Footprint Area (total)*	m^2	Pre-installation: 138.24 to 360 Post-installation: 211.2 to 300
Timings and Duration		
Proposed Pre-Installation Rock Placement Start Date	-	Q1 2027
Proposed Post-Installation Rock Placement Start Date	-	Q4 2027
Pre-Installation Rock Placement Duration	Days	1
Post-Installation Rock Placement Duration	Days	1

Notes:

** The dimensions of the top and bottom rock berm profiles have not been finalised and are subject to the crossing agreement which were under negotiation with the pipeline owner at the time of writing this document. Post-installation rock berm profile dimensions will be determined following post lay inspection and burials (PLIBs) that are performed after the subsea cable is installed.*

Table 2 Components for rock placement activities in Danish waters

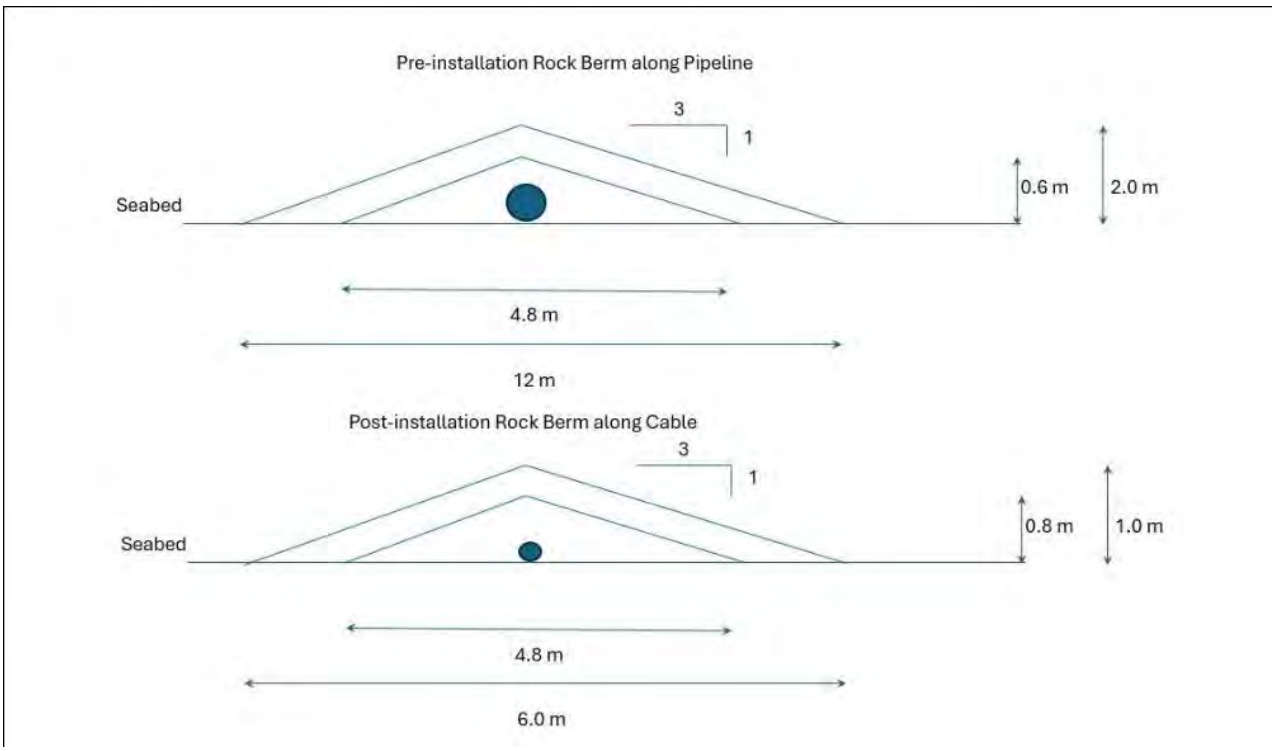


Figure 4 Cross-section profile of pre-installation and post-installation rock berms

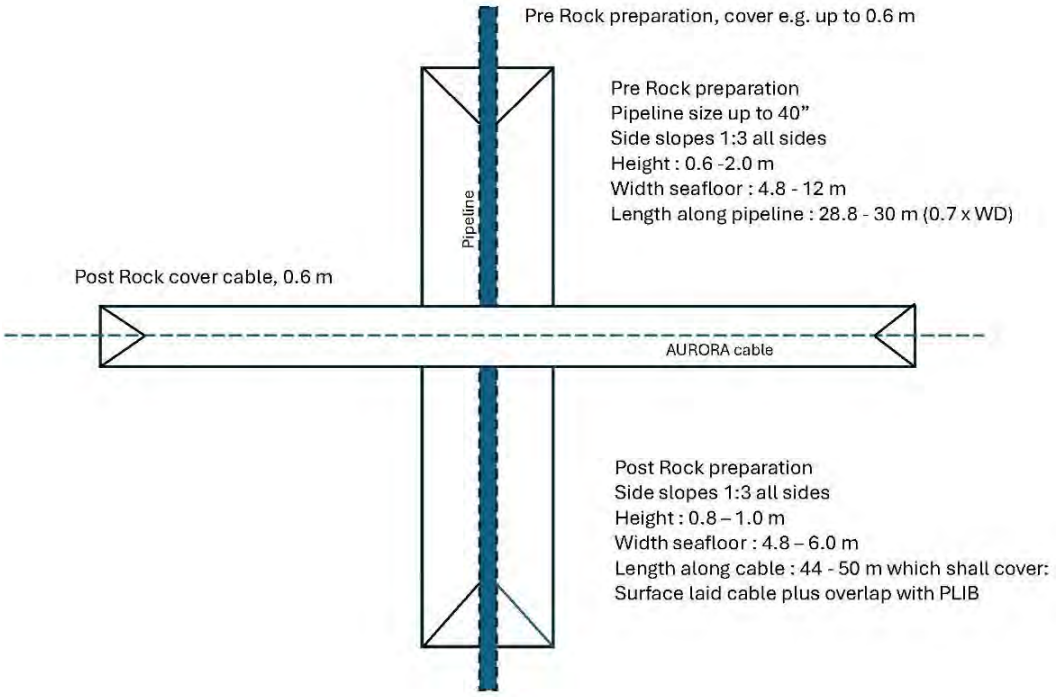


Figure 5 Top view plan of pre-rock and post-rock berms

Expected Lifetime of the Aurora Project
The subsea cable lifetime expectancy is approximately 25 years. At the end of the subsea cable's life the options for decommissioning will be evaluated. In most circumstances, the least environmentally damaging option may be to leave the cable in-situ. If the subsea cable is removed, it will be disposed of according to the standard agreed at that time; where feasible, parts of the cable will most likely be reused or recycled.

EIA Screening
An EIA screening report for the subsea cable installation activities within the Danish TS up to the BMH is provided in Appendix A: EIA Screening Report, Denmark.

Permit Applications
The following applications have been submitted or will be submitted shortly – see Table 3.

Permit/Dispensation	Authority
Permit under the Coastal Protection Act	Danish Coastal Authority (Kystdirektoratet)
Onshore EIA Construction Permit	Ringkøbing-Skjern Municipality

Table 3 Aurora Project Permit Applications

F. Beskrivelse af planlagte arbejdsmetoder

Kan evt. uddybes i bilag

Subsea Cable Installation
A full project description is provided in Section 3 Project Description, of the EIA Screening Report in Appendix A of the application. For a detailed description of the planned installation methodologies please refer to Section 3.4 of the report.

Rock Placement
The pre-installation rock placement at the pipeline crossing will be undertaken by a Flexible Fall Pipe Vessel (FFPV). The FFPV will deliver graded, crushed, rock material in a controlled manner from deck to seabed, via a flexible fall pipe. A remotely operated vehicle (ROV) will be located at the end of the flexible fall pipe. It will be fitted with survey and positioning equipment that manoeuvres the pipe to allow accurate and precise rock delivery on seabed. ROV will perform a video inspection to document the installation.

Post-installation rock placement will take place after PLIBs. The purpose of the post-installation rock placement is to protect the Aurora Project from external damage due to activities such as fishing. The post-installation rock placement method will be the same as that described for the pre-installation rock placement.
As post-installation rock berms are designed to protect the cable passing over a feature, such as a pipeline, it will generally be thinner and longer than the pre-installation rock berm.

Schedule of Rock Placement
The pre-installation rock placement within Denmark EEZ is expected to commence in Q1 2027 before the subsea cable is installed. Estimated duration is 1 day.
Post-installation rock placement is expected to commence in Q4 2027 after PLIBs. Estimated duration is 1 day.
These activities will operate on a 24-hour working schedule and will be subject to weather conditions.

G. Uddybning

Skal der i forbindelse med anlægget foretages uddybning?

☐ Ja

☑ Nej

Hvis ja skal mængden for uddybningen angives _____ m³

Beskrivelse af hvordan sedimentet fra uddybningen efterfølgende tænkes behandlet:

H. Opfyldning

Skal der i forbindelse med anlægget foretages opfyldning på søterritoriet?

☐ Ja

☑ Nej

Hvis ja skal mængden af opfyldningsmateriale angives _____ m³

Beskrivelse af opfyldningsmaterialets kvalitet:

I. Nødvendige bilag

Følgende bilag skal vedlægges:

- Søkort med indtegnet anlæg
- Matrikelkort med indtegnet anlæg
- Plan- og skitsetegning over det samlede anlæg
- Målsatte snittegninger over eventuelle moler, broer mv.
- Målfast oversigtskort med hele anlægget indtegnet
- Samtykkeerklæringer fra berørte grundejere

Evt. andet relevant materiale:

Appendix A: EIA Screening Report
Appendix B: Nautical Charts and Cadastral map of the Subsea Cable Route
Appendix C: Declaration of Consent
Appendix D: Risk Assessment according to guidelines from the Danish Maritime Authority

J. Erklæring og underskrift

Undertegnede ansøger erklærer, at oplysninger, der står i ansøgningen, er i overensstemmelse med de faktiske forhold.

Dato	Fulde navn *(benyt blokbogstaver)*	Underskrift
09/01/2026	Johan Ottosson	Johan Ottosson (Jan 9, 2026 13:57:48 GMT+1)

Ansøgningen sendes med post til:
Kystdirektoratet

Miljøministeriet
Kystdirektoratet

Højbovej 1
Postboks 100
7620 Lemvig

Eller via e-mail: ***kdi@kyst.dk***

Vejledning til ansøgningsskema

(vedrørende ansøgning om tilladelse til anlæg på søterritoriet)

Punkt A. Oplysninger om ejere
Her anføres navn, adresse mv. på ejere af den eller de matrikler, hvor anlægget opføres på eller ud for. Er der flere ansøgere, kan det anføres i et vedlagt bilag.

Punkt B. Evt. repræsentant (entreprenør, ingeniør eller lignende)
Her anføres navn, adresse mv. på den person, der fungerer som kontaktperson (projektansvarlig) under sagens behandling, det kan for eksempel være et entreprenør- eller ingeniørfirma.

Punkt C. Offentliggørelse af oplysninger
Kystdirektoratet er forpligtiget til at orientere naboer og andre berørte parter om ansøgninger om tilladelse til anlæg på søterritoriet. Ved orienteringen sker der altid en videregivelse af de oplysninger, som er angivet i skemaet. Endvidere offentliggøres ansøgningen på Kystdirektoratets hjemmeside.

Punkt D. Anlæggets placering
Her anføres projektets adresse, dvs. dets fysiske placering. Det er vigtigt for sagens behandling, at matrikelnumre samt ejerlav angives. Disse oplysninger kan findes i ejendommens skøde eller indhentes fra kommunen eller på internettet, f.eks. på www.miljoportalen.dk.

Punkt E. Beskrivelse af anlægget
Her beskrives anlægget i sin helhed. Beskrivelsen skal bl.a. omfatte formål og baggrund for anlægget, anlæggets udformning, en beskrivelse af hvilke materialer, der anvendes til anlægget og overvejelser over anlæggets indvirkning på strømningsforhold og den nærliggende kyst.

Til anvendelse for en screening for VVM skal beskrivelsen ligeledes belyse nedenstående forhold.
Anlæggets

- dimensioner
- kumulation med andre projekter
- anvendelse af naturressourcer
- affaldsproduktion, forurening og gener
- risiko for ulykker, navnlig under hensyn til de anvendte materialer og teknologier

Anlæggets betydning for den miljømæssige sårbarhed i området særligt i forhold til

- nuværende arealanvendelse
- de tilstedeværende naturressourcers relative rigdom, kvalitet og regeneringskapacitet
- det naturlige miljøs bæreevne med særlig opmærksomhed på kystområder, områder der er fredet eller omfattet af national og international natur- og miljøbeskyttelses lovgivning,tætbefolkede områder, områder der er af særlig betydning ud fra et historisk, kulturelt eller arkæologisk synspunkt

Anlæggets potentielle påvirkninger herunder

- påvirkningernes omfang (geografisk område og antal personer der berøres)
- påvirkningernes grænseoverskridende karakter
- påvirkningers grader og -kompleksitet
- påvirkningens sandsynlighed
- påvirkningens varighed, hyppighed og reversibilitet

Beskrivelsen kan eventuelt suppleres med bilag.

Punkt F. Beskrivelse af arbejdsmetoder
Her angives hvilke arbejdsmetoder, der benyttes ved opførelsen af anlægget, bl.a. hvordan og hvornår arbejdet udføres. Angivelsen af arbejdsmetoder er vigtigt for vurderingen af anlæggets påvirkning på miljøet.

Punkt G. Uddybning
Hvis der i forbindelse med anlægget foretages en uddybning, skal det angives i kubikmeter, hvor stor en mængde sediment uddybningen omfatter, og ligeledes hvad der efterfølgende skal ske med sedimentet, f.eks. om det skal bruges til kystfodring, opfyldning mv.

Punkt H. Opfyldning
Hvis der i forbindelse med projektet foretages en opfyldning, skal omfanget af opfyldningen angives i kubikmeter materiale brugt til opfyldningen. Kvaliteten af materialet til opfyldningen skal belyses, specielt mht. om det er forurenet eller uforurenet materiale, der benyttes.

Punkt I. Nødvendige bilag
Følgende bilag skal foreligge, før en ansøgning om tilladelse til anlæg på søterritoriet kan behandles:

- Søkort med anlægget indtegnet
- Matrikelkort med anlægget indtegnet. Matrikelkort kan findes på www.miljoportalen.dk. Anlæg kan f.eks. indtegnes med tusch på matrikelkortet.
- Plan- og skitsetegning over det samlede anlæg
- Målsatte snittegninger, der gør rede for anlæggets konstruktioner. På snittegningen angives f.eks. konstruktionernes højde, bredde, længde mv.
- Målfast oversigtskort med hele anlægget indtegnet
- Samtykkeerklæringer fra ejerne af alle berørte matrikler skal vedlægges, hvis anlægget strækker sig over mere end ansøger / ejers matrikel. Hvis en repræsentant for ejeren, f.eks. entreprenør- eller ingeniørfirma søger om tilladelse til anlægget på ejerens vegne, skal ansøgningen desuden vedlægges en samtykkeerklæring fra ejeren om, at han er indforstået med dennes repræsentation, samt at han er indforstået med, at anlægget opføres på hans ejendom.

Er der i forbindelse med anlægget lavet en strømningsanalyse eller lignende, er det hensigtsmæssigt at vedlægge den/dem som bilag for at belyse sagen bedst muligt.

Hvis der er spørgsmål til ansøgningsskemaet, kan Kystdirektoratet kontaktes på tlf. 99 63 63 63 eller på email: kdi@kyst.dk.

Kystdirektoratet

PREPARED FOR

ASN

Aurora Project: Denmark

Appendix A: EIA Screening Report

DATE
30 January 2025

REFERENCE
0715845

DOCUMENT DETAILS

The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.	
DOCUMENT TITLE	Aurora Project: Denmark
DOCUMENT SUBTITLE	Appendix A: EIA Screening Report
PROJECT NUMBER	0715845
Date	30 January 2025
Version	01
Author	ERM
Client name	ASN

DOCUMENT HISTORY

				ERM APPROVAL TO ISSUE		
VERSION	REVISION	AUTHOR	REVIEWED BY	NAME	DATE	COMMENTS
Final	01	ERM	Sophie Rice	Jonathan Perry	30.01.2025	

SIGNATURE PAGE

Aurora Project: Denmark

Appendix A: EIA Screening Report

0715845

Jonathan Perry
Partner

Environmental Resources Management Ltd
2nd Floor,
33 Exchequer Court,
St Mary Axe,
London,
EC3A 8AA
United Kingdom

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

Acronyms and Abbreviations	Description
°C	Degrees Celsius
µM	micromolar
AoI	Area of Interest
As	Arsenic
ASN	Alcatel Submarine Networks
BMH	Beach Manhole
BPEO	Best Practicable Environmental Option
BSH	Broad-Scale Habitat
BWM Convention	International Convention for the Control and Management of Ships' Ballast Water and Sediments
Cd	Cadmium
CGNS	Celtic and Greater North Sea
CLS	Cable Landing Station
cm	Centimetres
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
Cr	Chromium
CRS	Cable Route Survey
Cu	Copper
CWSS	Common Wadden Sea Secretariat
DCA	Danish Coastal Authority
DIN	Dissolved Inorganic Nitrogen
DIP	Dissolved Inorganic Phosphorous
DKCPC	Danish Cable Protection Committee
DMA	Danish Maritime Authority
EEA	European Environment Agency
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EPS	European Protected Species
EQS	Environmental Quality Standards
EQSD	Environmental Quality Standards Directive
ERM	Environmental Resources Management
EU	European Union
EU2020	Europe 2020 Strategy
EUNIS	European Nature Information System

Acronyms and Abbreviations	Description
FSA	Formal Safety Assessment
GES	Good Ecological Status
HDD	Horizontal Directional Drilling
Hg	Mercury
HMWB	Heavily Modified Water Body
HP	Horsepower
ICES	International Council for the Exploration of the Sea
ICPC	International Cable Protection Committee
IHR	International Health Regulations
ILO	International Labour Organisation
IMO	International Maritime Organization
INNS	Invasive Non-Native Species
ITU	International Telecommunications Union
kg	Kilograms
kJ	Kilojoules
km	Kilometres
LSE	Likely Significant Effect
m	Metres
MAJ	Marine Archaeology at Strandings Museet
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships
MDA	Medium double armour cable
MHWS	Mean High Water Springs
mm	Millimetres
MSFD	Marine Strategy Framework Directive
MSP	Maritime Spatial Plan
MU	Management Unit
NGO	Non-Governmental Organisation
Ni	Nickel
nm	Nautical Mile
NtM	Notice to Mariners
OOS	Out-of-Service
OPRC	International Convention on Oil Pollution Preparedness, Response, and Co-operation
OSH	Occupational Safety and Health
PAH	Polycyclic Aromatic Hydrocarbon

Acronyms and Abbreviations	Description
Pb	Lead
PCB	Polychlorinated Biphenyl
PEXA	Exercise areas and danger areas
PLB	Post-lay burial
PLGR	Pre-Lay Grapnel Run
PLI	Post-lay inspection
PLIB	Post-Lay Inspection and Burial
PLSE	Pre-Laid Shore End
PoP	Point-of-Presence
PP	Polypropylene
PRIB	Post-Repair Inspection and Burial
PSU	Practical Salinity Units
PVC	Polyvinyl Chloride
RC	Route Clearance
ROV	Remotely operated vehicle
SAC	Special Area of Conservation
SAL	Lightweight single armour cable
SCI	Sites of Community Importance
SEL	Shore-End Landing
SLVA	Seascape, Landscape and Visual Amenity
SOLAS	International Convention for the Safety of Life at Sea
SPA	Special Protection Area
SSC	Suspended Sediment Concentration
SST	Sea surface temperatures
TAEZ	Temporary archaeological exclusion zone
TBT	Tributyltin
TS	Territorial Sea
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States
UXO	Unexploded ordnances

Acronyms and Abbreviations	Description
VTS	Vessel traffic service
WFD	Water Framework Directive
WHO	World Health Organisation
WMP	Waste Management Plan
WWII	World War II
Zn	Zinc

EXECUTIVE SUMMARY

Alcatel Submarine Networks (ASN) has been awarded the contract to design, build and install the Aurora Project, which is a planned subsea fibre optic cable connecting landings in the United States (US) and Denmark, traversing through United Kingdom (UK) and Norwegian waters. ERM has been contracted by ASN to provide support with obtaining the appropriate permits and consents, including the production of this Environmental Impact Assessment (EIA) Screening Report for the installation of the Danish segment of the Aurora fibre optic telecommunication cable system (i.e. the Aurora Project). The Danish segment of the Aurora Project passes through Danish Territorial Seas (TS) to an already established Beach Manhole (BMH) located in Blaabjerg, Denmark, making use of the existing nearshore Horizontal Directional Drilling (HDD) duct to come onshore.

This EIA Screening Report provides a Project Description of the Aurora Project (**Section 3**), and EIA screening (**Section 4**) for any potential effects of the Aurora Project on receptors in the onshore environment and offshore Danish TS. Within this EIA Screening Report, only receptors within the onshore environment (i.e. from existing infrastructure [BMH to the HDD duct entry point (landward)]) and Danish TS (i.e. from the HDD duct exit point (seaward) to the limit of Danish TS) have been considered, as the laying of subsea cables in the Exclusive Economic Zone (EEZ) beyond the TS is governed by the United Nations Convention on the Law of the Sea (UNCLOS), therefore the EEZ is not considered within the Danish Establishment Permit application.

Section 4 of this report details the EIA screening conducted, including a baseline, effects assessment and screening outcome for each topic. Within each topic, the potential for any significant effects of the Aurora Project on the identified baselines is considered, taking into consideration any embedded mitigation measures such as avoidance of sensitive areas through advanced route planning and the re-use of existing infrastructure wherever feasible (see **Section 5.1**).

This EIA Screening Report concludes that the impacts of the Aurora Project on any associated environmental and socio-economic receptors are highly localised in extent and temporary in duration. Where potential impacts cannot be fully screened out taking into account any uncertainty in scheduling or variations in baseline information, such as the potential presence of otter holts or possible overlap with the tern breeding season, the precautionary principle has been applied and the potential for effects has been described together with any recommended mitigation measures.

Overall, the footprint of impact from subsea cable installation is narrow, generally restricted to a corridor of a few metres width along the subsea cable route, and impacts from the installation are temporary and of a small scale. Once installed, the Aurora Project will be buried below the seabed wherever conditions allow, therefore, having no potential pathways for effect on many of the receptors.

It has been concluded based on the findings of this EIA Screening Report, that the Aurora Project has no potential for significant effects on the majority of physical, biological and human receptors. There is considered to be a low potential for effects on marine physical processes, commercial fisheries and marine archaeology; however any potential effects are expected to be highly localised and temporary.

While there remains the potential for effects due to disturbance and temporary loss of habitat and foraging opportunities for otter and tern, the potential impacts are limited due to the use of existing infrastructure and small area of disturbance, as well as the short period of installation activity. Additional mitigation measures should include pre-installation visual survey for presence of otter holts and tern nests (where overlap with the tern nesting season cannot be avoided) and clear demarcation of work areas and control of vehicle movements.

On this basis, the Aurora Project can be screened out of requiring further consideration and assessment in an EIA.

A summary of the environmental screening from **Section 4** for potential for significant effects is presented in **Table 1**.

TABLE 1 SUMMARY OF THE ENVIRONMENTAL SCREENING

Receptor	Potential for Significant Effect	Comment
Marine Physical Processes (**Section 4.1**)		Considerations have been given to the below impacts: • Increase in suspended sediment concentration (SSC); • Changes to the sediment transport system; • Changes to the coastal and seabed morphology; and • Changes to the wave regime or tidal currents within the Study Area. Based on the assessment, there is **Low potential for Significant Effects** on marine physical processes.
Water Sediment Quality (**Section 4.2**)		Considerations have been given to the below impacts: • Decrease in water quality from temporary increase of total SSC and siltation; • Decrease in water and sediment quality from accidental release of pollutants from vessels and plant machinery; • Decrease in water and sediment quality from release of seabed contaminants through sediment disturbance; • Decrease of designated water bodies status (under the Water Framework Directive [WFD]) due to degradation of quality elements and statutory receptors; and • Decrease in bathing waters classification due to a decrease in water quality. Based on the assessment, and having carried out a WFD compliance assessment, **No Significant Effects** are expected from any of the impacts on any of the water and sediment quality receptors.
Benthic Ecology (**Section 4.3**)		Considerations have been given to the below impacts: • Temporary habitat disturbance; • Long-term temporary loss of habitat; • Temporary increase in SSC, turbidity, and siltation; • Accidental release of pollutants from vessels; • Accidental release of contaminants through sediment disturbance; • Introduction and colonisation of infrastructure by Invasive Non-Native Species (INNS); and • Long-term changes in physical processes. Based on the assessment, **No Significant Effects** are expected from any of the impacts on any of the benthic ecology receptor groups.
Fish and Shellfish Ecology (**Section 4.4**)		Considerations have been given to the below impacts: • Direct damage; • Habitat disturbance;

Receptor	Potential for Significant Effect	Comment
		• Smothering due to suspended sediments; and • Underwater noise. Based on the assessment, **No Significant Effects** are expected from any of the impacts on any of the fish and shellfish ecology receptor groups.
Terrestrial and Intertidal Ecology (**Section 4.5**)		Considerations have been given to the below impacts: • Vessel or machine related displacement; • Temporary loss of habitat and foraging opportunities; and • Sediment plumes. Based on the assessment, **No Significant Effects** are expected on waders. It cannot be determined that there will be **No Significant Effects** to otters and terns from machine related disturbance and temporary loss of habitat and foraging opportunities given uncertainties in timing and detailed baseline data; however, the area of disturbance is small and the period of installation activity is very short. The application of additional recommended mitigation measures will further reduce any potential for interaction with these species.
Marine Mammals (**Section 4.6**)		Considerations have been given to the below impacts: • Noise and vibration; • Vessel collision and displacement; and • Temporary loss of habitat and foraging opportunities. Based on the assessment, **No Significant Effects** are expected from any of the impacts on any of the marine mammal receptor groups.
Offshore Ornithology (**Section 4.7**)		Considerations have been given to the below impacts: • Habitat removal or alteration leading to secondary loss of foraging; • Vessel related disturbance; • Noise and vibration; and • Sediment plumes. Based on the assessment, **No Significant Effects** are expected from any of the impacts on any of the offshore ornithology receptor groups.
Aviation and Radar (**Section 4.8**)		Considerations have been given to impacts on aviation and radar receptors, such as: • Physical obstruction to military aircrafts; and • Interference with aviation radar systems. Based on the assessment, **No Significant Effects** are expected from any of the impacts on aviation and radar.

Receptor	Potential for Significant Effect	Comment
Noise and Vibration (**Section 4.9**)		Considerations have been given to the below impacts: For offshore - • Disturbance due to airborne noise and vibration; and • Disturbance due to underwater noise and vibration. For onshore - • Disturbance to human associated receptors (residential / recreational areas) through airborne and ground-borne noise and vibration; and • Disturbance to environmental receptors (protected / sensitive species) through airborne and ground-borne noise and vibration. Based on the assessment, **No Significant Effects** are expected from any of the impacts on noise and vibration onshore and / or offshore.
Seascape, Landscape and Visual Amenity (SLVA) (**Section 4.10**)		Considerations have been given to the below impacts: For offshore - • Seascape / landscape as a resource in its own right (caused by changes to its constituent elements, its specific aesthetic or perceptual qualities and / or its character). For onshore - • Views and visual amenity as experienced by people (caused by changes in the appearance of the seascape / landscape). Based on the assessment, **No Significant Effects** are expected from any of the impacts on SLVA onshore and / or offshore.
Commercial Fisheries (**Section 4.11**)		Considerations have been given to the below impacts: • Direct impacts to the commercial fishing industry, such as: ◦ Loss or restricted access to fishing grounds; ◦ Displacement of fishing activity into other areas; ◦ Interference with fishing activity; and ◦ Loss or damage to fishing gear due to snagging. • Indirect impacts to commercial fisheries resources. Based on the assessment, there is **Low potential for Significant Effects** to occur from the impacts of the Aurora Project on commercial fisheries receptor groups.
Shipping and Navigation (**Section 4.12**)		Considerations have been given to the below impacts: • Vessel-to-vessel collisions, due to the presence of the Aurora Project related vessel(s) and displacement of local vessels; • Direct collisions with the Aurora Project infrastructure, and associated snagging risks;

Receptor	Potential for Significant Effect	Comment
		• Disruption to pre-existing navigational management during installation, operation and maintenance, and decommissioning where activities may be taking place in key anchorages or waiting areas; and • Disruption to search and rescue operations, where search and rescue vessels may have to re-route due to presence of Aurora Project activities and associated vessels. Based on the assessment, and consideration to the low level of activity, short duration of installation work in the Danish TS and adherence to standard maritime safety procedures, the Aurora Project is considered to have **No Significant Effects** on shipping and navigation.
Marine Archaeology (**Section 4.13**)		Considerations have been given to the below impacts: • Direct physical impacts – the damage or full removal of a cultural heritage asset through installation, operation and maintenance, or decommissioning e.g. during the pre-lay grapnel run (PLGR) or subsea cable burial, or by the placement of protection measures on the seabed; and • Indirect physical impacts – the potential burial, destabilisation or damage of a cultural heritage asset due to physical changes indirectly caused by installation, operation and maintenance, or decommissioning e.g. changes in seabed sediment level or current flow. Based on the assessment and taking account of potential uncertainties in baseline information, the Aurora Project is considered to have **No Significant Effects** to known or unknown submerged prehistory, maritime archaeology, and aviation archaeology from direct physical impacts. Similarly, the Aurora Project is considered to have **No Significant Effects** to known or unknown archaeology from the subsea cable route from indirect physical impacts.
Terrestrial Archaeology (**Section 4.14**)		Considerations have been given to the below impacts: • Direct physical impacts – damage / removal wholly or in part, of a cultural heritage asset through installation, operation and maintenance, or decommissioning e.g. limited onshore burial of the subsea cable and any associated infrastructure; • Indirect physical impacts – damage / removal wholly or in part, a cultural heritage asset due to physical changes indirectly caused by installation, operation and maintenance, or decommissioning; and • Impacts to setting – changes to the setting of a designated cultural heritage asset within its landscape or seascape. There are anticipated to be **No Significant direct, indirect or setting effects** to terrestrial archaeology and/or heritage assets from the Aurora Project.
Other Users (**Section 4.15**)		Considerations have been given to the below impacts:

Receptor	Potential for Significant Effect	Comment
		• Direct damage to third party infrastructure, this has the potential to occur during installation where cable crossings are identified; • Temporary obstruction and / or displacement of other users activities, this has the potential to occur across all Aurora Project phases due to avoidance of installation vessel and / or vehicles and exclusion from safety zones; and • Increased SSC at aquaculture sites during installation activities. Based on the assessment, the Aurora Project is considered to have **No Significant Effects** on other users within the offshore TS and the onshore area surrounding the proposed Danish segment of the Aurora Project.
Cumulative Effects (**Section 4.16**)		Considerations have been given to the below impacts: • Underwater noise generated from the Aurora Project vessel sources affecting marine mammals; • Seabed habitat change from a number of seabed installations (e.g. future pipelines and cables); and • Seabed disturbance / sediment dispersion from cable / pipeline installation activities. Based on the assessment, **No Significant Effects** are expected from the Aurora Project, cumulatively with other projects in the region.
Designated Sites for Natural Conservation (**Section 4.17**)		Considerations have been given to the below Natura 2000 sites: • Ringkøbing Fjord Special Protection Area (SPA) / Ramsar; and • Ringkøbing Fjord og Nymindestrømmen Special Area of Conservation (SAC). Based on the assessment, **No Significant Effects** are expected from the Aurora Project on the classified populations and supporting habitat features of the Ringkøbing Fjord SPA / Ramsar, and the designated Annex I habitat features and Annex II populations of the Ringkøbing Fjord og Nymindestrømmen SAC.
Transboundary Impacts (**Section 4.18**)		Considerations have been given to the below Exclusive European Area States: • UK; • Norway; and • Danish Exclusive European Area States. Based on the assessment, **No Significant Effects** are expected from the Aurora Project inside or outside of the Danish Exclusive European Area State.

Receptor	Potential for Significant Effect	Comment
No Significant Effects		Potential effects that are indistinguishable from the background/natural level of environmental and socio-economic change. Effects are considered “not significant”.
Low Potential for Significant Effects		Potential effects of low magnitude, within acceptable standards. Effects are considered “not significant”.
Moderate Potential for Significant		These potential effects may or may not be significant, depending on the context, and additional mitigation may thus be required in order to avoid or reduce the effect to non-significant levels.
Major Potential for Significant Effects		Exceeds acceptable limits and standards. Potential effects are considered “significant”.

1. INTRODUCTION

1.1 OVERVIEW

Aurora is a planned subsea fibre optic telecommunication cable system (hereafter known as the Aurora Project, or the subsea cable), with a total estimated length of 7,230 kilometres (km). The Aurora Project will connect landings at Manasquan, New Jersey in the United States (US) and Blaabjerg in Denmark, traversing through both United Kingdom (UK) and Norwegian waters. The subsea cable route will be installed across the seabed and buried where conditions allow.

The Aurora Project is expected to go live in 2027/28. The objective of the Aurora Project is to install a subsea fibre optic cable to provide connectivity across the Atlantic Ocean and North Sea. This will increase telecommunication reliability and security and increase data transmission capacity and speeds between the US and Denmark.

Within the Danish Territorial Seas (TS), approximately 33 km of subsea cable will be installed. Between the TS and the Exclusive Economic Zone (EEZ)[1] boundary, approximately 167 km of subsea cable will be installed. The freedom to lay such subsea cables in EEZs beyond the TS is governed by the United Nations Convention on the Law of the Sea (UNCLOS) {Part V Article 58}, of which Denmark ratified on 16 November 2004. It is customary, however, for coastal states to be notified of subsea cable installations across their EEZs and as such, appropriate notifications for this EEZ portion of the Aurora Project will be made available in advance of installation. The EEZ is therefore excluded from permit or licence applications for the installation of the subsea cable in Danish waters, with only the portion to be installed through Denmark's TS to the existing Beach Manhole (BMH), at Blaabjerg, being considered in this environmental screening exercise.

The planning of the route is being performed in accordance with industry recognised standards and codes including those of the International Telecommunications Union (ITU). Installation, operation and maintenance, and decommissioning will be performed according to approved and certified ISO quality systems.

The Aurora Project is compliant with the Europe 2020 Strategy (EU2020), and the Digital Agenda for Europe, which furthermore underlines the importance of broadband deployment to promote competitiveness, social inclusion and employment in the European Union (EU) and defines the aim as to "*ensure the roll-out and take-up of broadband for all, at increasing speeds, through both fixed and wireless technologies, and to facilitate investment in the new very fast open and competitive internet networks that will be the arteries of a future economy*".

In Denmark, the competent authority for permitting of a subsea cable is the Danish Coastal Authority (DCA), which is a division of the Danish Ministry of the Environment.

1.2 RESPONSIBLE PARTIES

The local Landing Provider and Project Proponent for Denmark is Arelion. Alcatel Submarine Networks (ASN) has been contracted to design, build and install the system, and

[1] As defined by the UNCLOS (1982), the EEZ is an area beyond and adjacent to a coastal state's territorial sea, extending to a limit of 200 nautical miles (nm) (approximately 370 km) from its baseline.

Environmental Resources Management (ERM) have been appointed by ASN to obtain the necessary permits for the installation of the Aurora Project in Danish waters.

1.3 OBJECTIVE OF THE REPORT

The purpose of this report is to present the project description and an environmental screening of potential effects from the installation, operation and decommissioning of the planned subsea cable within Danish waters. The report is part of the permit application documentation for installation of the subsea cable in Danish waters up to the BMH at the landing site at Blaabjerg, Denmark. The onshore part of the Aurora Project landward of the BMH will be handled by other parties in separate applications to the relevant Danish authorities.

The following environmental and socio-economic parameters are included in the screening, further details can be found in **Section 4**:

- Marine Physical Processes;
- Water and Sediment Quality;
- Benthic Ecology;
- Fish and Shellfish Ecology;
- Terrestrial and Intertidal Ecology;
- Marine Mammals;
- Offshore Ornithology;
- Aviation and Radar;
- Noise and Vibration;
- Seascape, Landscape and Visual Amenity;
- Commercial Fishing;
- Shipping and Navigation;
- Marine Archaeology;
- Terrestrial Archaeology;
- Other Users;
- Cumulative Effects;
- Designated Sites for Nature Conservation: Natura 2000 Sites; and
- Transboundary Impacts.

1.4 OUTLINE OF THE REPORT

The remainder of this Environmental Impact Assessment (EIA) Screening Report is structured as follows:

- **Section 2:** Legal Framework
- **Section 3:** Project Description
- **Section 4:** EIA Screening
- **Section 5:** Conclusion

Supporting information is provided in the following annexes:

- **Annex 1:** As-Built HDD Duct Design and Dimensions

2. LEGAL FRAMEWORK

This section of the report describes the legislation and policies that regulate the activities involved with the Denmark segment of the Aurora Project. Context is also provided with respect to the required Danish permits required for the Aurora Project.

2.1 INTERNATIONAL CONVENTIONS, GUIDELINES AND STANDARDS

Denmark is a signatory to several international conventions and agreements targeted toward the conservation and protection of the environment to ensure sustainable development. The relevant international conventions and regulations most applicable to the Aurora Project are highlighted below in **Table 2-1**.

TABLE 2-1 LIST OF RELEVANT INTERNATIONAL CONVENTIONS AND REGULATIONS

Conventions	Year Adopted	Overview
Convention on the Territorial Sea and Contiguous Zone	1958	Under the 1958 Convention on the Territorial Sea and Contiguous Zone, states cannot suspend the innocent passage of foreign ships through straits that are used for international navigation between one part of the high seas and another part of the high seas or the TS of a foreign state. The 1982 treaty established a new right of transit passage for the purpose of continuous and expeditious transit in straits used for international navigation between one part of the high seas or EEZ and another.
Convention on the High Seas, Geneva	1958	The 1958 Convention on the High Seas, signed in Geneva, is an international agreement that outlines rules for the use of the high seas, which are areas of the ocean not under any one country's jurisdiction. It covers various aspects like navigation, fishing, and scientific research, emphasising freedom of navigation, the obligation to assist vessels in distress, and the promotion of global marine scientific research. This treaty is a crucial development in international maritime law, providing guidelines for the peaceful and responsible use of the high seas by all nations.
Convention on the International Regulations for Preventing Collisions at Sea (COLREGs)	1972	The regulations are published by the International Maritime Organization (IMO) and set out, among other things, the "rules of the road" or navigation rules to be followed by ships and other vessels at sea to prevent collisions between two or more vessels. COLREGs can also refer to the specific political line that divides inland waterways, which are subject to their own navigation rules, and coastal waterways which are subject to international navigation rules.
Convention for the Protection of the World Cultural and Natural Heritage	1972	The Convention defines the kind of natural or cultural sites which can be considered for inscription on the World Heritage List. The Convention sets out the duties of States Parties in identifying potential sites and their role in protecting and preserving them.

Conventions	Year Adopted	Overview
International Convention for the Safety of Life at Sea (SOLAS)	1974	The main objective of the SOLAS Convention is to specify minimum standards for the construction, equipment and operation of ships, compatible with their safety. Flag States are responsible for ensuring that ships under their flag comply with its requirements, and a number of certificates are prescribed in the Convention as proof that this has been done. Control provisions also allow Contracting Governments to inspect ships of other Contracting States if there are clear grounds for believing that the ship and its equipment do not substantially comply with the requirements of the Convention - this procedure is known as port State control.
International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)	1978	This Convention is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six (6) technical Annexes.
EU Birds Directive	1979	The EU Birds Directive (Council Directive 79/409/EEC of 2 April 1979, as amended) obliges EU member states to conserve selected bird species that are characteristic, rare or endangered in the EU. In addition to halting the decline or disappearance of bird species, the Directive aims to allow bird species to recover and thrive over the long-term. To achieve these aims, EU countries are required to take any necessary measures to maintain or restore bird populations.
Convention on the Conservation of Migratory Species of Wild Animals, 1979	1979	This Convention, also known as the Bonn Convention, was adopted in 1979 and entered into force in 1983. It stipulates actions for the conservation and management of migratory species including habitat conservation.
UNCLOS	1982	Denmark is signatory to UNCLOS and claims rights within 12 nm of the TS and 200 nm of the EEZ. According to the UNCLOS, the sovereignty of a coastal state extends beyond its land territory and internal waters to an adjacent area of sea. In Denmark, this relates to maritime boundaries. The proposed Aurora Project and related activities fall within the jurisdiction of the TS.
International Telecommunication Regulations	1989	The provisions of these regulations supplement the ITU, with a view to attaining the purposes of the ITU in promoting the development of telecommunication services and their most efficient operation while harmonising the development of facilities for world-wide telecommunications. The regulations establish general principles which relate to the provision and operation of international telecommunication services offered to the public as well as to the underlying international telecommunication transport means used to provide such services.

Conventions	Year Adopted	Overview
International Convention on Oil Pollution Preparedness, Response, and Co-operation (OPRC)	1990	Parties to the International Convention on OPRC are required to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries. Parties to the convention are required to provide assistance to others in the event of a pollution emergency and provision is made for the reimbursement of any assistance provided. Ships and operators are required to carry a shipboard oil pollution emergency plan, oil pollution emergency plans or similar arrangements which must be coordinated with national systems for responding promptly and effectively to oil pollution incidents.
EU Habitat Directive	1992	The 1992 EU Habitats Directive (Council Directive 92/43/EEC, as amended) obliges EU member states to conserve selected habitats and species that are characteristic, rare or endangered in the EU. It sets up the 'Natura 2000' network, which is the largest ecological network in the world, comprising of special areas of conservation designated by EU countries under this directive and Special Protection Areas (SPAs) classified under the Birds Directive (Directive 2009/147/EC).
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter	1992	The objective of this convention is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter.
The Rio Declaration on Environment and Development	1992	The Declaration was made in 1992 in Rio de Janeiro, reaffirming the declaration of the United Nations Conference on Human Environment adopted at Stockholm in 1972. The principle works towards international agreement which respects the interest of all and protects the integrity of the global environment and development. The principles of the declaration relevant to the proposed Aurora Project include: Principle 4: In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it. Principle 17: EIA as a national instrument shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.
The Aarhus Convention	1998	The Aarhus Convention grants the public rights regarding access to information, public participation and access to justice in governmental decision-making processes on environmental matters.
EU Water Framework Directive (WFD)	2000	The EU WFD (Council Directive 2000/60/EC of 23 October 2000) sets the framework for the protection of rivers and lakes, transitional waters (estuaries, lagoons, etc.), coastal waters and groundwater in all EU countries.

Conventions	Year Adopted	Overview
Convention on Conservation of Underwater Cultural Heritage	2001	The Convention on the Conservation of the Underwater Cultural Heritage is a treaty that was adopted on 2 November 2001 by the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO). The Convention is intended to protect "all traces of human existence having a cultural, historical or archaeological character" which have been under water for over 100 years. This extends to the protection of shipwrecks, sunken cities, prehistoric artwork, treasures that may be looted, sacrificial and burial sites, and old ports that cover the oceans' floors.
International Labour Organisation (ILO): ILO-OSH, 2001 - Guidelines on Occupational Safety and Health (OSH) Management	2001	These guidelines call for coherent policies to protect workers from occupational hazards and risks while improving productivity. The guidelines present practical approaches and tools for assisting organisations, competent national institutions, employers, workers and other social partners in establishing, implementing and improving OSH management systems, with the aim of reducing work-related injuries, ill health, diseases, incidents and deaths. At the organisational level, the guidelines encourage the integration of OSH management system elements as an important component of overall policy and management arrangements. Organisations, employers, owners, managerial staff, workers and their representatives are motivated in applying appropriate OSH management principles and methods to improve OSH performance.
International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention)	2004	This Convention aims to prevent, minimise, and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships' ballast water and sediments.
International Health Regulations (IHR)	2005	The IHR is an international legal instrument that is binding on 196 countries across the globe, including all the Member States of World Health Organisation (WHO). This binding instrument of international law was first adopted in 1969, revised in 2005 and entered into force on 15 June 2007. The purpose and scope are "to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks and which avoid unnecessary interference with international traffic and trade".
Marine Spatial Framework Directive	2014	The Marine Spatial Framework Directive (Council Directive 2014/89/EU of 23 July 2014) sets the framework for maritime spatial planning in an ecosystem-based approach.
The Invasive Alien Species Regulation (Regulation (EU) 1143/2014)	2014	The Invasive Alien Species Regulation sets the measures to be adopted by EU countries in relation to invasive alien species. The regulation details the Invasive Alien Species of Union concern (Union

Conventions	Year Adopted	Overview
		List) and the restrictions and measures that apply to each.

2.2 NATIONAL LEGISLATION

Table 2-2 shows the relevant national legislative framework for the installation of a subsea cable in Danish waters.

TABLE 2-2 RELEVANT LEGISLATIVE FRAMEWORK FOR SUBSEA CABLE INSTALLATION IN DANISH WATERS

Legislative Framework	Relevance
Executive order on the protection of cables and submarine pipelines (BEK no. 939 of 27/11/1992)	§ 4: A 200 m protection zone is automatically established on either side of a cable. Within this zone, anchoring, extraction of materials and any use of tools that drag on the bottom (including bottom trawls), are prohibited.
Executive order on the safety of navigation in connection with engineering works and other activities, etc. in Danish waters (BEK no. 1351 of 29/11/2013)	§ 3: An activity may only be carried out if a risk assessment shows that shipping safety will not be significantly impaired and that free shipping will not be hindered.
Executive Order on navigational safety during construction works and other activities in Danish waters (BEK nr 1229 af 03/10/2023)	§ 6. When an activity entails that official charts, harbour plans or descriptions in nautical publications published by the Geodata Agency must be updated, the project must submit information and drawing material to the Geodata Agency no later than three (3) weeks after an activity has been completed. § 7. Within a vessel traffic service (VTS) area, the project must cooperate with VTS on the implementation of an activity. § 9. The project on and in the seabed has a duty to investigate the dangers and restrictions that may be associated with this. 2. If remnants of ammunition, war gases or unidentified objects that could be dangerous are found, the work must be temporarily stopped, and the Naval Command must be contacted. 3. Activities on the seabed in prohibited areas, where there may be ammunition remnants or war gases, etc., require permission according to a special procedure, which can be found on the Danish Maritime Authority (DMA) website.
Statutory order on the museum act (LBK no. 358 of 08/04/2014)	§ 25: The applicant may request an opinion from the relevant cultural history museum. When the museum has received a request, it must provide an opinion as to whether the work to which the request relates involves a risk of destruction of cultural heritage.
Executive order on the administration of international nature conservation areas and the protection of certain species in relation to coastal protection measures, as well as the establishment and extension of certain plants on the territorial sea (BEK no. 896 of 21/06/2016)	§ 4: After consultation with other relevant authorities, the DCA may decide that a project might have a significant impact on an international nature protection area, then an impact assessment will be required.

Legislative Framework	Relevance
Statutory order on the nature conservation act (LBK no. 934 of 27/06/2017)	§ 8: No changes may be made to the condition of the dune conservation areas (e.g. on the west coast of Denmark). § 15: No changes may be made to the conditions of beaches or other areas lying between the onshore section and the beach protection line (*strandbeskyttelseslinjen*) (which is typically a 300 m zone). Should exemption be required, this should be requested from the DCA.
Statutory order on the registration cable owners act (LBK no. 206 of 15/03/2018)	§ 6: The Project Proponent must ensure that it is recorded in the Cable Owner Register (LER register).
Statutory order of the act on hunting and game management (LBK no. 270 of 12/04/2018)	§ 6: The breeding or resting areas of the mammals listed in Annex **1** must not be destroyed or damaged. § 7: The mammals listed in **Annex 1** and birds must not intentionally be interfered with to a degree which is harmful to the species or populations.
Maritime Spatial Plan (MSP) (LBK no 400 of 06/04/2020)	The Ministry of Industry, Business and Financial Affairs is the competent authority of maritime spatial planning, delegated to the DMA. A new MSP has now been published and came into effect as of 28 June 2024. All Danish ministries, agencies, municipalities and Non-Governmental Organisations (NGOs) are part of the consultation along with the general public, including private companies. § 14: Plans and projects in conflict with the MSP cannot be permitted. Changes to the MSP can be made by the Ministry of Industry, Business and Financial Affairs.
Coastal Habitat Order (BEK no 654 of 19/05/2020)	According to the Coastal Habitat Order, decisions about establishment cannot be made before an assessment of whether the project in itself or in connection with other projects, including previously completed projects, may significantly affect an international nature conservation area or certain species designated pursuant to the Act on Environmental Objectives, etc. for International Nature Conservation Areas.
EIA Act (LBK no 4 of 03/01/2023)	The Executive Order of the Act on Environmental Assessment of Plans and Programmes and of Specific Projects (i.e. EIA). In appendices I and II to the act, projects that require an EIA are listed (Statutory or after a screening). Subsea cables are not covered in either of the appendices. However, the DCA may decide that an EIA must be compiled for a project as a result of their screening after the Coastal Habitat Order (see above). In that case, the EIA Act will set the framework for the reporting of impacts.
Statutory order of the act on fisheries and fish farming (Fisheries Act) (LBK no 205 0f 01/03/2023)	§ 77-80: If needed, relevant compensation agreements with fishermen can be made either before or after a permit application is submitted. The DCA will consult fishermen during the consultation phase. A permit may be given on the condition that an agreement be made with fishermen.
Coastal Protection Act (BEK no 806 of 14/06/2023)	§ 16a: The DCA is the competent authority to grant the Establishment Permit. The Establishment Permit covers both the installation phase and operation phase.
Guidance from the Danish Environmental Protection Agency Dumping of dredged seabed material – disposal (VEJ nr 9607 of 01/10/2005)	The guidance document elaborates and explains the legislative framework and is aimed at parties involved in marine spoils disposal. The guidelines aim to help those who apply for a disposal permit.

Legislative Framework	Relevance
Guidance from the Danish Agency for Urban and Landscape Dumping of absorbed seabed material – dredging (VEJ no 9702 of 20/10/2008)	The guidance elaborates and explains the legislative framework and is aimed at everyone involved in marine spoils disposal. The guidelines aim to help those who apply for a disposal permit.

2.3 PERMIT REQUIREMENTS

The permits required for the installation of the subsea cable in Danish waters up to the BMH at the landing site in Blaabjerg, Denmark are detailed below. Any consenting requirements for the onshore elements of the Aurora Project will be processed by the responsible parties completing the required applications.

2.3.1 ESTABLISHMENT PERMIT

The Coastal Protection Act regulates coastal protection, including detailing consenting requirements for marine works. The establishment of facilities or the execution of activities requires an Establishment Permit. The authority responsible for granting Establishment Permits for activities in Danish waters, including the installation of submarine cables, is the DCA, which is a division of The Danish Ministry of the Environment.

The DCA assesses and consults on applications for an Establishment Permit, before deciding whether a permit can be granted and under what conditions, or whether an EIA is required. The need for an EIA will be determined based on initial screening of the potential effects, together with consultation with the competent authorities. This report presents the screening of topics for potential effects from the Aurora Project and forms part of the Establishment Permit application documentation.

2.3.2 ONSHORE PERMIT

In addition to the Establishment Permit (as mentioned in **Section 2.3.1** above), an onshore permit would also be required for the beach works between the existing Horizontal Directional Drill (HDD) duct entry point (landward) to the existing BMH (refer to **Section 3.4.2.3** for further detail of onshore installation works).

It is currently understood that a permit has been granted (on 30 October 2023) which covers the onshore activities for the Aurora Project, and is valid for activities utilising the existing infrastructure for the Aurora Project. Therefore, on this basis, it is understood that a renewal of this existing permit may be required subject to the installation schedule. However, no further permitting is required for the onshore activities.

3. PROJECT DESCRIPTION

3.1 PROJECT LOCATION

For the Danish segment of the Aurora Project, approximately 33 km of subsea cable will be installed in the Danish TS. Between the TS and the Danish EEZ boundary, approximately 167 km of subsea cable will be installed. As explained in **Section 1.1**, the portion of the subsea cable in the EEZ is excluded from this EIA Screening Report as installation beyond the Danish TS will be managed separately via a notification in accordance with UNCLOS.

Table 3-1 provides the coordinates of the key infrastructure for the Danish segment of the Aurora Project and the points at which the subsea cable will enter and exit Danish waters.

Prior to the screening process, the planned subsea cable route was surveyed in September 2024 by ASN's marine survey subcontractor, EGS. The information gathered during the Cable Route Survey (CRS) has been used to support the marine baseline of the EIA Screening Report. The landing site at Blaabjerg was chosen as the preferred landing site due to the ease of access to the beach, the proximity to existing terrestrial telecommunications network infrastructure (including the existing HDD duct connections and BMH), and the short distance from the location of the BMH to the Cable Landing Station (CLS).

TABLE 3-1 DENMARK SUBSEA CABLE LOCATIONS

Location Description	Latitude	Longitude
Enter Danish EEZ	056˚ 42.8484' N	005˚ 25.2606' E
Enter Danish TS	056˚ 06.2293' N	007˚ 44.6706' E
Existing HDD duct exit point (seaward)	055˚ 55.5962' N	008˚ 08.2037' E
Existing HDD duct entry point (landward)	055˚ 55.3710' N	008˚ 09.0800' E
Existing BMH	055˚ 55.3720' N	008˚ 09.1080' E

Note: WGS84 Datum in degrees decimal minutes.

Source: ASN, 2024

FIGURE 3-1 SUBSEA CABLE OVERVIEW: DANISH EXCLUSIVE ECONOMIC ZONE

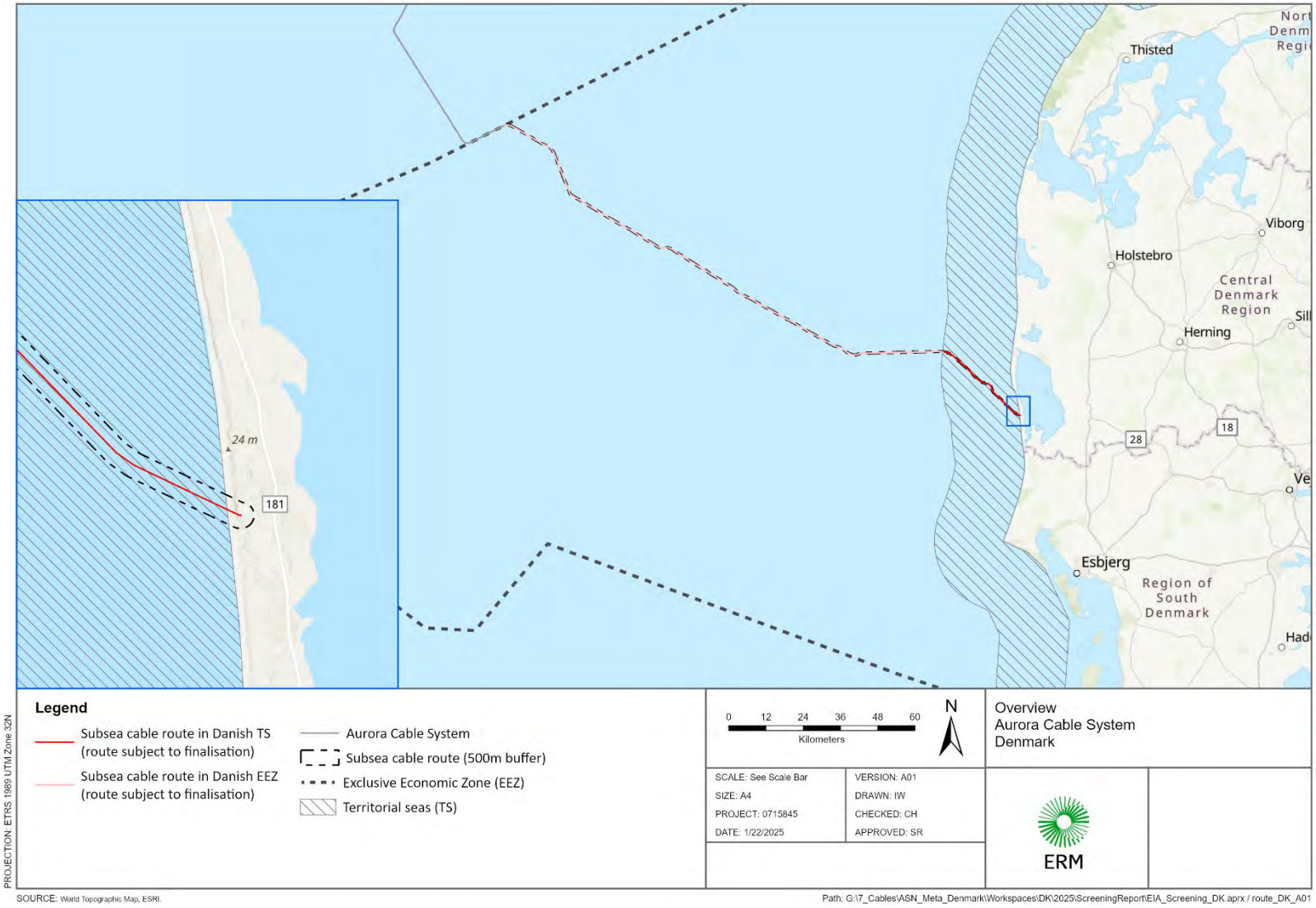
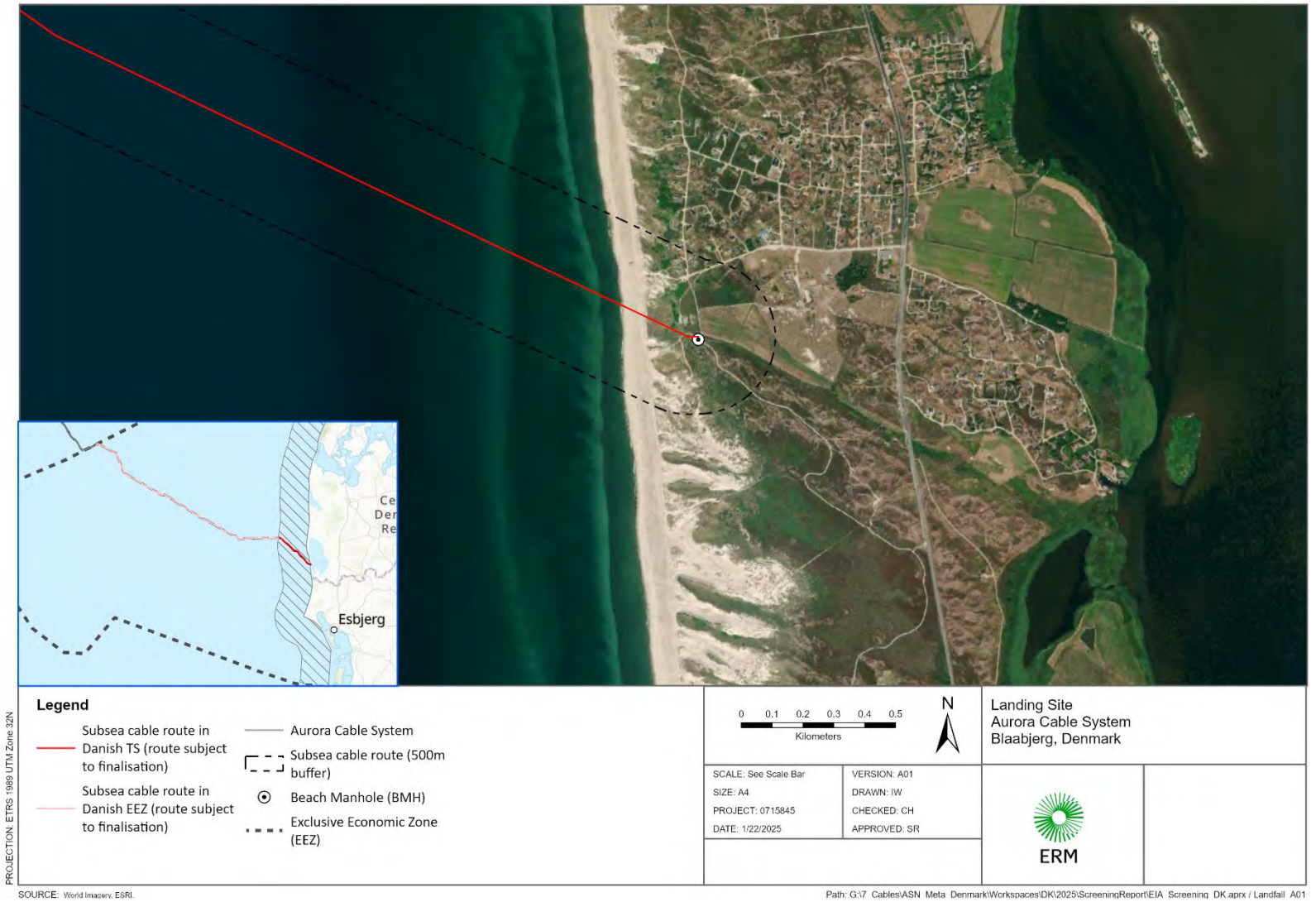


FIGURE 3-2 BLAABJERG LANDING SITE: SUBSEA CABLE, DENMARK



3.2 ONSHORE LOCATION AND INFRASTRUCTURE

3.2.1 THE LANDING SITE

The installation of the subsea cable at Blaabjerg, Denmark, plans to utilise an existing HDD duct, where its exit point (seaward) is around 150 m from the shore and the entry point (landward) is approximately 29 m from the existing BMH, as show in **Figure 3-3**. This will allow the subsea cable to be installed at the landing site at Blaabjerg while minimising the Aurora Project installation activities within proximity of the Natura 2000 sites and / or environmentally sensitive areas. Further information on the existing HDD duct is provided in **Section 3.2.2**.

The landing site is a recreational green undeveloped area on a land strip forming a barrier between the North Sea and Ringkøbing Fjord. The land strip is a large expanse of heather and heathland surrounded by dunes. A solitary beach house is located around 30 m north of the landing site, and the area may be used for horseback riding as there is a horse-riding centre around 300 m east of the landing site.

As shown in **Figure 3-4**, the landing site is close to, but does not overlap with, the Natura 2000 site no. DK00CY163 (Habitats Directive Site - Ringkøbing Fjord og Nymindestrømmen also called SAC62), DK00CX043 (Bird Directive Site - Ringkøbing Fjord). The area is designated to protect different dune types and beach meadow among other habitats.

The existing BMH location may be in proximity of several protected habitat types: beach meadow, decalcified fixed dunes with *Empetrum nigrum*, fixed coastal dunes with herbaceous vegetation ("grey dunes")', and grassland. Further information on the existing BMH is provided in **Section 3.2.2.**

FIGURE 3-3 HORIZONTAL DIRECTIONAL DRILLING DUCT ENTRY AND EXIT POINTS AT LANDING SITE IN BLAABJERG, DENMARK

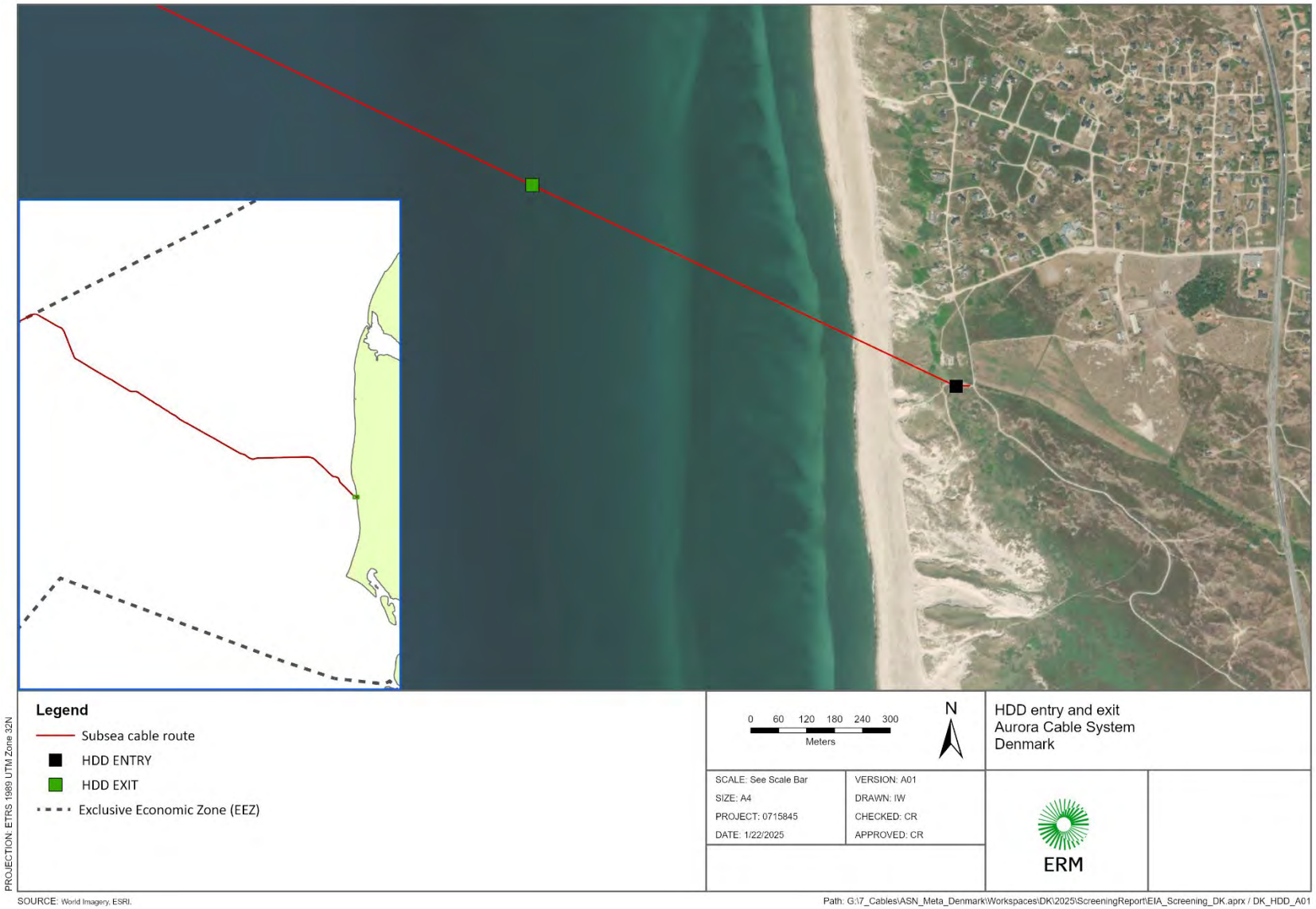
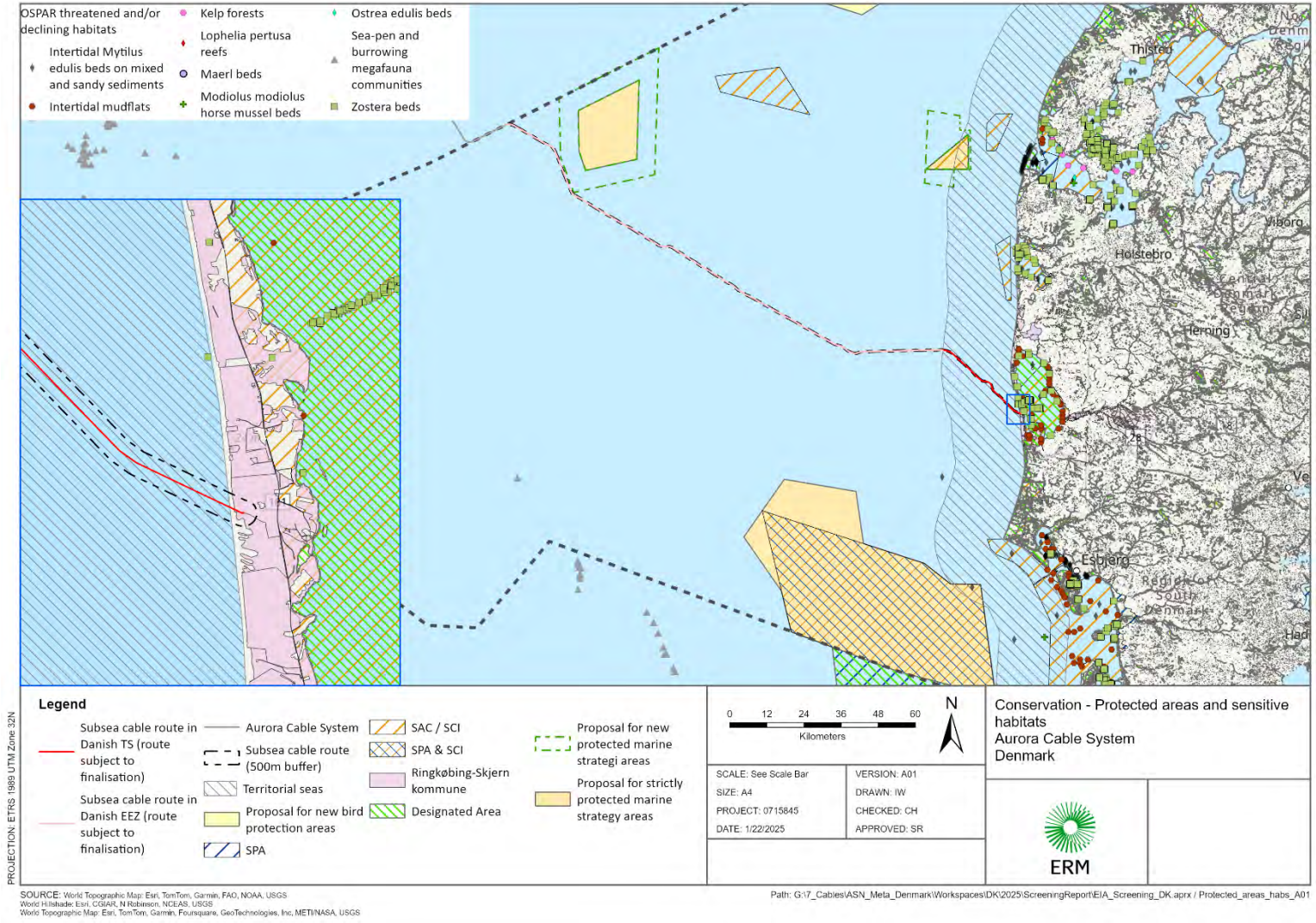


FIGURE 3-4 KNOWN PROPOSED AND EXISTING PROTECTED AREAS, AND SENSITIVE HABITATS IN DANISH EXCLUSIVE ECONOMIC ZONE AND TERRITORIAL SEAS



3.2.2 BEACH MANHOLE AND HORIZONTAL DIRECTIONAL DRILLING DUCT

The Aurora Project will utilise the existing BMH at the landing site in Blaabjerg, Denmark. The BMH, which was part of the decommissioned TAT-14 cable system, is a concrete utility vault where the marine portion of the subsea cable is connected to the terrestrial cable. The BMH is located underground with two (2) access hatches flush with ground level comprising a tamper proof cover.

The approximate size of the BMH is 2 m long x 3 m wide x 1.2 m deep. The manhole lids are made of cast iron. The sub-surface chamber will be accessed via the manholes, and the manhole cover is the only element of the BMH visible above ground, as shown in **Figure 3-5.**

FIGURE 3-5 IMAGE OF EXISTING BEACH MANHOLE WITH TWO ACCESS HATCHES

Source: ASN, 2024

The Aurora Project will also utilise the existing HDD duct at the landing site in Blaabjerg, Denmark. This existing HDD duct is originally part of the TAT-14 cable system which is now decommissioned. In between the existing BMH and HDD duct, a short section of cable approximately 29m in length will be installed. This section of cable will be buried in between the HDD duct and the BMH.

The as-built HDD duct design and dimensions are provided in **Annex 1**.

The decommissioned TAT-14 cable has been removed and the existing HDD duct (as shown in **Figure 3-6**) was subject to a proving operation in May 2024. This proving operation involved passing a mandrel (with a diameter slightly less than the minimum internal diameter of the

existing HDD duct, but larger than the planned subsea cable) through the conduit, to prove it is free from any obstructions that can hinder or damage the subsea cable.

FIGURE 3-6 VIEW TOWARDS NORTH-EAST ACROSS THE BEACH MANHOLE AND HORIZONTAL DIRECTIONAL DRILLING DUCT AT BLAABJERG, DENMARK

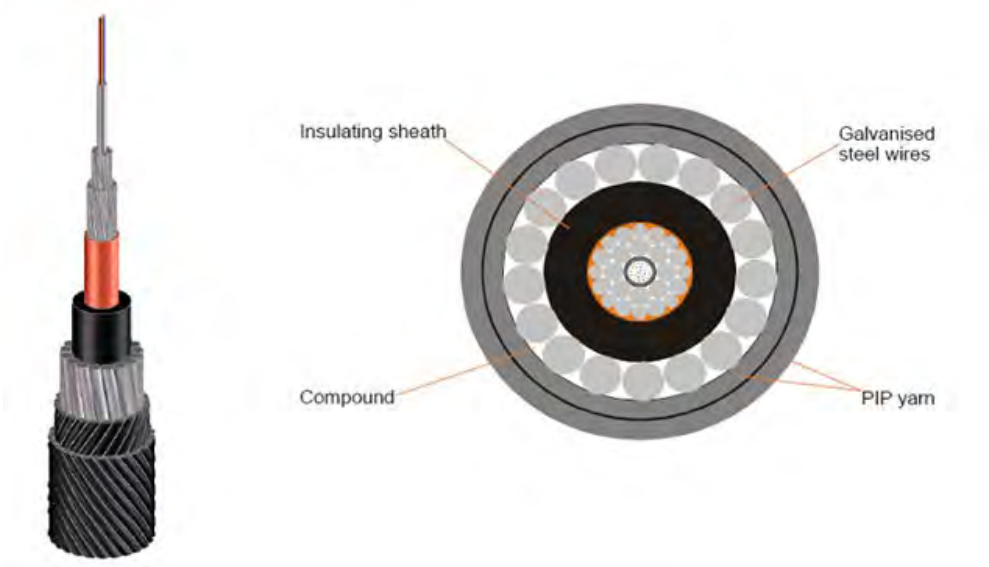
Source: ASN, 2024

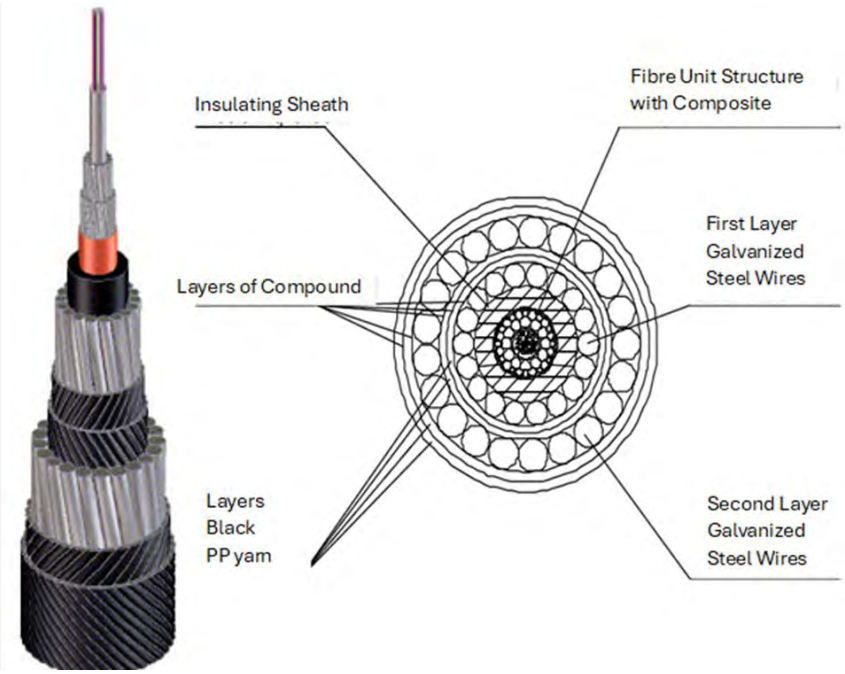
3.3 OFFSHORE INFRASTRUCTURE

3.3.1 THE SUBSEA FIBRE OPTIC CABLE

The subsea fibre optic cable that will be used within the Danish TS is the OALC4 cable, developed and manufactured by ASN. **Figure 3-7** depicts the two (2) types of OALC4 cable that will be used in the Danish TS; the lightweight single armour cable (SAL) with 28 millimeter (mm) outer diameter and, the medium double armour cable (MDA) with 37.5 mm outer diameter.

FIGURE 3-7 EXAMPLE OF A SINGLE AND DOUBLE ARMOUR FIBRE OPTIC CABLE





Source: ASN, 2024

The core of the subsea cable is the fibre unit structure, where the optical fibres are set in a steel tube and insulated with high-density polyethylene which provides abrasion resistance. The fibre unit and insulation sheath are surrounded by layers of galvanised steel wires and layers of black polypropylene (PP) yarn that provide additional protection against external threats. Only the outer layer of PP yarn which is inert, will be in contact with the surrounding environment.

3.3.2 REPEATERS

Subsea cables which span large distances require repeaters to amplify the subsea cable signal and prevent the optical signal from deteriorating from the point of origin to the destination. Repeaters are optical amplifiers that are installed at points along the length of the subsea cable. They are used to extend the reach of optical communications links by overcoming loss due to attenuation. Repeaters will be installed approximately every 75 km along the length of the Aurora Project, so one (1) repeater within the Danish TS is expected.

The repeaters are fitted to and form a part of the subsea cable, typically measuring up to approximately 270 mm (diameter) x 980 mm (length) in size. The total length of the repeater section is approximately 3,900 mm to 4,240 mm depending on subsea cable coupling. An example of a repeater is shown in **Figure 3-8**.

FIGURE 3-8 EXAMPLE OF A REPEATER AND FIBRE OPTIC CABLE

Source: ASN, 2024

Note: Repeater and fibre optic cable shown during subsea cable installation from installation vessel.

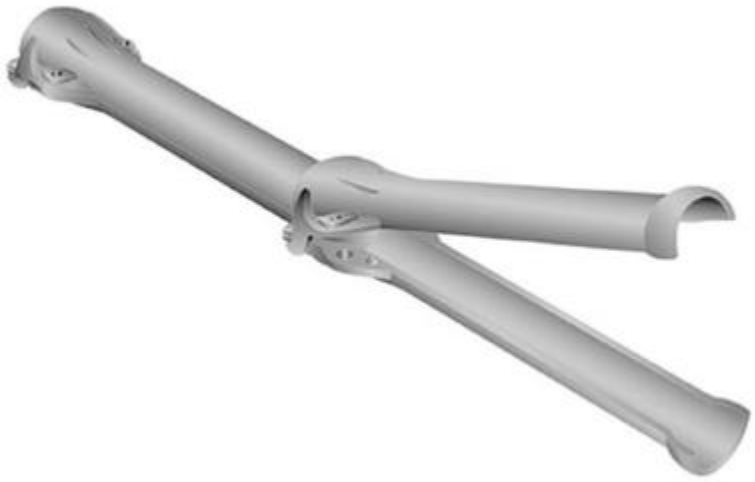
3.3.3 ADDITIONAL PROTECTION

Additional protection of the subsea cable is anticipated to be required in areas where there is a greater risk of damage or abrasion. Approximately 29 m of articulated pipes will be installed over the subsea cable from the BMH towards the HDD duct entry point (landward) at the landing site, and 25 m of articulated pipes will be installed from HDD duct exit point (seaward) to full burial depth. This provides stability and protection from abrasion or external aggression on the subsea cable in the surf zone. An example of the articulated pipe typically used is shown in **Figure 3-9**.

To prevent lateral movement of the articulated pipe in high energy surf zones in the nearshore, articulated pipe can be fixed to the seabed using saddle clamps or subsea cable clamps installed by divers at suitable intervals. Clamps will only be considered for articulated pipe on hard ground in high energy surf zones where there is a significant risk of subsea cable movements. Given the use of the existing HDD duct through the nearshore, clamps are currently not expected to be required but are described here as a contingency. Typical articulated pipe saddle clamps and cable clamps are shown in **Figure 3-10**.

The decision to incorporate additional protection to the subsea cable will be made by the engineers on site during installation in response to assessment of site-specific conditions.

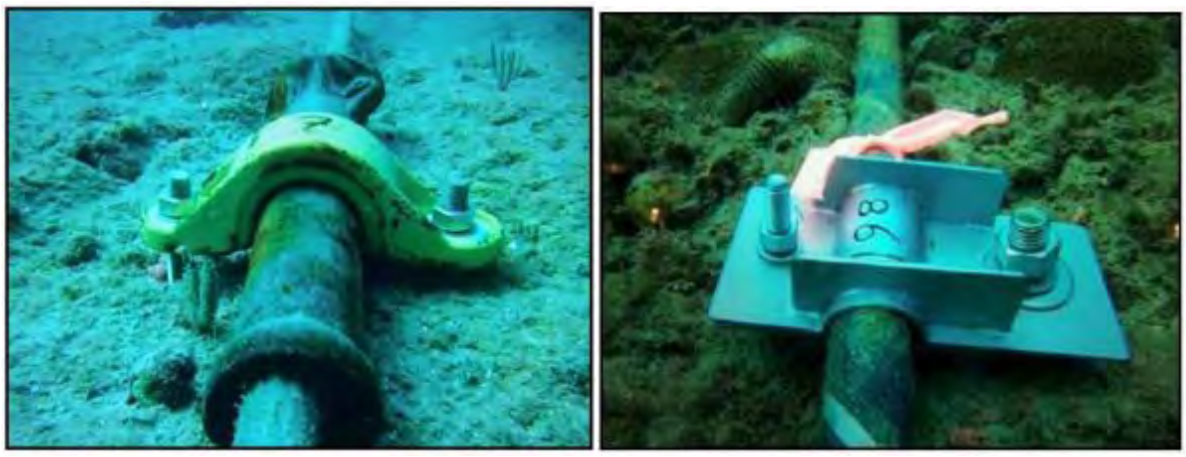
FIGURE 3-9 ARTICULATED PIPE AND TYPICAL SPECIFICATIONS



Specifications (PS055/500/09)	
Segment Length - Overall	546 mm
Effective Installed Length/segment pair	500 mm
Minimum Internal Diameter	55 mm - for subsea cables up to 47 mm diameter
Maximum External Diameter	130 mm
Wall Thickness	9 mm
Material	Ductile Iron to AS1831 / ISO 1083
Tensile Strength / Elongation	400 MPa / 12% elongation
Impact Resistance	≥7.5 Kilojoules (kJ)
Minimum Bend Diameter	4.0 m
Weight per Segment	8.1 kilograms (kg)
Weight per installed metre (air)	16.4 kg
Weight per installed metre (water)	14.3 kg
Fasteners	M12x50 Bolts and M12 Nyloc Nuts Material: Stainless Steel G316/A4 Recommended usage: 1 pair per 10 metres of installed pipe

Source: ASN / Protectorshell.com, 2024

FIGURE 3-10 EXAMPLE OF SUBSEA CABLE CLAMPS AND INSTALLATION



Source: ASN, 2024

Left: Example of an articulated pipe section with saddle clamp, showing typical installation.
Right: Example of a subsea cable and a subsea cable clamp, showing typical installation.

3.4 PROJECT ACTIVITIES

The Aurora Project will involve the following activities in Danish TS and onshore:

- Pre-Installation Activities in the marine environment:
  - Route Clearance (RC) of Out-of-Service (OOS) Cables; and
  - Pre-Lay Grapnel Run (PLGR);
- Installation Activities:
  - Main Subsea Cable Lay; and
  - Post-Lay Inspection and Burial (PLIB);
  - Shore-End Landing (SEL) Installation;
- Subsea Cable Operation and Maintenance; and
- Retirement, Abandonment or Decommissioning.

There are no in-service cables or pipelines in Danish TS that will be crossed by the subsea cable. Hence, this activity will not be addressed further in this EIA Screening Report.

Although it is planned to install a new system earth (to support the Aurora Project landing in Denmark) at the existing CLS in Norre Nebel, this activity will be undertaken by other parties who will handle the separate permit applications (as required) to the relevant Danish authorities. Therefore, system earth installation will not be addressed further in this EIA Screening Report.

3.4.1 PRE-INSTALLATION ACTIVITIES

3.4.1.1 ROUTE CLEARANCE OF OUT-OF-SERVICE CABLES

The purpose of the RC operations is to clear the subsea cable route of obstacles such as redundant OOS cables that were identified during the CRS, as these can be hazardous to both the installation vessel's equipment and the subsea cable itself. RC is only carried out where subsea cable burial by ploughing is planned.

The CRS (completed in September 2024) identified six (6) OOS cables that need to be removed from the subsea cable route in the Danish TS. Details and locations of the OOS cables are provided in **Table 3-2**.

TABLE 3-2 DETAILS AND LOCATIONS OF OUT-OF-SERVICE CABLES

OOS Cable	Latitude	Longitude	Water Depth (m)
CX FO DB TAT 14 seg K1	056º 03.7320' N	007º 51.6531' E	23
CX FO DB TAT 14 seg N	056º 02.4624' N	007º 54.0628' E	22
CX FO DB TAT 14 seg N	056º 00.8946' N	007º 58.2682' E	22
CX FO DB TAT 14 seg N	055º 56.2237' N	008º 06.3955' E	14
CX FO DB TAT 14 seg N	055º 55.9734' N	008º 06.8666' E	12
CX TELE DB Newbiggen-Sondervig No1	056º 05.1764' N	007º 48.6930' E	27

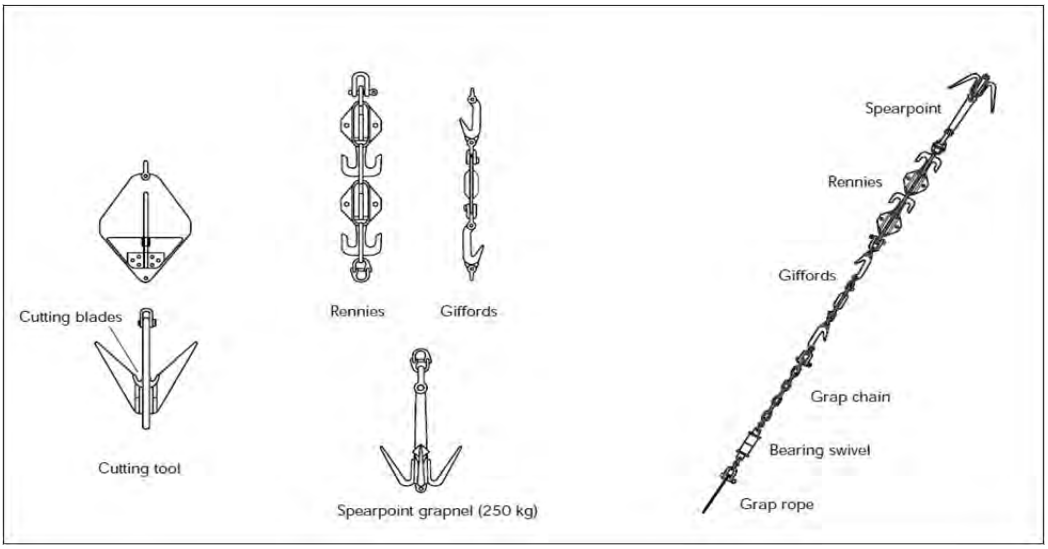
Source: ASN, 2024

Depending on availability, the RC operations will be conducted using the main lay installation vessel or a third-party vessel, and will be conducted in accordance with International Cable Protection Committee (ICPC) Recommendation 1 *"Management of Redundant and Out of Service Cables"* [ICPC], 2020), involving the following steps:

- The vessel will position itself perpendicular and close to the OOS cable;
- A grapnel is lowered from the stern of the vessel (**Figure 3-11**);
- The vessel moves towards the OOS cable, with the flukes of the grapnel penetrating up to 1.5 m of the seabed to unbury the OOS cable;
- The vessel will continue to move until the OOS cable is broken, leaving the two (2) ends of the OOS cable on the seabed (**Figure 3-12**);
- The vessel will then undertake grapnel runs to retrieve each OOS cable end, individually;
- Once the OOS cable is on the back deck, clump weights are attached to the cut OOS cable ends;
- The vessel will return the cut OOS cable ends (with the weights) to the seabed, leaving an empty space on the seabed that corresponds to the width of the proposed subsea cable route; and
- The OOS cable cut is kept onboard and disposed of onshore in accordance with MARPOL 73/78 regulations, Danish standards and waste disposal best practice.

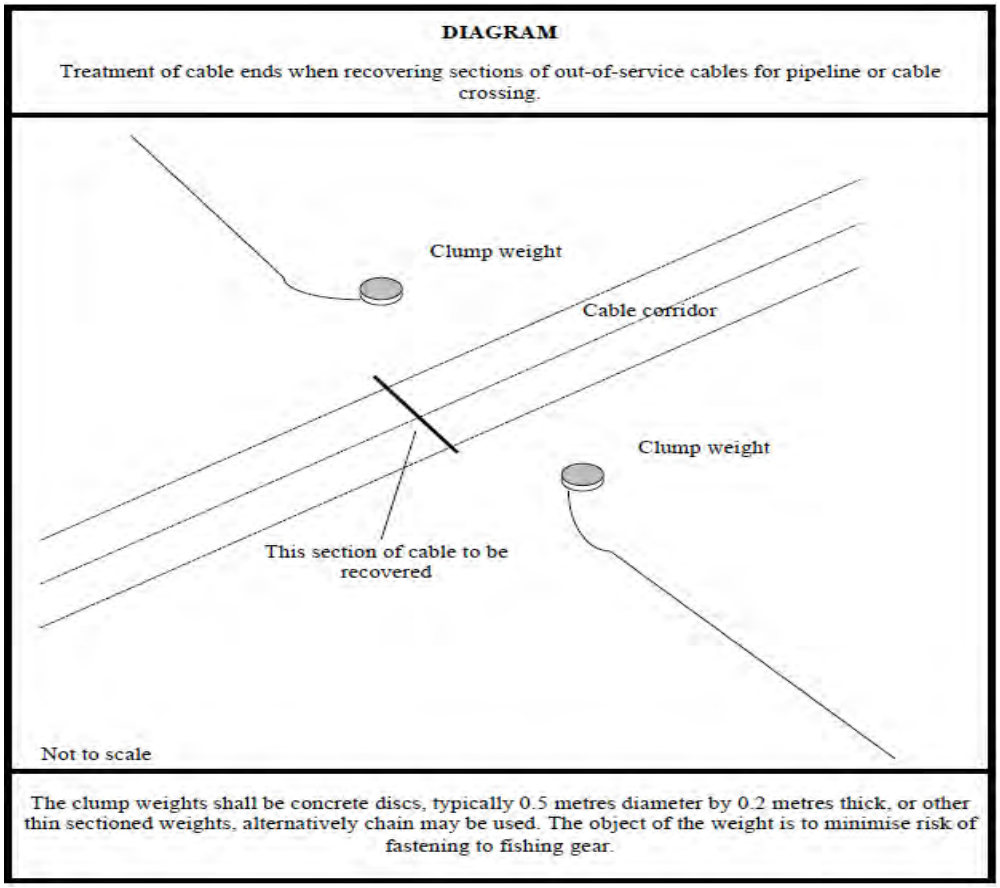
All RC operations would be conducted using the same navigational accuracy as that proposed for the subsea cable installation.

FIGURE 3-11 TYPICAL EXAMPLE OF GRAPNELS USED FOR THE ROUTE CLEARANCE OPERATIONS



Source: ASN, 2021

FIGURE 3-12 DIAGRAM SHOWING SECTION OF CUT OUT-OF-SERVICE CABLE TO BE RECOVERED



Source: ICPC, 2020

3.4.1.2 PRE-LAY GRAPNEL RUN

PLGR will only be carried out along segments of the route where subsea cable burial by plough is planned. Undertaken just before ploughing, PLGR is intended to clear the route of obstacles

and debris (e.g. discarded fishing gear, hawsers, scrap, etc.) that could potentially impede the safe progress of the subsea cable burial equipment (i.e. the sea plough) or cause damage to the installed subsea cable.

Depending on availability, the main lay installation vessel or a third-party vessel will be utilised for the PLGR.

During the PLGR, one (1) or an array of grapnels (**Figure 3-11**) is towed by the vessel along the length of the route to be ploughed. The vessel moves at a speed that allows the grapnels to remain in continuous contact with the seabed.

Should the first pass encounter any type of debris, two (2) additional parallel passes, on either side of the centre-line of the proposed subsea cable route, will be made.

The footprint of the PLGR will be limited to areas dredged by the grapnels and will not extend beyond the width of the proposed subsea cable route. As the grapnel is pulled across the seabed, typical blade seabed penetration of up to 40 centimeters (cm) to 80 cm is achieved, depending on seabed composition.

PLGR will not be conducted in hard bottom or rocky areas and will avoid in-service marine infrastructure.

The debris retrieved by the grapnels is kept onboard the vessel and will be disposed of onshore in accordance with MARPOL 73/78 regulations, Danish standards and waste disposal best practice.

3.4.2 INSTALLATION ACTIVITIES

3.4.2.1 MAIN SUBSEA CABLE LAY

Subsea cable Installation Vessel

The marine portion of the subsea cable will be installed from a purpose-built installation vessel (**Figure 3-13**).

The exact installation vessel to be utilised has yet to be confirmed but will be fully equipped with all the necessary equipment, tools, and facilities to safely handle and install, joint and test the subsea cable and power the submerged equipment, such as the sea plough and remotely operated vehicle (ROV) (**Figure 3-23**). In addition, the vessel will have sufficient power and dynamic positioning capability to carry out the installation in the expected weather and current conditions without the need for anchors. This reduces the impact to the seabed as compared to older models that used anchors to stabilise and position the vessel while burying subsea cables under the seabed.

Subsea cable lay software is used to install the subsea cable along the route with high positional accuracy and control of the subsea cable tension in combination with the ship's navigational systems. The average subsea cable installation speed is approximately 0.3 knots (14.4 km per day) for ploughing / subsea cable burial, and approximately 2 knots (90 km per day) during surface lay installation. The speed of the installation vessel may be amended to suit the topography of the seabed or any operational complexity encountered.

The vessel will be entirely self-sufficient for the duration of the installation and will also conform to IMO / MARPOL 73/78 standards and applicable Danish regulations in relation to waste management and ballast water management. This includes general requirements over

the control of waste oil, engine oil discharges and grey and black wastewater discharges; prevention of pollution by garbage from ships and prevention of air pollution; and operating procedures for dealing with incidents such as oil and waste spillages that potentially may threaten the marine environment. Under normal circumstances the vessel therefore represents no risk as a source of marine pollution. A vessel Waste Management Plan (WMP) will be implemented to manage the waste streams associated with the Aurora Project.

If necessary, a guard vessel will accompany the installation vessel to maintain surveillance around the worksite ensuring other vessels are kept clear to reduce the risk of collision. The guard vessel may be a local vessel employed for their knowledge of the installation area and other vessels operating in the area.

FIGURE 3-13 TYPICAL INSTALLATION VESSEL

Source: ASN, 2024

Subsea Cable Installation (including plough burial)

The main lay installation vessel will install the subsea cable in the Danish TS starting from the 15 m water depth. Wherever feasible, simultaneous subsea cable installation with plough burial will be undertaken along the proposed subsea cable route, to a target depth of 2 m.

Plough burial involves a sea plough (**Figure 3-14**), towed behind the main lay installation vessel, burying the subsea cable into the seabed as it progresses along the route. A typical ploughing configuration is shown in **Figure 3-15** with the towed plough normally two (2) or three (3) times the water depth behind the vessel.

During this activity, the subsea cable is fed through the plough into a narrow furrow at the bottom of a share blade which cuts into the seabed creating a trench for the subsea cable. As the share blade moves forward, the wedge of sediment falls back into the trench to cover the subsea cable. The plough target burial depth is 2.0 m, where seabed sediments and slopes allow.

The footprint of the plough on the seabed is limited to where the four (4) plough skids are in contact with the seabed and the plough share, which is approximately 0.2 m wide. A schematic of the plough footprint is provided in **Figure 3-16**.

The seabed will be left nearly undisturbed after ploughing. Only temporary track marks from the skids and the plough share will remain visible for a short period after installation, but are expected to be rapidly reinstated due to seabed currents and wave action.

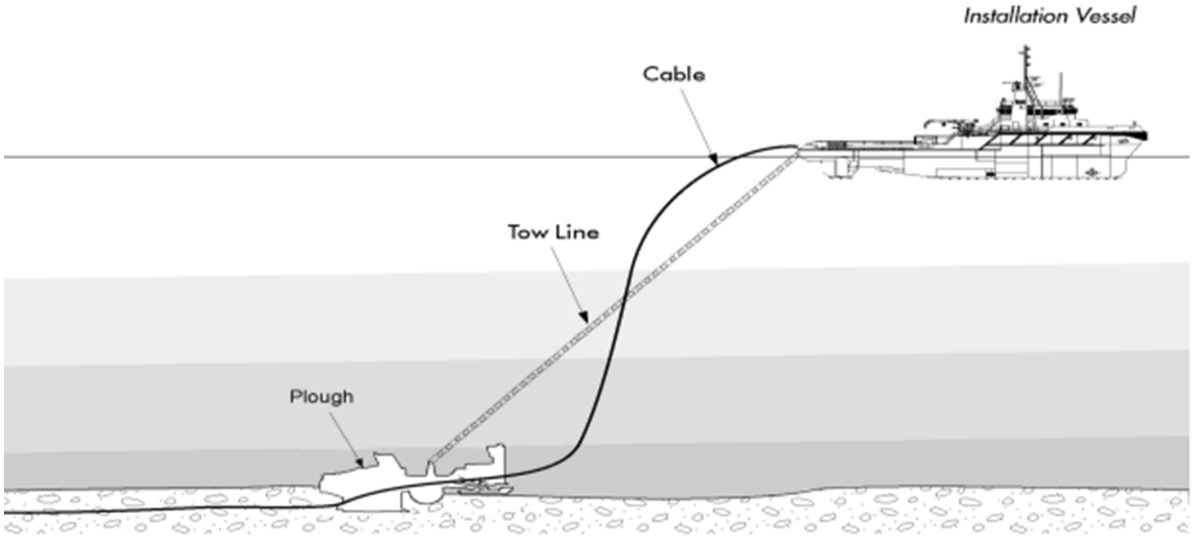
Ploughing is a well proven industry standard subsea cable burial process which will minimise the environmental impact compared to other available burial techniques such as water jetting, airlifting, sediment dredging, rock cutting and rock placement.

The plough will not be deployed in areas where steep or side slopes prevent it, or where the route crosses in-service infrastructures.

FIGURE 3-14 A SEA PLOUGH READY TO BE DEPLOYED FROM INSTALLATION VESSEL

Source: ASN, 2024

FIGURE 3-15 TYPICAL PLOUGHING CONFIGURATION

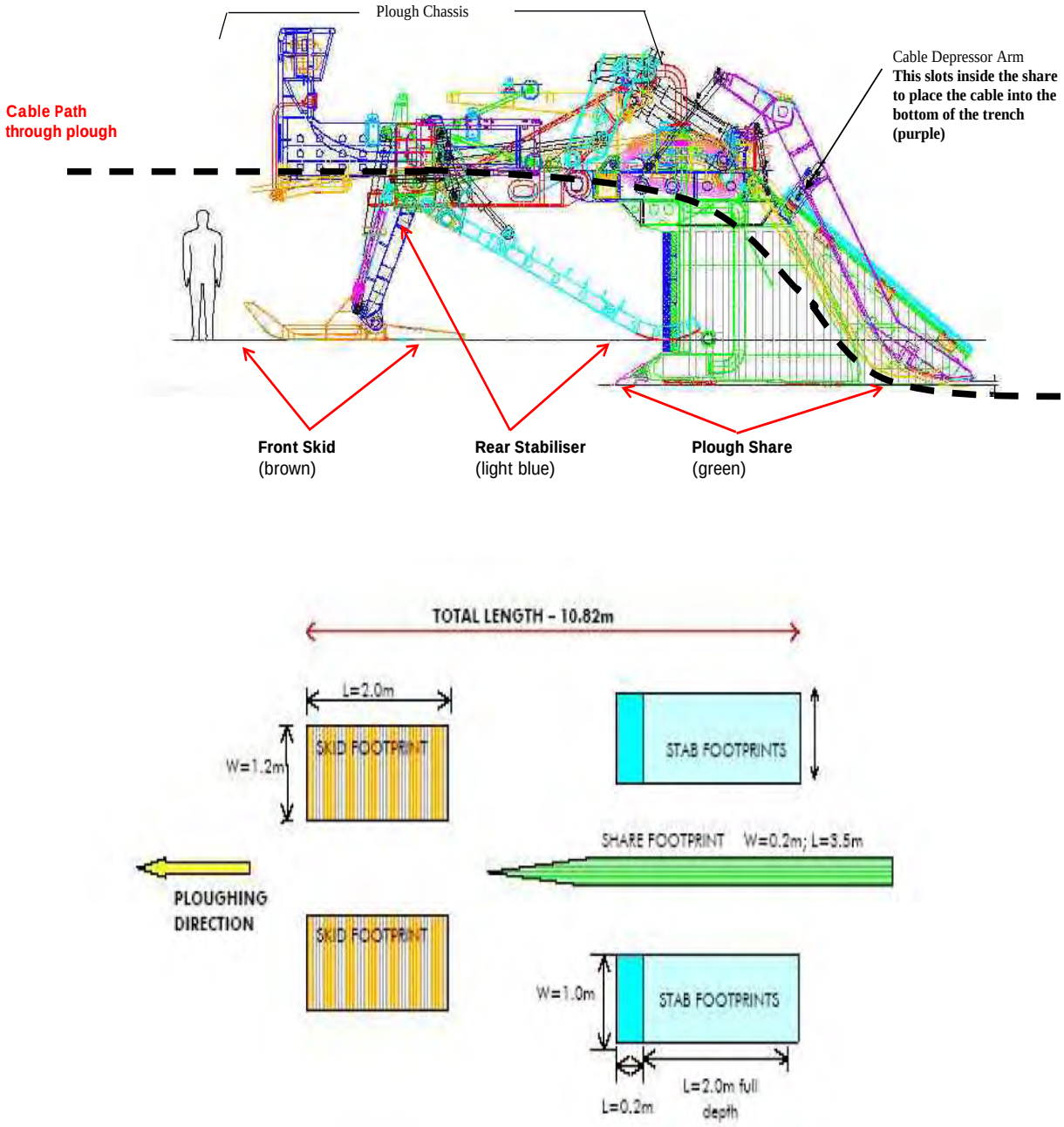


Source: ASN, 2024

Diagrammatic representation of the Cable Ship Ploughing set up with Tow Line, Umbilical and subsea cable

FIGURE 3-16 SCHEMATIC OF A SEA PLOUGH AND PLOUGH FOOTPRINT

Schematic of cable burial plough. The plough has two front skids, two rear facing stabilisers and a vertical, 2.3m deep share blade. These are the primary parts of the plough that come into contact with the seabed during cable burial operations.



Source: ASN, 2024

3.4.2.2 POST-LAY INSPECTION AND BURIAL

Post-Lay Inspection and Burial (PLIB) is the last step of the subsea cable installation process where the subsea cable has been left unburied. This process will involve the use of a ROV deployed and operated from the installation vessel or third-party vessel via a control umbilical (**Figure 3-17**).

FIGURE 3-17 ROV DEPLOYMENT FROM THE VESSEL

Source: ASN, 2024

Post-lay inspection (PLI) of the planned subsea cable burial areas is undertaken to check and verify the success of subsea cable burial. During the PLI, the ROV with on-board cameras and detectors, tracks along the route recording and measuring burial depths and identifying areas that may require further burial.

Post-lay burial (PLB) will be performed in planned plough burial areas at the following locations, using the same ROV:

- Crossings of in-service power and telecommunications cables[2];
- Unplanned plough skips; and
- Areas where seabed slopes are not suited for ploughing and where jetting burial is possible.

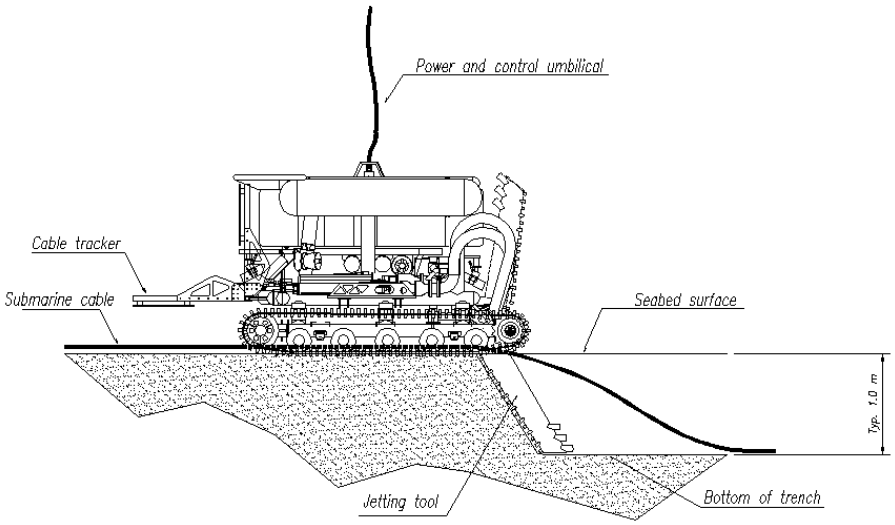
The ROV will be operated either in tracked or free flying (neutral buoyancy) mode. In free flying mode less power is available for water jetting tool(s). In tracked mode maximum water jetting power is available to bury the subsea cable. PLBs at subsea cable crossings will normally be performed in tracked mode.

During the PLB, a tracked ROV will use seawater jetting tools to cut a narrow trench approximately 0.2 m wide and liquefy the sediment to a target depth of approximately 2 m or to hard ground (whichever comes first) beneath the subsea cable, which then sinks under its own weight to the bottom of the trench. Most of the emulsified material will remain in the trench and quickly consolidate. Any residual open trench will backfill naturally (**Figure 3-18**).

[2] There are no in-service cables or pipelines within the route in Danish TS that will be crossed by the Aurora Project.

In shallower waters (less than 15 m water depth) where an ROV is not suitable, divers may examine the burial condition and bury the subsea cable manually if required.

FIGURE 3-18 POST-LAY BURIAL USING A TRACKED REMOTELY OPERATED VEHICLE



Source: ASN, 2024

Diagrammatic representation of subsea cable installation and Post Lay Inspection and Burial (PLIB) by ROV.

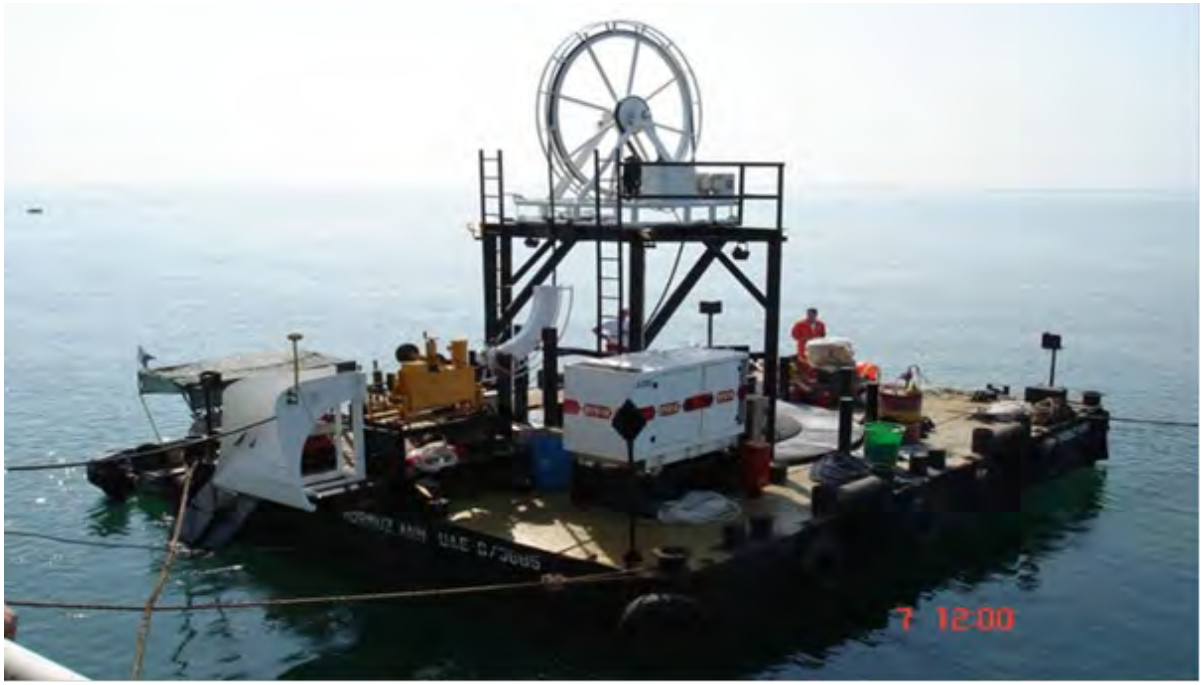
3.4.2.3 SHORE-END LANDING INSTALLATION

A description of the installation activities that are planned for the SEL of the subsea cable is provided as follows.

Pre-Laid Shore End

A Pre-Laid Shore End (PLSE) is planned for the landing of the subsea cable at Blaabjerg. The PLSE operation will be undertaken ahead of the main subsea cable lay (as presented in **Section 3.4.2.1**). This operation will involve the use of a shallow draft vessel or barge supported by small work boats and divers to install the subsea cable from the 15 m depth contour to the offshore HDD duct.

FIGURE 3-19 TYPICAL SHALLOW DRAFT VESSEL OR BARGE

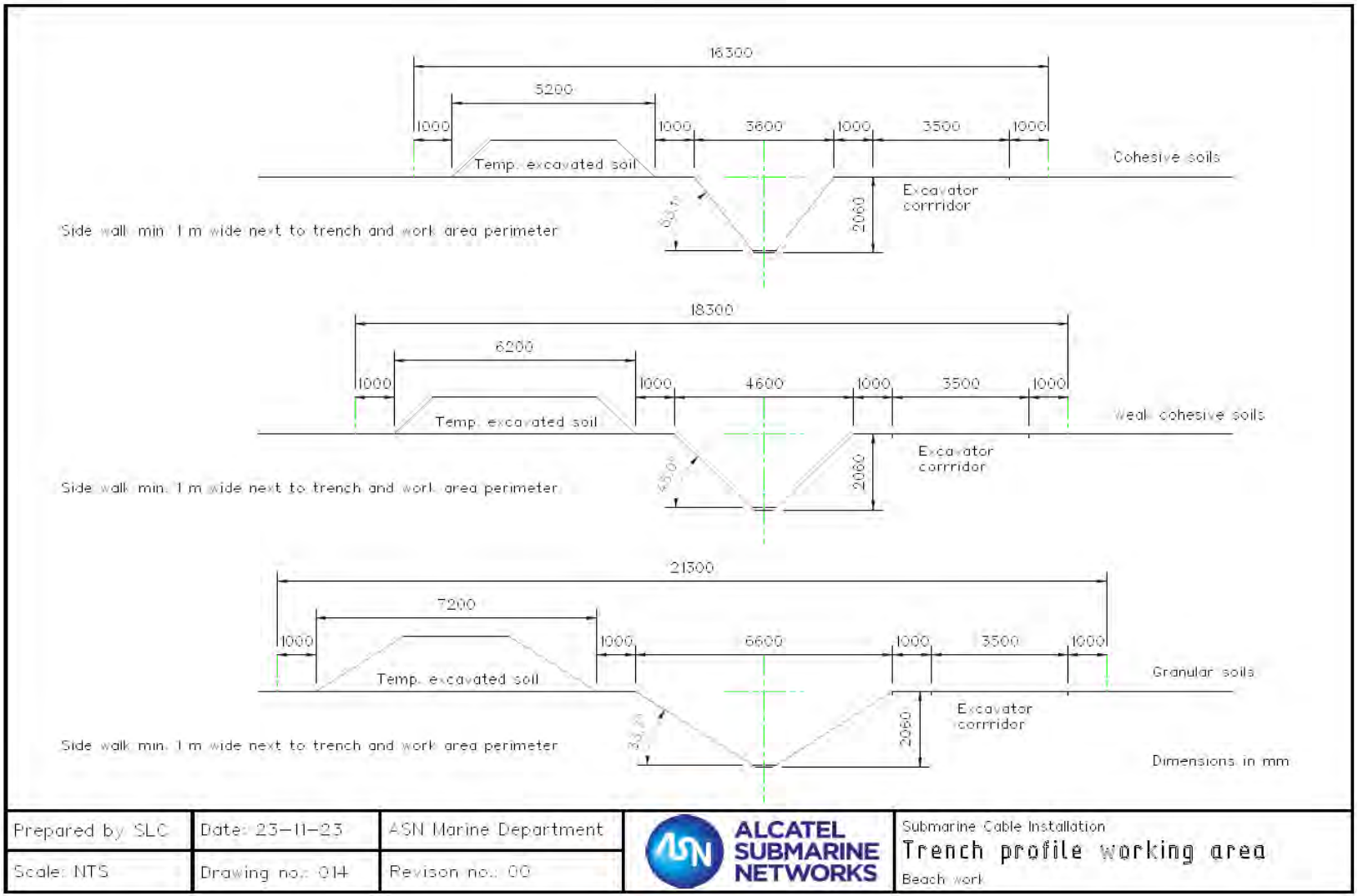


Source: ASN, 2025

The distance between the existing HDD duct entry (landward) and exit (seaward) points is approximately 1,024 m as shown in **Figure 3-3**. Divers will locate the HDD duct exit point (seaward) and excavate sediment from the end of the duct to clean the inside of the duct. A check valve or blanking plate may be installed at the offshore end of the duct to keep seawater from entering before the subsea cable is installed.

The PLSE operation will start at the existing BMH with the exposure of the seaward ducts and the excavation of a short trench between HDD duct entry point (landward) and the BMH. The trench is expected to be 20 cm at the base, 2 m deep (or to bedrock, whichever is reached first), and 2 m wide at ground level from the HDD duct entry point (landward), with transition landward to 1 m wide near BMH. The maximum width of working area between HDD duct entry point (landward) to the BMH is 12 m x 29 m long. Walkways of approximately 1 m wide will be created on either side of trench. **Figure 3-20** provides an indicative plan of the working area for the trenching.

FIGURE 3-20 INDICATIVE PLAN OF WORKING AREA FOR TRENCHING BETWEEN HORIZONTAL DIRECTIONAL DRILLING DUCT ENTRY POINT (LANDWARD) AND BEACH MANHOLE



During PLSE operation, the subsea cable is pulled from the barge and with the assistance of the support boats and divers, the subsea cable is connected to the messenger line within the HDD duct (seaward).

A pulling winch (**Figure 3-21**) will be set up near the BMH and secured to an excavator. A 4 ton pulling winch is expected to be used and the 13 ton excavator is expected to be 2.5 m wide.

The pulling winch will connect to the messenger line and be used to pull the subsea cable through the HDD duct (landward) towards the BMH and secured. A plan view of the proposed SEL pulling winch location is provided in **Figure 3-21**.

Once the subsea cable is pulled through the HDD duct (landward) to the BMH, it will be tested for electrical insulation and fibre continuity to ensure it is not damaged. From the HDD duct entry point (landward) to the BMH, articulated pipes would be fitted over the subsea cable to provide additional protection before the subsea cable is buried in the trench.

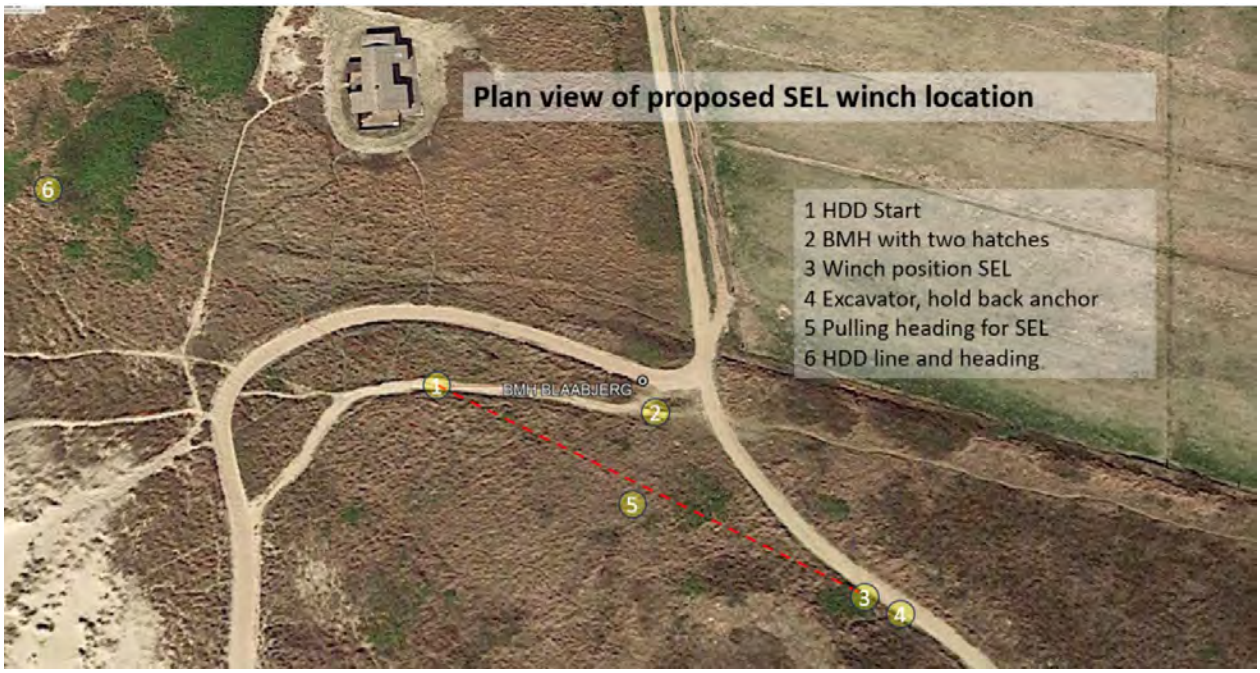
During the PLSE operation, the working area will be fenced with no access to the public. The noise levels will not exceed 115 dB.

Upon completion of the PLSE operation, the working area will be restored, and all equipment, tools and waste materials will be removed from the site.

FIGURE 3-21 TYPICAL WINCH EQUIPMENT

Source: ASN, 2024

FIGURE 3-22 PLAN VIEW OF PROPOSED SHORE-END LANDING PULLING WINCH LOCATION



Source: ASN, 2024

Inshore Subsea Cable Burial

Following completion of the PLSE and successful testing of the subsea cable, inshore burial of the subsea cable will be undertaken. Before undertaking this, divers will check that the subsea cable is exiting the HDD duct (seaward) and that it is lying flat on the seabed in an acceptable position. The divers will manually reposition the subsea cable, if required.

From the HDD duct exit point (seaward), approximately 25 m of articulated pipes will be fitted over the subsea cable before its burial. The articulated pipes will be installed by divers in 6 m water depth.

Inshore burial of the subsea cable up to 15 m water depth will be undertaken by divers using water jetting, airlifting or jetting sledge (as described below). The subsea cable will be buried to a target depth of 2 m or to hard ground whichever is reached first. At greater than 10 m water depth where it is deemed unsafe to use divers, a mobile ROV crawler will be used (as described below).

Note that the preference is to avoid using divers and only use the ROV crawler for all inshore burials, wherever possible.

Water Jetting

Handheld water jetting is a system where the diver uses a small portable water pump and fire hose often fitted with a special double nozzle to counterbalance the reaction force. This can be used from the waterline and out. This tool can also be used to fluidise the sand around the subsea cable to allow it to sink deeper into the sediments. The principle here is based on a combination of sediment being blown away and fluidisation.

Airlifting

The airlifting tool involves use of a long air hose and compressor. The airlift can be a 6-10 inch diameter x 2 m long hard polyvinyl chloride (PVC) pipe section fitted with a diver operated valve that will feed compressed air into the pipe. By holding the tube/pipe section in near upright and allowing air into the pipe this will generate a flow up and out of the pipe which in turn will start a suction process at the bottom end. The compressor may need to be accommodated on a small boat when working. The airlift system can only be considered at water depths of more than approximately 2 m. The principle is based on suction removal of sediments and will discharge all sediments in the water column.

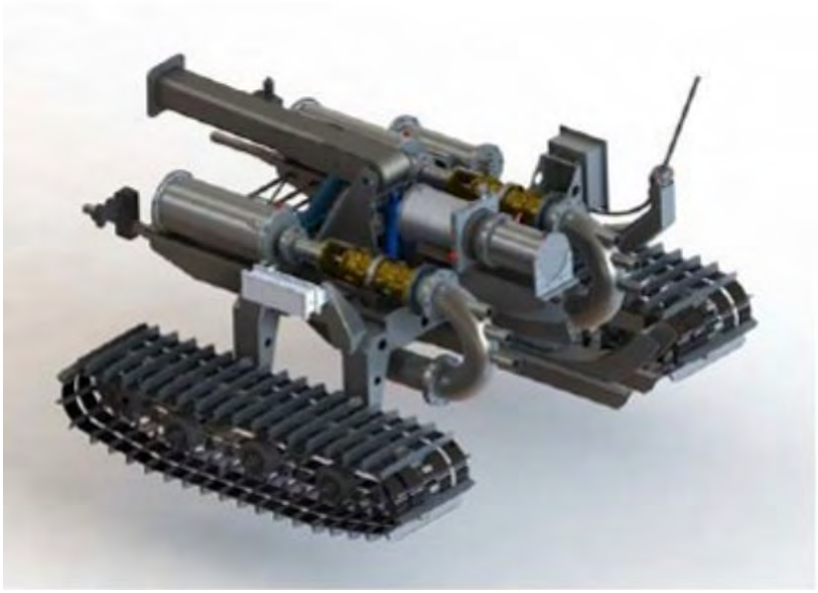
Burial Jetting Sledge

The jetting sledge is the most powerful inshore burial tool as it is often supported by a more powerful water pump. This pump can be in the range 100-400 horsepower (HP). This system needs a small barge/vessel platform to support the diving team and pumping unit. The jetting sledge fluidises the sand around the subsea cable, allowing the subsea cable to be lowered to the required depth (where possible). The jetting sledge may tow the pump barge as burial progresses.

Mobile Remotely Operated Vehicle Crawler

The PLSE vessel will be equipped with a mobile ROV crawler (**Figure 3-23**) which is a diver-less subsea ROV used to bury the subsea cable after its installation. Its main features are 425 HP jetting power and trench width up to 150 mm. The ROV fluidises the sand around the subsea cable, allowing the subsea cable to be lowered to the required depth (where possible). This ROV is deployed from the PLSE vessel where all the pumps and power feeding equipment are installed.

FIGURE 3-23 MOBILE REMOTELY OPERATED VEHICLE CRAWLER



Source: ASN, 2023

If inshore burial is not possible due to hard seabed conditions and the subsea cable is deemed to be at risk of being moved in the high energy surf zone, it may be pinned to the seabed using clamps (as presented in **Section 3.3.3**).

3.4.3 SUBSEA CABLE OPERATION AND MAINTENANCE

At the CLS, the subsea cable will interconnect to inland terrestrial networks, typically via a backhaul network into a network provider's inland Point-of-Presence (PoP). The CLS operations will involve powering the subsea cable's network transmission system, as well as the regular monitoring of the subsea cable. Connection from BMH to CLS and activity at the CLS is outside the scope of this EIA Screening Report, which encompasses activities from the boundary of Danish TS up to the BMH, only.

The subsea cable is intended to operate with no regular maintenance throughout the projected 25-year lifespan. However, should a problem be detected and the analysis concludes that repair of the subsea cable is damaged or broken, it may be necessary to retrieve and remove the damaged segment of the subsea cable and replace with new subsea cable, which is spliced into the system. Recovery of the damaged subsea cable involves grapnel activities similar to those used in RC operation (**Section 3.4.1.1**).

A repair vessel would be deployed and an ROV or electrodes used to determine the location of the fault. Once located, the subsea cable would be retrieved to the vessel by grapnels and then cut. The cut segment will be recovered on board the repair vessel and retained for disposal when onshore.

Following testing, the faulty portion of the subsea cable would be removed, and a new subsea cable segment joined to one end of the subsea cable. The two ends of the subsea cable would be re-joined and then lowered back into position on the seabed. If necessary, post-repair inspection and burial (PRIB) may be carried out following any subsea cable repairs to bury the repaired subsea cable. The repair process itself (including PRIB) would take a minimum of seven (7) days, subject to weather conditions. However, this does not take into account regional location of the subsea cable and jointing spares, vessel availability and the operational / work permits that may be required by the repair vessel.

3.4.4 RETIREMENT, ABANDONMENT OR DECOMMISSIONING

The Aurora Project has a planned in-use life span of 25 years, however the Aurora Project could operate long after this period.

At the end of its life span, the subsea cable and the associated terrestrial infrastructure will be dealt with in line with the legislation in force at the time and based on consideration of the Best Practicable Environmental Option (BPEO), taking into account socio-economic and environmental impacts, technical and financial feasibility and local regulations. The marine portion of the Aurora Project, including the subsea cable, and the existing HDD duct and BMH, may be dealt with differently in accordance with the following options:

- The subsea cable itself can either be removed or left *in situ*. Standard international industry practice is to leave subsea cables *in situ* where they have been colonised by benthic organisms and the impacts of removal would be greater than the impacts of the leaving the subsea cable in place, or where removal of the subsea (and often partially buried) cable is technically or economically impractical. The subsea cable will be inert and there are no significant long-term environmental impacts from leaving subsea cables *in situ*;
- Should removal of the subsea cable be undertaken, this would involve mobilising a vessel to recover the subsea cable and transport it to a suitable location for reuse, recycling or

disposal to an appropriate facility. Impacts of removal would be similar in nature to the impacts of installation.

Should a full or partial recovery of the subsea cable be required, a decommissioning plan that aligns with industry recommendations and standards (i.e. ICPC Recommendation 1-14A '*Management of Decommissioned and Out-of-Service Cables'*) will be developed and adhered to.

It should be noted that United Nations Environment Program (UNEP) documentation (Carter *et al.,* 2009) points out that the removal of subsea telecommunication cables and associated infrastructure should be evaluated on a case-by-case basis, as the procedures for withdrawal and some local conditions (based on soil / sediment type, crossing other cables, etc.) can often have a greater environmental impact than the procedures related to the installation itself.

3.5 PROJECT SCHEDULE

The CRS in Danish waters was completed in September 2024. The results of the CRS have been used to inform the final subsea cable route, identifying any obstacles that need to be avoided as well as informing the environmental baseline for screening.

The SEL installation (including PLSE) is anticipated to commence in Q4 2026. The PLSE will be undertaken before the other SEL activities. Prior to main subsea cable lay and plough burial, the pre-installation activities will take place along the subsea cable route; this is anticipated from Q1 2027 to Q2 2027. The main subsea cable lay and plough burial within the Danish TS is currently anticipated to commence in Q2 2027. The PLIB will commence after completion of the main subsea cable installation.

The estimated duration for installation from the BMH to the Danish TS boundary is presented in **Table 3-3**.

Arelion will obtain the required local permits to support landing installation and operation of the Aurora Project. It is currently understood that a permit has been granted (on 30 October 2023) which covers the onshore activities and is valid for activities utilising the existing infrastructure for the Aurora Project. Therefore, on this basis, it is understood that a renewal of the permit may be required subject to the installation schedule. However, no further permitting is required for the onshore activities given the planned reuse of existing infrastructure including the HDD duct and BMH.

On the day of landing, the PLSE operation will normally start at first light of the day. Following the landing of the subsea cable, it will take several days to complete in-shore burial activities and restore the beach.

TABLE 3-3 PROPOSED INSTALLATION DURATION FROM THE BMH TO THE DANISH TERRITORIAL SEAS BOUNDARY

Activity	Estimated Duration (subject to weather conditions)
RC and PLGR	5 days
PLSE including onshore subsea cable burial (from BMH to HDD duct entry point [landward])	9 days
Inshore Subsea Cable Burial (up to 15 m water depth)	2 days

Activity	Estimated Duration (subject to weather conditions)
Subsea Cable Installation (Including Plough Burial [>15 m water depth])	3 days
PLI and PLIB	3 days

The onshore work between the HDD duct entry (landward) and BMH will be undertaken during daylight hours including weekends; same also for the in-shore cable burial activities undertaken by divers.

As the cable needs to be installed in one continuous operation, the PLSE barge will work 24 hours per day including weekends; same also for the main subsea cable installation (including plough burial), the PLB and in-shore burials using the ROV crawler.

4. EIA SCREENING

The Executive Order of the Act on Environmental Assessment of Plans and Programmes and of Specific Projects (i.e. EIA) details in two (2) appendices, which projects require an EIA (Statutory or after a screening). Subsea cables are not covered in either of the appendices. However, the DCA may decide that an EIA must be compiled for a project as a result of their screening after the Coastal Habitat Order.

The DCA is the competent authority to grant the Establishment Permit according to the EIA Act's Section 16a. The Establishment Permit covers both installation phase and operation phase.

This section identifies environmental and social topics and explains why it is appropriate for the Aurora Project to be screened out of the requirement for an EIA when considering each topic individually as well as the Aurora Project as a whole. Further details on each of these topic areas are given below, including a description of the baseline findings and consideration of any significant effects.

4.1 MARINE PHYSICAL PROCESSES

This section describes the marine physical processes baseline in the Danish TS and assesses the potential for significant effects of the Aurora Project on marine physical processes, which can include but are not limited to mechanisms such as sediment transport, erosion and deposition or potential bathymetric and oceanographic changes. Impacts of the Aurora Project on marine physical processes may include:

- An increase in suspended sediment concentration (SSC);
- Changes to a sediment transport system;
- Changes to coastal and seabed morphology; and
- Changes to wave regime or tidal currents.

4.1.1 BASELINE

The marine physical processes offshore Study Area for the Aurora Project in the Danish TS, includes a coastal region – adjacent to the subsea cable landing site. It also includes an offshore region, which encompasses an area of the eastern North Sea, extending 15 km either side of the proposed subsea cable burial route (**Figure 4-1)**. The coastal region of the Study Area - approximately 15 km to the north and south of the subsea cable landing site at Blaabjerg, Denmark, forms a land bar, less than 2 km in width, that separates the Ringkøbing Fjord – a shallow lagoon, from the North Sea. Sandy beaches dominate this stretch of coastline, with relief being created by large dune systems that run parallel to the coast. At the Blaabjerg landing site, an existing HDD duct (landward) will be utilised for subsea cable burial, which will minimise and mitigate the disturbance to the seabed, water column and coastline in the initial 150 m of the subsea cable route. The inclusion of both coastal and offshore regions in the Study Area, suggest that impacts to both tidal and oceanic currents, coastal and seabed erosion, as well as sediment transport and deposition due to works carried out during the subsea cable burial must be considered.

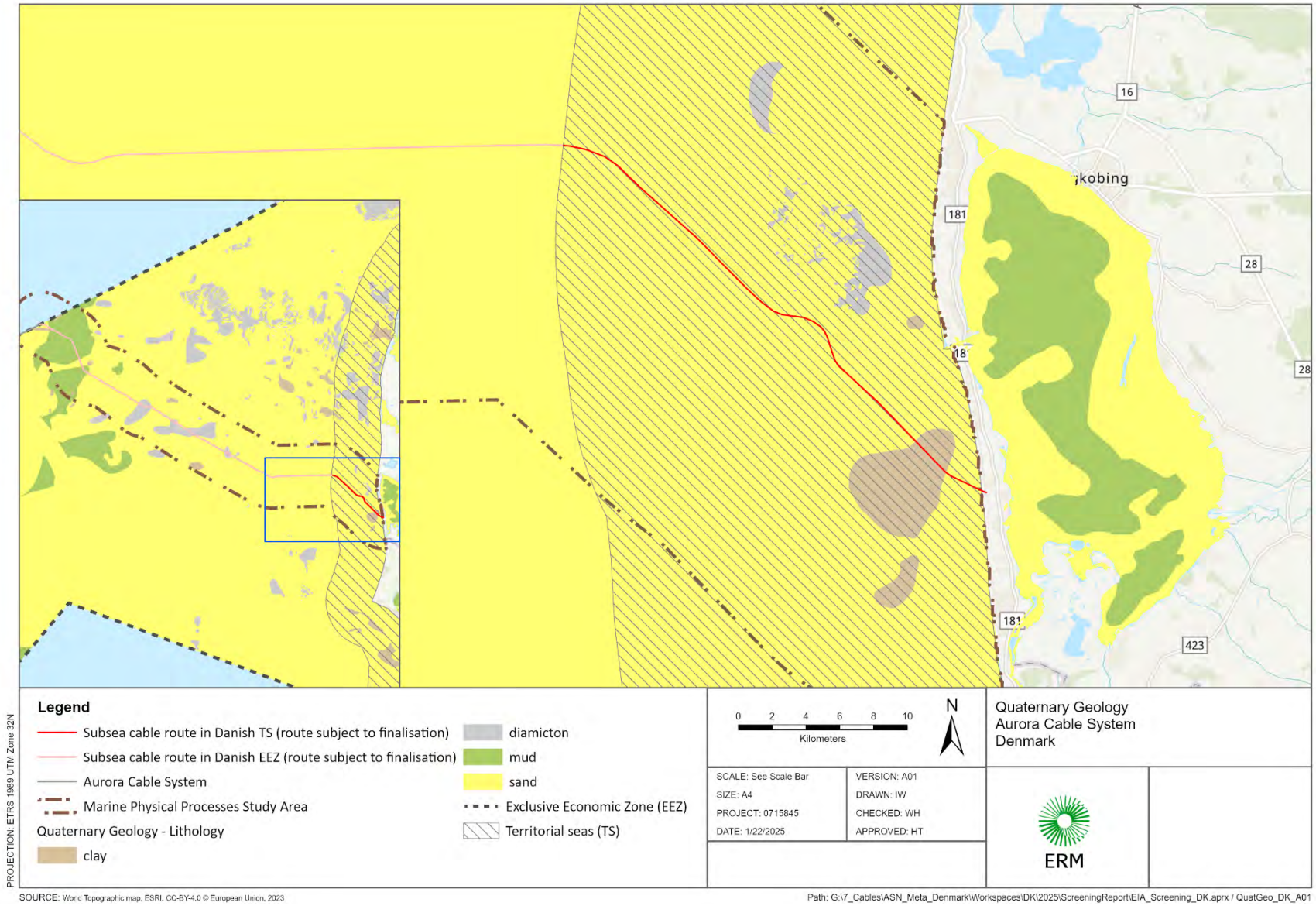
4.1.1.1 BATHYMETRY

Publicly available data and data collected from the CRS (completed in September 2024) have been used to investigate bathymetry in the marine physical processes offshore Study Area. Here, conditions can be described as being generally shallow, with no abrupt or significant bathymetric changes. Depths within the Study Area range from approximately 0.5 m at the location of the HDD duct exit point (seaward), 150 m offshore, gradually sloping to a maximum depth of approximately 30 m at the Danish TS boundary (EMODnet, 2022).

4.1.1.2 SEABED GEOLOGY

The seabed sediment along the proposed subsea cable route is predominantly made up of a fine to medium grained mobile sand layer, with areas of clay being also present. This mobile layer is approximately 0.5 m thick in the first 10 km of the route, with substratum composed of Eemian Marine Sediments, Holocene Marine Gravel, Miocene Sediments, and an assortment of Till and Glaciogenic Sandy Outwash deposits (Leth *et al.*, 2004). Further to the north, areas of Clay and Diamicton-dominated seabed can also be found. Morphologically, this mobile sand layer forms a series of north-east - south-west trending shoreface-connected ridges that sit close to the coast in the area through which the proposed subsea cable route passes, with thickness increasing toward the north from an initial approximate 0.5 m, to form two (2) large areas of sediment accumulation up to 4 m thick (Anthony and Leth, 2002). Although these large accumulations sit just to the north of the proposed subsea cable route, they are important to consider for the purpose of understanding the mechanics and direction of sediment transport.

FIGURE 4-1 SEABED GEOLOGY, AND MARINE PHYSICAL PROCESSES STUDY AREA, AURORA PROJECT, DANISH NORTH SEA



4.1.1.3 WAVES AND TIDES

The predominant wave direction in the Study Area is approximately north-west and south-east, with mean wave heights shown to increase in size moving offshore from the coast. The mean wave height at the shoreline is recorded as being less than 1.0 m, increasing to 1.7 m at the Danish TS boundary. Maximum significant wave heights at the coast are recorded as being >2 m, with these measurements increasing to >4 m further offshore (ABPmer, 2024). The north north-west-directed tidal flood current is stronger than the tidal ebb current (Leth *et al.*, 2004), resulting in a northward-dominated current. The tidal range also decreases northward and is <1 m in the marine physical processes Study Area.

4.1.1.4 SEDIMENT TRANSPORT

The initial approximate 0.5 m thickness of the mobile sand layer suggests that, where the subsea cable makes landfall, sediment supply is low with only a limited amount being available for transport at any time (Leth *et al.*, 2004). The morphology of the bedforms found within this layer implies that sediment transport is primarily controlled by tidal, and wave induced currents, with coastal currents having an overall northward net direction (Knudsen *et al.*, 2002). The thickening of sediments to the north also alludes to a decrease in tidal strength northwards, where suspended sediment carried from the south can no longer be efficiently transported.

4.1.2 EFFECTS ASSESSMENT

An effect is a physical change resulting from the proposed Aurora Project's activity, such as a change to hydrodynamics or sediment transport due to the placement of infrastructure, whilst an impact is the resultant measurable change in the environment. Therefore, an effect does not necessarily result in an impact if the environment is not sensitive to it. **Table 4-1** asseses the potential for significant effects on marine physical processes and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

The marine physical processes assessment also identifies changes as pathways that affect other section topics within the Aurora Project. Therefore, the information on these pressure pathways will be utilised by other section topics to inform the potential effects on their key receptors, such as changes in suspended sediment on Water and Sediment Quality (**Section 4.2**), Benhic Ecology (**Section 4.3**), Fis and Shellfish Ecology (**Section 4.4**) or Mrine Archaeology (**Section 4.13**). Thse potential effects are discussed in their respective sections.

TABLE 4-1 POTENTIAL FOR SIGNIFICANT EFFECTS ON MARINE PHYSICAL PROCESSES

Effect	Potential for Significant Effects
Increase in SSC	An initial increase in SSC is probable, particularly during the subsea cable burial phase of the Aurora Project – however this is likely to be short term and spatially restricted. The levels of suspended sediment may vary however, depending on the trenching asset being used and sediment type. Close to shore, the use of an existing HDD duct for subsea cable burial will mitigate suspended sediment levels at this location. Due to the nature of the Aurora Project and the trenching asset to be used during subsea cable burial, No Significant Effects or prolonged changes to SSC are likely to occur.

Effect	Potential for Significant Effects
Change to sediment transport system	Changes to a sediment transport system may occur if significant quantities of sediment are removed from the seafloor, or if permanent infrastructure associated with subsea cable burial is installed e.g. subsea c uarternary able protection. Installation of such infrastructure often results in areas of increased sediment scouring or deposition, and a resultant change in the overall concentration of sediment being transported. Currently there is no such subsea cable protection installation planned, nor should quantities of sediment be removed from the seabed. Therefore **No Significant Effects** to the sediment transport system are likely to occur.
Changes to coastal and seabed morphology	At the coast, an existing HDD duct will be utilised to facilitate subsea cable burial, emerging on the seabed approximately 150 m from the shoreline, thus ensuring that any potential effects that the Aurora Project may have on coastal morphology are mitigated. However, any indirect changes from temporary infrastructure linked to installation in the nearshore may potentially result in scour. Offshore, although a series of ridges can be found within the mobile sand layer, effective route engineering ensures that large ridges with significant slope will be avoided, and smaller features will typically be crossed perpendicularly. During subsea cable burial, the plough will simultaneously lay and bury the subsea cable, with the trench immediately backfilled as the plough advances. This, coupled with the mobile nature of this sand layer will ensure that any changes to seabed morphology will be minimal and spatially restricted. The installation vessel being deployed is also fitted with a dynamic positioning system. Therefore, anchoring during deployment will not be required, again ensuring that damage to the seabed is negligible. The utilisation of the existing HDD duct nearshore, coupled with effective route engineering offshore, will ensure that **No Significant Effects** are likely to occur to the coastal or seabed morphology during the installation of the Aurora Project.
Changes to wave regime or tidal currents	Anthropogenic changes to wave regimes and tidal currents can often be attributed to newly created infrastructure that can act as a physical barrier to the flow of tidal currents, or wave action. The subsea cable will be buried offshore where possible and an existing HDD duct will be used in the nearshore. Therefore **No Significant Effects** are predicted to occur to either the wave regime or tidal currents in the Study Area.

4.1.3 SCREENING OUTCOMES

The potential impacts to marine physical processes during the installation, operation and maintenance, and decommissioning phases of the Aurora Project, are determined to be 1. An increase in SSC, 2. Changes to the sediment transport system, 3. Changes to the coastal and seabed morphology, and 4. Changes to the wave regime or tidal currents within the Study Area.

Due to the nature of the Aurora Project, the lack of permanent infrastructure being installed above the seabed, the type of trenching asset being utilised, and effective route engineering, it is considered that any potential impacts will likely be negligible, short term and spatially restricted.

Based on these considerations, it was determined that there will be **No Significant Effects** to marine physical processes associated with the Aurora Project within the Study Area.

4.2 WATER AND SEDIMENT QUALITY

This section describes the water and sediment quality baseline in the Danish TS and assesses the potential for significant effects of the Aurora Project on water and sediment quality. Impacts of the Aurora Project on water and sediment quality may include:

- Decrease in water quality from temporary increase of total SSC and siltation;
- Decrease in water and sediment quality from accidental release of pollutants from the installation vessel and plant machinery;
- Decrease in water and sediment quality from release of seabed contaminants through sediment disturbance;
- Decrease of WFD designated water bodies status due to a decrease in quality of the quality elements and statutory receptors; and
- Decrease in bathing waters classification due to a decrease in water quality.

Water and sediment quality are included in the Marine Strategy Framework Directive (MSFD) (2008/56/ EC) under descriptors D5 (Eutrophication), D6 (Seabed Integrity), D7 (Hydrophysical conditions) and D8 (Contaminants). This section will also consider the WFD (2000/60/EC), the WFD designated coastal and transitional water bodies and the related statutory receptors potentially affected by the Aurora Project activities.

4.2.1 BASELINE

4.2.1.1 WATER QUALITY

Water quality is affected by its physical properties (i.e. salinity, temperature and SSC), the concentration of chlorophyll-a, nutrients, metals, hydrocarbons and other contaminants listed under the Environmental Quality Standards Directive (EQSD) (2008/105/EC) (concentrations above Environmental Quality Standards [EQS] thresholds define pollution).

Salinity and Temperature

Water circulation dynamics in the central North Sea are driven by differences in the physical properties of the water masses (e.g. salinity and temperature) meeting in the North Sea basin. Sea surface temperatures (SST) are subject to seasonal variation, with the surface temperature averaging approximately 7 degrees Celsius (°C) in winter months and between 15-19°C in summer months (DHI, 2014). The lowest temperature is found in the northern section and the highest temperature is found in the shallow areas of the southern section of the North Sea.

Salinity within the North Sea basin ranges between 25 to 35 practical salinity units (PSU) (EMODnet, 2024). In the west, it is generally more saline, becoming brackish at coastal areas in the east due to freshwater runoff, freshwater inflow from estuaries and rivers and close proximity to the Baltic Sea (European Environment Agency [EEA], 2008).

Nutrients and primary production

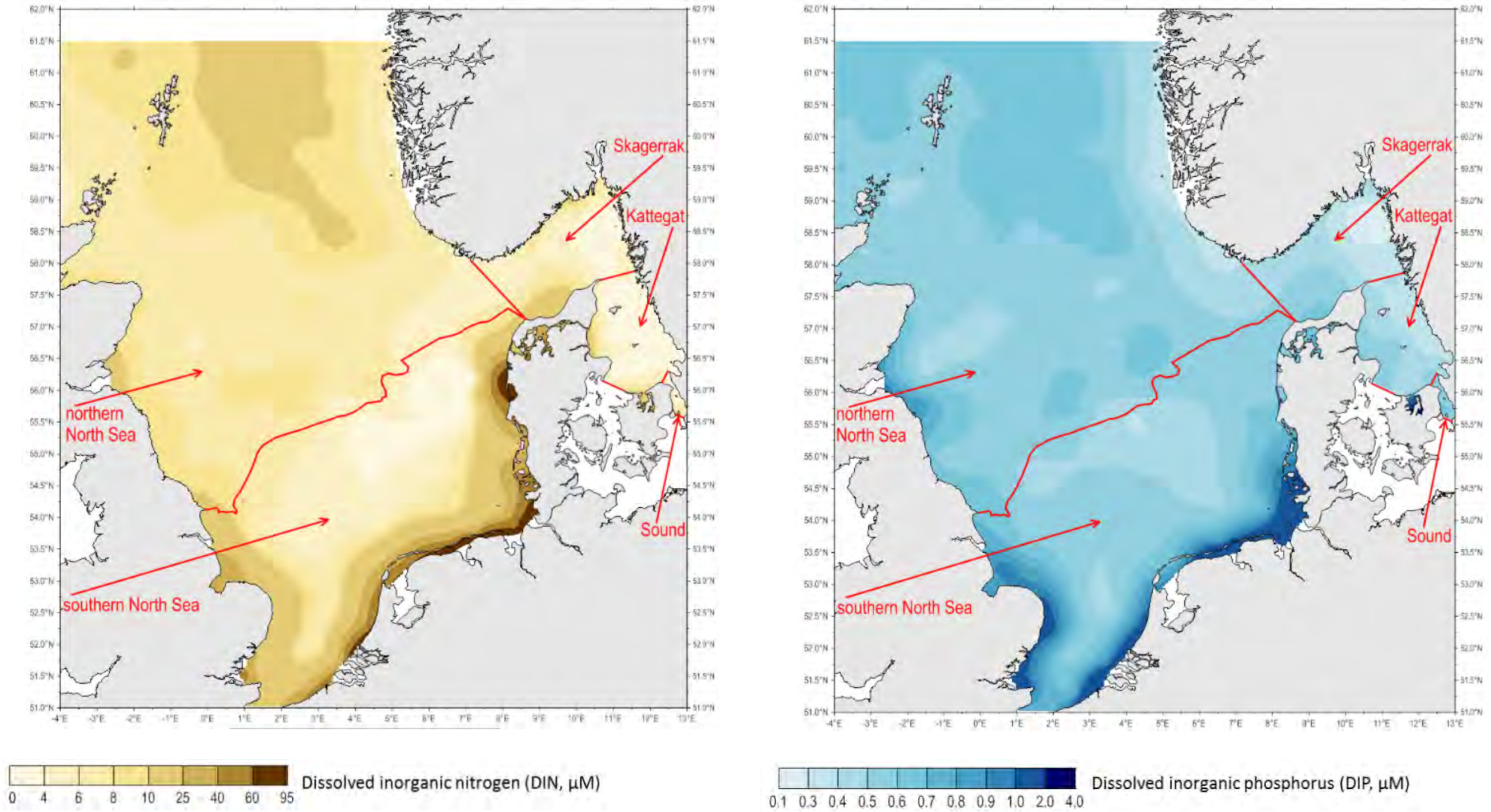
The North Sea is characterised by seasonally stratified waters affecting biogeochemical and primary productivity cycles. Nutrients reach the North Sea through land runoff, the atmosphere, weathering processes, rivers and direct discharges including nitrogen, phosphorous and silicate, which are discharged due to anthropogenic sources. Anthropogenic sources include agriculture, aquaculture, combustion and wastewater activities. The levels of

dissolved inorganic nitrogen (DIN) and dissolved inorganic phosphorous (DIP), during the winter season, is indicative of the quantity of these discharges in the water column and consequently, water quality (OSPAR, 2017). Nitrogen levels in rivers which flow out into the North Sea typically originates from agricultural use of fertiliser, and the presence of phosphorous from erosion or wastewater (EEA, 2008).

Dissolved macronutrients enrichment can cause rapid primary producers' growth (phytoplankton bloom) leading to excess algal biomass and eutrophication (MSFD Descriptor 5) events; these are characterised by high concentrations of chlorophyll-a (indicator parameter) (Song *et al.,* 2022). Primary production in relation to marine biodiversity (MSFD Descriptor 1) and food webs (MSFD Descriptor 4) is considered to ensure good environmental status by monitoring abundance and distribution. Excess abundance of primary producers can lead to eutrophication, which can decrease available oxygen concentration (hypoxia) due to bacteria-driven decomposition processes and algal respiration induced by light-limitation, subsequently affecting the growth of other living organisms in the area (EEA, 2008).

Average winter concentrations of DIN and DIP in the North Sea are shown in **Figure 4-2**, respectively (OSPAR, 2017). The concentration of dissolved macronutrients is higher along coastal areas.

FIGURE 4-2 DISSOLVED INORGANIC NITROGEN (LEFT) AND DISSOLVED INORGANIC PHOSPHOROUS (RIGHT) IN THE DANISH NORTH SEA (1990-2014)



Source: OSPAR, 2017

At the proposed subsea cable landfall, the DIN concentration is 95 micromolar (µM), with the concentration decreasing with increasing distance from land to 0-4 µM. The DIP concentration at the landing site is 0.4-0.5 µM, which decreases with increasing distance from land to as low as 0.1 µM.

4.2.1.2 WATER FRAMEWORK DIRECTIVE

The WFD (2000/60/EC) has been the main law for water protection in Europe and focuses on ensuring all groundwater and surface waters achieve 'good' ecological status / potential by 2027, including coastal and transitional water bodies, bathing water, protected sites and shellfish waters up to 1 nm off the coast and 12 nm for chemical status.

The assessment of the impacts from the Aurora Project's installation activities on compliance with the WFD has utilised the generic environmental objectives outlined in Article 4.1 of the WFD. These objectives include:

- Objective 1: Avoid any alterations that could affect or lead to a failure in achieving Good Ecological Status (GES) or Potential for surface water, or lead to a decline in surface water Ecological Status or Potential; and
- Objective 2: Prevent any changes that may permanently obstruct or undermine the achievement of Environmental Objectives in other water bodies.

This evaluation has been conducted for the relevant water bodies to pinpoint potential alterations in hydromorphological aspects, and physical and biological quality elements attributable to the preferred option. The WFD Compliance Assessment methodology is completed in the following stages:

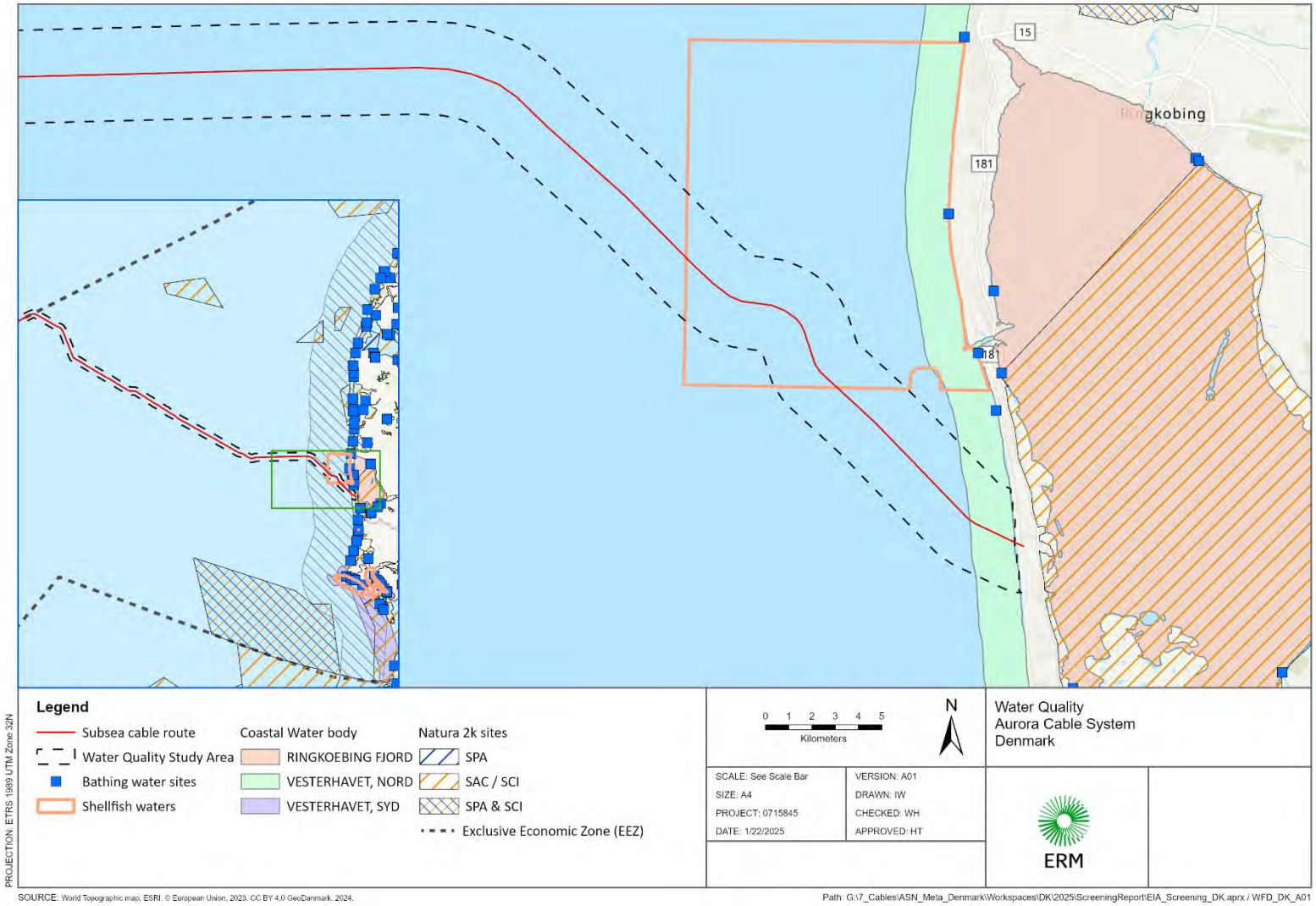
- Stage 1 Screening: identify activities associated with the Aurora Project (at each phase) that have the potential to have an impact, and identify the water bodies hydrologically connected to the Aurora Project activity;
- Stage 2 Scoping: identify the potential risks to each water body and each receptor; and
- Stage 3 Impact Assessment: assess the hydrological connectivity (pathway) of the site investigation activities (source) on the WFD water bodies and other statutory receptors.

Further considerations are then made in relation to additional mitigation measures required to prevent impact on the WFD water body status.

The Executive Order on Water Planning (LBK no. 126 of 26/01/2017) implements the WFD in Denmark. In accordance with this legislation, the Danish Ministry of the Environment is the authority responsible for implementing the WFD and published a management plan for each sub-region covering the period 2021-2027 (DHI, 2021).

The WFD sites within 2 km (WFD impact radius) of the Study Area can be seen in **Figure 4-3**.

FIGURE 4-3 WATER FRAMEWORK DIRECTIVE WATER BODIES LOCATED WITHIN 1 NAUTICAL MILE OF THE DANISH COAST AND LOCATED WITHIN 2 KILOMETRES OF THE AURORA PROJECT STUDY AREA



Source: Miljøministeriet Miljøstyrelsen, 2021. Amended by ERM, 2024.

The current status of the WFD water bodies and designated protected sites of interest is detailed in **Table 4-1**.

TABLE 4-1 ECOLOGICAL STATUS OF WATER FRAMEWORK DIRECIVE WATER BODIES LOCATED WITHIN 1 NAUTICAL MILE OF THE DANISH COAST AND DESIGNATED PROTECTED SITES

Receptor	Category	Status/Classification (2021)	Distance from route (km)	Distance from Study Area (km)
Ringkøbing Fjord	Coastal Water Body	Good Ecological Potential	1	1
Vesterhavet Nord	Coastal Water Body	Good Ecological Status	1	0
Vesterhavet, årgab	Bathing Water	Excellent	4.9	2.1
Bjerge strand hv.sande	Bathing Water	Excellent	6.4	3.5
Vesterhavet, hvide sande	Bathing Water	Excellent	7.2	4.1
Hv.sande nord	Bathing Water	Excellent	11.0	3.9
Bjerregård (ringkøbing fjord sydvest)	Bathing Water	Good	6.6	4.7
Shellfish Waters		N/A	0	0

Source: Miljøministeriet Miljøstyrelsen, 2022

The Ringkøbing Fjord under assessment is presently categorised as a Heavily Modified Water Body (HMWB) which possesses a designated set of mitigation measures aimed at facilitating the attainment of GES. The Aurora Project activities will not interfere with the implementation of these mitigation measures. It should also be noted that the landing site at Blaabjerg is likely to go through WFD designated shellfish waters and in proximity to designated Natura 2000 sites (see **Section 4.17** [Designated Sites for Nature Conservation: Natura 2000 Sites]).

The WFD Assessment considers existing conditions of the following quality elements to determine the ecological status of the water body:

- Phytoplankton;
- Rooted plants (cover seeded);
- Benthic invertebrates;
- Water clarity;
- Oxygen conditions; and
- Nationally specific substances.

The chemical status is determined from identification of water pollutants known as ‘priority substances’ that pose the greatest concern and risk to and via the aquatic environment across the EU.

The ecological and chemical condition, considering the above quality elements, can be seen for both coastal water bodies present within the Study Area (**Table 4-2**).

TABLE 4-2 EXISTING CONDITIONS CONSIDERING WATER FRAMEWORK DIRECTIVE QUALITY ELEMENTS

Quality Elements	Ringkøbing Fjord	Vesterhavet Nord
Ecological conditions		
Phytoplankton	Good ecological potential	Good ecological status
Rooted plants (cover seeded)	Good ecological potential	Good ecological status
Benthic invertebrates	Good ecological potential	Good ecological status
Water clarity	Good ecological status	Good ecological status
Oxygen conditions	Good ecological status	Good ecological status
Nationally Specific Substances	Good ecological potential	Good ecological status
Chemical conditions		
EU priority substances	Good (coastal waters out to 1 nm) Good (1 nm out to 12 nm)	Good (coastal waters out to 1 nm) Good (1 nm out to 12 nm)

Source: Miljøministeriet Miljøstyrelsen, 2022

Due to the large size of the water bodies, the small size of the subsea cable landing site and the short-term nature of the Aurora Project activities, no quality elements will be significantly impacted by the Aurora Project activities. Therefore, the Aurora Project will not affect the status of the water bodies and is consequently considered to be WFD compliant.

4.2.1.3 SEDIMENT QUALITY

Sediment quality is determined by the concentration of compounds such as heavy metals, Polychlorinated Biphenyls (PCBs) and hydrocarbons. **Table 4-3** shows the guidelines published by the Danish Environmental Protection Agency relating the threshold values for marine sediments pollution applicable to Denmark. A Lower Action Level threshold (harmless level of contamination) and an Upper Action Level threshold (harmful contamination) are set for the concentration of metals, PCBs, Polycyclic Aromatic Hydrocarbons (PAHs) and other pollutants in marine sediments (OSPAR, 2008).

TABLE 4-3 DANISH ACTION LEVELS FOR ENVIRONMENTAL HAZARDOUS SUBSTANCES

Substance	Lower Action Level, mg/kg DW	Upper Action Level, mg/kg DW
Copper (Cu)	20	90 (200 kg/year/port)
Mercury (Hg)	0.25	1
Nickel (Ni)	30	60
Zinc (Zn)	130	500
Cadmium (Cd)	0.4	2.5

Substance	Lower Action Level, mg/kg DW	Upper Action Level, mg/kg DW
Arsenic (As)	20	60
Lead (Pb)	40	200
Chromium (Cr)	50	270
Tributyltin (TBT)	0.007	0.2 (1 kg/year/port)
PCB	0.02	0.2
PAH	3	30

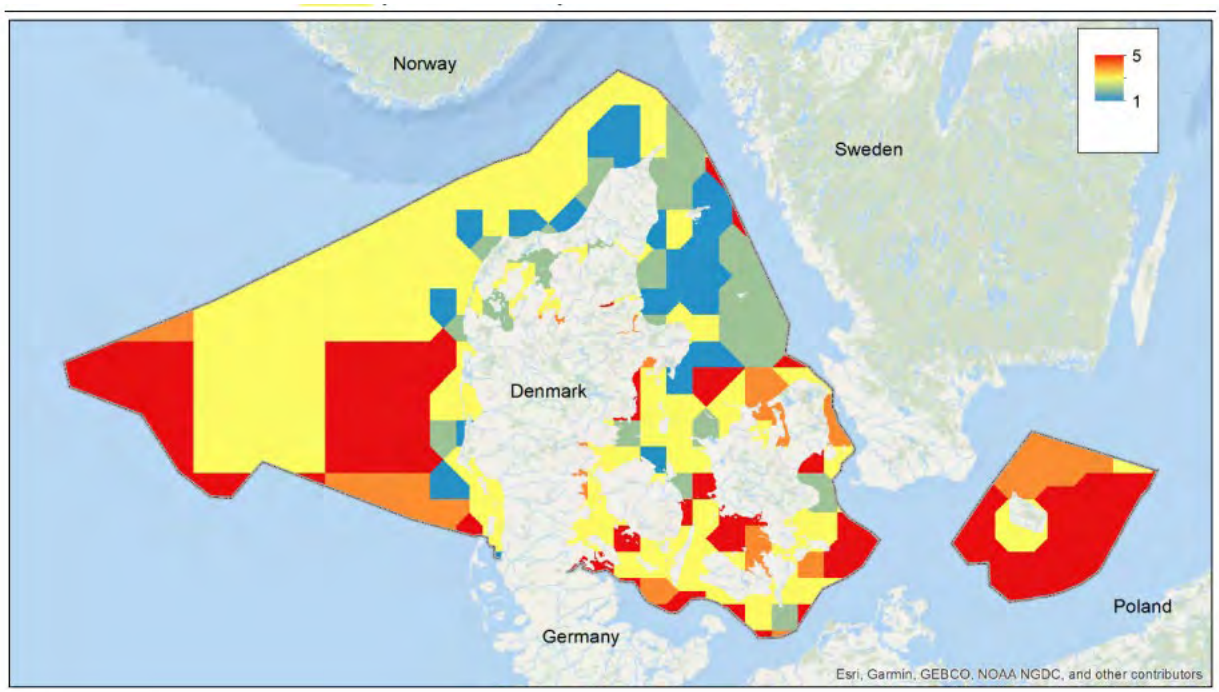
Source: LBK 9702 of 20/10/2008

Heavy metals are an essential element which are naturally occurring in low concentrations and include mercury (Hg), cadmium (Cd), copper (Cu), lead (Pb), chromium (Cr) and zinc (Zn). Human activities have increased metal concentrations in the marine environment, which can be toxic above threshold concentrations and bioaccumulates in higher trophic levels of marine organisms (biomagnification) (Danovaro *et al.,* 2023). Heavy metals have a wide industrial use including batteries, fertilisers, paints and ships. In the southern North Sea, sources of zinc (Zn) and lead (Pb) in the sediments have been associated with Elbe and Weser River discharges from anthropogenic mining in the Harz Mountains and the German Erzgebirge regions.

NIVA (2020) assessed the level of contamination of Danish TS, which measured concentrations of different contaminants compared with agreed threshold values to determine a contamination ratio. The assessment uses CHASE+ classifications of a numerical scale 1: High, 2: Good, 3: Moderate, 4: Poor and 5: Bad, which uses OSPAR contamination thresholds (ICES, 2022). Level 3-5 contamination is defined as ‘problem areas’ where there is evidence of undesirable disturbance to the marine ecosystem due to contaminants (Tett *et al.*, 2008).

At the proposed landing site, the contamination level is level 3 contamination (moderate), increasing to level 5 contamination (bad) further offshore, and returns to moderate contamination in the north of the Danish EEZ. There are small areas of level 1 (high) and level 2 (good) classification inshore. The main offshore anthropogenic sources of contamination include shipping, aquaculture, oil spills, deep-sea mining and offshore oil platforms.

FIGURE 4-4 ARINE CONTAMINANTS IN THE DANISH NORTH SEA



Source: NIVA, 2020

The triggering substances for 'problem areas' within sediment were metals (i.e. mercury (Hg), cadmium (Cd), copper (Cu), lead (Pb), etc.), organobromines, PCBs, other organohalogens, PAHs, imposex, organotins and organochlorines respectively. Some of the most toxic contaminants, such as the PCB congener CB118, mercury and cadmium, are likely to continue to pose a risk for marine organisms (OSPAR, 2017).

4.2.2 EFFECTS ASSESSMENT

Based on current parameters that are of relevance to water and sediment quality, **Table 4-4** assesses the potential for significant effects on water and sediment quality receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-4 POTENTIAL FOR SIGNIFICANT EFFECTS ON WATER AND SEDIMENT QUALITY

Effects	Potential for Significant Effects
Decrease in water quality from temporary increase of temporary SSC and siltation	During the installation period, through trenching activities, seabed sediments will be disturbed and resuspended. Resuspended sediments may create a temporary and localised plume which will settle and deposit back on the seabed. The levels of suspended sediment may very however, depending on the trenching asset being used and sediment type. Close to shore, the use of an existing HDD duct will avoid disturbance of seabed sediments at this location. Therefore, while there may be some impact on water and sediment quality, only a small amount of sediment is expected to be disturbed and due to the small scale and short term nature of the Aurora Project, there will be No Significant Effect on water and sediment quality from temporary SSC, turbidity and siltation.

Effects	Potential for Significant Effects
Decrease in water and sediment quality from accidental release of pollutants from vessels and plant machinery	During installation, the installation vessel and associated equipment will be in use, which poses the risk of accidental release of pollutants (e.g. oils, diesel and lubricants). The magnitude of an accidental spill is expected to be limited to a short period and be further reduced through adoption of appropriate standard mitigation measures and the limited chemical or oil inventory for the installation vessel and any onshore plant machinery (see **Sections 2.1** and **3.4.1**). In the event of accidental release of pollutants, spills and leaks, these compounds could enter the underlying water column, where they will be transported and dispersed by currents and deposited over distances which will introduce potentially long-term changes to the receptors. Due to the nature of the Aurora Project, and the implemented embedded mitigation measures (**Section 5.1**) and management plans in place, it is expected there will be **No Significant Effect** on water and sediment quality.
Decrease in water and sediment quality from release of seabed contaminants through sediment disturbance	During the installation period, seabed sediments will be disturbed and resuspended. Resuspended sediments may contain settled contaminants such as heavy metals and other pollutants, which will be resuspended within a temporary plume of higher SSC, which will settle locally and deposit back on the seabed. This impact may alter water and sediment quality through seabed sediment changes. Although there is only a small amount of sediment expected to be disturbed, the high concentrations of nutrients and contaminants assessed in the sediment show there is potential for release of contaminants in resuspended sediment, which will suspend into the water column and reduce water quality. The use of a sea plough to install and bury the subsea cable in one (1) process, together with the use of an existing HDD duct through the nearshore area and the small scale and short duration of activities for the installation, operation and maintenance, and decommissioning phases mean that **No Significant Effect** on water and sediment quality is anticipated.
Decrease of WFD designated water bodies status due to a decrease in quality of the quality elements and statutory receptors	During the installation period which introduces seabed and water column disturbances, the quality elements determining the ecological and chemical status of the designated WFD water bodies may be affected on a temporary basis.
Decrease in bathing waters classification due to a decrease in water quality	During the installation period which introduces seabed and water column disturbances and the potential for unplanned events to occur, the water quality of bathing waters may be affected temporarily.

4.2.3 SCREENING OUTCOMES

The impacts associated with the installation, operation and maintenance, and decommissioning of the Aurora Project were determined to be temporary, including increase of temporary SSC and siltation, accidental release of pollutants from the installation vessel and plant machinery, accidental release of contaminants through sediment disturbance on water and sediment quality receptors, and potential for a decrease in status of water bodies and decrease in bathing water classification as part of the WFD. **No Significant Effects** are expected from any of the impacts on water and sediment quality receptors.

A WFD compliance assessment has been carried out within this EIA Screening Report to comply with the Danish legislation requiring that the receptors protected by the WFD are not impacted by the Aurora Project activities. The Aurora Project activities are expected to have, at most, temporary and short-term impacts to designated WFD water bodies. Temporary impacts are not considered to result in deterioration in WFD status of the water body, if the water body:

- Is only impacted for a short period of time;
- Recovers within a short-term period (one [1] to two [2] tidal cycles, or 14-28 days); and/or
- Recovers without the need for any restoration measures.

Therefore, the Aurora Project activities will not cause deterioration in WFD status of any designated coastal or transitional water body, or hinder the implementation of any mitigation measures necessary for the water body to maintain good environmental potential within 2 km of the Study Area.

4.3 BENTHIC ECOLOGY

This section describes the benthic ecology baseline in the Danish TS and assesses the potential for significant effects of the Aurora Project on benthic ecology receptors. Impacts of the Aurora Project on benthic ecology may include:

- Temporary habitat disturbance;
- Long-term loss of habitat;
- Temporary increase in SSC, turbidity, and siltation;
- Accidental release of pollutants from the installation vessel;
- Accidental release of contaminants through sediment disturbance;
- Introduction and colonisation of infrastructure by Invasive Non-Native Species (INNS); and
- Long-term changes in physical processes.

4.3.1 BASELINE

The landing site in Norre Nebel, at Blaabjerg, Denmark comprises sandy beaches backed by sand dunes. There is limited information available on the intertidal habitats present at the landing site, however based on available information these are expected to be characteristic of the European Nature Information System (EUNIS) broadscale habitat MA52 ‘Atlantic littoral sand’ (EEA, 2024).

Analysis of the Viking Link landfall location approximately 18.5 km south of the Blaabjerg plantation (2014-2016) and investigations approximately 36 km south of the Aurora Project landing site at Horns Rev III offshore windfarm, concluded there were no macroflora in the shallow coastal waters (Randløv *et al.,* 2019). The nearshore waters of the Viking Link comprised soft-bottom fauna communities characterised by the clam (*Limecola balthica*) (Randløv *et al.,* 2019). The nearshore waters of the Horns Rev III offshore windfarm comprise fine sediments, with sand that is silty / clayey (Macnaughton *et al.,* 2014). The highest percentages of 3-4% of silt and clay were found near the coast, and this provides a suitable habitat for species such as cut trough shell (*Spisula subtruncata*).

Further offshore within the Danish TS, seabed sediment along the Viking Link cable route consisted of sandy sediments characterised by *Tellina fabula, Montacuta ferruginosa* and *Echinocardium cordatum* (Randløv *et al.,* 2019). In the offshore waters of the Horns Rev III offshore windfarm, the sediment is sandy and can vary from gravel, gravelly sand, and sand in the southern and western parts of the area, which becomes finer towards the north-east, with minor fractions of silt and clay (Macnaughton *et al.,* 2014). The habitat in the Horns Rev III offshore windfarm was dominated by fine to coarse sand, which contains infauna such as burrowing bivalves and polychaetes, as well as generalist species such as *Pagurus bernhardus, Carcinus maenas* and *Asterias rubens.*

Broad-scale habitat (BSH) benthic data was sourced from EUSeaMap (EMODnet, 2024) with spatial mapping of level 2 to 4 classified habitats. **Figure 4-5** shows the spatial distribution of the broad scale habitats present along the subsea cable. The seabed present along the subsea cable is predominantly comprised of sand (A5.25 circalittoral fine sand or A5.26 circalittoral muddy sand), with a smaller patch of mixed sediment (A5.44 circalittoral mixed sediments). The seabed close to shore is comprised of fine sand (A5.23 infralittoral fine sand or A5.24 infralittoral muddy sand). **Table 4-5** summarises the dominant sedimentary biotopes present along the subsea cable, as described by EEA (2024).

FIGURE 4-5 EUNIS BIOTOPES PRESENT ALONG THE SUBSEA CABLE

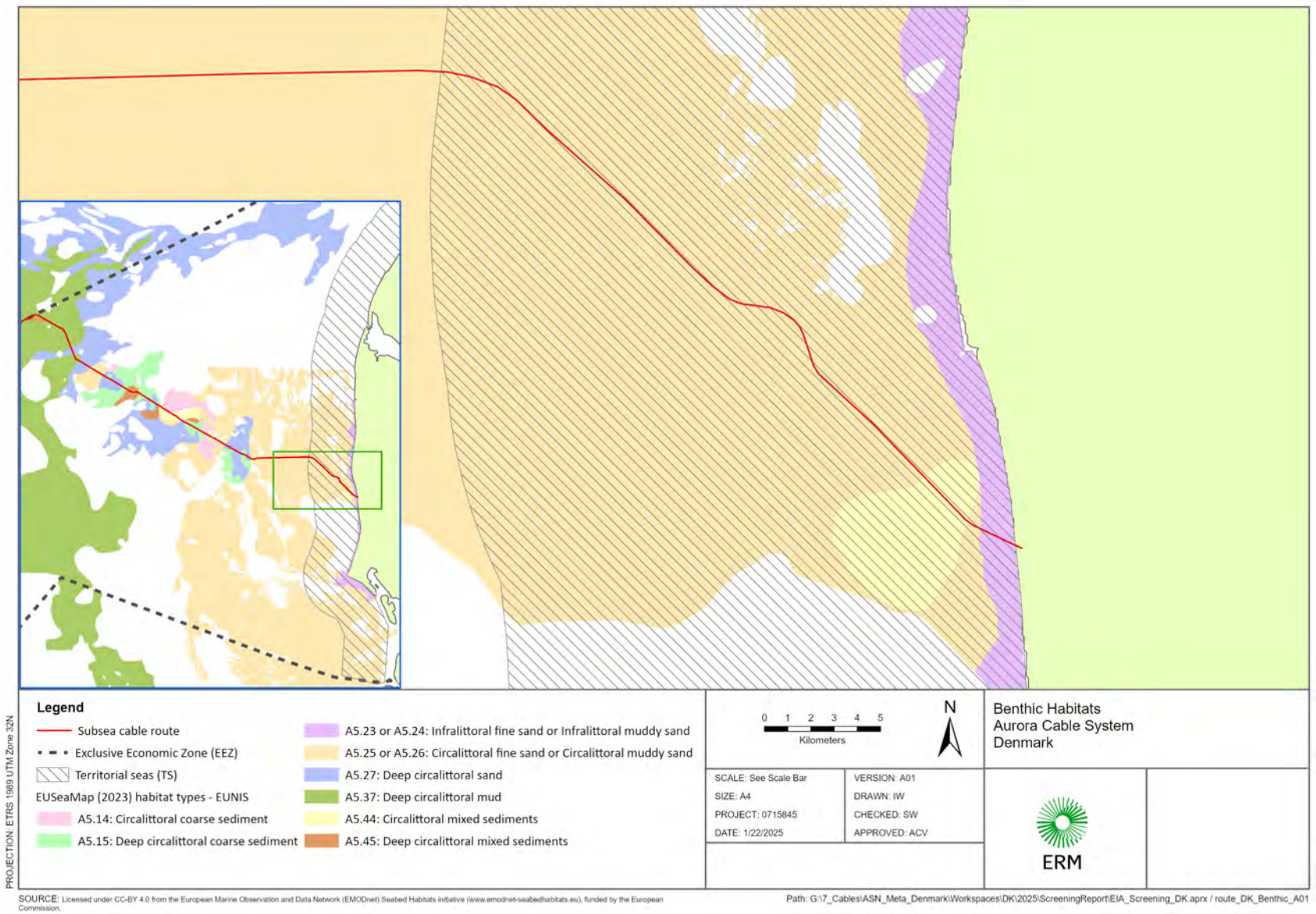


TABLE 4-5 EUNIS HABITATS PRESENT ALONG THE SUBSEA CABLE

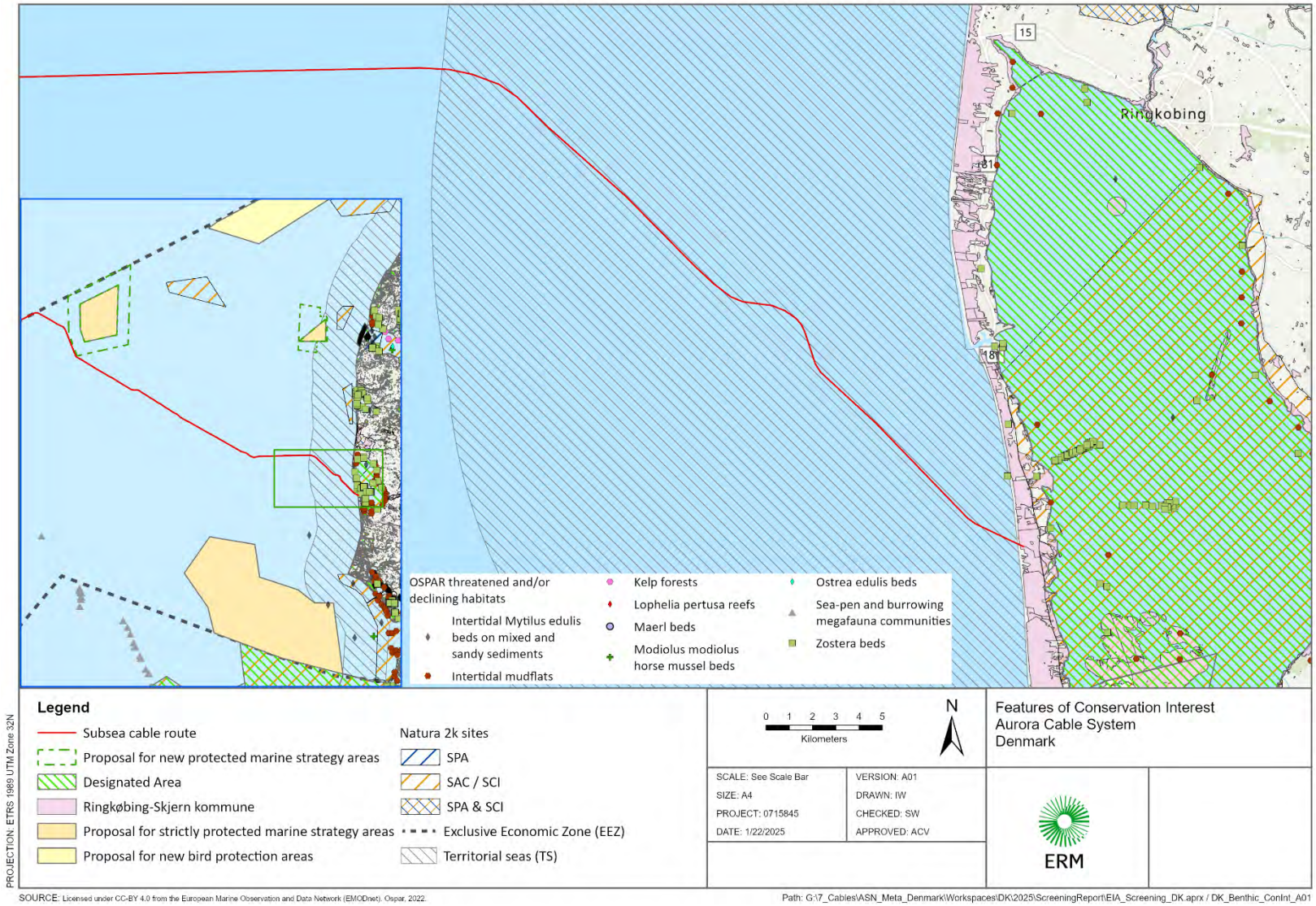
EUNIS 2022 Habitat Classification	EUNIS 2012 (amended 2019) Habitat Classification	Description
Sublittoral sand		
MB523 Faunal communities of full salinity Atlantic infralittoral sand	**A5.23** or **A5.24** Infralittoral fine sand or Infralittoral muddy sand	(**A5.23**) Clean sands which occur in shallow water, either on the open coast or in tide-swept channels of marine inlets. Typically lacks a significant seaweed component and is characterised by robust fauna, particularly amphipods (*Bathyporeia*) and robust polychaetes including *Nephtys cirrosa* and *Lanice conchilega*. (**A5.24**) Non-cohesive muddy sand (with 5%-20% silt / clay) in the infralittoral zone, extending from the extreme lower shore down to more stable circalittoral zone at about 15-20 m. Supports polychaetes (*Magelona mirabilis*, *Spiophanes bombyx* and *Chaetozone setosa*), bivalves (*Fabulina fibula* and *Chamelea gallina*) and the urchin (*Echinocardium cordatum*).
MC521 Faunal communities of Atlantic circalittoral sand	**A5.25** or **A5.26** Circalittoral fine sand or Circalittoral muddy sand	(**A5.25**) Clean fine sands with <5% silt/clay in deeper water, either on the open coast or in tide-swept channels of marine inlets in depths >15-20 m. Habitat may also extend offshore. Characterised by a wide range of echinoderms, polychaetes, and bivalves. Habitat generally more stable than shallower, infralittoral sands and consequently supports a more diverse community. (**A5.26**) Circalittoral non-cohesive muddy sands with the silt content of the substratum typically ranging from 5%-20%. Generally found in water depths >15-20 m. Characterised by a wide variety of polychaetes, bivalves such as *Abra alba* and *Nucula nitidosa*, and echinoderms such as Amphiura spp., Ophiura spp., and *Astropecten irregularis*. These habitats tend to be more stable than their infralittoral counterparts, and as such support a richer infaunal community.
Sublittoral mixed sediments		
MC421 Faunal communities of Atlantic circalittoral mixed sediment	**A5.44** Circalittoral mixed sediments	Mixed (heterogeneous) sediment habitats in the circalittoral zone (generally >15-20 m) including well mixed muddy gravelly sands or very poorly sorted mosaics of shell, cobbles and pebbles embedded in or lying upon mud, sand or gravel. A wide range of infaunal polychaetes, bivalves, echinoderms and burrowing anemones such as *Cerianthus lloydii* are often present. The presence of hard substrata (shells and stones) on the surface enables epifaunal species to become established, particularly hydroids such as Nemertesia spp. and *Hydrallmania falcata*.

EUNIS 2022 Habitat Classification	EUNIS 2012 (amended 2019) Habitat Classification	Description
		The combination of epifauna and infauna can lead to species rich communities.

Source: EEA, 2024; EMODnet, 2024

There are no Annex I habitats or nature conservation sites relevant to benthic ecology receptors that overlap with the subsea cable route or the landing site at Blaabjerg, Denmark (**Figure 4-6**). The closest nature conservation site to the subsea cable is Sandbanker ud for Thorsminde (DK00VA341) located approximately 31 km to the north of the subsea cable, which is designated for the protection of Annex I Sandbanks which are slightly covered by sea water all the time (H1110). No known OSPAR threatened and / or declining habitats occur in close proximity to the subsea cable route (EMODnet, 2024).

FIGURE 4-6 KNOWN PROPOSED AND EXISTING PROTECTED AREAS, AND SENSITIVE HABITATS IN DANISH EXCLUSIVE ECONOMIC ZONE AND TERRITORIAL SEAS



4.3.2 EFFECTS ASSESSMENT

Table 4-6 assesses the potential for significant effects on benthic ecology receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-6 POTENTIAL FOR SIGNIFICANT EFFECTS ON BENTHIC ECOLOGY

Effects	Potential for Significant Effects
Temporary habitat disturbance	There is the potential for the temporary loss and / or damage to habitats and species as a result of activities relating to the installation activities of the Aurora Project (e.g. direct disturbance from installation vessel anchoring and installation of the subsea cable) during operation and maintenance activities (e.g. direct disturbance from vessels anchoring and, operation and maintenance activities), and decommissioning. This physical disturbance to the seabed and intertidal areas may alter the local habitat for supporting species, which can reduce habitat suitability and resources, resulting in displacement of fauna to more suitable areas. However, due to the small scale of the Aurora Project and the short timeframe of the installation, operation and maintenance, and decommissioning activities, **No Significant Effect** on the benthic ecology receptor groups is expected.
Long-term loss of habitat	There is the potential for long-term loss to benthic habitats as a result of activities relating to the installation, operation and maintenance, and decommissioning phases of the Aurora Project (e.g. long-term placement of scour protection). Given there is no plan for installation of such subsea cable protection and based on the small scale of the Aurora Project and the short timeframe of the installation, operation and maintenance, and decommissioning activities, **No Significant Effect** on the benthic ecology receptor groups is expected due to loss of habitat.
Temporary increase in SSC, turbidity, and siltation	Sediment disturbance resulting from installation, operation and maintenance, and decommissioning activities may result in increased SSC and may result in indirect impacts on benthic communities, resulting from the associated impacts of sediment deposition. This will increase water column turbidity, and subsequently result in increased siltation and smothering of sessile fauna and / or clogging of their feeding apparatus from sediment deposition. However, due to the small scale of the Aurora Project and the short timeframe of the installation, operation and maintenance, and decommissioning activities, **No Significant Effect** on the benthic ecology receptor groups is expected.
Accidental release of pollutants from vessels	There is the risk of accidental release of pollutants such as oils, diesel, and lubricants from Aurora Project's installation vessel during the installation, operation and maintenance, and decommissioning phases. Such impacts may result in sub-lethal and lethal effects on benthic fauna, and alteration in their supporting habitats. The magnitude of an accidental spill is expected to be limited by the chemical or oil inventory on the installation vessel. Any accidental release may be expected to be of a greater relative significance to benthic receptors across the landfall and shallow subtidal areas of the Aurora Project, where the risk of impingement and interaction is higher. The use of an existing HDD through the nearshore zone greatly reduces this risk. Embedded mitigation measures (**Section 5.1**) will be adopted

Effects	Potential for Significant Effects
	so that the potential risk for accidental release of pollutants is reduced. Due to the limited inventory and the very low likelihood of an accidental release over the timeframe of the installation, operation and maintenance, and decommissioning activities, **No Significant Effect** on the benthic ecology receptor groups is expected.
Accidental release of contaminants through sediment disturbance	The North Sea has a high proportion of contaminated sediments. During the installation, operation and maintenance, and decommissioning activities, there is potential for sediment disturbance, which may re-mobilise contaminated sediments into the environment. The resuspension of contaminants may increase the bioavailability of these compounds to benthic fauna, impacting their physiology and overall fitness, and influencing local community structure. The use of a subsea cable installation plough to install and bury the subsea cable in one (1) process, within a narrow trench (typically around 0.2 m wide) will limit remobilisation of any potentially contaminated sediments. Due to the factors above, the small scale of the Aurora Project and the short timeframe of the installation, operation and maintenance, and decommissioning activities, **No Significant Effect** on the benthic ecology receptor groups is expected.
Introduction and colonisation of infrastructure by INNS	Vessel and personnel activities during the installation, operation and maintenance, and decommissioning activities have the potential to introduce INNS into the area, which could result in long-term colonisation of hard structures by INNS fauna, whereby these structures provide suitable artificial habitat for settlement. INNS taxa may outcompete and replace native fauna, altering a community's structure and functioning. The installation vessel will follow established industry standards to mitigate the risk of introducing INNS, including ballast water management standards as prescribed by the IMO. In addition, the subsea cable will be buried where possible and therefore, hard structures will be limited for colonisation by INNS. Due to the factors above, the small scale of the Aurora Project and the short timeframe of the installation, operation and maintenance, and decommissioning activities, **No Significant Effect** on the benthic ecology receptor groups is expected.
Long-term changes in physical processes	The long-term placement of infrastructure on the seabed (e.g. subsea cable protection) may result in changes in seabed morphology and tidal currents, causing localised scouring in these areas. Scour can result in localised loss of sediment, which can physically alter habitats and in turn affect benthic communities. Currently, there is no such subsea cable protection installation planned, nor should quantities of sediment be removed from the seabed. Due to the factors above, the small scale of the Aurora Project and the short timeframe the installation, operation and maintenance, and decommissioning activities, **No Significant Effect** on the benthic ecology receptor groups is expected.

4.3.3 SCREENING OUTCOMES

The potential impacts associated with installation of the subsea cable were determined to be temporary habitat disturbance, long-term loss of habitat, temporary increase in SSC, turbidity, and siltation, accidental release of pollutants from vessels, accidental release of contaminants through sediment disturbance, introduction and colonisation of infrastructure by INNS, and long-term changes in physical processes.

Based on the above, **No Significant Effects** are expected from any of the impacts on any of the benthic ecology receptor groups.

4.4 FISH AND SHELLFISH ECOLOGY

This section describes the fish and shellfish ecology baseline in the Danish TS and assesses the potential for significant effects of the Aurora Project on fish and shellfish ecology receptors. Impacts of the Aurora Project on fish and shellfish ecology may include:

- Direct damage;
- Habitat disturbance;
- Smothering due to suspended sediments; and
- Underwater noise.

4.4.1 BASELINE

The fish and shellfish ecology receptors can be categorised into five (5) groups:

- Elasmobranchs;
- Demersal fish;
- Pelagic fish;
- Shellfish; and
- Migratory fish.

4.4.1.1 ELASMOBRANCHS

The elasmobranch species known to be present in the waters of western Denmark consist of sharks, rays and skates. The shark species known to be present include porbeagle (*Lamna nasus*), spurdog (*Squalus acanthias*), basking shark (*Cetorhinus maximus*), thresher shark (*Alopias vulpinus*), blue shark (*Prionace glauca*), tope (*Galeorhinus galeus*), smoothhound (*Mustelus mustelus*), starry smoothhound (*Mustelus asterias*), small-spotted catshark (*Scyliorhinus canicula*), nursehound (*Scyliorhinus stellaris*), blackmouth catshark (*Galeus melastomus*), velvet belly lanternshark (*Etmopterus spinax*) and Greenland shark (*Somniosus microcephalus*). The following skate and ray species are also known to be present in Danish waters; longnose skate (*Dipturus oxyrinchus*), Norwegian skate (*Dipturus nidarosiensis*), blue skate (*Dipturus batis*), sailray (*Dipturus linteus*), spotted ray (*Raja montagui*), undulate ray (*Raja undulata*), thornback ray (*Raja clavata*), starry ray (*Amblyraja radiata*), round ray (*Rajella fyllae*), shagreen ray (*Leucoraja fullonica*), cuckoo ray (*Leucoraja naevus*) and sandy ray (*Leucoraja circularis*) (CMS, 2023).

4.4.1.2 DEMERSAL FISH

There are several demersal fish species which have spawning grounds overlapping the subsea cable route. These species are of commercial importance and include sole (*Solea vulgaris*), cod (*Gadus morhua*), lemon sole (*Microstomus kitt*) and sandeel (Ammodytes spp.) (**Figure 4-7**). Other demersal fish known to be common in the region are haddock (*Melanogrammus aeglefinus*), common dab (*Limanda limanda*), plaice (*Pleuronectes platessa*), sole (Soleidae spp.), turbot (*Psetta maxima*), flounder (*Paralichthys dentatus*), hooknose (*Agonus cataphractus*), sand goby (*Pomatoschistus minutus*), saithe (*Pollachius virens*), Norway pout

(*Trisopterus esmarki*), dragonets (Callionymidae spp.), and gurnards (Triglidae spp.) (Ramboll, 2019).

4.4.1.3 PELAGIC FISH

There are two (2) pelagic fish species known to have spawning grounds overlapping the subsea cable route. These are mackerel (*Scomber scombrus*) and sprat *(Sprattus sprattus*) (**Figure 4-7**). Furthermore, Atlantic herring (*Clupea harengus*), whiting (*Merlagius merlangius*) and horse mackerel (*Trachurus trachurus*) (Ramboll, 2019).

4.4.1.4 SHELLFISH

The main shellfish species of commercial and / or ecological importance known to be present in the region containing the subsea cable include northern shrimp (*Pandalus borealis*), Norway lobster (*Nephrops norvegicus*), blue mussel (*Mytilus edulis*), brown crab (*Cancer pagurus*) and brown shrimp (*Crangon crangon*) (Ramboll, 2019; Ramboll, 2021).

4.4.1.5 MIGRATORY FISH

The landing site of the subsea cable is close to (but does not overlap with) the Natura 2000 site no. DK00CY163 (Habitats Directive Site - Ringkøbing Fjord og Nymindestrømmen also called SAC62). In addition to the terrestrial and non-fish designated features, this site is also designated for the protection of migratory fish species which may encounter the subsea cable on their migratory routes. These species are Atlantic salmon (*Salmo salar*), allis shad (*Alosa alosa*), twaite shad (*Alosa fallax*), sea lamprey (*Petromyzon marinus*) and river lamprey (*Lampetra fluviatilis*) (Ramboll, 2019).

4.4.1.6 SPAWNING GROUNDS WHICH OVERLAP WITH THE SUBSEA CABLE ROUTE

The subsea cable route overlaps with the spawning grounds of *G. morhua*, *M. kitt*, *S. scombrus* Ammodytes spp., *S. vulgaris* and *S. sprattus* as shown in **Figure 4-7**. Further information on these species spawning, migration and habitat preference is presented in **Table 4-7**.

FIGURE 4-7 FISH SPAWNING GROUNDS WHICH OVERLAP WITH THE SUBSEA CABLE ROUTE

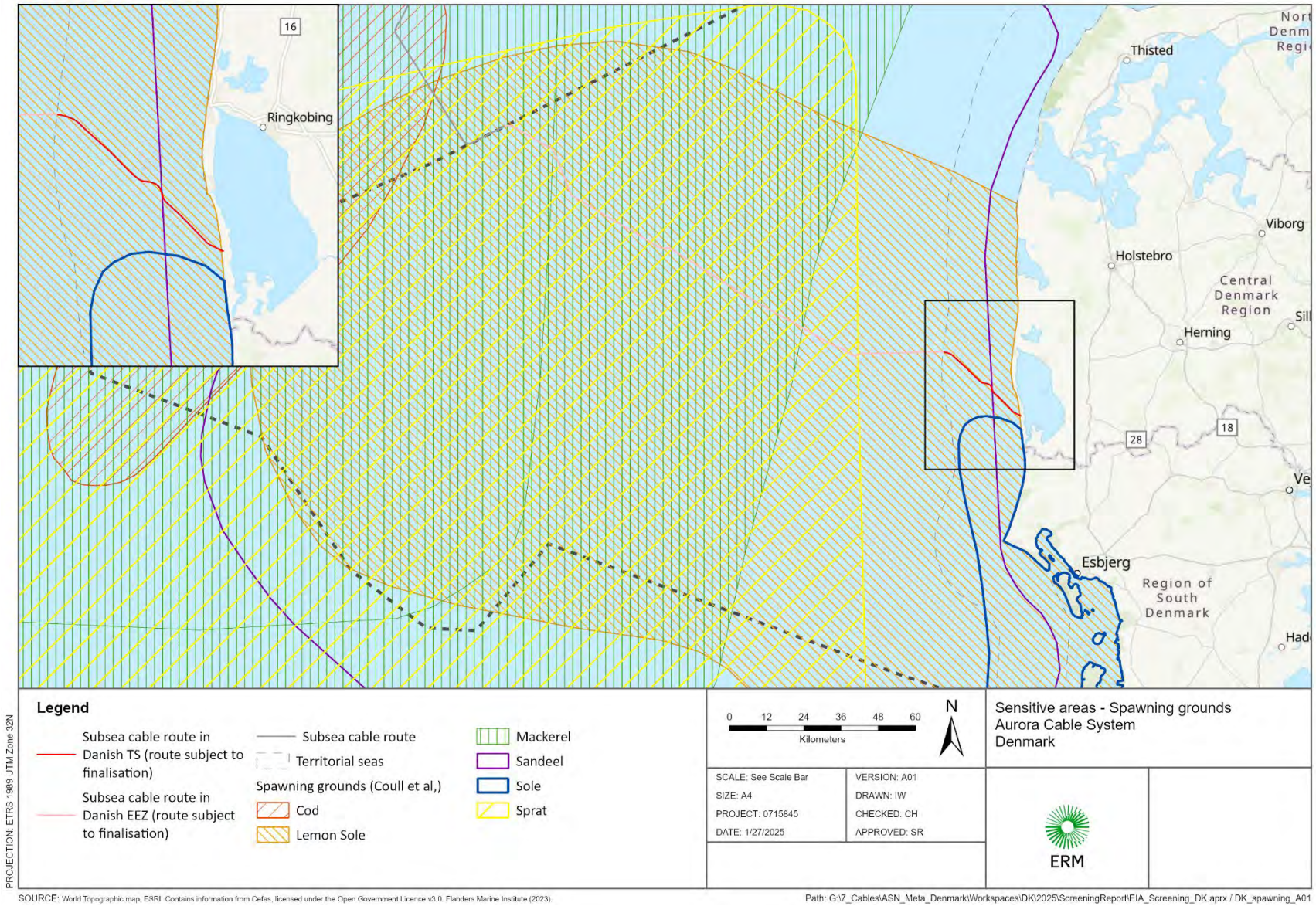


TABLE 4-7 ECOLOGY INFORMATION FOR THE FISH SPECIES WITH SPAWNING GROUNDS WHICH OVERLAP WITH THE SUBSEA CABLE ROUTE

Common Name	Latin Name	Seasonality	Habitat Association	Migration	Predator-Prey Relationships	Hearing Group
Atlantic cod	*Gadhus morhua*	Spawning occurs in winter and beginning of spring. Eggs and larvae are pelagic for up to 2.5 months prior to settling on the seabed.	Juveniles prefer shallower waters (10-30 m) with complex habitats than adults (up to 600 m).	Migrate between spawning, feeding and overwintering areas, journeys of <200 km.	Omnivorous, feeding on mostly fish and invertebrates.	Fish with a swim bladder involved in hearing.
Lemon sole	*Microstomus kitt*	The timing of spawning is related to a temperature threshold. Spawning usually occurs between May and October with the peak being between May and August (Geffen *et al*., 2021).	Found on stony bottoms at depths between 20 and 200 m.	None reported.	Feeds on invertebrates, primarily polychaetes.	Fish with no swim bladder.
Atlantic mackerel	*Scomber scombrus*	Spawning occurs during summer. This species is a pelagic spawner, and the larvae are also pelagic.	Widely distributed on coastal shelves up to 200 m depth.	Migrate in winter and early spring to spawning areas (inshore); spawn in summer; migration to post-spawning feeding grounds and overwinter areas.	Filter-feeders on zooplankton, such as small fish and prawns.	Data deficient.
Sole	*Solea vulgaris*	Spawning occurs in shallow waters at temperature between 6 and 12 °C. Spawning generally occurs between February and May. Demersal spawner.	Associated with sandy and muddy bottoms at depths down to 150 m.	In the first two years, juveniles inhabit bays and nursery grounds prior to migrating to deeper waters in the winter.	Adults prey upon worms, molluscs and small crustaceans.	Fish with no swim bladder.
European sprat	*Sprattus sprattus*	Spawn throughout the year, though primarily in spring and summer. This	Occurs in the water column at depths of 10-150 m.	Shows strong migrations between winter feeding and summer spawning grounds.	Feeds on planktonic crustaceans.	Fish with a swim bladder involved in hearing.

Common Name	Latin Name	Seasonality	Habitat Association	Migration	Predator-Prey Relationships	Hearing Group
		species is a pelagic spawner.		Diurnal migrations through the water column.		
Sandeel species	Ammodytes spp.	Spawning occurs over the winter, typically between November and February. Demersal spawner.	Buried within the seabed at depths down to 150 m. Prefers sandy substrates.	None reported.	Feeds on zooplankton and some species prey upon small fish.	Fish with no swim bladder.

4.4.2 EFFECTS ASSESSMENT

Table 4-8 assesses the potential for significant effects on fish and shellfish ecology receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-8 POTENTIAL FOR SIGNIFICANT EFFECTS ON FISH AND SHELLFISH ECOLOGY RECEPTOR GROUPS

Effects	Potential for Significant Effects
Direct damage	**Elasmobranchs, Demersal fish, Pelagic fish, Shellfish and Migratory fish:** Installation only - Species with demersal life stages, or who use the seabed as a spawning ground (e.g. thornback ray and Atlantic herring) may experience direct damage to eggs and larvae. Species that live in close association with the seabed through later life stages (e.g. sandeel and brown crab) may also suffer direct damage as a result of limited mobility. However, due to the small scale of the Aurora Project and the short timeframe of the installation phase, **No Significant Effect** on the fish and shellfish ecology receptor groups is expected.
Habitat disturbance	**Elasmobranchs, Demersal fish, Pelagic fish, Shellfish and Migratory fish:** Permanent habitat loss has the potential to occur during the installation phase of the Aurora Project where seabed infrastructure such as crossing protection is installed. No seabed protection is planned within the Danish TS and given the small scale of the Aurora Project **No Significant Effect** on the fish and shellfish ecology receptor groups is expected.
Smothering due to suspended sediments	**Elasmobranchs, Demersal fish, Pelagic fish, Shellfish and Migratory fish:** The placement of the subsea cable may cause suspended sediment plumes which could impact upon activities such as filter feeding, foraging and feeding, survival of eggs and larvae and movements and migrations. Furthermore, sessile shellfish species are more likely to be affected by this impact and subsequent smothering as they are unable to avoid it. With the exception of sandeel, which tend to spawn in winter months, all fish species with overlapping spawning grounds are pelagic spawners and therefore their eggs are unlikely to be impacted by smothering. Furthermore, the burial method using a subsea cable plough and the small scale of the Aurora Project will minimise smothering impacts, and so **No Significant Effect** on the fish and shellfish ecology receptor groups is expected.
Underwater noise	**Elasmobranchs, Demersal fish, Pelagic fish, Shellfish and Migratory fish:** Noise from the installation phase originates from the laying of the subsea cable which has the potential to cause disturbance and avoidance behaviour in sensitive fish species within the vicinity. Fish with a swim bladder used in hearing will be used as a realistic worst-case scenario when assessing the impacts. This is due to these species being more sensitive to the potential effects of noise and vibration than the other receptor groups. The potential effects of noise and vibration on fish species include physical damage, hearing damage, masking effects and death. Furthermore, shellfish species are more susceptible to

Effects	Potential for Significant Effects
	the impacts of underwater noise due to their limited or lack of mobility. However, underwater noise and vibration will arise primarily from installation vessel engine and propulsion, as well as movement of the sea plough as it buries the subsea cable and there is not predicted to be any impulsive or high energy sound emitted during this activity. The installation vessel will also be moving constantly at a slow speed, whereby mobile marine fauna will be able to move away from any disturbance. Based on the above and given the short timeframe of the installation phase, **No Significant Effect** on the fish and shellfish ecology receptor groups is expected.

4.4.3 SCREENING OUTCOMES

The potential impacts associated with the installation, operation and maintenance, and decommissioning phases of this subsea cable were determined to be direct damage, habitat disturbance, smothering due to suspended sediments and underwater noise.

Based on the above, **No Significant Effects** are expected from any of the potential impacts on any of the fish and shellfish ecology receptor groups.

4.5 TERRESTRIAL AND INTERTIDAL ECOLOGY

This section describes the terrestrial and intertidal ecology baseline in the Danish onshore environment and assesses the potential for significant effects of the Aurora Project on terrestrial and intertidal ecology receptors. Impacts of the Aurora Project on terrestrial and intertidal ecology may include:

- Vessel or machine related displacement;
- Temporary loss of habitat and foraging opportunities; and
- Sediment plumes.

4.5.1 BASELINE

4.5.1.1 TERRESTRIAL ECOLOGY

The subsea cable route will make landfall at Blaabjerg, Denmark, utilising an existing HDD duct and existing BMH thereby avoiding any construction work on or within the dunes and minimising potential impacts from installation activities on the Ringkøbing Fjord og Nymindestrømmen Special Area of Conservation (SAC) (**Figure 4-6**).The Ringkøbing Fjord og Nymindestrømmen SAC contains 20 coastal / marine habitats and six (6) marine species features.

The only native Danish otter species is the Eurasian otter *(Lutra lutra*), which is protected as a European Protected Species (EPS) under the Habitats Directive. Otters are a qualifying feature of the Ringkøbing Fjord og Nymindestrømmen SAC with a population estimation of 600 to 800, their numbers having dropped due to habitat degradation (Elemros *et al.,* 2006). Freshwater habitats are the primary home for otters, with the area covering, on average, between 20 km^2 to 32 km^2. Saltwater habitats may also provide an increased prey availability (see Kruuk, 2006; Parry *et al*., 2011). Coastal dwelling otters must be close to a fresh water source to enable them to rid their fur of salt (Dean and Chanin, 1999). Otter intertidal foraging activities have been observed in shallow waters within 100 m offshore (Kruuk and Moorhouse, 1991).

4.5.1.2 INTERTIDAL ORNITHOLOGY

The subsea cable will connect to the land next the dune systems bordering the Ringkøbing Fjord Special Protection Area (SPA) (**Section 4.17.2**) which is home for 37 species of birds including migratory, breeding and wintering birds. The intertidal areas including the evolving dune systems are used for foraging and nesting of several wader and tern species.

The species of terns within the SPA include: i) common tern *Sterna hirundo,* ii) Arctic tern (*Sterna paradisaea*) and iii) sandwich tern (*Thalasseus sandvicensis*). These species are protected under Annex I of the Bird Directive. Although, the little tern (*Sternula albifrons*) is not a featured species on the SPA, individuals have been observed foraging and potentially nesting in the area (Madsen *et al.,* 2006).

Terns migrate to the Danish coast to breed between March to September and forage chiefly for fish within coastal shallow waters (Wernham *et al*., 2002). The breeding season foraging range of terns are: i) Arctic Tern 25.7 km ± 14.8 km, ii) sandwich Tern 34.3 km ± 23.2 km, iii) little tern 5 km and iv) common Tern 18.0 km ± 8.9 km (Woodward *et al., 2019*), covering also the lagoon of the SPA. The main prey consumed are sand eels, herring and sprat. Occasionally small prey such as crustaceans, or any prey on the surface (e.g. insects), will be taken by surface dipping (Essink, 1999). As such, localised changes in prey availability may have considerable effects on the tern populations. Further to this, terns require clear water for optimal foraging (Essink, 1999).

The intertidal zone and rolling dunes act as a barrier to the Ringkøbing Fjord SPA which is home to several wader species including dunlin (*Calidris alpina*), bar-tailed godwit (*Limosa lapponica*), ruff (*Philomachus pugnax*) and avocet (*Recurvirostra avosetta*). There birds will use the intertidal area as well as the dune system for foraging and breeding (Borgmann, 2011). Wader species forage efficiently by feeding in the best areas and selecting the most profitable size-classes of prey (Cayford, 1993). Waders generally concentrate where prey density, prey availability and intake rates are relatively high and where energy expenditure is relatively low (Cayford, 1993). There may be large numbers of opportunistic waders using the intertidal zone at any one time.

4.5.2 EFFECTS ASSESSMENT

Table 4-9 assesses the potential for significant effects on terrestrial and intertidal ecology receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-9 POTENTIAL FOR SIGNIFICANT EFFECTS ON TERRESTRIAL AND INTERTIDAL ECOLOGY

Effects	Potential for Significant Effects
Vessel or machine related displacement	**Otter** Otters are known to be tolerant to low level disturbance (Tüzün and Albayrak, 2005). However, they are sensitive to disturbance from development especially if their resting places are disturbed (e.g. holts) (Dean and Chanin, 1999). Otters are naturally inquisitive, known to explore and investigate machinery. This can lead to accidents and sometimes death (Dean and Chanin, 1999). Mitigation measures including buffer zones, avoiding holts and surveys prior to installation activity can reduce the likelihood of a significant effect (Dean and Chanin, 1999). Given the potential presence of otters in this area, the **potential for impact due to disturbance cannot be discounted**, although the potential

Effects	Potential for Significant Effects
	impact is limited by the use of existing onshore infrastructure (i.e. the HDD duct and BMH), the short duration of onshore installation activity and the small area of potential disturbance. **Terns** Tern species are considered to be of low sensitivity to disturbance at-sea and during foraging, and are moderately flexible in terms of habitat use (Furness *et al*., 2013; Garthe and Hüppop, 2004). However, during nesting and chick-rearing, terns are sensitive to disturbance at breeding sites. Adults will likely leave their nest if disturbed (Goodship and Furness, 2022). There is a risk that nests could be crushed, chicks killed or abandoned if machinery or people cut through nesting grounds. However, if works take place outside of nesting areas or outside of the breeding season, then the impact-receptor pathway is removed and no impact would be expected. While there are no confirmed nests for little tern in the vicinity of the site, they have been ringed in the area, indicating their presence and potential nesting interest (Madsen *et al.*, 2006). However, sandwich terns are a designated feature of the Ringkøbing Fjord SPA with known nests in the vicinity of the Study Area. Disturbance may lead to abandonment of nests and death of chicks. Therefore, without the application of mitigation measures, there is the **potential for impacts to terns which may be nesting** in the area of the onshore subsea cable route between the HDD duct entry point (landward) towards the BMH (approximately 29 m), due to machine related displacement. Mitigation measures may include pre-activity surveys to check for the presence of nesting terns, avoidance of the breeding season and clearly demarcating activity areas to avoid any overlap with potential nesting areas. **Waders** As bar-tailed godwit is listed as an Annex I species it will be used as the baseline for potential worst-case impacts. Bar-tailed godwit is tolerant of human foot-traffic disturbance and typically does not display flushing behaviour until as low as 40 m (Versluijs, 2011). However, this species is relatively sensitive to vessel- and machine-related disturbance compared to other wader species, flushing at distances up to 300 m (Goodship and Furness, 2022). They prefer quieter areas to forage and roost so may actively vacate areas within the vicinity of works likely due to a stress response (Davidson and Rothwell, 1993; Kirby *et al*., 1993). Due to the short duration of the works and the large foraging area available around the Ringkøbing Fjord SPA these responses would be short term and recoverable once installation works have ceased. Therefore, there will be **No Significant Effect** on any waders within the vicinity.
Temporary loss of habitat and foraging opportunities	**Otter** Otters are known to occupy freshwater habitats necessary for their survival e.g. food availability, resting places, access to coastal waters (Dean and Chanin, 1999). They are tolerant to low levels of disturbance (Tüzün and Albayrak, 2005). Otter have been observed foraging in shallow waters within 100 m of shore (Kruuk and Moorhouse, 1991). The use of existing onshore infrastructure for installation of the subsea cable will minimise the potential impacts to coastal habitats and foraging areas; however trenching and burial of the short (29 m) onshore subsea cable segment between the existing HDD duct entry point (landward) and the existing BMH has the potential to cause limited habitat fragmentation, loss of holts and loss of feeding opportunities (Dean and Chanin, 1999). Otter surveys and mitigation steps including buffer zones, avoiding holts and pre-installation surveys can reduce the likelihood of a significant effect (Dean and Chanin, 1999). Given the potential presence of otters in this area, the potential for impact due to temporary loss of habitat and foraging opportunities cannot be discounted, although the potential impact is limited by the use of existing onshore infrastructure and the small area of potential disturbance. **Tern**

Effects	Potential for Significant Effects
	When breeding, sandwich tern require extensive, sheltered, shallow waters that provide access to clear water, rich in surface-level fish and usually fairly shallow with a sandy substrate within foraging range of suitable nesting habitat (Snow and Perrins, 1998). Common tern species are considered to be moderately flexible in term of habitat use (Furness *et al*., 2013; Garthe and Hüppop, 2004). Little tern species have a foraging range of 5 km, (Woodward *et al.,* 2019) if the planned works are in the range of this it could reduce little terns' foraging availability. The impact of direct loss of habitat and foraging opportunities will be impacted differently for each tern species. Therefore, without the application of mitigation measures, there is the **potential for impacts due to temporary loss of habitat and foraging opportunities** for terns within the vicinity of works. The potential for impact is mitigated by the use of an existing HDD duct, which means there will be no loss of habitat in the shallow nearshore waters. Any potential impacts to seabed habitats beyond the HDD duct exit point (seaward) offshore will also be limited to temporary disturbance over a small area during subsea cable burial. **Waders** Wader species are often non present around estuaries in the summer but present throughout the rest of the year (Collop, 2016). The subsea cable will be installed through the intertidal area and into the dune system, although existing infrastructure will be used for all elements other than a short connecting section between the existing HDD and BMH. As bar-tailed godwit is listed an Annex I species it will be used as the baseline for potential worst-case impacts. Bar-tailed godwit is tolerant of disturbance; however, if disturbed, they are likely to vacate an area and forage/roost in quieter areas (Collop, 2016). Bar-tailed godwits have been observed spending 10% less time foraging due to stress response from disturbance (Furness, 1973). Due to the short duration of the works and the large foraging area available around the Ringkøbing Fjord SPA these responses would be short term and recoverable once installation have ceased. Therefore, there will be **No Significant Effect** on any waders within the vicinity.
Sediment plumes	**Terns** Terns are plunge diving species that forage on fish in the upper 1 m of the water column (RPS, 2011). Terns prey on small and young pelagic fish as well as on benthic organisms by taking shallow dives where the seabed is within diving range, requiring relatively clear water to locate prey (Essink, 1999). As a result, tern species are considered vulnerable to changes in turbidity and changes in prey availability (Cook and Burton, 2010). However, due to the use of the existing HDD duct through the coastal zone, the short duration of the works and the large foraging area available around the Ringkøbing Fjord SPA these responses would be short term and recoverable once installation has ceased. Therefore, there will be **No Significant Effect** on any terns within the vicinity.

4.5.3 SCREENING OUTCOMES

The impacts associated with the installation, operation and maintenance, and decommissioning phases of this subsea cable were determined to be vessel or machine related displacement, temporary loss of habitat and foraging opportunities, and sediment plumes. The impacts are localised to the Study Area, with a small area for the subsea cable installation and a short period of installation works. The outcomes of this assessment are as follows:

- It **cannot be determined that there will be No Significant Effect** to otter for machine related disturbance and temporary loss of habitat and foraging opportunities; however potential impacts are limited due to the use of existing infrastructure and small area of

disturbance, as well as the short period of installation activity. Additional mitigation measures should include pre-installation survey for presence of otter holts and clear demarcation of work areas and control of vehicle movements.

- For tern, it **cannot be determined that there will be No Significant Effect** for vessel or machine related disturbance and temporary loss of habitat and foraging opportunities; however it was determined there was **No Significant Effects** for sediment plumes. Potential impacts to terns are limited due to the use of existing infrastructure and small area of disturbance, as well as the short period of installation activity. Should onshore installation take place during tern breeding season, additional mitigation measures should include pre-installation survey for presence of tern nests and clear demarcation of work areas and control of vehicle movements.
- Waders determined **No Significant Effects** for vessel or machine related disturbance and temporary loss of habitat and foraging opportunities.

4.6 MARINE MAMMALS

This section describes the marine mammal baseline in the Danish TS and assesses the potential for significant effects of the Aurora Project on marine mammal receptors. Impacts of the Aurora Project on marine mammals may include:

- Noise and vibration;
- Vessel collision and displacement; and
- Temporary loss of habitat and foraging opportunities.

4.6.1 BASELINE

There are seven (7) commonly present cetacean species in the North Sea including harbour porpoise (*Phocena phocena*), common bottlenose dolphin (*Tursiops truncatus*), white-beaked dolphin (*Lagenorhynchus albirostris*), common dolphin (*Delphinus delphis*), Risso's dolphin (*Grampus griseus),* minke whale (*Balaenoptera acutorostrata*), and killer whale (*Orcinus orca*). Pinniped species known to be located around the Aurora Project's Study Area include the grey seal (*Halichoerus grypus*) and harbour seal (*Phoca vitulina*) (Waggit *et al*., 2019). The SCANS IV survey results for the NS-I and NS-J survey blocks list harbour porpoise as having the highest abundance across marine mammal species, while common dolphin, minke whale and white-beaked dolphin were recorded infrequently within the vicinity of the Study Area (Gillies *et al*., 2023).

Harbour porpoise are generalist feeders, with a wide variety of prey including Atlantic cod, whiting, sprat, Atlantic herring, sandeel species, and Gobidae (Booth, 2020). Harbour porpoise tend to forage on the top one (1) or two (2) most abundant fish species in the local area (NRW, 2016). Harbour porpoise are a transient species with an estimated population of 346,000 within the North Sea Management Unit (NS MU) (IAMMWG, 2023). The Scans IV NS-I and NS-J have an estimated abundance of between 30,000 and 34,000 (Gillies *et al*., 2023). Within the NS MU there are 52 designated sites (SACs) with harbour porpoise as a qualifying feature.

White beaked dolphin are commonly found over the continental shelf in waters less than 200 m deep (Reid *et al.*, 2003). They are encountered all year, most commonly seen in Skagerrak (Galatius and Kinze, 2016). White-beaked dolphin feed on a variety of prey, such as cod, whiting, hake, haddock, mackerel, and herring, various species of sandeels, gobies, flatfishes,

and scaldfishes; cephalopods, and sometimes crustaceans (Kinze, 2009). White beaked dolphin in Danish TS are part of the Celtic and Greater North Sea Management Unit (CGNS MU), which has a population estimation of 43,951 individuals (Hammond *et al.,* 2021, IAMMWG, 2023). The Scans IV NS-J have an estimated abundance of between 3,955 individual white-beaked dolphin (Gillies *et al*., 2023). Within the CGNS MU, there are no designated sites with white-beaked dolphin as a qualifying feature.

Minke whale are found in open waters in the north-western part of the Danish North Sea along the Norwegian Trench as well as the central Danish North Sea (Edevlang *et al*., 2017). Most sightings occur between July and August, although the species may be present anytime between May and October (Northridge *et al.,* 1995). Their diet mainly comprises teleost fish, such as atlantic herring, atlantic cod, capelin, sandeel, haddock, whiting and saithe, as well as plankton and pelagic crustaceans such as krill (Sea Watch Foundation, 2012). There is no MU assigned to minke whales, so abundance estimates are based on the CGNS MU, including 20,118 individuals (Hammond *et al.,* 2022). However, the SCANS IV survey for the NS-J area recorded minke whale estimating an abundance of 638 individuals (Gillies *et al*., 2023, IAMMWG, 2023). Within the NS MU, there are no designated areas with minke whale as a qualifying feature.

Grey seal are widely distributed throughout the North Atlantic, hauling-out on land and coastlines exposed to the open sea (Carter *et al*., 2022). Grey seal feed on a wide variety of fish, comprised primarily of benthic and demersal species including sandeel, cod, herring, and flatfish, however, their diet composition is dependent on prey availability (Hammond and Wilson, 2016). In 2023, a total of 10,544 grey seals were counted in the Wadden Sea survey (Denmark, Germany, Netherlands and Belgium) with a total of 145 individuals counted in Denmark (Common Wadden Sea Secretariat [CWSS], 2023). There is no site-specific data for the Study Area.

Harbour seal are primarily found in coastal waters off the continental shelf. Haul-out sites include a variety of beaches, rocky cliff bases, and manmade structures (Carter *et al*., 2022). They can spend several days at a time out at sea, alone or in small groups. They are generalist feeders on a wide variety of prey including cod, herring, flatfish, gobies and sandeel (Hall *et al*., 1998). In 2023, a total of 22,621 harbour seals were counted in the Wadden sea survey (Denmark, Germany, Netherlands and Belgium) with a total of 5,639 individuals counted in Denmark (CWSS, 2023). As for grey seal, there is no site-specific data for the Study Area.

There are no protected sites with a cetacean as a designated feature within the proximity of the Study Area. There are no harbour seal or grey seal colonies located within the vicinity of the subsea cable route. The densities of the seal species are relatively low along the planned route.

4.6.2 EFFECTS ASSESSMENT

Table 4-10 assesses the potential for significant effects on marine mammal receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-10 POTENTIAL FOR SIGNIFICANT EFFECTS ON MARINE MAMMALS

Effects	Potential for Significant Effects
Noise and vibration	Underwater noise produced by installation activities has the potential to disturb marine mammal species. However, noise generating activities will be limited to installation vessel movement and subsea cable burial equipment only, resulting in a short-term and localised increase in background noise levels. Vessel noise is related to vessel size, speed, load, condition, age and engine, and can range from <150 dB re. 1 µPa to >190 dB re. 1 µPa (Hawkins *et al*., 2014). Underwater noise can lead to varied direct impacts on marine mammals, including mortality, auditory injury, masking of communication signals and displacement (Todd *et al*., 2015). Vessel noise will be mitigated by the slow speed of installation activity. Marine mammals are highly mobile; they are able to move away from an impacted area and return once installation works have ceased, demonstrating that they are recoverable and adaptable to short-term disruption. Therefore, there will be **No Significant Effect** on any cetaceans or pinnipeds within the vicinity.
Vessel collision and displacement	There is potential for pinnipeds and cetaceans to collide with vessels deployed for subsea cable works, potentially causing stress, injury, or mortality. However, seals are inquisitive and adaptable, often approaching vessels and avoiding collisions by moving away while harbour porpoise tend to swim away from vessels. There is a significant reduction in seal collisions at vessel speeds under 4 knots and harbour porpoise at speeds below 14 knots (Laist *et al*., 2001). The average ploughing installation speed would be 0.3 knots, therefore it is highly unlikely that these activities will result in collision with, or displacement of individual animals or wider populations of pinnipeds and cetaceans in the area. Therefore, it is predicted that there will be **No Significant Effect** on cetaceans or pinnipeds within the vicinity.
Temporary loss of habitat and foraging opportunities	The process of installing the subsea cable will involve opening the seabed and closing it over the subsea cable once it has been inserted, or else laying the subsea cable on the seabed where burial is not feasible or in deep waters (> approx. 1,000 m depth). Seabed disturbance from subsea cable installation will therefore be limited in extent but may overlap with feeding grounds and spawning sites for prey of marine mammals. Harbour porpoise tend to forage on the top one (1) or two (2) abundant species in a local area (NRW, 2016). Grey and harbour seal are generalist feeders with a wide varied diet. Based on the above, it is likely that subsea cable installation, operation and maintenance, and decommissioning activities will result in no significant impacts on prey abundance (see **Section 4.6.2**). Therefore, there will be **No Significant Effect** on any cetaceans or pinnipeds within the vicinity.

4.6.3 SCREENING OUTCOMES

The potential impacts associated with the installation, operation and maintenance, and decommissioning phases of this subsea cable were determined to be noise and vibration, vessel collision and displacement, and temporary loss of habitat and foraging opportunities. The impacts are localised to the small installation area and limited in duration to the short

installation period. The installation vessel will move at a slow, consistent speed and marine mammal species are adaptable.

Based on the above, **No Significant Effects** are expected from any of the impacts on any of the marine mammal receptor groups.

4.7 OFFSHORE ORNITHOLOGY

This section describes the offshore ornithology baseline in the Danish TS and assesses the potential for significant effects of the Aurora Project on offshore ornithology receptors. Impacts of the Aurora Project on offshore ornithology may include:

- Habitat removal or alteration leading to secondary loss of foraging;
- Vessel related disturbance;
- Noise and vibration; and
- Sediment plumes.

4.7.1 BASELINE

Seabirds use the coast of the greater North Sea, the summer season is used for breeding by at least 19 species including, in particular, large numbers of black-legged kittiwake (*Rissa tridactyla*) (an OSPAR protected species), herring gull (*Larus argentatus*), lesser black-backed gull (*Larus fuscus*), common guillemot (*Uria aalge*), and northern gannet (*Morus bassanus*) (Edevlang *et al*., 2017). Many of these species nest in dense coastal colonies, relying on local feeding conditions within close ranges of their nesting sites. Others travel several hundred kilometres during foraging trips (Edevlang *et al*., 2017).

Outside the breeding season, some species remain near their breeding grounds, while others migrate across the North Sea or travel further. The North Sea serves as a staging and wintering area for breeding colonies, migratory birds, and overwintering populations. Feeding habits vary by species: auks and cormorants dive from the surface, gannets and terns use plunge diving, gulls, kittiwakes and fulmars feed mostly on the surface, and skuas are kleptoparasites (Dunnet *et al*., 1990).

The subsea cable will enter the Danish inshore waters and utilise an existing HDD duct to land at a point within close proximity of (but not overlapping) the Ringkøbing Fjord SPA (**Figure 4-6**). This site is designated for waders, birds of prey, wildfowl, and seabirds such as terns. The Ringkøbing Fjord SPA hosts some notable Annex I listed birds including terns, geese, European shag (*Phalacrocorax aristotelis*), swans, harriers and waders (Meltofte and Clausen, 2016). Impacts to inshore birds are discussed further previously in **Section 4.5**. Other inshore wintering species includes common scoter (*Melanitta nigra*) and red-throated diver (*Gavia stellata*). The area is also of high importance for velvet scoter (*Melanitta fusca*), little gull (*Hydrocoloeus minutus*), and sandwich tern (*Thalasseus sandvicensis*).

The available food resources, including invertebrates from mudflats and beaches, plankton, small schooling fish and discards or detritus, influence seabird responses to environmental changes and human activities. Some species such as gulls and fulmars, benefit directly from human fishing activities by feeding on discards or offal. However, in recent years, local breeding success for some species has been low, linked to shortages of foraged fish (Edevlang *et al*., 2017).

4.7.2 EFFECTS ASSESSMENT

Table 4-11 assesses the potential for significant effects on offshore ornithology receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-11 POTENTIAL FOR SIGNIFICANT EFFECTS ON OFFSHORE ORNITHOLOGY

Effects	Potential for Significant Effects
Habitat Removal or Alteration leading to secondary loss of foraging	Removal of seabed sediment may have an impact upon the prey species of northern gannet, northern fulmar *Fulmarus glacialis*, gull species, black-legged kittiwake, and common guillemot. Black-legged kittiwake and common guillemot in particular are sensitive to impacts on prey species, as they have a more constrained diet. If the habitat is altered to an extent that it can no longer support prey species, individuals may be required to find alternative foraging habitats which can have direct implications on energy expenditure and competition. Common scoter are listed as critically endangered and are sensitive to loss of prey species due to a lack of flexibility in habitat use. However, most seabird species have an extensive foraging range (Woodward *et al.*, 2019), therefore there is a wide range of habitat available to the species outside of the subsea cable route. Installation of the subsea cable is also predicted to have **No Significant Effect** on fish and shellfish ecology (see **Section 4.4**). It is expected that seabirds will be highly tolerant and adaptable to habitat loss and alteration due to their ability to target a variety of prey items and use alternative foraging habitats (Cook and Burton, 2010). Therefore, the impact of habitat loss (removal or alteration, including impacts to prey species) is predicted to have **No Significant Effect** on offshore ornithology receptors.
Vessel Related Disturbance	Vessel presence can displace sensitive bird species from their usual foraging grounds, resulting in a reduction in foraging success and increase in energy expenditure to access alternative foraging areas. Some species such as terns are insensitive to vessels at sea, however, others, such as divers and scoters are highly sensitive to vessel related disturbance (Burger *et al.,* 2019; Cook and Burton, 2010; Garthe and Hüppop, 2004). Other seabirds are considered to have a high tolerance and adaptability to vessel disturbance as they are highly flexible in habitat use and have an extensive foraging range (Woodward *et al*., 2019). Considering the short installation period, it is unlikely there will be a long-term impact on any species within the proximity of the installation works. Therefore, there will be **No Significant Effect** on any seabirds within the vicinity.
Noise and Vibration	Seabirds often dive for their prey into the sea which can expose them to underwater noise and vibration. There is not extensive research on the impact of underwater noise on diving seabirds' activity. Seabird responses to approaching vessels are highly variable, e.g. red-throated divers and common scoter are highly sensitive to vessel activity (Garthe and Hüppop, 2004; Burger *et al*., 2019; Fliessbach *et al*., 2019). Vessels would be expected to displace most diving seabirds by flushing them out of the area, causing displacement, thereby limiting their exposure to the highest sound pressures generated by the installation works. Similarly, behavioural disturbance of seabirds due to acoustic activities is most likely to cause temporary displacement associated with the physical presence of the vessel, comparable to that experienced by routine shipping traffic (Hartley Anderson Limited, 2020). Thus, the noise of the installation of the subsea cable is unlikely to impact diving birds. Therefore, there will be **No Significant Effect** on any seabirds within the vicinity.
Sediment Plumes	The subsea cable will be installed utilising the existing HDD duct, approximately 150 m offshore (**Figure 3-10**). Burial of the subsea cable in the offshore environment could potentially cause sediment plumes causing an impact for foraging or diving birds. Increases in turbidity can affect their ability to detect

Effects	Potential for Significant Effects
	prey items, particularly for tern species (Cook and Burton, 2010), and can alter the distribution of prey items and supporting benthic habitats. Red-throated diver are sensitive to loss of prey resources, as they depend upon small fish such as Atlantic herring (*Clupea harengus*) (Guse *et al.*, 2009). Other seabird species, with exception of kittiwakes and guillemots (as previously discussed), are considered to have a high tolerance and adaptability to loss of prey resources as they can target a variety of prey items and have an extensive foraging range (Woodward *et al*., 2019). Sediment plumes will be limited to close proximity of the subsea cable burial activity and will be of short duration and are therefore expected to have **No Significant Effect** on benthic ecology and fish and shellfish ecology (see **Sections 4.3** and **4.4**). Due to the small scale of the Aurora Project and the short timeframe of the installation, operation and maintenance, and decommissioning activities, **No Significant Effect** on the offshore ornithology receptor groups is expected.

4.7.3 SCREENING OUTCOMES

The potential impacts associated with the installation of this subsea cable were determined to be habitat removal or alteration leading to secondary loss of foraging, vessel related disturbance, noise and vibration, and inshore disturbance. The impacts are localised to the installation route, with a small area for the subsea cable burial and a short period of installation, and seabird species are adaptable.

Based on the above, **No Significant Effects** are expected from any of the impacts on any of the offshore ornithology receptor groups.

4.8 AVIATION AND RADAR

This section describes the aviation and radar baseline in the Danish TS and assesses the potential for significant effects of the Aurora Project on aviation and radar receptors.

Impacts to aviation and radar receptors (such as physical obstruction to military aircrafts or interference with aviation radar systems) for offshore developments are primarily confined to developments that have marine infrastructure above the surface of the water, such as an offshore windfarm. As the Aurora Project is a subsea cable, there is no pathway for impact on radars or military aircraft so these receptors are not considered further.

4.8.1 BASELINE

For the Aurora Project, a single military firing range has been identified to the south of the Aurora Project Study Area which may impact offshore vessel movements.

No military exercise areas and danger areas (PEXA) that overlap with the Study Area have been identified; this has been considered further in **Section 4.15** (Other Users). Navigation of offshore vessels associated with the Aurora Project and other rights may be restricted in military practice areas. Areas along the Danish coast are regularly used for firing exercises, so it is recommended to inform and coordinate with the Danish Ministry of Defence prior to installation activities in order to clarify any issues.

4.8.2 SCREENING OUTCOMES

The Aurora Project has no above sea infrastructure in the offshore environment and no military PEXAs overlap the Study Area so there will be **no potential for significant effects** to aviation and radar.

The Aurora Project installation vessel operating in the Danish TS within an already active shipping area will not impact on the normal activity of the nearby firing exercises therefore there is **no potential for significant effects** on the single firing range identified.

4.9 NOISE AND VIBRATION

This section describes the noise and vibration baseline in the Danish onshore environment and offshore environment (Danish TS) within the Aurora Project's Study Area, and assesses the potential for significant effects of the Aurora Project on noise and vibration receptors. Impacts of the Aurora Project from noise and vibration may include:

- Disturbance to offshore receptors from airborne noise and vibration;
- Disturbance to offshore receptors from underwater noise and vibration; and
- Disturbance to onshore receptors from airborne noise and ground-borne vibration.

OFFSHORE ENVIRONMENT

4.9.1 BASELINE

Existing levels of offshore airborne and underwater noise and vibration are likely to be generated by both anthropogenic activities and natural sources. Natural sources of airborne noise include wind, wave action and precipitation. Key anthropogenic sources of airborne and underwater noise include vessel activity such as shipping, fishing, dredging, offshore construction / installation activities and tourist crafts. The Aurora Project is situated within a heavily active offshore area, with it being likely that other offshore activities and infrastructure vessels will be present in the wider area; further details can be found in **Section 4.11** (Commercial Fisheries), **Section 4.12** (Shipping and Navigation) and **Section 4.15** (Other Users). Protected marine mammals, including both pinnipeds and cetaceans, are known to be found in the offshore Study Area of the Aurora Project and could potentially be sensitive to the underwater noise and vibration produced by the Aurora Project, see **Section 4.6** (Marine Mammals).

4.9.2 EFFECTS ASSESSMENT

Table 4-12 assesses the potential for significant effects on offshore noise and vibration receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-12 POTENTIAL FOR SIGNIFICANT EFFECTS ON NOISE AND VIBRATION IN OFFSHORE ENVIRONMENT

Effect	Potential for Significant Effects
Disturbance due to airborne noise and vibration	Installation, operation and maintenance, and decommissioning activities associated with vessel movements from the Aurora Project for subsea cable installation may impact other seabed users in the area through increased levels of airborne noise and vibration.

Effect	Potential for Significant Effects
	Vessels are transient in nature and Aurora Project activities will be temporary, therefore any interaction associated with the installation, operation and maintenance, and decommissioning phases of the Aurora Project would only be in the short term. Commercial fishing and shipping vessels produce noise and vibration from routine operations. The noise generated by Aurora Project activities will be of a similar level to other vessel use in the area including fishing and shipping activity, therefore, no increase in the level of noise and vibration beyond baseline levels in the area is anticipated. As impacts will be temporary and noise levels will not exceed existing baseline activities, **No Significant Effects** of airborne noise from the Aurora Project activities on these receptors is expected.
Disturbance due to underwater noise and vibration	Marine mammals are sensitive to underwater noise in specific frequency ranges. Aurora Project activities may have impacts on marine mammals with respect to noise, however, the installation of the subsea cable will not generate significant vibration as no piling will take place and burial of the subsea cable using a plough will produce only low level non-impulsive vibrations over a small area, which is continuously moving as installation progresses. Therefore, there is **no pathway for effect** from vibration on marine mammals. With respect to noise, marine mammals may be affected by underwater noise caused by installation activities. The potential effects of the Aurora Project on marine mammals are considered further in **Section 4.6** (Marine Mammals), which concludes **No Significant Effects** on cetaceans or pinnipeds from noise and vibration impacts of the Aurora Project. Additionally, the potential effects of the Aurora Project on fish and shellfish ecology are considered in **Section 4.4** (Fish and Shellfish Ecology), which concludes **No Significant Effects** on these receptors from noise and vibration impacts of the Aurora Project. Underwater noise from the installation vessel is short term and will not significantly increase the levels of noise and vibration beyond the existing baseline in the active commercial fishing and shipping area. Therefore, the Aurora Project is expected to have **No Significant Effects** of disturbance due to underwater noise and vibration.

4.9.3 SCREENING OUTCOMES

The Aurora Project has the potential to introduce additional noise in the offshore environment, potentially impacting on other users of the marine environment. However, Aurora Project activities will be temporary and short term and will not significantly increase the existing noise baseline, therefore, no potential significant effects on these receptors are anticipated. There is also potential for underwater noise and vibration to impact marine mammal species in the vicinity of the Aurora Project. However, the Aurora Project will not generate significant vibration as no piling will take place, therefore, there will be no impacts of vibration on receptors. Additionally, due to marine mammal habitat ranges, they have the ability to move away from any noise associated with the Aurora Project. Any underwater noise will also be temporary, so any impacts on marine mammals are considered to be not significant and in the short term only.

Therefore, **No Significant Effects** are expected from impacts of the Aurora Project on the noise and vibration receptors.

ONSHORE ENVIRONMENT

4.9.4 BASELINE

As mentioned in **Section 3.2.1**, the landing site is a recreational, undeveloped green area on a land strip forming a barrier between the North Sea and Ringkøbing Fjord. A solitary beach house has been identified around 30 m north of the BMH and 200 m north of the BMH there is a small residential area. The area may also be used for horseback riding as there is a horse-riding centre around 300 m east of the landfall site.

Due to the minimal anthropogenic activity and infrastructure in the area, existing noise and vibration will be low, at a level similar to that of the atmospheric noise of the natural environment. As the location of the landing site is adjacent to the sea, natural sources of noise may include waves, wind and precipitation. The anthropogenic sources of noise include the residential area, recreational activities, pedestrian activities, and the nearby roads connecting the residential area to the main road.

4.9.5 EFFECTS ASSESSMENT

Table 4-13 assesses the potential for significant effects on onshore noise and vibration receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-13 POTENTIAL FOR SIGNIFICANT EFFECTS ON NOISE AND VIBRATION IN ONSHORE ENVIRONMENT

Effects	Potential for Significant Effects
Disturbance to human associated receptors (residential / recreational areas) through airborne and ground-borne noise and vibration	As the onshore scope of works does not involve piling or drilling, the Aurora Project will not result in any vibration, therefore there is no pathway for effect of vibration on human receptors. Noise impacts on human receptors may arise from the onshore Aurora Project works limited to the short distance (29m) of trenching between the existing HDD duct and BMH, burial of the subsea cable, and noise from any associated vehicles and equipment. Due to the short term and localised nature of the onshore activities, any noise generated will be temporary and concentrated to the area in the vicinity of the onshore works. Use of large mobile plant and heavy vehicles has the potential to give rise to local noise issues. However, activities involving mobile plant will be very short-term and will not be undertaken at night, limiting any potential for local disturbance. Due to the location of the landing site and the level of noise produced from the onshore works, No Significant Effects on local human receptors as a result of increased noise associated with the Aurora Project are expected.
Disturbance to environmental receptors (protected / sensitive species) through airborne and ground-borne noise and vibration	As the onshore scope of works does not involve piling or drilling, the Aurora Project will not result in any vibration, therefore there is no pathway for effect of vibration on environmental receptors. Noise impacts on protected and / or sensitive species may arise from the onshore Aurora Project works limited to the trenching between the existing HDD duct and BMH, burial of the subsea cable, and noise from any associated vehicles and equipment.

Effects	Potential for Significant Effects
	Due to the short term and localised nature of the onshore activities, any noise generated will be temporary and concentrated to the area in the vicinity of the onshore works. Use of large mobile plant and heavy vehicles has the potential to give rise to localised disturbance. The increased level of noise has the potential to disturb and displace protected species; however the area of potential disturbance is small compared to the area of available habitat and displaced species are likely to find alternative suitable habitat within adjacent areas to relocate to. Any disturbance and displacement is expected to be temporary and short-term. Due to the small scale and temporary nature of the onshore works, **No Significant Effects** from airborne and ground-borne noise impacts of the Aurora Project on protected species are expected**.** The potential effects of the onshore works associated with the Aurora Project on intertidal and terrestrial ecology, and the features of designated sites are considered in more detail in **Section 4.5** (Terrestrial and Intertidal Ecology) and **Section 4.17** (Designated Sites for Nature Conservation: Natura 2000 sites).

4.9.6 SCREENING OUTCOMES

Due to the use of existing infrastructure and the onshore scope of works only involving trenching, there will be no generation of vibration from the Aurora Project activities, therefore there is **no pathway for effects** of vibration on any receptors.

Installation, operation and maintenance, and decommissioning works associated with the Aurora Project have the potential to result in onshore noise, resulting in short term and localised increases in noise, which may affect human and environmental receptors. Human receptors in the vicinity of the onshore works will only be exposed to additional noise concentrated to an area in the vicinity of the onshore work in the short term and therefore, impacts will be negligible. Environmental receptors such as protected species may be impacted by onshore noise associated with the onshore works. However, due to the existing baseline of noise from environmental sources (e.g. wind, waves etc.), as well as anthropogenic sources of noise in the area, the small scale and temporary nature of the onshore works will have negligible impacts on environmental receptors. Therefore, there are **No Significant Effects** of noise expected from the Aurora Project on noise and vibration onshore receptors.

4.10 SEASCAPE, LANDSCAPE AND VISUAL AMENITY

This section describes the seascape, landscape and visual amenity (SLVA) in the Danish onshore environment and offshore environment (Danish TS) within the Aurora Project's Study Area, and provides an overview of the SLVA impact assessment screening and potential for significant effects of the Aurora Project. This SLVA impact assessment screening considers impacts on:

- Seascape / landscape as a resource in its own right (caused by changes to its constituent elements, its specific aesthetic or perceptual qualities and / or its character); and
- Views and visual amenity as experienced by people (caused by changes in the appearance of the seascape / landscape).

OFFSHORE ENVIRONMENT

4.10.1 BASELINE

The offshore part of the Aurora Project's Study Area considered within this report can generally be described as an open area of sea out to 12 nm (i.e. the Danish TS boundary), with a number of vessel movements operating in the area from nearby ports. The area is frequented by both commercial vessels and recreational vessels. Due to the nature of the Aurora Project and the installation of subsea cables below the surface, limited impacts to the seascape and associated visual amenity are expected.

4.10.2 EFFECTS ASSESSMENT

During the installation, operation and maintenance, and decommissioning of the subsea cable, the presence of the installation vessel will not be discernible against the existing baseline of vessel movement within the Study Area. Therefore, the presence of an additional vessel from the Aurora Project, in a busy commercial and recreational area, will have negligible impacts on the seascape and visual amenity of the area.

Once installed, the entire Aurora Project will not be visible above the surface. Therefore, there is no pathway for effect on seascape and visual amenity once the subsea cable has been installed.

4.10.3 SCREENING OUTCOMES

Based on the subsea nature of the Aurora Project and the limited vessel requirements (one [1] primary installation vessel), impacts of the Aurora Project on seascape and visual amenity are negligible.

Therefore, **No Significant Effects** are expected from the impacts of the Aurora Project on seascape and visual amenity.

ONSHORE ENVIRONMENT

4.10.4 BASELINE

As mentioned in **Section 3.2.1**, the landing site is a recreational, undeveloped green area on a land strip forming a barrier between the North Sea and Ringkøbing Fjord. The land strip is a large expanse of heather and heathland surrounded by dunes. An existing HDD duct and BMH will be utilised for the Aurora Project to minimise potential impacts from installation activities on the Ringkøbing Fjord og Nymindestrømmen SAC. A solitary beach house is around 30 m north of the landing area and the area may be used for horseback riding as there is a horse-riding centre around 300 m east of the landing site.

4.10.5 EFFECTS ASSESSMENT

During the installation, operation and maintenance, and decommissioning of the onshore segment of the Aurora Project, there will be an increase in vehicular movement and human activity, in addition to the presence of other onshore infrastructure, such as a site cordon. Project vehicles and other associated infrastructure may affect the physical characteristics and visual amenity of the landscape in the vicinity of the landing site. However, installation, operation and maintenance, and decommissioning activities are expected to be minimal, taking place over a short period and with existing access tracks being utilised. Due to the temporary

nature and the small scale of the onshore works, with trenching limited to the short distance between the existing HDD duct entry point (landward) and existing BMH, any impacts to the landscape and visual amenity will be negligible and in the short term only.

Once installed, the subsea cable will lie entirely below ground, therefore having no pathway for effect on landscape and visual amenity. The only visible element of the Aurora Project is the access to the BMH, which is pre-existing and therefore, does not form part of the Aurora Project infrastructure considered for potential effects in this EIA Screening Report.

4.10.6 SCREENING OUTCOMES

Due to the onshore works associated with Aurora Project being temporary and of a small scale, whilst using existing infrastructure and access tracks where possible, impacts of the Aurora Project on landscape and visual amenity are considered to be negligible. Therefore, **No Significant Effects** are expected from the impacts of the Aurora Project on landscape and visual amenity.

4.11 COMMERCIAL FISHERIES

This section describes a high-level commercial fisheries baseline and assesses the potential for significant effects of the Aurora Project on commercial fisheries receptors. Impacts of the Aurora Project on commercial fisheries may include:

- Direct impacts to the commercial fishing industry, such as:
  - Loss or restricted access to fishing grounds;
  - Displacement of fishing activity into other areas;
  - Interference with fishing activity; and
  - Loss or damage to fishing gear due to snagging.
- Indirect impacts to commercial fisheries resources, such as:
  - Direct damage, habitat disturbance, underwater noise and the effects of suspended sediments on commercially important fish and shellfish ecology receptor groups. The potential for significant effects has been assessed in **Section 4.4.2** (Fish and Shellfish Ecology); and
  - Increased collision and allision risk to commercial fishing vessels. The potential for significant effects has been assessed in **Section 4.12.2** (Shipping and Navigation).

4.11.1 BASELINE

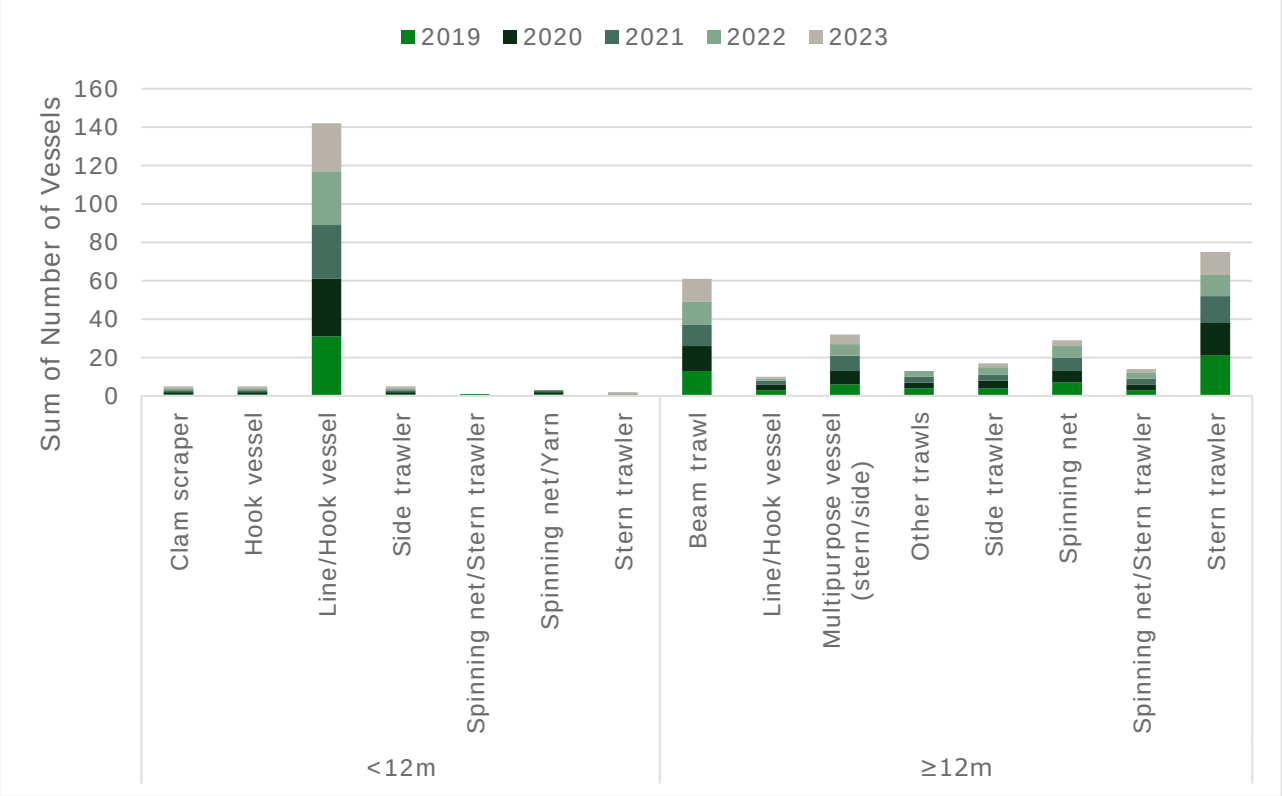
The Aurora Project crosses the North Sea, which is an important area for several key species of commercial interest including sole, cod, lemon sole, sandeel, mackerel and sprat. The commercial fisheries baseline in the Danish TS in proximity to the proposed Aurora Project has been categorised by vessel gear type and length class.

Due to limited engine power and the extensive travel time to and from the fishing grounds, smaller fishing vessels (<12 m) are more limited in their spatial extent and usually fish in the vicinity of the home port. Therefore, it can be assumed that the smaller local vessels utilise the gross area of the Aurora Project within the Danish TS as fishing grounds.

The number of commercial fishing vessels registered to the three (3) closest ports (Hvide Sands, Thorsminde and Thyborøn) to the landing site at Blaabjerg, of the proposed Aurora

Project have generally decreased over the study period (2019-2023) (**Figure 4-8**). The number of commercial fishing vessels have decreased from 36 vessels in 2019 to 29 vessels in 2023 for the smaller length class (<12 m), and from 61 vessels in 2019 to 37 vessels in 2023 for the larger length class (≥12 m). The line / hook vessels dominate in terms of number of vessels from the smaller size class (29 vessels in 2023), while beam trawls and stern trawls are the most abundant gear types in the larger size class (61 and 75 vessels in 2023, respectively) (the Danish Fisheries Agency, 2024).

FIGURE 4-8 THE NUMBER OF DANISH COMMERCIAL FISHING VESSELS BY VESSEL TYPE AND LENGTH CLASS, WITH A HOME PORT IN HVIDE SANDS, THORSMINDE AND THYBORON (2019-2023)

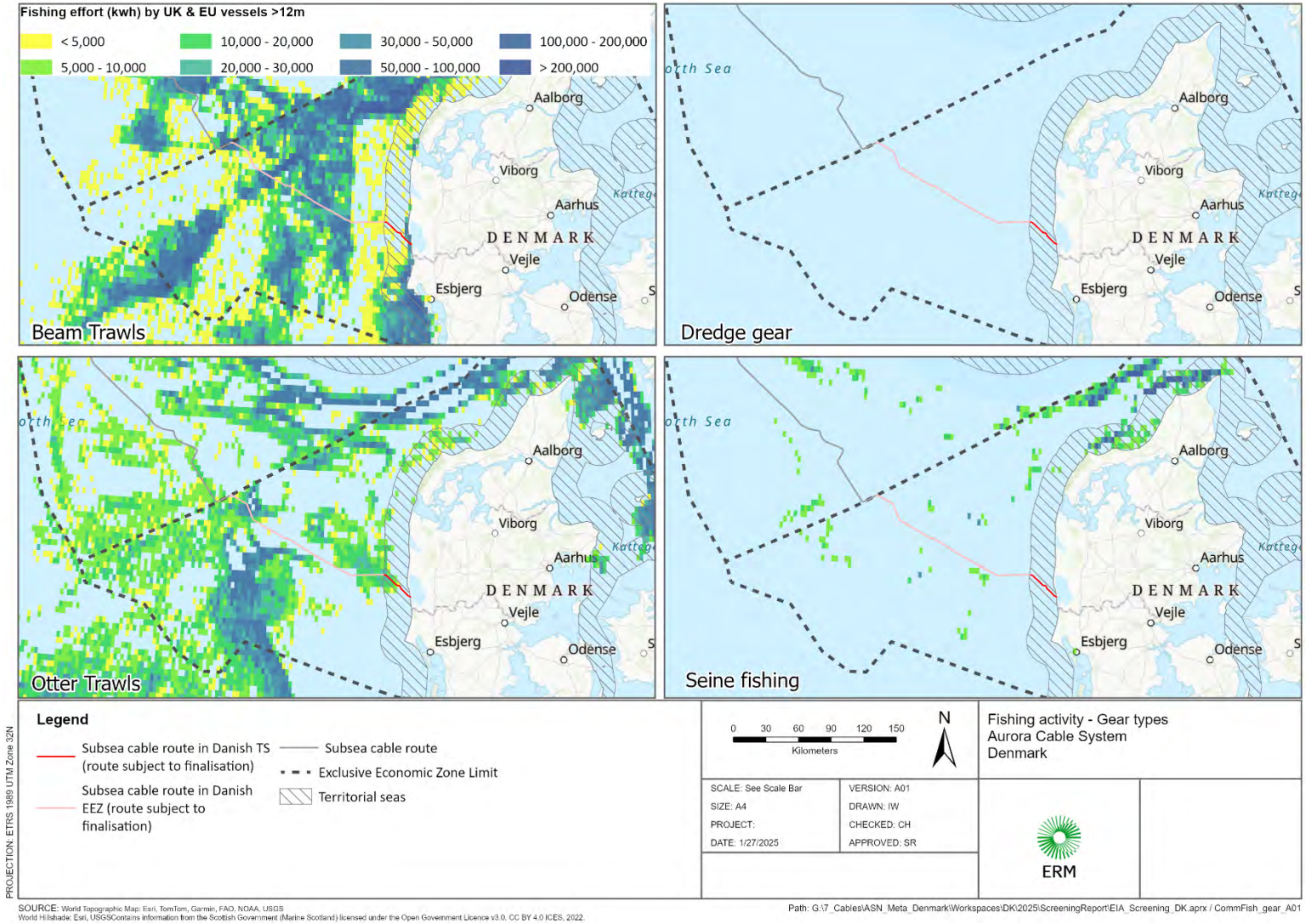


Source: The Danish Fisheries Agency, 2024

The International Council for the Exploration of the Sea (ICES) commercial fishing effort data (kwh) by vessels >12 m from the EU and UK is illustrated in **Figure 4-9**. This figure indicates the highest levels of activity in Danish offshore waters, particularly by vessels deploying otter trawls and beam trawls (ICES, 2020). Within the Danish TS, the primary gear types deployed are beam trawls, otter trawls, pelagic trawls, pelagic seine nets, and static gears (ICES, 2019; EMODnet, 2024). However, the overall density of the >12 m fishing vessel within the Danish TS is less than in the offshore waters outside of the Danish TS boundary. **Figure 4-9** indicates relatively high levels of beam trawl activity (>12 m) within the Danish TS, located to the south of the proposed Aurora Project. It can also be noted from **Figure 4-9** that activity by vessels >12 m deploying dredges has not been recorded in proximity to the proposed Aurora Project. There is also minimal demersal seine netting activity in this area, none of which can be observed to overlap with the proposed Aurora Project.

EIA SCREENING

FIGURE 4-9 FISHING EFFORT BY VESSELS UTILISING BEAM TRAWLS, DREDGES, OTTER TRAWLS AND SEINE NETS (EUROPEAN UNION AND UNITED KINGDOM VESSELS >12 METRES) (2017 TO 2020)



Source: ICES, 2020

4.11.2 EFFECTS SCREENING

Table 4-14 assesses the potential for significant effects on commercial fisheries receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

As a result of the baseline review process within **Section 4.11.1**, the following commercial fisheries receptor groups have been identified and taken forward into the screening of significant effects (**Table 4-14**):

- Smaller (<12 m) local fishing vessels (i.e. line / hook and static gear vessels);
- Beam trawl vessels (≥12 m);
- Otter trawl vessels (≥12 m); and
- Pelagic netting vessels (≥12 m).

TABLE 4-14 POTENTIAL FOR SIGNIFICANT EFFECTS ON COMMERCIAL FISHERIES

Effect	Potential for Significant Effects
Loss or restricted access to fishing grounds	**Smaller local commercial fishing vessels (<12 m); beam trawl vessels (≥12 m); otter trawl vessels (≥12 m); pelagic netting vessels (≥12 m):** There is the potential for temporary loss or restricted access to fishing grounds as a result of activities relating to the installation phase of the proposed Aurora Project (i.e. the entire length of the subsea cable route within the Danish TS will be closed to commercial fishing vessels during installation, as a realistic worst-case scenario). However, due to the limited level of observed commercial fishing activity overlapping with the proposed Aurora Project within the Danish TS, the Aurora Project's relatively small scale and short timeframe for installation, no significant effect on commercial fisheries receptor groups during the installation phase is anticipated. There is the potential for loss or restricted access to fishing grounds as a result of the presence of the proposed Aurora Project on the seabed, as well as any necessary maintenance activities. Exclusion zones will be implemented around any Aurora Project vessel undertaking major maintenance; however no routine maintenance activities are planned and any necessary maintenance due to unplanned events is anticipated to be highly localised and of relatively short duration, with fishing activity only being excluded from discrete spatial areas. As described within **Section 3.4**, in water depths of less than 1,000 m the subsea cable will be buried to a target depth of 2 m (where feasible), while in water depths of more than 1,000 m, the subsea cable will be laid on the seabed surface. Outputs of publicly available bathymetry data indicate that depths within the Danish TS where the proposed Aurora Project is to be located, range from approximately 0.5 m at the location of the existing HDD duct exit point (seaward), gradually sloping to a maximum depth of approximately 30 m at the Danish TS boundary (EMODnet, 2022). Furthermore, the seabed sediment along the proposed subsea cable route is predominantly made up of a fine to medium grained sand and clay, with no indication of hard, rocky substrates (as described in **Section 4.1.1.1**). It can, therefore, be assumed that the subsea cable within the Danish TS will be buried to target depth (2 m) and due to the nature of the fishing gear active in the region (i.e. limited bottom contact), fishing is expected to continue without any significant loss of area or restricted access due to presence of the buried subsea cable. No significant effect on commercial

Effect	Potential for Significant Effects
	fisheries receptor groups due to maintenance activity is anticipated. In light of the above, it is concluded that there is **Low potential for Significant Effects** on commercial fisheries receptors with regard to loss or restricted access to fishing grounds as a result of the proposed Aurora Project, as any impacts will be minimal and temporary.
Displacement of fishing activity into other areas	**Smaller local commercial fishing vessels (<12 m); beam trawl vessels (≥12 m); otter trawl vessels (≥12 m); pelagic netting vessels (≥12 m):** As described above for "loss or restricted access to fishing grounds", any displacement of fishing activity into other areas during the installation phase of the proposed Aurora Project will be minimal and temporary, due to the limited level of observed commercial fishing activity overlapping with the proposed Aurora Project within the Danish TS, the Aurora Project's relatively small scale and short timeframe for installation. No significant effect on commercial fisheries receptor groups during the installation phase is anticipated. Any displacement of fishing activity into other areas during maintenance activities is expected to be limited to discreet spatial areas, due to the small scale and short duration of any maintenance activities. As described above for "loss or restricted access to fishing grounds", it can be assumed that the subsea cable within the Danish TS will be buried to target depth (2 m). Due to the nature of the fishing gear active in the region (i.e. limited bottom contact), fishing is expected to continue without any significant loss of area or restricted access, limiting any displacement of fishing activity into other areas due to the presence of the subsea cable. No significant effect on commercial fisheries receptor groups during maintenance activity is anticipated. In light of the above, it is concluded that there is **Low potential for Significant Effects** on commercial fisheries receptors with regard to displacement of fishing activity into other areas as a result of the proposed Aurora Project, as any impacts will be minimal and temporary.
Interference with fishing activity	**Smaller local commercial fishing vessels (<12 m); beam trawl vessels (≥12 m); otter trawl vessels (≥12 m); pelagic netting vessels (≥12 m):** There is potential for interference with fishing activity during installation, operation and maintenance, and decommissioning, where the presence and activity of the Aurora Project's installation vessel may occur in areas of commercial fishing. Although the installation vessel will add to the existing level of shipping activity in the area, there are already moderate levels of vessel traffic that exist in the area and there is co-existence of fishing vessels with other marine traffic. Fishing vessels engaged in fishing must exhibit appropriate lighting; and have the right of way over most other marine traffic. Therefore, installation, operation and maintenance, and decommissioning activities are not anticipated to result in permanent interference with commercial fishing activity, and through the use of adequate marking and navigational safety procedures, impacts are considered to be infrequent and temporary. As such, there is a **low potential for Significant Effects** on commercial fisheries receptors due to interference with fishing activity as a result of the proposed Aurora Project.

Effect	Potential for Significant Effects
Loss or damage to fishing gear due to snagging	**Smaller local commercial fishing vessels (<12 m); beam trawl vessels (≥12 m); otter trawl vessels (≥12 m); pelagic netting vessels (≥12 m):** The installation, operation and maintenance, and decommissioning of the proposed Aurora Project may lead to loss or damage to fishing gear due to snagging. Snagging risks may occur as a result of exposed infrastructure on the seabed, such as unburied subsea cable (or subsea cable not buried to target depth). The Aurora Project, including the 'as-laid' coordinates, shall be recorded and submitted to the relevant authorities and Kingfisher for inclusion on charts. The commercial fishing industry will be fully informed of any potential snagging risks through Notice to Mariners (NtM). Use of advisory clearance distances and safety zones during any maintenance will minimise the risk of interaction between fishing vessels and project infrastructure, therefore reducing the risk of snagging. Where it is deemed necessary, snagging risks will be marked by a guard vessel or navigational marker. Based on commitments to follow standard protocols, there is a **low potential for Significant Effects** on commercial fisheries receptors with regard to loss or damage to fishing gear due to snagging as a result of the proposed Aurora Project.

4.11.3 SCREENING OUTCOMES

The potential impacts to commercial fisheries receptor groups during the installation, operation and maintenance, and decommissioning of the Auora Project within the Danish TS are determined to be:

- Loss or restricted access to fishing grounds;
- Displacement of fishing activity into other areas;
- Interference with fishing activity; and
- Loss or damage to fishing gear due to snagging.

Due to the nature of the Aurora Project, the lack of permanent seabed infrastructure being installed, the type of trenching asset being utilised, and effective route engineering, it was determined that the potential for **Significant Effects** to commercial fisheries associated with the Aurora Project within the Study Area is **Low**.

4.12 SHIPPING AND NAVIGATION

This section describes the shipping and navigation baseline in the Danish TS and assesses the potential for significant effects of the Aurora Project on shipping and navigation receptors. Impacts of the Aurora Project on shipping and navigation may include:

- Vessel-to-vessel collisions, due to the presence of the Aurora Project's installation vessel and displacement of local vessels;
- Direct collisions with the Aurora Project infrastructure, and associated snagging risks;
- Disruption to pre-existing navigational management during installation, operation and maintenance, and decommissioning where activities may be taking place in key anchorages or waiting areas; and
- Disruption to search and rescue operations, where search and rescue vessels may have to re-route due to presence of Aurora Project activities and associated vessels.

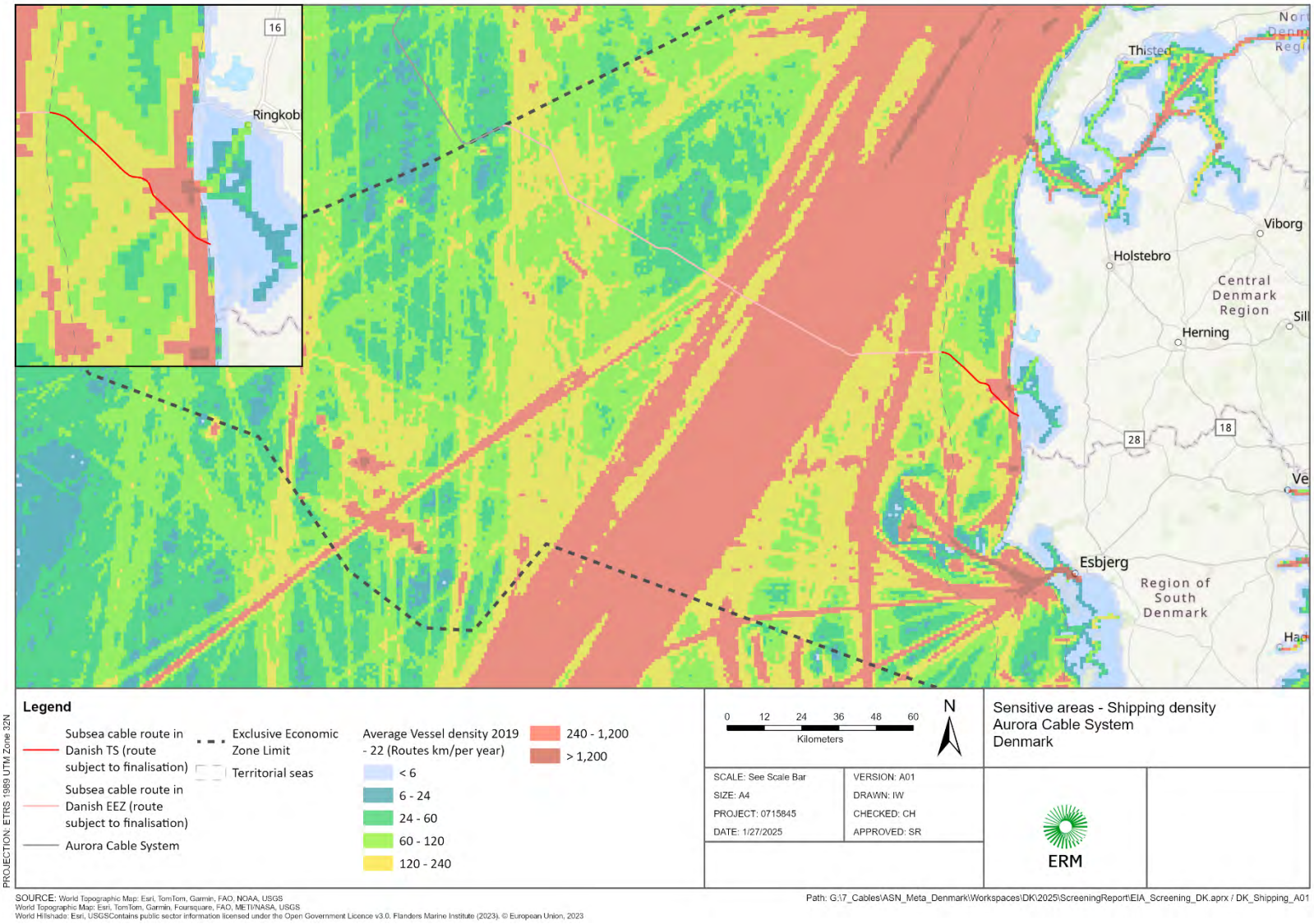
4.12.1 BASELINE

4.12.1.1 COMMERCIAL VESSELS INCLUDING TANKERS, CARGO, FISHING, DREDGING, RECREATIONAL AND SERVICE VESSELS

As shown in **Figure 4-10** below, the proposed subsea cable route crosses an area of high-density shipping traffic for vessels transiting around the northern coast of Denmark. The activity in this area is undertaken by a large range of vessel types.

Within the subsea cable route within the Danish TS, fishing activity attains the largest vessel density within the Study Area, with the highest densities located within and around the port, decreasing in activity further offshore (EMODnet, 2023). Cargo activity attains a low vessel density within the Study Area (EMODnet, 2023). Similarly, military and law enforcement vessels are measured to have low densities within the Study Area (EMODnet, 2023). Limited dredging or underwater operation vessel densities are found within the vicinity of the Aurora Project landing site (as defined in **Section 3** [Project Description]). However, densities are observed to increase from Hvinde Sande harbour and further south of the landing site (EMODnet, 2023). Recreational vessels are observed to follow a similar trend, with little activity observed surrounding the landing site, with higher densities observed further south of the site and subsea cable route (EMODnet, 2023).

FIGURE 4-10 SHIPPING DENSITY IN DANISH EXCLUSIVE ECONOMIC ZONE AND TERRITORIAL SEAS



4.12.1.2 PRE-EXISTING NAVIGATIONAL MANAGEMENT

The Aurora Project within Denmark TS is located near to Hvinde Sand Harbour. In recent years, the port has developed into an active traffic port, providing a base for fishing activities, goods transportation and a number of offshore wind activities, including crew boats and Jack-up vessels, acting as a key area for anchoring. Reflecting this, overall vessel traffic is high within the area of the TS neighbouring either side of and within the harbour, with densities reducing further offshore along the subsea cable route (EMODnet, 2023; MarineTraffic, 2022).

4.12.1.3 SEARCH AND RESCUE OPERATIONS

The Aurora Project within Denmark TS is an active search and rescue area.

4.12.1.4 OTHER OFFSHORE ACTIVITIES AND INFRASTRUCTURE VESSELS

The Aurora Project is situated within a busy offshore area, with large amounts of other offshore activities and infrastructure vessels present. There are several offshore windfarms in the vicinity of the proposed subsea cable route. Horns Rev III, Horns Rev II and Horns Rev I are located outside of the TS boundary. The subsea cable route passes through the lease areas for Nordsren I, Nordsren II and Nordsren III. The only offshore windfarm within the TS in the vicinity of the Aurora Project is Vesterhav Syd, although the subsea cable does not pass through this area. Associated tug and towing vessels are observed to have high densities surrounding the Aurora Project landing site area, between the inshore areas and renewable infrastructure further offshore (EMODnet, 2023). Associated service vessels are reported to have significantly lower average densities offshore within the TS along the subsea cable route, with high densities centralised within Hvinde Sande port (EMODnet, 2023).

4.12.2 EFFECTS ASSESSMENT

The Aurora Project will follow standard maritime safety procedures throughout the duration of the Project. Embedded mitigation measures (in addition to those in **Section 5.1**) include:

- NtM;
- Notices to local fishermen;
- Safety Exclusion Zone established around the main lay vessel in agreement with the DMA; and
- Dedicated lookout on the installation vessel, regular broadcasts and direct warning over radio of nearby traffic.

A protective zone will be established around the subsea cable (‘cable field’) in accordance with order no. 939 of 27 November 1992 on protection of submarine cables and submarine pipelines (the cable order), within which, ships may not anchor, without urgent necessity.

The installation vessel will comply with Danish and international maritime safety legislation, including COLREGs. Standard commercial operations regulations and standards should be adhered to throughout the subsea cable installation including SOLAS and MARPOL 73/78. For sufficient navigational safety, the Aurora Project should act in accordance with Section 6 of the Act on Safety at Sea, as established by the DMA; specific requirements are defined in further detail within the order on safety of navigation in connection with installation works and other activities, etc. in Danish waters.

Table 4-15 assesses the potential for significant effects on shipping and navigation receptors and impact pathways, as a result of Aurora Project activities.

TABLE 4-15 POTENTIAL FOR SIGNIFICANT EFFECTS ON SHIPPING AND NAVIGATION

Effect	Potential for Significant Effects
Potential for vessel-to-vessel collisions, direct collisions with infrastructure and snagging risk	There is potential for installation, operation and maintenance, and decommissioning activities to result in vessel-to-vessel collisions, due to the presence of the Aurora Project related vessels and displacement of local vessels. Snagging risks may also occur where project infrastructure is present, specifically for anchoring and fishing vessels. When considering the short duration of installation work in the Danish TS (approximately three [3] weeks), the one (1) installation vessel and the embedded mitigation above, **No Significant Effects** are expected.
Disruption to pre-existing navigational management	There is potential for disruption to pre-existing navigational management during installation where activities may be taking place in key anchorages or waiting areas, resulting in loss of access to these areas. Installation is not considered to be a permanent displacement for other vessels. When considering the short duration of installation work in the Danish TS (approximately three [3] weeks), the one (1) installation vessel and based on the use of adequate marking and navigational safety procedures, impacts are considered to be infrequent and temporary, therefore, **No Significant Effects** are expected.
Disruption to search and rescue operations	There is potential for disruption to search and rescue operations where search and rescue vessels may have to reroute due to the presence of the Aurora Project activities and associated vessels. The subsea cable route will be adequately marked on navigational charts and positions will be notified prior to works, therefore the impacts are considered to be infrequent and temporary, therefore, **No Significant Effects** are expected.

4.12.3 SCREENING OUTCOMES

There are considered to be **No Significant Effects** on shipping and navigation based on the low level of activity, short duration of installation work in the Danish TS (approximately three [3] weeks), and adherence to standard maritime safety procedures throughout the duration of the Aurora Project.

Should there be a significant increase in the Aurora Project related vessel traffic or a significant increase in baseline shipping levels due to e.g. active offshore windfarm construction activity in the area of the subsea cable route, it is recommended that the DMA is consulted with in order to determine whether a further assessment of safety of navigation should be undertaken. Any such assessment should be undertaken in compliance with international industry guidance and best practices (The IMO Formal Safety Assessment [FSA]).

4.13 MARINE ARCHAEOLOGY

This section establishes a high-level archaeological and historical baseline for the area surrounding the Aurora Project, located in the North Sea and making landfall in Denmark at the isthmus separating the Ringkobing Fjord and the North Sea. This section assesses potential impacts of the Aurora Project on the cultural heritage and archaeology resource in the area potentially affected by Aurora Project activities.

Impacts on cultural heritage assets may include:

- Direct physical impacts – the damage or full removal of a cultural heritage asset through installation, operation and maintenance, and decommissioning e.g. during RC (including PLGR) or subsea cable burial, or by the placement of protection measures on the seabed; and
- Indirect physical impacts – the potential burial, destabilisation or damage of a cultural heritage asset due to physical changes indirectly caused by installation, operation and maintenance, and decommissioning e.g. changes in seabed sediment level or current flow.

For this assessment marine archaeology is separated from terrestrial archaeology by the Mean High Water Springs (MHWS). All installation related activity is limited to the marine environment, all intertidal and terrestrial components are assessed in **Section 4.14** (Terrestrial Archaeology).

4.13.1 BASELINE

Marine cultural heritage assets can be divided into known and unknown assets, with the known cultural heritage assets being further split between designated and non-designated assets. Designated marine assets may include:

- World heritage sites; and
- Protected World War II (WWII) wrecks (including military remains).

Known non-designated assets may be of archaeological and cultural significance but not necessarily qualified, at present, as a designated asset. Unknown assets include assets that have not as yet been identified or located, but have the potential to be present.

The types of marine heritage receptors can be grouped into the following categories:

- Submerged prehistory and landscapes;
- Marine archaeology; and
- Aviation archaeology.

4.13.1.1 BASELINE METHODOLOGY

This assessment utilises freely available data from the United Kingdom Hydrographic Office (UKHO) wrecks and obstruction database (Admiralty, no date), UNESCO World Heritage List (UNESCO, no date), Splashcos Viewer (Splashcos, no date), and data from Fund Og Fortidsminder (no date). To develop an appropriate baseline for assessment, a consideration is made for the potential direct and indirect physical impacts to known designated and non-designated assets identified via these sources.

The Study Area was used to identify potential direct or indirect physical impacts to known designated and non-designated assets. A 1 km Area of Interest (AoI) was created which consists of the subsea cable route, plus a 1 km buffer corridor, to identify known heritage designated and non-designated assets to aid in the assessment of the potential for any previously unknown heritage assets, and provide contextual information.

4.13.1.2 DESIGNATED ASSETS

There are no designated assets within the Study Area or within the 1 km AoI.

4.13.1.3 NON-DESIGNATED ASSETS

There are no non-designated assets within the Study Area.

Within the 1 km AoI there are three shipwrecks and one anchor and chain (foul area) identified in the UKHO database (UKHO number 32370, 32373, 79338, and 90171 respectively).

4.13.1.4 SUBMERGED PREHISTORY

Denmark has a dense concentration of submerged prehistoric sites due to its conditions being favourable for archaeological preservation, deposition and changes in sea level during the Pleistocene and Holocene (Cohen *et al.*, 2017). These conditions most often included rapid infilling of gyttja or fine clay from when the artefacts were initially deposited that encased the artefacts creating an anoxic environment, alongside prehistoric settlement areas located on the palaeoshoreline, that were subject to subsequent sea-level rise of roughly 30-40 m because of marine inundation (Cohen *et al*., 2017). This has then maintained the material in permanently submerged and anoxic conditions (Baeily *et al.*, 2020). The subsea cable makes landfall along the isthmus separating Ringkobing Fjord and the North Sea, which may have these favourable conditions as known sites as early as the Neolithic have been found in the area. While these are not known marine assets, they do indicate the moderate potential for there being unknown buried prehisotric archaeology within the subsea cable route.

4.13.1.5 MARITIME ARCHAEOLOGY

The footprint of the Study Area is located over open water to the MHWS, as such any unknown assets present would fall under the category of marine archaeology. Marine archaeology can be defined as evidence of “human utilisation of maritime space by boat, settlement, fishing, hunting, shipping and its attendant subcultures, such as pilotage, lighthouse and seamark maintenance” (Westerdahl, 1992). Remains considered for assessment range from shipwrecks or other durable evidence such as cargos and ballast, to features including navigational aids, sailing marks, ports, harbours, and jetties. Maritime assets may also include intertidal and coastal features which do not specifically relate to a wreck or vessel site. These may include fish traps and other evidence of human interaction with the sea, or intertidal areas such as eroded remains from nearby coastal features or settlements, or other evidence of coastal use.

Preservation of maritime heritage assets, particularly for organic and less robust materials, is more likely in lower energy environments and areas where the seabed contains a suitable depth of fine-grained marine sediments conducive to creating an anoxic environment. Conversely, higher energy environments (e.g. within the zones of wave action and stronger tidal energy) and areas of rocky seabed are less conducive to the preservation of maritime remains.

Information regarding the preservation potential or presence of wreck sites within the Study Area is limited due to a lack of archaeologically reviewed survey data. Although there are no known designated marine assets within the Study Area, three (3) undesignated assets have been identified within the AoI (**Section 4.13.1.3**). A site specific geophysical survey conducted by EGS as part of the CRS (completed in September 2024), identified one (1) potential wreck (AUR-S1-EV-SC002; >200 m from the RPL), and 57 potential items of in descript debris and fishing gear and 176 magnetic anomalies (32 unknown) within Danish waters (EGS, 2024). There is a high potential for further unknown submerged archaeology in the Study Area as the immediate vicinity of the subsea cable is located along an isthmus that

may have formerly been a port of call for ships along the west coast of Denmark that has been submerged by the sea since the mid-1600s (Fund og Fortisminder, 2024).

4.13.1.6 AVIATION ARCHAEOLOGY

Marine aviation, in this context, includes civilian and military aircraft that have crashed, sunk or been scuttled under a body of water. Aviation technology has been available since the early 20th century, although air travel became more prevalent after WWI. During the inter-war years commercial air travel boomed, and during WWII the skies were dominated by military aircraft. After the war, commercial aviation steadily increased and improved; often for this type of archaeology the main periods are associated with major developments in aviation design including pre-1939, 1939 to 1945, and post-1945. No contacts linked to aviation debris were identified within the geophysical survey within Danish waters, although items of debris and magnetic anomalies were identified (EGS, 2024). While no databases provided information about known aviation wrecks within the 1 km AoI, it can be assumed that with the scattered population and coastal settlements across Denmark, any marine wreck event had the potential to be properly recorded. Therefore, there is presumed to be a low potential to identify any unknown aircraft within the Study Area, however any identified may be significant due to the high intangible value.

4.13.2 EFFECTS ASSESSMENT

Table 4-16 assesses the potential for significant effects on marine archaeology receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-16 POTENTIAL FOR SIGNIFICANT EFFECTS ON MARINE ARCHAEOLOGY

Effect	Potential for Significant Effects
Direct Effects	There are predicted to be **No Significant Direct Effects** to known or unknown submerged prehistory, maritime archaeology, or aviation archaeology, as designated or non-designated assets, based on the assumptions below (**Section 4.13.2.1**).
Indirect Effects	There are predicted to be **No Significant Indirect Effects** to known or unknown submerged prehistory, maritime archaeology, or aviation archaeology, as designated or non-designated assets, based on the assumptions below (**Section 4.13.2.1**).

4.13.2.1 ASSUMPTIONS

This effects assessment is based on the following assumptions:

- Site specific survey data will be fit for purpose and made available to the local Danish archaeological body (Marine Archaeology at Strandings Museet [MAJ]) and any potential finds of archaeological interest will be reviewed by a qualified archaeologist to ensure that any micro-siting via exclusion zones are identified;
- A photographic record and log of any cores sampled and tested along the route will be made available to the local Danish archaeological body (MAJ) and reviewed by a qualified archaeologist (alongside any available ground models), with potential for further review and assessment upon identification of units of interest, where practicable;

- Any unexploded ordnances (UXO) survey data, investigations and reporting will be made available to the appropriate Danish authorities for review;
- The onshore segment of the subsea cable route from the existing HDD duct entry point (landward) towards the BMH will be in an area that is previously disturbed; and
- During installation, operation and maintenance, and decommissioning activities, any potential finds of archaeological interest are retained, reported to the relevant Danish authorities (MAJ) and managed appropriately.

4.13.3 SCREENING OUTCOMES

There are **no significant direct adverse effects** to known or unknown submerged prehistory, maritime archaeology, and aviation archaeology. Awareness and avoidance, where possible, of contacts identified during the geophysical survey is recommended and a temporary archaeological exclusion zone (TAEZ) of 100m should be maintained around the wreck identified in the cable route survey (understood to be located >200 m from the RPL). The TAEZ should be maintained until further review by an archaeologist is completed (Table 4-17). Similarly, there are **no anticipated indirect effects to known or unknown archaeology** from the subsea cable route. This is based on the assumptions listed in **Section 4.13.2.1**.

TABLE 4-17 RECOMMENDED ARCHAEOLOGICAL EXCLUSION ZONE (PROJECT SPECIFIC PROJECTION; WGS84 MERCATOR)

ID	Easting (m)	Northing (m)	KP RPL offset	Description	Dimensions (m)	TAEZ
AUR-S1-EV-SC002	5797392.5	14006063.1	7019.059 208m NW	Possible ship wreck	50.9x8.3x3	100 m

4.14 TERRESTRIAL ARCHAEOLOGY

This section establishes a high level archaeological and historical baseline for the Study Area surrounding the Aurora Project, located in the North Sea and the landing site at Blaabjerg, Denmark in the strip of land separating the Ringkobing Fjord and the North Sea and assesses potential impacts of the Aurora Project on the cultural heritage and archaeology resource in the area potentially affected by the Aurora Project's activities.

Impacts on cultural heritage assets may include:

- Direct physical impacts – damage / removal wholly or in part, of a cultural heritage asset through installation, operation and maintenance, and decommissioning of the Aurora Project e.g. onshore burial of the subsea cable and any associated infrastructure;
- Indirect physical impacts – damage / removal wholly or in part, a cultural heritage asset due to physical changes indirectly caused by installation, operation and maintenance, and decommissioning of the Aurora Project ; and
- Impacts to setting – changes to the setting of a designated cultural heritage asset within its landscape or seascape.

For this assessment marine archaeology is separated from terrestrial archaeology by the MHWS. It is currently understood that installation will occur above the MHWS, within the landfall Study Area in the terrestrial environment. Therefore, all direct and indirect physical

impacts are anticipated to be within the terrestrial environment for this section, as the subsea cable will not be visible onshore after its installation.

4.14.1 BASELINE

As mentioned in **Section 4.13**, for this report, the dividing line between terrestrial and marine cultural heritage assets is the MHWS. Terrestrial heritage assets are defined as all heritage assets located onshore above the MHWS.

Terrestrial assets can be divided into known and unknown assets, with the known cultural heritage assets being further split between designated and undesignated assets. Designated assets may include:

- World heritage sites;
- Protected stone and earth dykes;
- Protected buildings; and
- Ancient sites and monuments, including cultural heritage areas of national importance.

Known non-designated assets may be of archaeological and cultural significance but not necessarily qualified, at present, as a designated asset. Unknown assets include assets that have not as yet been identified or located, but have the potential to be present.

4.14.1.1 BASELINE METHODOLOGY

This assessment utilises freely available data from the UNESCO World Heritage List, Google Earth, Splascos Viewer (Splashcos, no date), and data from Fund Og Fortidsminder (Fund Og Fortidsminder, 2024). To develop an appropriate baseline for assessment, a consideration is made for the potential direct and indirect physical impacts to known designated and non-designated assets identified via these sources.

The Study Area was used to identify potential direct or indirect physical impacts to known designated and non-designated assets A 1 km AoI was created which consists of the subsea cable route, plus a 1 km buffer corridor, to identify known heritage designated and non-designated assets to aid in the assessment of the potential for any unknown heritage assets.

4.14.1.2 DESIGNATED ASSETS

There is one (1) designated asset within the Study Area, it is a Cultural Heritage Area of National Importance: Sdr. Haurvig (166484). It encompasses an area where a former trading post may have been that has been partially submerged since the 1600's.

There are no designated assets within 1 km AoI.

4.14.1.3 NON-DESIGNATED ASSETS

There are 14 recorded isolated finds within the Study Area, all were coins that range in age from the Iron Age to recent times.

Within the 1 km Study Area there are 12 recorded isolated finds and one WWII bunker. Of the 12 findspots, 11 are locations where coins were identified, these range in age from the Iron Age to recent times. The final isolated findspot was a Stone Age pendant.

4.14.2 EFFECTS ASSESSMENT

Table 4-18 assesses the potential for significant effects on terrestrial archaeology receptors and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-18 POTENTIAL FOR SIGNIFICANT EFFECTS ON TERRESTRIAL ARCHAEOLOGY

Effect	Potential for Significant Effects
Direct Effects	On the assumption that the Aurora Project groundworks will take place within areas that have been previously disturbed, there is **no potential for direct significant adverse effects,** to sites and monuments, archaeology, world heritage sites, or listed buildings. This is predicated on the previous ground disturbance having removed any heritage assets existing within the bounds of the initial disturbance. Should additional groundworks subsequently be required in areas with no previous ground disturbance, a further assessment of potential effects on terrestrial archaeology should be undertaken.
Indirect Effects	**There are no anticipated potential significant, indirect effects to heritage assets from the Aurora Project** as ground disturbance will occur in a previously disturbed area.
Setting Effects	**There are no anticipated potential significant, or setting effects to heritage assets from the Aurora Project** as it will utilise existing terrestrial infrastructure including the existing HDD duct and BMH, with no new above ground facilities or infrastructure that could introduce new characteristics to the landscape that would negatively affect the way an asset is understood, appreciated, or experienced.

4.14.3 SCREENING OUTCOMES

There are **no anticipated significant direct, indirect or setting effects** to terrestrial archaeology heritage assets as ground disturbances related to the Aurora Project are assumed to occur within the limits of previous disturbance within the area. As such, based on this assumption, terrestrial archaeology can be screened out of further assessment. However, in the event that ground disturbances will need to occur within an area that has not been previously disturbed then an additional assessment of the potential effects to terrestrial heritage assets should be undertaken.

4.15 OTHER USERS

This section details the baseline in the Danish TS and identifies the potential for significant effects on other users within the onshore environment surrounding the proposed Danish segment of the Aurora Project. Impacts to other users and infrastructure may include:

- Direct damage to third party infrastructure;
- Temporary obstruction and / or displacement of other users activities, this has the potential to occur across all of the Aurora Project phases due to avoidance of installation vessel and / or vehicles and exclusion from safety zones; and
- Increased SSC on aquaculture sites during installation activities.

4.15.1 BASELINE

4.15.1.1 OFFSHORE RENEWABLE ENERGY

The Danish Energy Agency has committed to 12.9 GW of offshore wind by 2030 and the proposed subsea cable route passes through the offshore wind lease areas for Nordsren I, II and III on the boundary of the TS. Also located near (but outside of) the TS boundary are the operational Horns Rev II and III offshore windfarms. The only offshore windfarm identified within the TS is the operational Vesterhav Syd offshore windfarm. It should be noted that the proposed subsea cable does not intersect any operational offshore windfarm array areas or their export cables. The final site details of the offshore windfarm lease areas are not yet known; however, it is considered unlikely that construction of these sites will be undertaken prior to the installation of the Aurora Project.

4.15.1.2 OFFSHORE OIL AND GAS INSTALLATIONS

No oil and gas installations or active licences are located in proximity to the proposed Aurora Project within Danish TS. Three (3) active pipelines make landfall between Nymindegab and Henne Strand south of the landing site in Norre Nebel, at Blaabjerg, Denmark. These are identified as:

- PL1014_PR gas pipeline, operated by Dong Exploration and Production;
- PL1017_PR gas pipeline, operated by Maersk Oil; and
- PL1007_PR oil pipeline, operated by Maersk Oil.

4.15.1.3 SUBSEA CABLES

A total of five (5) active subsea telecommunication cables make landfall between Nymindegab and Henne Strand, south of the landing site in Norre Nebel, at Blaabjerg, Denmark. These are identified as:

- Havfrue Seg 07;
- Havhingsten;
- Cantat 3;
- UK-Denmark 4; and
- Danice.

4.15.1.4 AGGREGATE EXTRACTION AND DREDGING

Husby Klit, an active aggregate extraction area is identified north of the proposed Aurora Project. Several other active and exploration aggregate areas are also identified north of the proposed subsea cable within the Danish TS.

Maintenance dredging of Ringkøbing Fjord and dredging of its harbours is undertaken on a routine basis. The dredged material is then disposed of at sea.

4.15.1.5 AQUACULTURE

Seven (7) aquaculture sites for diversified salmonid and other fish species are located along the western edge of Ringkøbing Fjord. Five (5) of these sites are located north of the Aurora Project and landing site in Norre Nebel, at Blaabjerg, Denmark, and two are located south of the Aurora Project.

4.15.1.6 MILITARY AREAS

No military areas have been identified in the Danish TS in proximity to the proposed Aurora Project.

4.15.1.7 ONSHORE RECREATIONAL USERS AND TOURISM

The landing site is located in Norre Nebel, Blaabjerg, west of Ringkøbing Fjord. The beaches along the west coast of Jutland are freely accessible to tourists and are a popular location for recreational activities like horse riding and hiking, with a number of coastal walking routes located in the Study Area. Within Ringkøbing Fjords sport angling and tours of the Fjord are also undertaken. Peak tourism and recreational periods are expected during the summer months between June to August, annually.

4.15.2 EFFECTS ASSESSMENT

Table 4-19 assesses the potential for significant effects on other users and impact pathways, as a result of installation, operation and maintenance, and decommissioning of the proposed Aurora Project.

TABLE 4-19 POTENTIAL FOR SIGNIFICANT EFFECTS ON OTHER USERS

Effect	Potential for Significant Effects
Direct damage to third party infrastructure	The only identified offshore windfarm within the Danish TS in proximity to the Aurora Project is the operational Vesterhav Syd offshore windfarm, which is not intersected by the Aurora Project. Three (3) active pipelines and five active subsea cables are also identified south of the landing site of the Aurora Project. As there are no proposed cable or pipeline crossings and the Aurora Project does not cross in close proximity to the identified offshore windfarm, cables and pipelines within the TS, it is considered that direct damage to third party infrastructure is unlikely. Therefore, it is considered that there is **no potential for significant effects**.
Temporary obstruction and/or displacement of other users activities	The Aurora Project does not intersect the Vesterhav Syd array area and vessel activity associated with Vesterhav Syd offshore windfarm is considered to be greatly reduced now the project has finished construction. Furthermore, the Aurora Project does not cross in close proximity to the three (3) identified pipelines and five (5) subsea cables or intersect the Husby Klit extraction site and routine dredging sites within of Ringkøbing Fjord. Vessels transiting to these sites would be infrequent and temporary, as such it is considered that there is **no potential for significant effects** due to obstruction to vessels. Beach access to recreational users and tourists will be maintained throughout installation and existing infrastructure (i.e. HDD duct) will be utilised to land the subsea cable. There is potential for some obstruction of recreational activities when the subsea cable is pulled through the existing HDD duct and connected to the BMH, however this will be temporary and short-term. Therefore, it is considered that there is **no potential for significant effects**. No military areas, oil and gas installations or active licences are identified which are likely to interact with installation, operation and maintenance, and decommissioning activities, therefore there is **no potential for significant effects**.

4.15.3 SCREENING OUTCOMES

It is concluded that potential impacts from the installation of the Aurora Project will largely be short-term and temporary. Any impacts relating to obstruction and / or displacement of other user activities and increased SSC are unlikely to result in a significant effect. Additionally, as the Aurora Project does not cross any identified cables or pipelines within the Danish TS, or intersect any operational offshore windfarm array areas, there is no potential for direct damage to occur to third party infrastructure.

As such, **No Significant Effects** to other users within the offshore TS and the onshore Study Area surrounding the proposed Danish segment of the Aurora Project are expected.

4.16 CUMULATIVE EFFECTS

Cumulative effects are the impacts of a development on people or the environment, which act cumulatively with other planned or reasonably predictable developments. Cumulative effects can arise from individual impacts resulting in minor effects, which when combined with other planned developments result in a more significant effect. Activities and developments which are already underway at the time of this screening activity have been assessed as forming part of the baseline environment and are therefore not considered as part of the cumulative assessment.

This section describes the baseline of existing and proposed developments in the vicinity of the Aurora Project and considers the potential for significant cumulative effects as a result of these developments. Based on the Aurora Project activities, the following potential cumulative effects on sensitive receptors have been considered:

- Underwater noise generated from the Aurora Project related vessel sources affecting marine mammals;
- Seabed habitat change from a number of seabed installations, (e.g. future pipelines and cables); and
- Seabed disturbance / sediment dispersion from cable / pipeline installation activities.

4.16.1 BASELINE

As outlined in **Section 4.15** (Other Users), the Aurora Project passes through, or in close proximity to existing offshore windfarms, and dredging areas in the Danish TS. A review of the status of projects and activities in general proximity to the Aurora Project's Study Area has identified the following offshore windfarms and lease areas:

- **Nordsren I, II and III lease areas** – located outside of the TS, the Aurora Project will pass in close proximity to these lease areas, however it is expected that the construction of these site will take place after the Aurora Project has been installed;
- **Horns Rev II and III offshore windfarms** – operational offshore windfarms located outside of the TS; the Aurora Project does not pass through; and
- **Versterhav Syd offshore windfarm** – operational offshore windfarm located within the TS; the Aurora Project does not pass through.

The following planned or operational cables and pipelines have been identified as either crossing or being within 500 m of the Aurora Project, located outside of the TS (Danish Cable Protection Committee (DKCPC), no date):

- **IOEMA** – proposed subsea telecommunications cable connecting the UK, Germany, the Netherlands, Denmark and Norway. Project plans were launched in May 2024, therefore not anticipated to be installed until after the Aurora Project;
- **Havfrue** – operational subsea telecommunications cable connecting the US, to Ireland, Norway and Denmark;
- **NordLink** – operational subsea power cable connecting Germany and Norway;
- **NordNed** – operational subsea power cable connecting Norway and the Netherlands;
- **Shefa 2** – operational subsea telecommunications cable; and
- **DANICE** – operational subsea telecommunications cable connecting Iceland and Denmark.

4.16.2 EFFECTS ASSESSMENT

No planned or reasonably predictable projects have been identified which are likely to temporally overlap with the installation of the Aurora Project. The cables and pipelines in the vicinity of the Aurora Project are outside of the TS boundary, and are either already installed or will not be installed during the timeline of installation for the Aurora Project and therefore will not contribute to cumulative effects. The Aurora Project passes in close proximity to the proposed Nordsren offshore windfarms, which are not expected to be constructed until after the Aurora Project is installed. Therefore, there is no potential for cumulative effects to arise from the impacts of the installation of the Aurora Project, cumulatively with other installations or constructions.

As there are no known installations or constructions in the vicinity of the subsea cable route which are likely to overlap with installation of the Aurora Project, there is no potential for cumulative effects to arise from the impacts of underwater noise. Any impacts from the Aurora Project on seabed habitat disturbance and sediment dispersion will be negligible due to the temporary nature and small scale of the installation. Seabed habitats will likely have recovered, and sediment will have settled before future activities are carried out, therefore there is no potential for cumulative effects with the Aurora Project.

Once installed, the Aurora Project will not have further impacts on noise, habitat disturbance and seabed dispersal, therefore having no potential for significant cumulative effects on an operational basis.

4.16.3 SCREENING OUTCOMES

Given the absence of other installation and construction activities which may overlap with installation of the Aurora Project, there are not expected to be any cumulative effects of noise, seabed habitat and sediment disturbance. Due to the small area of seabed being affected by the Aurora Project and the anticipated rapid recovery, the Aurora Project is not expected to have any cumulative effects when considering other proposed projects in the area.

Therefore, **No Significant Effects** are expected from the Aurora Project, cumulatively with other projects in the region.

4.17 DESIGNATED SITES FOR NATURE CONSERVATION: NATURA 2000 SITES

The Birds and Habitats Directives together form the cornerstones of EU biodiversity policy. The Birds Directive (Council Directive 2009/147/EC) protects birds and their habitats, including

through designation of SPA. The Habitats Directive (Council Directive 92/43/EEC) protects habitats through the designation of Sites of Community Importance (SCI) and SAC. Together with Ramsar sites, SPAs, SCIs and SACs form the Natura 2000 network, and for the purposes of this report, form consideration of nature conservation sites.

This first step of a Natura 2000 assessment is a Natura 2000 screening, which identifies the potential effects of a project on a Natura 2000 site(s), either alone or in combination with other projects or plans and considers whether these effects are likely to be significant. If significant effects are likely or some degree of uncertainty remains, further appropriate assessment should be carried out.

The subsea cable landing site occurs close to (but not overlapping with) the Ringkøbing Fjord SPA / Ramsar and the Ringkøbing Fjord og Nymindestrømmen SAC (**Figure 4-6**). An existing HDD duct and BMH will be utilised for the Aurora Project to minimise potential impacts from installation activities on the Ringkøbing Fjord og Nymindestrømmen SAC.

4.17.1 RINGKØBING FJORD SPECIAL PROTECTION AREA / RAMSAR

Ringkøbing Fjord SPA / Ramsar is an internationally important area for breeding, overwintering and staging for 37 species of waterbirds. The proposed landing site is located at the barrier beach in front of the site. Classified populations will be exposed to noise and light during operations which may disturb breeding and non-breeding populations, particularly those that may nest within the dune systems. Installation works may also impact behaviour of species that forage at sea.

Considering the magnitude of the proposed Aurora Project and associated installation impacts, and also set in the context of the existing HDD duct and BMH, and associated installation, it is determined that there will be no Likely Significant Effect (LSE) for the classified populations and supporting habitat features of the Ringkøbing Fjord SPA / Ramsar.

4.17.2 RINGKØBING FJORD OG NYMINDESTRØMMEN SPECIAL AREA OF CONSERVATION

The Ringkøbing Fjord og Nymindestrømmen SAC contains 20 coastal / marine habitat and six (6) marine species features. The proposed landing site is connected to the BMH via an existing HDD duct within an area crossed by established paths and associated recreational use. Setting in the context of the proposed Aurora Project's installation activities, it can be shown that the subsea cable laying installation works at the landing site will not impact the dunes feature of the site. The same conclusion is determined for the Annex II population of Eurasian otter (*Lutra lutra*). It is determined that there will be no LSE for the designated Annex I habitat features and Annex II populations of the Ringkøbing Fjord og Nymindestrømmen SAC.

4.18 TRANSBOUNDARY IMPACTS

Transboundary impacts occur when an impact extends into other Exclusive European Area States. The Aurora Project passes through, the UK, Norwegian and Danish Exclusive European Area States. This section of the application relates exclusively to transboundary impacts as a result of the Danish segment of the Aurora Project. Transboundary impacts as a result of the Norwegian and UK segments of the Aurora Project will be assessed as appropriate within separate applications to the respective national authorities.

No Significant Effects are predicted for the activities and impacts associated with the Aurora Project within the Danish TS. Therefore, it is considered that the Aurora Project will not result in significant effects inside or outside of the Danish Exclusive European Area State. As such, **No Significant Transboundary Impacts** are identified.

5. CONCLUSION

This EIA Screening Report for the Aurora Project in Denmark has been conducted in accordance with the requirements of the EIA Act (LBK no 4 of 03/01/2023).

This report aimed to screen for any potential significant environmental effects to inform decision-making and environmental accountability, and to assist in achieving environmentally sound installation works throughout the life cycle of the Aurora Project. Consistent with the national regulatory standards, the environmental status of the Aurora Project's AoI has been carefully reviewed using universally accepted methodologies.

Generally, the subsea cable installation activities for the Aurora Project result in temporary and localised impacts. The footprint of impact is narrow, generally restricted to a corridor of a few metres width along the subsea cable route. The method of installation; whereby a towed sea plough lifts the sediment, installs the cable and reburies it in a single operation; is designed to minimise the level of disturbance and the area of potential impact. Once installed, the Aurora Project will be buried below the seabed wherever conditions allow, therefore, having no potential pathways for effect on many of the receptors.

Given the benign nature of subsea fibre optic cables once installed, the operation of subsea cables does not have any significant ongoing environmental effects. Potential decommissioning options will be reviewed closer to the end of the planned 25 year operational life; however given the subsea cable will either be left *in situ* or removed for re-use, recycling or disposal, the potential effects of decommissioning will be similar in nature to installation, but on a smaller scale.

Section 5.1 provides a list of embedded mitigation measures for the duration of the Aurora Project installation, together with any additional mitigation measures specified as the basis for this screening assessment. With the embedded controls and specified mitigation measures in place, the Aurora Project has no potential for significant effects on the surrounding physical, biological and human environment, therefore, the Aurora Project can be screened out of requiring further consideration and assessment in an EIA.

5.1 MITIGATION MEASURES

A number of embedded / inbuilt control measures have been incorporated into the Aurora Project design to avoid and minimise effects on these receptors, including the careful routing of the subsea cable to avoid or minimise interaction with sensitive receptors. Additional mitigation measures are also specified below where they have been built into the screening assessment.

The following mitigation measures have been taken into consideration for this EIA Screening Report of the Aurora Project:

- Avoidance of protected and sensitive areas e.g. Natura 2000 sites and use of existing infrastructure wherever feasible, such as re-use of the existing HDD duct and BMH to minimise potential effects to coastal areas;
- Avoidance of areas with existing or planned infrastructure, e.g. offshore windfarms, existing raw material extraction areas and military areas;

The following mitigation measures are planned during the installation phase;

- The Aurora Project will, in conjunction with the relevant installation contractors, provide the locations of the installation vessel and the size of the requested safety exclusion zones through NtMs to increase awareness of the vessel traffic associated with the Aurora Project;
- Micro-routing will be performed around identified wrecks, munitions and seabed anomalies based on the results of the CRS;
- The Aurora Project will maintain regular contact and coordinate with the appropriate authorities to minimise the risk of conflict between military activities and the installation vessel;
- The Aurora Project will implement a series of monitoring and “watching-brief” management measures during the onshore installation works at the existing HDD duct entry point (landward) to the BMH, noting that the re-use of existing infrastructure means that the potential area of disturbance is small (approximately 29 m) and the onshore operations will therefore be short term and over a limited area;
- To mitigate the UXO risk, the Aurora Project has engaged with the Danish Ministry of Defence on UXO specific requirements, and will prepare a UXO Awareness document which will be shared with all contractors and personnel involved in the subsea cable SEL activities. This document describes what types of mines have been used in this area and what to do in case one is encountered (recognise, retreat and report);
- To mitigate the shipping and navigational risk, the Aurora Project has included a Risk Assessment as part of the Establishment Permit application to aid DCA’s consultation with DMA on the Aurora Project’s activities;
- Given the proximity of the landing area to the Natura 2000 designated Ringkøbing Fjord coastal site and the potential presence of protected species, the following additional mitigation measures are recommended during installation activity:
    - Prior to onshore works, a pre-installation visual survey should be undertaken for the presence of otter holts in the immediate area, with clear demarcation of work areas and control of vehicle movements; and
    - Should onshore installation take place during tern breeding season, a pre-installation visual survey for presence of tern nests should be undertaken, with clear demarcation of work areas and control of vehicle movements.

With the application of these mitigation measures, in particular the constraints-based route engineering of the subsea cable route and re-use of existing infrastructure, as well as the application of additional mitigation where appropriate, it is considered that the potential environmental and social impacts of the Aurora Project will generally be localised and short term, with no potentially significant effects identified. On this basis, and in alignment with the regulatory framework in Denmark, it is recommended that the Aurora Project is screened out of requiring further consideration and assessment through an EIA.

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ANNEX 1 AS-BUILT HDD DUCT DESIGN AND DIMENSIONS

No.	Modification	Date	Name	Status

Drawn by: MK Date: 24.11.99

Figur: HDD Shore Approach
AS-BUILD-DRAWING

Client: Submarine Cable & Pipe GmbH
Hauptstraße 248
D - 26639 Wiesmoor

Project: Shore Approach
Denmark (Blaabjerg)
Segment N

Haustadt +Timmermann
Bohrtechnik

Rohrleitungsbau-Tiefbau-Pipelinebau
Bergheimer Straße 121
D - 47228 Duisburg 14
Telefon: (0 20 65) 69 03-0
Telefax: (0 20 65) 69 03-370
E-Mail : Bohrtechnik.ht@t-online.de

Scale:	Drawing nr.:	Page:	of:	File-name:
1:1000	AS-99-0035	1	1	AS990035.DWG

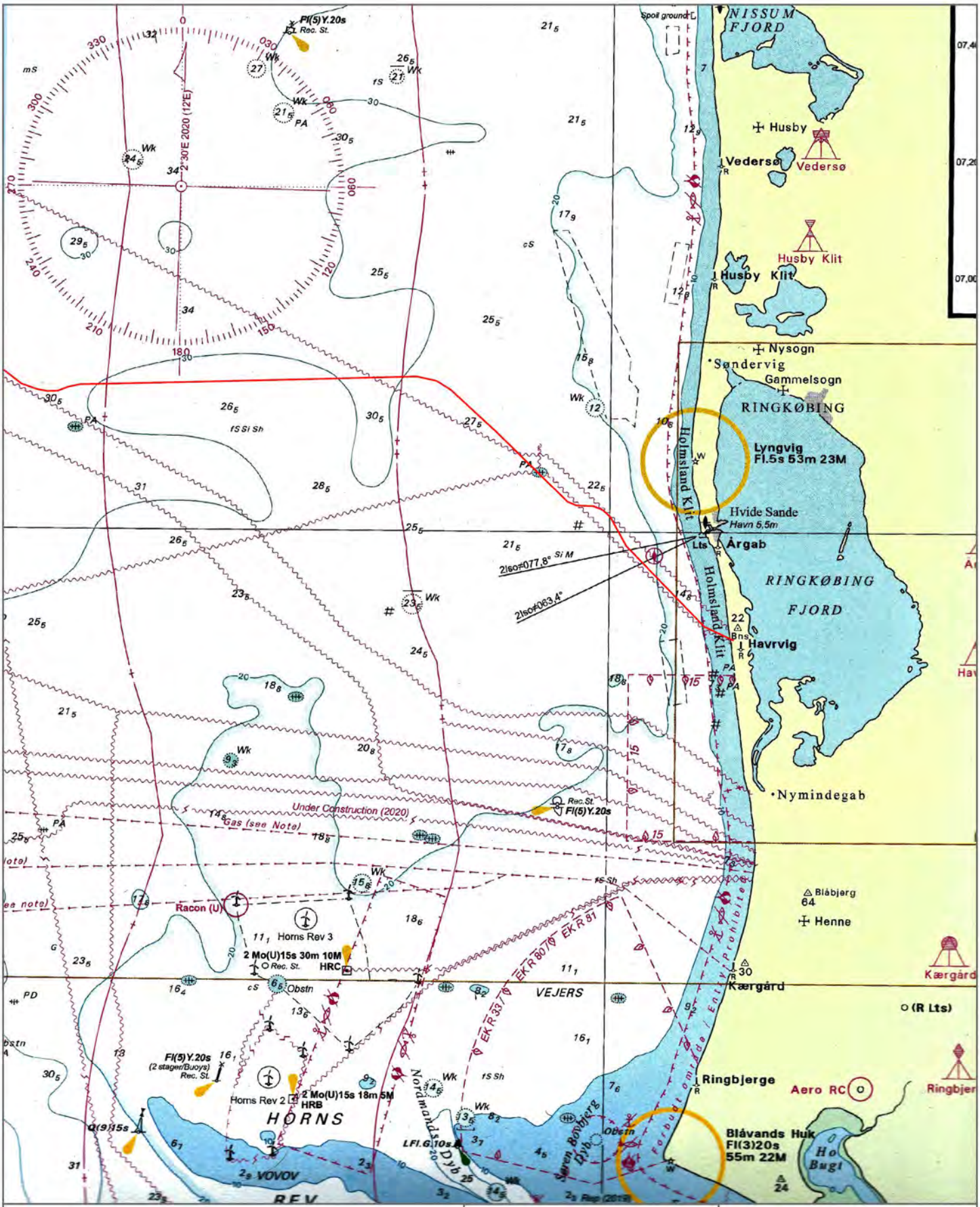
ERM HAS OVER 160 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

Argentina
Australia
Belgium
Brazil
Canada
China
Colombia
France
Germany
Ghana
Guyana
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
Mozambique
The Netherlands
New Zealand
Peru
Poland
Portugal
Romania
Senegal
Singapore
South Africa
South Korea
Spain
Switzerland
Taiwan
Tanzania
Thailand
UAE
UK
US
Vietnam

ERM UK
Environmental Resources Management Ltd
2nd Floor
Exchequer Court
33 St Mary Axe
London
EC3A 8AA
United Kingdom

T: +44 20 3206 5200
F: +44 20 3206 5440

www.erm.com



Subsea cable route

0 2 4 6 8 10
Kilometers

N

Aurora Cable System
Denmark

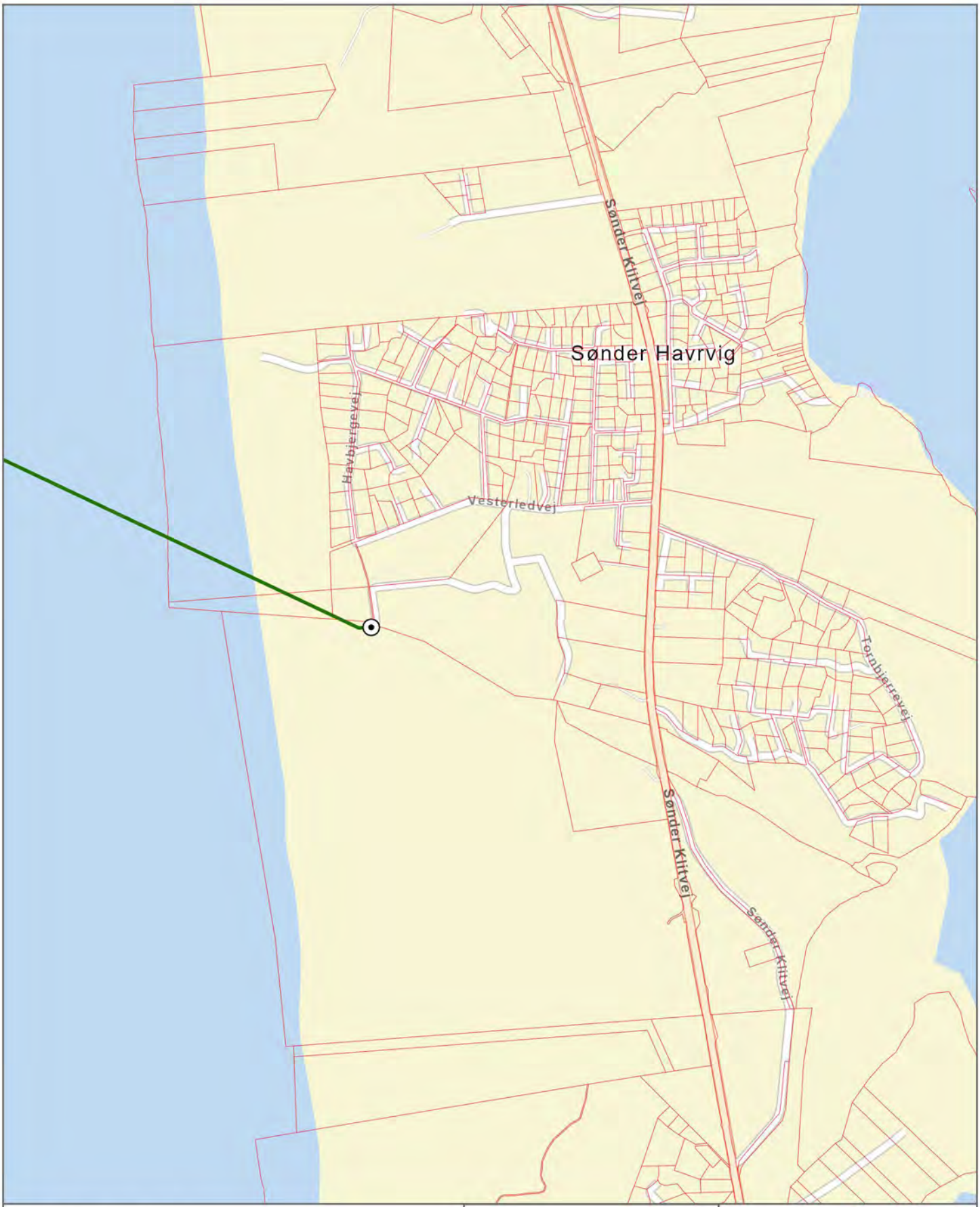
SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: IW
PROJECT: 0715845	CHECKED: CR
DATE: 8/7/2024	APPROVED: CR

ERM

PROJECTION: ETRS 1989 UTM Zone 32N

SOURCE: World Topographic Map (ESRI)

Path: G:\7_Cables\ASN_Meta_Denmark\Workspaces\E_A_R\Denmark\ASN_Meta_DK_route_ADM_20240807.aprx / A4P_A01



Subsea cable route

Beach Manhole (BMH) BLAABJERG

0 70 140 210 280 350

Meters

N

Aurora Cable System
Cadastral map
Denmark

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: IW
PROJECT: 0715845	CHECKED: CR
DATE: 8/13/2024	APPROVED: CR

ERM

PROJECTION: ETRS 1989 UTM Zone 32N

SOURCE: World Topographic Map (ESRI). Contains data from the Danish Geodata Agency, Cadastral Map, WMS service

Path: G:\7_Cables\ASN_Meta_Denmark\Workspaces\E_A_R\Denmark\ASN_Meta_DK_route_Cadastral_20240813.aprx / A4P_A01

Akt: Skab nr.
(udfyldes af dommerkontoret)

Justitsministeriets gengartopapir

Matr. nre. 156ad, 156ak, 156ao, 156pm, 156rv, 156aøu, 156aøv, 156 aøx og 163cc Søgård Hovedgård, Holmsland Klit

1400,-

Anmelder:

Landinspektørerne Syd
Kronprinsensgade 68
6700 Esbjerg
Tlf.: 75 12 13 66

DEKLARATION

Undertegnede ejer meddeler hermed på egne og efterfølgende ejeres vegne Telia Net ret til på den mig tilhørende ejendom, matr. nre. 156 ad, 156 ak, 156ao,156pm, 156rv, 156aøu, 156aøv,156aøx og 163cc Søgård Hovedgård, Holmsland Klit at have kabler liggende i jorden i tracé, som vist på vedhæftede kortskitse.

Telia Net har endvidere ret til senere at lægge flere kabler i ovennævnte tracé mod at betale erstatning, herunder servituterstatning, efter landsaftalens regler.

Telia Net yder erstatning for eventuelle skader i forbindelse med fremføring af kablerne, herunder skader på ledningsanlæg, dræn og hegn. Udgifterne ved udbedring af skader, som først kommer for dagen på et senere tidspunkt, erstattes ligeledes, såfremt skaderne er forvoldt ved kablernes etablering. Skaderne skal anmeldes til og besigtiges af Telia Net forinden reparationen foretages.

Telia Net skal i tjenesteanliggende have fri og uhindret adgang til kablerne med værktøj og materiel. Så vidt muligt skal ejeren af ejendommen adviseres forinden, og vedkommendes anvisninger vedrørende færdsel på ejendommen skal efterkommes. Der ydes erstatning for eventuelle skader.

Kablerne er nedlagt i en dybde på henholdsvis 75 cm og 45 cm. Idet den nødvendige sikkerhedsmargin udgør 30 cm, skal arbejde i nærheden af kablerne i større dybde, fx grubning, dræning, plantning af træer, opførelse af bygninger og de dermed forbundne jordarbejder, hvorved der kan være fare for en beskadigelse af kablerne, skal arbejdet anmeldes til Telia Net senest 8 dage, før det påbegyndes. Telia Net vil så for egen regning træffe de nødvendige foranstaltninger til sikring af kablerne.

Telia Net kan for egen regning lade denne deklaration tinglyse som servitut på den førnævnte mig tilhørende ejendom.

Påtaleberettiget er **Telia Net A/S** Ejby Industrivej 135, 2600 Glostrup

Med hensyn til de ejendommene påhvilende pantehæftelser, servitutter og andre byrder henvises til ejendommens blade i tingbogen. Deklarationen respekterer uden yderligere samtykke alle kommende pantehæftelser samt kommende servitutter, hvis udøvelse ikke er til hinder for den Telia Net tillagte ret.

Ålholt

Den 15. august 2000 Som ejere af matr. nr. 156 ad, 156 ak, 156 ao, 156 pm, 156 rv 156aøu, 156 aøv og 156 aøx og 163cc Søgård Hovedgård, Holmsland Klit :

Miljø- og Energiministeriet
Oxbøl Statsskovdistrikt
Ålhoh, Ålholtvej 1 - 6840 Oksbøl
Telefon 76 54 10 20 - Giro 6 06 21 56

Stiftelsen af foranstående byggeservitut tiltrædes i henhold til lov om planlægning § 42. Tilvejebringelse af lokalplan er ikke påkrævet.

Hvide Sande, den 02 NOV. 2000

Iver Enevoldsen / Steen Davidsen

HOLMSLAND KOMMUNE
TEKNISK FORVALTNING
Kirkevej 4, 6960 Hvide Sande
Tlf. 96 59 59 59

Blanketnr. 295

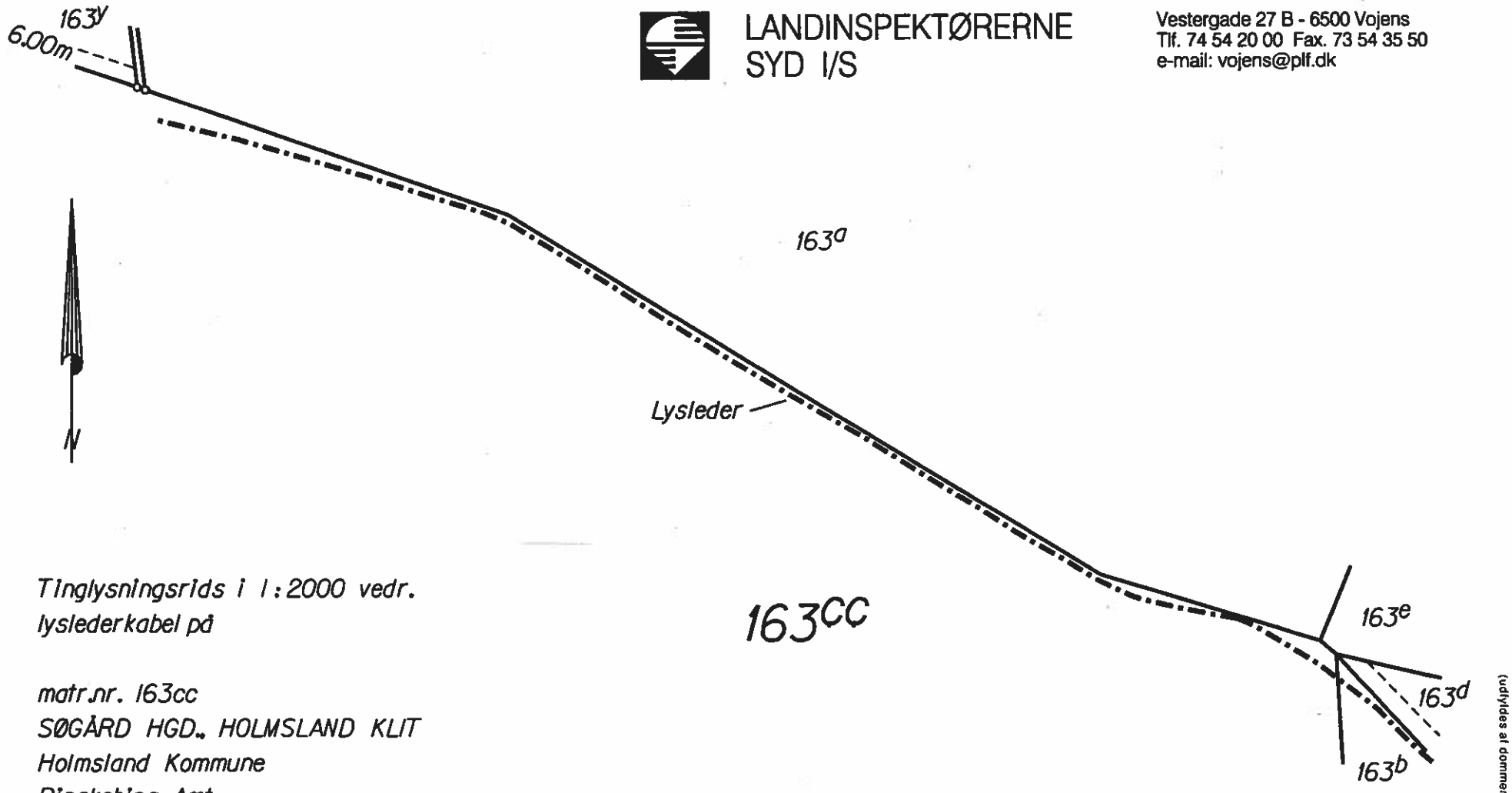
Af denne kort-genpart er nøjagtig genpart af det originale kort vedrørende ejendommen(e)

matr. nr. 163cc Søgård Hgd., Holms- land Klit, Holmsland Kommune Ringkøbing Amt

attesteres herved. Vojens d. 25-10-2000 Navn

Justitsministeriets genpartpapir. Til kort.

Den Danske Landinspektørforening



LANDINSPEKTØRERNE
SYD I/S

Vestergade 27 B - 6500 Vojens
Tlf. 74 54 20 00 Fax. 73 54 35 50
e-mail: vojens@plf.dk

Tinglysningsrids i 1:2000 vedr.
lysslederkabel på

matr.nr. 163cc
SØGÅRD HGD., HOLMSLAND KLIT
Holmsland Kommune
Ringkøbing Amt

J.nr. 22711

Akt: Skab nr.
(udfyldes af dommer/kontoret)

Akt: Skab nr.

(udfyldes af dommerkontoret)

LANDINSPEKTØRERNE
SYD I/S

Vestergade 27 B - 6500 Vojens
Tlf. 74 54 20 00 Fax. 73 54 35 50
e-mail: vojens@plf.dk

Mlr. nr. 156rv Søgård Hgd., Holms- land Klit, Holmsland Kommune Ringkøbing Amt

attesteres herved. Vojens d. 25-10- 2000 Navn

At denne kort-genpart er nøjagtig genpart af det originale kort vedrørende ejendommen(e)

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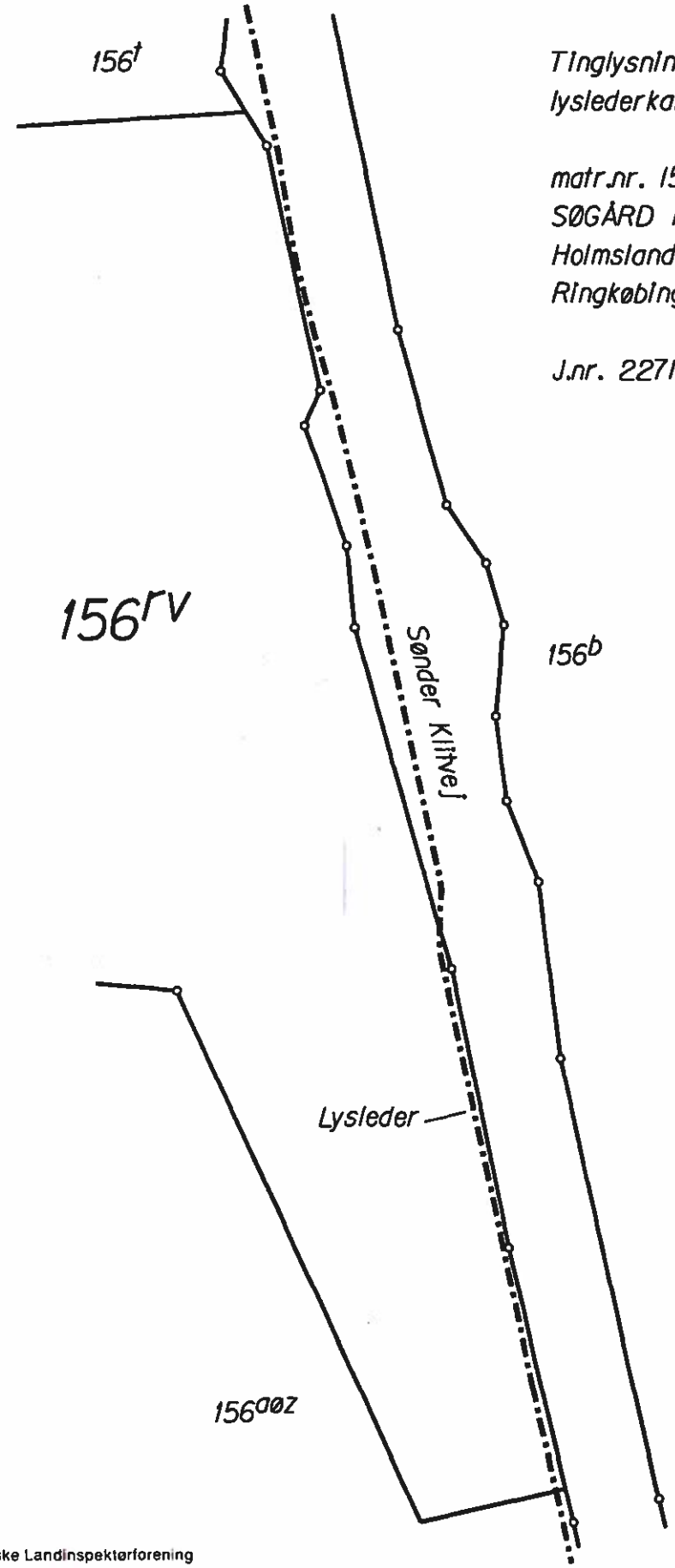


Tinglysningsrids i 1:1000 vedr. lysslederkabel på

matr.nr. 156rv
SØGÅRD HGD., HOLMSLAND KLIT
Holmsland Kommune
Ringkøbing Amt

J.nr. 22711

LANDINSPEKTØRERNE
SYD I/S

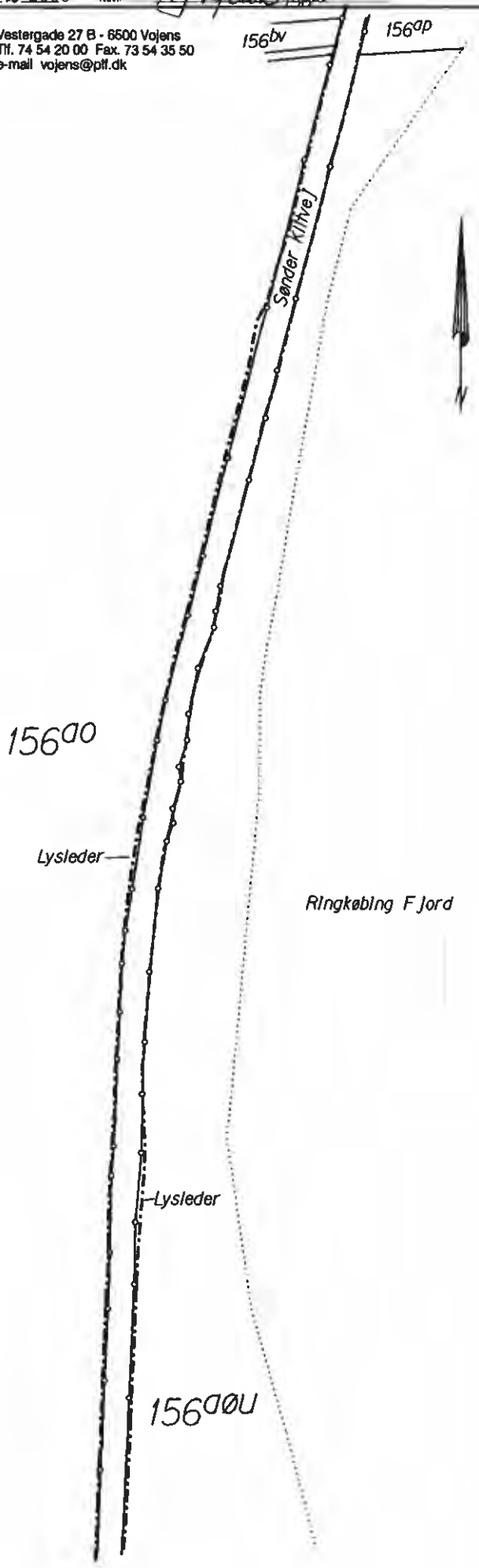
Vestergade 27 B - 6500 Vojens
Tlf. 74 54 20 00 Fax. 73 54 35 50
e-mail vojens@plf.dk

Akt: Skab nr.
(udfyldes af domhavskontoret)

Tinglysningsrids I 1:2500 vedr.
lysslederkabel på

matr.nre. 156ao og 156aøu
SØGÅRD HGD., HOLMSLAND KLIT
Holmsland Kommune
Ringkøbing Amt

J.nr. 22711

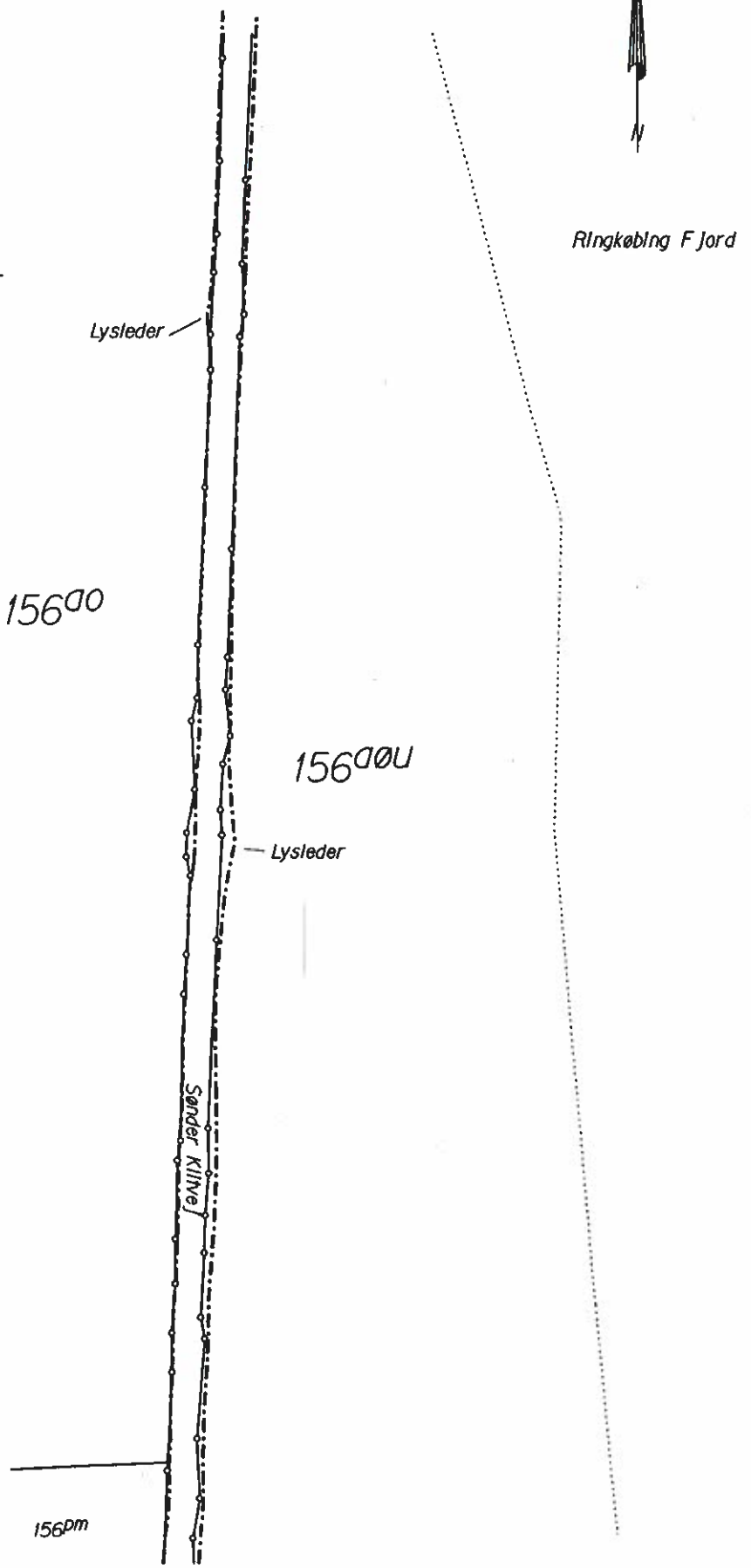


LANDINSPEKTØRERNE
SYD I/S
Vestergade 27 B - 6500 Vojens
Tlf. 74 54 20 00 Fax. 73 54 35 50
e-mail: vojens@plf.dk

Tinglysningsrids 1 1:2500 vedr.
lysiederkabel på

matr.nre. 156ao og 156aøu
SØGÅRD HGD., HOLMSLAND KLIT
Holmsland Kommune
Ringkøbing Amt

J.nr. 2271l



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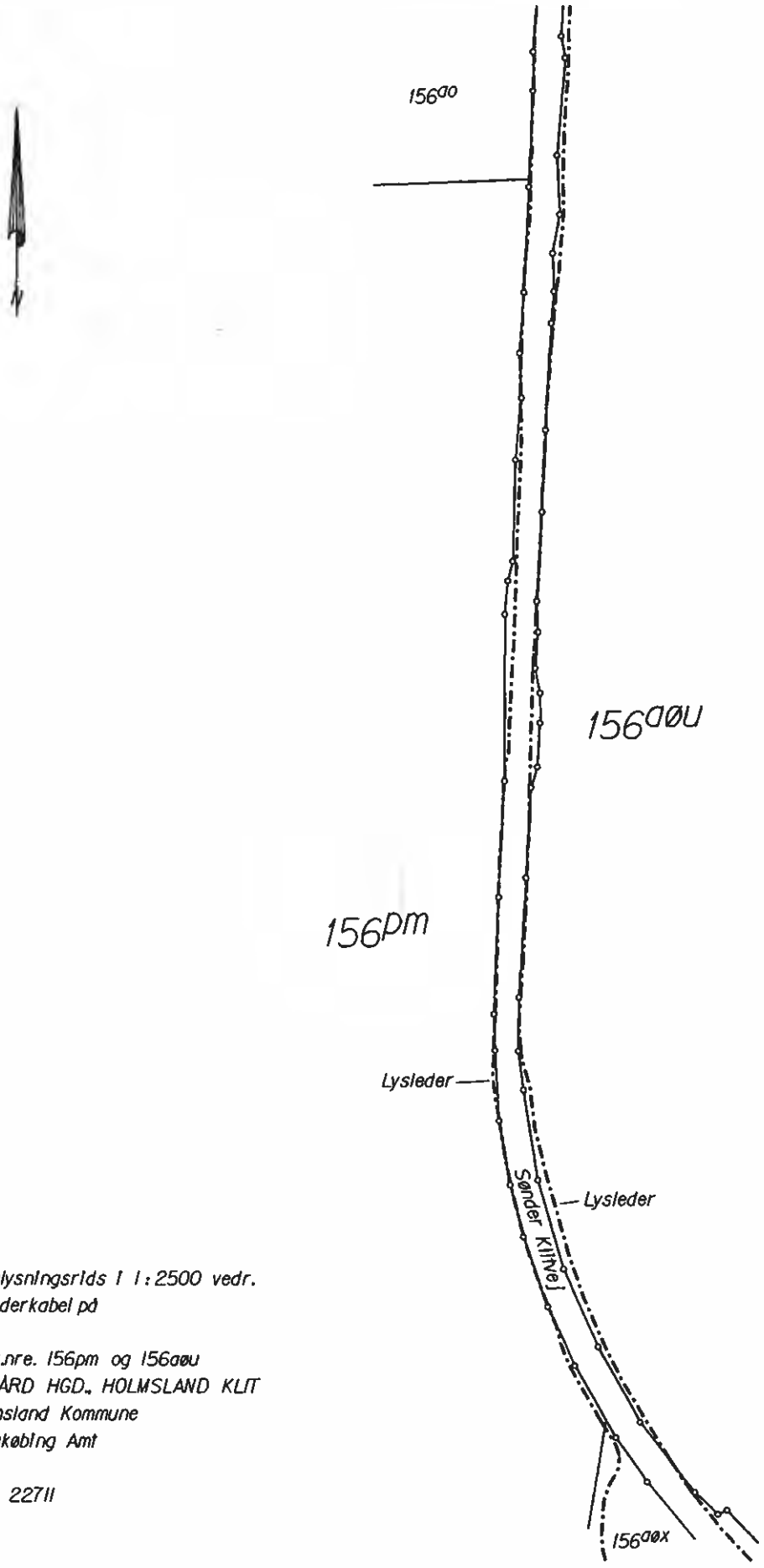
(udfyldes af domstolen)

LANDINSPEKTØRERNE
SYD I/S

Vestergade 27 B - 6500 Vojens
Tlf. 74 54 20 00 Fax. 73 54 35 50
e-mail: vojens@plf.dk



Tinglysningsrids I 1:2500 vedr.
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SØGÅRD HGD., HOLMSLAND KLIT
Holmsland Kommune
Ringkøbing Amt

J.nr. 22711

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At denne kort-genpart er nøjagtig genpart af det originale kort vedrørende ejendommen(e)

matr. nr. 156ad, 156ak, 156ao, 156aøv og 156aøx Søgård Hgd., Holmsland Klit

attesteres herved. Vojens d. 25 - 10 - 19 2000 Navn

Justitsministeriets genpartspapir Til kort

Den Danske Landinspektørforening

LANDINSPEKTØRERNE
SYD I/S

Vestergade 27 B - 6500 Vojens
Tlf. 74 54 20 00 Fax. 73 54 35 50
e-mail: vojens@plf.dk

156aøu

Ringkøbing Fjord

156pm

156aøx

156aøs

N

Sønder Klitvej

156ak

Akt: Skab nr.
(udfyldes af dommerkontoret)

Ringkøbing Fjord

Lysleder

Lysleder

156ao

156aøv

156ad

156am

Tinglysningsrids i 1:2500 vedr.
lysledérkabel på

matr.nre. 156ad, 156ak, 156ao, 156aøv og 156aøx
SØGÅRD HGD., HOLMSLAND KLIT
Holmsland Kommune
Ringkøbing Amt

J.nr. 2271l

ASSESSMENT OF SAFETY OF NAVIGATION IN CONNECTION WITH MARINE CONSTRUCTION WORKS

Cf. order no. 1351 of 29 November 2013 on safety of navigation in connection with engineering works and other activities, etc. in Danish waters
(as regards recreational activities, reference is made
to the website of the Danish Maritime Authority (link))

Planning phase

Screening

Initially, the client, its consultant or lead contractor makes a screening of the intended project. In case of major projects (offshore wind farms, large port construction works, road/railway bridges, etc.), the Danish Maritime Authority must be contacted in order to clarify the need for any documentation and risk analyses, etc.

The screening must contain a description of the activity and the areas/waters affected (for example geotechnical drilling at X Port in X Belt).

Brief description of the work:

The proposed Project consists of the installation of a planned subsea fibre optic telecommunication cable system (hereafter known as the Aurora Project or the subsea cable) connecting landings at Manasquan New Jersey in the United States (US) and Blaabjerg in Denmark. The local Landing Provider and Project Proponent in Denmark is Anelon, Alcatel Submarine Networks (ASN) has been contracted to design build and install the system and Environmental Resources Management (ERM) have been appointed by ASN to obtain the necessary permits for the installation of the Aurora Project in Danish waters.

The application covers the works to be done within Danish territorial seas (TS). The freedom to lay such subsea cables in Exclusive Economic Zones (EEZs) beyond the TS is governed by the United Nations Convention on the Law of the Sea (UNCLOS) (Part V Article 58) of which Denmark ratified on 16 November 2004. The EEZ is therefore excluded from permit or licence applications for the installation of the Project in Danish waters with only the portion to be installed through Denmark's TS to the Beach Manhole (BMH) at Blaabjerg being considered in the application.

The route of the Aurora Project is shown in the Figure 1 at the end of this document

This screening as well as "part 1", if filled in, must accompany the tender documentation or be communicated otherwise to the performing contractor.

The performance of an activity is conditional upon the approval hereof by the authority granting permits.

Does the activity take place close to any of these areas?
If the activity takes place in the waters of a port, the port authority must be involved.
(If one or more of the items below are considered to involve an increased risk, "part 1" must be filled in)

	YES	NO	If yes, does the activity involve an increased risk? (see note)	Any arguments or reasons for not filling in "part 1"
Navigable spans	☐	☑		
Narrow fairways or channels	☐	☑		
Ship traffic routes	☑	☐	Risk is not significant, please refer to the EIA Screening	
Ship routeing systems, including traffic separation systems and deepwater routes, etc.	☐	☑		

Port entrances	☐	☑		
Leading lights or lights sectors	☐	☑		
Anchorages	☐	☑		
Areas of prohibition or dangers (See Areas of prohibition and Annex to Notices to Mariners - EfS A)	☐	☑		
Within 200 metres of submarine cables or submarine pipelines not owned by the person or company responsible	☑	☐	No. Cables and pipelines have been identifies and are being handled according to industry standards.	
Pilot boarding places	☐	☑		
Does the activity impede the freedom of navigation?	☐	☑		
Other critical places from a navigational perspective	☐	☑		

Diving

	YES	NO	If so, follow the link for the assessment form to determine whether permission must be obtained from the Danish Maritime Authority
Is diving included?	☐	☑	Link

Though it is possible to answer no to the above, the activity may still be of importance to navigation in the area, for which reason it will be necessary to provide seafarers with information. Contact the editorial office of Notices to Mariners (EfS@dma.dk / +45 72 19 60 40) no later than three weeks before it is expected to start the activity in order to ensure that the shipping industry is appropriately warned.

Please note that the Danish Maritime Authority (sifa@dma.dk / +45 72 19 60 00) must always be informed about water depth reductions of or above 0.2 metres.

Date: 28 JAN 2025

Kell Saa

Signature of the one responsible

Note:

Examples of activities involving increased danger:

- Mounting activities/Diving operations
- Anchoring
- Work with dragging gear
- Atypical navigational patterns
- Establishment of permanent structures that may damage ships in case of collision
- Long-term repair or maintenance work on existing structures in case it reduces the free space profile of navigable spans or reduces the width of leading lights, light sectors, port entrances, ship routeing systems, ship traffic routes, narrow fairways or channels
- In case a vessel or a fleet needs to lie still for a long period of time, for example due to geotechnical drilling or if the anchoring of the vessel or fleet extends to the areas mentioned

- Dredging
- Special transports with large elements, such as offshore jackets or the like
- Pipeline work (cables and pipelines)

Examples of activities not involving increased danger:

- Multibeam Survey, ROV inspections, activities of very limited duration
- Minor works within the waters of the port that do not prevent ships' entrance
- Works of short duration where it is possible for the work vessel to move at short notice
- Works close to coastlines and outside ship routes and ship routeing systems
- Where the area is designated a work area by the Danish Maritime Authority

Assessment, part 1 (client/consultant/lead contractor)

(The template must be filled in and forwarded to the Danish Maritime Authority (sifa@dma.dk) no later than six weeks prior to start unless otherwise agreed with the Danish Maritime Authority)

1. Contact details of the one responsible for part 1:

Name:	Keld Gregers Sørensen
Address:	Arelion Denmark A/S, Industrivej 15, 6830 Noerre Nebel , Denmark
Email:	keld.sorensen@arelion.com
Telephone nos:	+4528279767

2. Detailed description of the activity:

Aurora is a planned subsea fibre optic telecommunication cable system (hereafter known as the Aurora Project or the subsea cable) with a total estimated length of 7,230 kilometres (km). The Aurora Project will connect landings at Manasquan, New Jersey in the United States (US) and Blaabjerg in Denmark, traversing through both United Kingdom (UK) and Norwegian waters. The subsea cable route will be installed across the seabed and buried where conditions allow.

Within the Danish Territorial Seas (TS), approximately 33 km of subsea cable will be installed.

The offshore works for the Aurora Project will involve the following activities in Danish TS:
- Pre-installation Activities in the marine environment:
  - Route Clearance (RC) of Out-of-Service (OOS) Cables; and
  - Pre-Lay Grapnel Run (PLGR).
- Installation Activities:
  - Main Subsea Cable Lay; and
  - Post-Lay Inspection and Burial (PLIB).
  - Shore-End Landing (SEL) Installation.
- Subsea Cable Operation and Maintenance; and.

3. Coloured chartlets showing the location of the activity in the territorial waters :

The installation works will take place along the subsea cable route within the Danish TS, as shown in the Figure 2 (in red) at the end of this document, which illustrates the ship traffic density in Danish waters

4. Geographical latitude/longitude and place name of the activity given as geodetic Datum (for example WGS84 and 57°25.86' N 10°42.75' E)

Enter Danish EEZ	056	°	42	.	8454	'	N		005	°	25	.	2606	'	E
Enter Danish TS	056	°	06	.	2293	'	N		007	°	44	.	6706	'	E
HDD exit point (seaward)	055	°	55	.	5962	'	N		008	°	09	.	2037	'	E
		°		.		'	N			°		.		'	E

5. Period during which the activity is expected to be carried out: see attachment for specifics of activities and durations

From		/		-20		at		:		to		/		-20		at		:	
From		/		-20		at		:		to		/		-20		at		:	
From		/		-20		at		:		to		/		-20		at		:	
From		/		-20		at		:		to		/		-20		at		:	

6. Result of any consultation of the users of the waters. See the website of the Danish Maritime Authority (link) (have any navigational objections to the activity been received):

Within the subsea cable route within the Danish TS, fishing activities attains the largest vessel density within the Project area, whereas there are low vessel densities in the Project area for cargo activity, military and law enforcement vessels and dredging or underwater operation vessels.

The Aurora Project will follow standard maritime safety procedures throughout the duration of the Project. Embedded mitigation measures include:
- Notice to Mariners
- Notices to local fishermen
- Safety Exclusion Zone established around the main lay vessel in agreement with the DMA
- Dedicated lookout on the installation vessel, regular broadcasts and direct warning over radio of nearby traffic
- Compliance with Danish and international maritime safety legislation, including the International Regulations for the Prevention of Collisions at Sea, 1972 (COLREGs), Safety of Life at Sea Convention (SOLAS) and the International Convention for the Prevention of Pollution form Ships (MARPOL 73/78).

There are a number of offshore infrastructures around the subsea cable route in Danish TS. Agreements with offshore developers will be handled in a separate process to the this risk assessment.

As such, a consultation has not been deemed relevant at this stage of the Project. Further information can be found in the EIA Screening Report, section 4.12 Shipping and Navigation.

7. Have any new or changed aids to navigation been approved in connection with the activity? (buoys, lighthouses, beacons, signs, lights, etc. must be approved by the Danish Maritime Authority)

YES	NO	REMARKS
	X	

8. Have any preventive measures been approved by the authorities, cf. item 17?

YES	NO	REMARKS
	X	

9. Will the activity necessitate any changes of charts, port plans or nautical publications?
(In case of YES, all relevant information must be forwarded to the Danish Geodata Agency no later than three weeks after the conclusion of the activity [see www.gst.dk])

YES	NO	REMARKS
X		The position of the subsea cable route will be provided on the navigational charts upon completion of the installation works

10. Does the activity take place within the area of a vessel traffic service (VTS) in the Sound or the Great Belt, respectively?
Sound VTS: Link
Great Belt VTS: Link

YES	NO	REMARKS
	X	

11. Will bottom-fixed structures with sharp edges be established below the surface of the water?

YES	NO	REMARKS
	X	

12. Is it possible to place any new submarine cables or submarine pipelines in connection with existing layouts of such lines?

YES	NO	REMARKS
X		The proposed Aurora Project parallel to existing cables as much as possible in several areas.

13. Is it necessary to pass any of the below in connection with new submarine cables or submarine pipelines?

Where	YES	NO	Can it be done perpendicularly to the direction of navigation?		REMARKS
			YES	NO	
Navigable spans		X			
Narrow fairways or channels		X			
Ship traffic routes	X		X		Subsea cable corridor runs NW-SE approximately perpendiculr to main shipping routes which are NE-SW
Ship routeing systems, including traffic separation systems and deepwater routes, etc.		X			
Port entrances		X			
Leading lights and light sectors		X			
Other submarine cables or submarine pipelines	X				There are a number of offshore infrastructures around the subsea cable route in Danish TS Agreements with offshore developers will be handled in a separate process to the this risk assessment

14. Is it possible, when placing DC heavy current cables, to locate them so as to minimize the impact on ships' compasses?
(In case of NO, documentation of the impact must be forwarded to the Danish Maritime Authority)

YES	NO	REMARKS
☐	☐	N/A

15. Are work vessels capable of warning approaching ships about the activity and providing guidance about how to pass the area safely and giving notice about any restrictions or obstructions by constantly having an overview of the ship traffic and any other conditions in the area?
(In case of NO, the use of dedicated guard vessels must be considered; please contact the Danish Maritime Authority)

YES	NO	REMARKS
☑	☐	

16. Have you as the one responsible (client/consultant/lead contractor) examined the conditions in the activity area as regards the following:

(In case of NO, "Remarks" must be filled in. If it is not considered relevant, please mark n/a)

Condition	YES	NO	REMARKS	n/a
Traffic intensity, including regular ferry connections, fishing and yachting, etc.	☑	☐		
Ports	☑	☐		
Fairways	☑	☐		
Buoyage and aids to navigation	☑	☐		
Presence of submarine cables,	☑	☐		

pipelines, overhead power lines and bridges, etc.	☑	☐		
Participating ships' obligation to take a pilot	☑	☐		
Wind, weather, ice, sea and current	☑	☐		
Communications	☑	☐		
Nature of the waters, including the bottom and water depths	☑	☐		
Anchorages	☑	☐		
Pilot boarding places	☑	☐		
Military areas and shooting areas	☑	☐		
Other simultaneous activities in the area	☐	☑	To be coordinated with DMA	
Other things	☐	☑	Nothing to remark	

17. Which preventive measures have been planned?
Abbreviations of approving authorities:
DCA = Danish Coastal Authority, DTA = Danish Transport Authority, DMA = Danish Maritime Authority, DGA = Danish Geodata Agency

No.	Preventive measures	YES	NO	REMARKS/DESCRIPTION
1	Physical safeguards, etc. (DCA or TS)	☐	☑	
2	New or changed buoying, including lighthouses, buoys, beacons, lights and signs, etc. (DMA)	☐	☑	
3	Speed limitations or other restrictions to ships (DMA)	☑	☐	The installation vessel will be traveling at approximately 0.3 knots (14.4 km per day). An exclusion area around the installation vessel will be applied.
4	Establishment of special ship routes (DMA)	☐	☑	
5	Establishment of areas of prohibition (DMA, see item 18)	☐	☑	
6	Hydrographic surveys (DGA)	☐	☑	
7	Dredging (DCA or DTA)	☐	☑	
8	Production of charts (DGA)	☐	☑	
9	Information/guidance	☑	☐	Information will be sent via Notice to Mariners
10	Guard or accompanying vessels	☐	☑	
11	Navigational coordination	☑	☐	The installation vessel(s) will contact other vessels in the area via radio to coordinate traffic, esp. in more densely trafficked areas.
12	Communication plans	☐	☑	
13	Surveillance/monitoring	☑	☐	Other vessels are monitored by the installation vessel(s) to enable timely coordination of the traffic.
14	Emergency plans	☑	☐	HSE plans for the installation vessel(s)' crew will be in place
15	Start training	☐	☑	
16	Ensuring that the area can be left and be free and safe for navigation before a ship arrives	☐	☑	

17	Other things	☐	☑

18. Request to establish areas of prohibition (cf. item 17-5)

If, in consideration of safety of navigation or prevention of danger, it is requested to establish an area of restriction in connection with an activity, you must send an application hereon to the Danish Maritime Authority no later than six weeks before starting the activity.

A template for the application is available from the website of the Danish Maritime Authority.

19. Risk assessment after having launched preventive measures
(In connection with minor projects, this item can be filled in according to professional discretion)
M = **Planned preventive measure no. from the table in item 17 above.**
Risk index after preventive measures
= **Consequence figure + Probability figure (5 or less is normally acceptable)**

Incident **(What could go wrong?** **"brainstorm")**	**Consequence figure** (total amount for environmental cleaning. loss of values. loss of lives/injuries per year): 0 in the amount of DKK 20,000 (limited) 1 in the amount of DKK 200,000 (minor) 2 in the amount of DKK 2,000,000 (considerable) 3 in the amount of DKK 20,000,000 (serious) 4 in the amount of DKK 200,000,000 and above (catastrophic)	**Probability** 7=10 accidents/year (often) – about once a month 6=1 accidents/year (relatively often) – once a year 5=0.1 accident/year (probable) – once every 10. year 4=0.01 accident/year (possible) – once every 100. year 3=0.001 accident/year (seldom) – once every 1000 year 2=0.0001 accident/year (very seldom) – once every 10,000. year 1=0.00001 accident/year (extremely seldom) – once every 100,000. year 0=0.000001 accident/year (improbably seldom) – once every 1,000,000. year	**M**	**R** **(C+P)** **<5**
Collision between installation vessel and other vessels	2 - Estimated collision frequency covers the full range from a full collision to a mere glansing. Consequence number is therefore chosen in the intermediate interval	1 - Collision frequency per year following the total installation works negigible. Further detail can be found under Section 4.12 of the EIA Screening Report.		

20. General professional assessment of safety of navigation before, during and after the activity

Question	YES	NO	ELABORATIVE EXPLANATION
Is there, after having filled in this template and according to a general professional estimate, any noticeable danger to ships?	☐	☑	
Is there, after having filled in this template and according to a general professional estimate, any noticeable danger to human beings?	☐	☑	
Is there, after having filled in this template and according to a general professional estimate, any noticeable	☐	☑	

danger to the environment?	☐	☑	
Is there, after having filled in this template and according to a general professional estimate, any noticeable danger to values?	☐	☑	

Date: 28 JAN 2025

Kaid Soon

Signature of the one responsible

Performance phase

Assessment, part 2 (contractor)

(Part 2 must be filled in before starting the work. In case there are any changes or additions in relation to part 1, please forward the filled in template to the Danish Maritime Authority (sifa@dma.dk))

In case the activity necessitates any changes in relation to previous notice in Notices to Mariners, please inform the editorial office of Notices to Mariners (EfS@dma.dk / +45 72 19 60 40) as early as possible in order to ensure an updated warning of the shipping industry.

A-1. 24-7 contact details of the one responsible for part 2:

Name:	
Address:	
Email:	
Telephone nos:	

A-2. 24-7 contact details of the substitute for part 2:

Name:	
Address:	
Email:	
Telephone nos:	

B. Acceptance by the contractor of the assessment made in part 1:

YES	NO
☐	☐

In case of "NO", proceed to item C – In case of "YES", proceed to item D.

Date:

Signature of the one responsible

C. Description of deviation from part 1:

D. Any supplementary description of the activity (part 1 – item 2):

E. Period during which the activity is carried out:

From		/		**-20**		**at**		:		**to**		/		**-20**		**at**		:	
From		/		**-20**		**at**		:		**to**		/		**-20**		**at**		:	
From		/		**-20**		**at**		:		**to**		/		**-20**		**at**		:	
From		/		**-20**		**at**		:		**to**		/		**-20**		**at**		:	

F. Will the activity lead to an impediment to freedom of navigation that is not evident from the initial screening or from part 1?

YES	NO	REMARKS
☐	☐	

G. In case any ships are involved in the activity, please list them here:

(Only primary vessels are to be listed – if changes are made during the process, the list will be updated)

Name of ship	Call sign	MMSI number	Any IMO number	VHF channels listened to			Any cell phone no.

H. Are the above-mentioned work vessels capable of warning approaching ships about the activity and providing guidance about how to pass the area safely and of warning about any restrictions or obstructions by having an overview at any time over the ship traffic and any other conditions of the area?

(In case of NO, dedicated guard vessels must be used in accordance with a more detailed agreement with the Danish Maritime Authority, if relevant)

YES	NO	REMARKS
☐	☐	

I. Have you, as the one responsible, examined the conditions in the activity area as regards the following:
(In case of NO, "Remarks" must be filled in. If it is not considered relevant, please mark n/a)

Conditions	YES	NO	REMARKS	n/a
Traffic intensity, including regular ferry connections, fishing and yachting, etc.	☐	☐		
Ports	☐	☐		
Fairways	☐	☐		
Buoyage and aids to navigation	☐	☐		
Presence of submarine cables, pipelines, overhead power lines and bridges, etc.	☐	☐		
Participating ships' obligation to take a pilot	☐	☐		
Wind, weather, ice, sea and current	☐	☐		
Communications	☐	☐		
Nature of the waters, including the bottom and water depths	☐	☐		
Anchorages	☐	☐		
Pilot boarding places	☐	☐		
Military areas and shooting areas	☐	☐		
Other simultaneous activities in the area	☐	☐		
Other things	☐	☐		

J. Establishment of areas of prohibition

If, in consideration of safety of navigation or prevention of danger, it is requested to establish an area of restriction in connection with an activity, you must send an application hereon to the Danish Maritime Authority no later than six weeks before starting the activity.
A template for the application is available from the website of the Danish Maritime Authority.

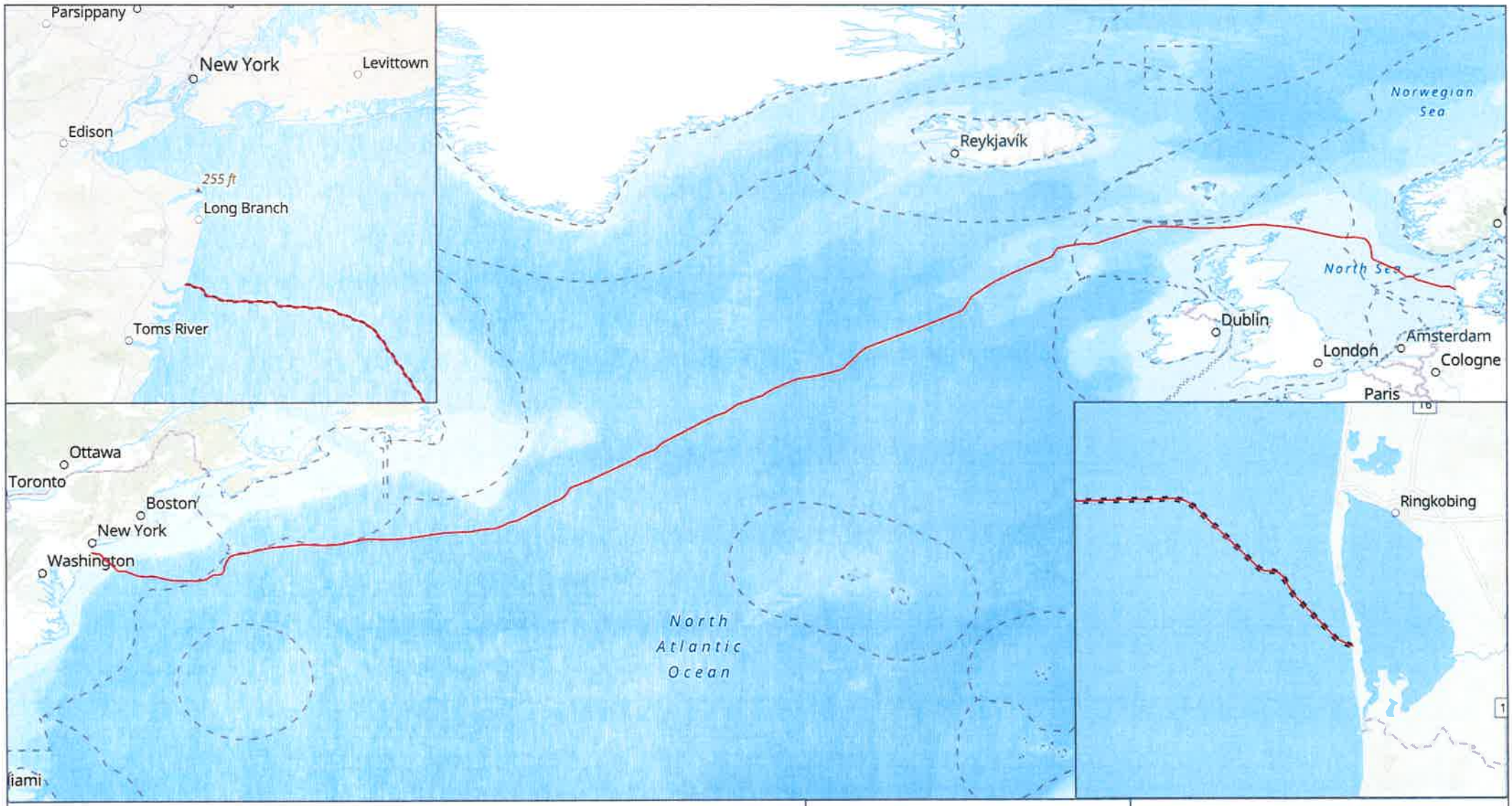
K. General professional assessment of safety of navigation before, during and after the activity

Question	YES	NO	ELABORATIVE EXPLANATION
Is there, after having filled in this template and according to a general professional estimate, any noticeable danger to ships?	☐	☐	
Is there, after having filled in this template and according to a general professional estimate, any noticeable danger to human beings?	☐	☐	
Is there, after having filled in this template and according to a general professional estimate, any noticeable danger to the environment?	☐	☐	
Is there, after having filled in this template and according to a general professional estimate, any noticeable danger to values?	☐	☐	

Date: ☐

_____

Signature of the one responsible



Legend

- Aurora Cable System
- Subsea cable route survey corridor (500m) (route subject to finalisation)
- Exclusive Economic Zone boundaries

0 300 600 900 1,200 1,500

Kilometers

N

Aurora Cable System - Figure 1
USA - Denmark

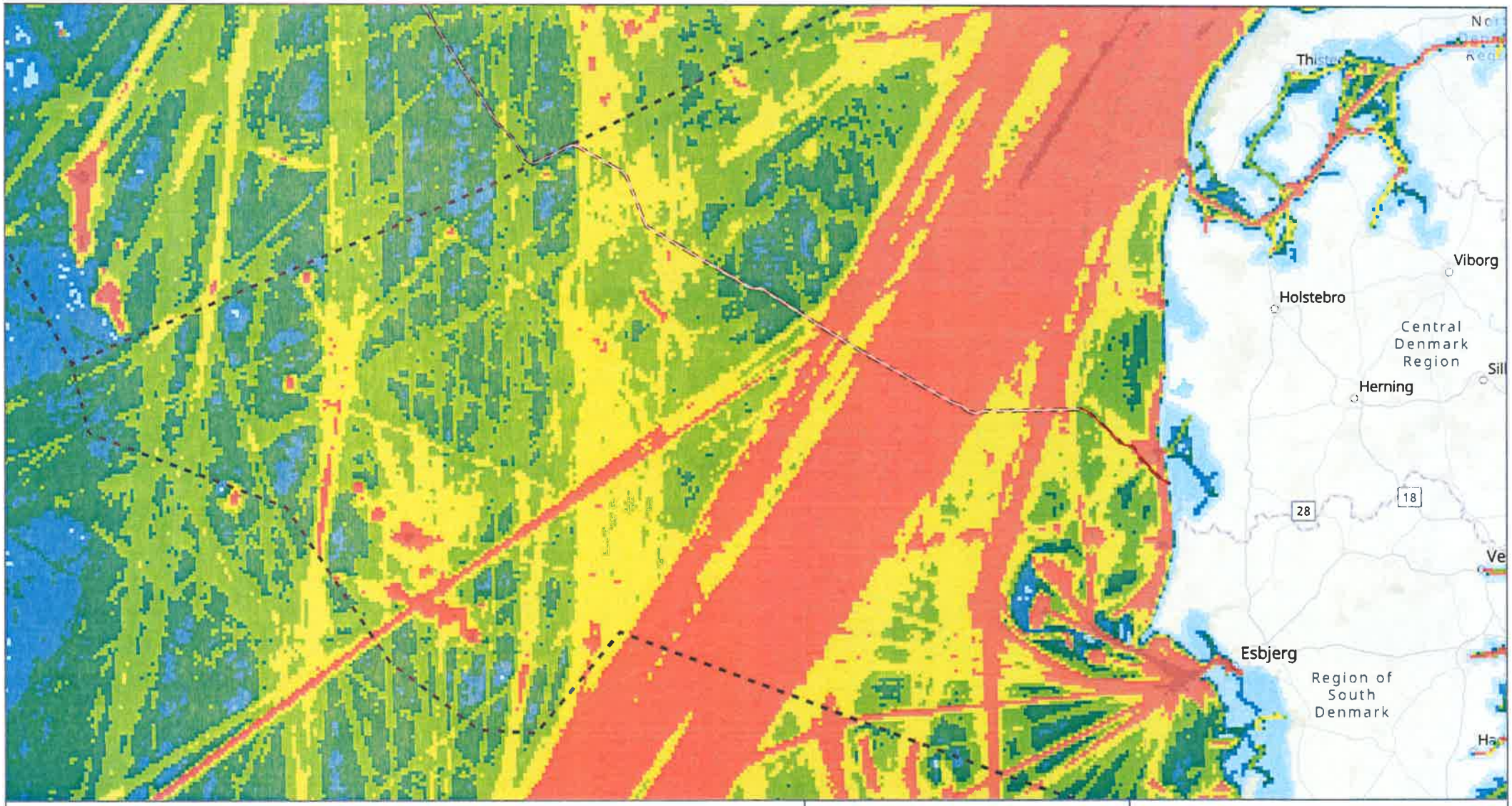
SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: IW
PROJECT:	CHECKED: CH
DATE: 5/24/2024	APPROVED: SR

ERM

PROJECTION: GCS WGS 1984

SOURCE: World Topographic Map, ESRI.

Path: G:\7_Cables\ASN_Mets_Denmark\Workspaces\Phase 1\ASN_Meta_USA_DEN_route_overview_20240523.aprx / Route_Overview_A01



Legend

- Subsea cable route in Danish TS (route subject to finalisation)
- Subsea cable route in Danish EEZ (route subject to finalisation)
- Aurora Cable System
- Subsea cable route (500m buffer)
- Exclusive Economic Zone Limit
- Territorial seas

Average Vessel density 2019 - 22 (Routes km/per year)

- < 6
- 6 - 24
- 24 - 60
- 60 - 120
- 120 - 240
- 240 - 1,200
- > 1,200

0 12 24 36 48 60
Kilometers

N

Sensitive areas - Shipping density - Figure 2
Aurora Cable System
Denmark

SCALE: See Scale Bar	VERSION: A01
SIZE: A4	DRAWN: IW
PROJECT:	CHECKED: CH
DATE: 5/28/2024	APPROVED: SR

ERM

PROJECTION: ETRS 1989 UTM Zone 32N

SOURCE: World Topographic map, ESRI, Flanders Marine Institute (2023), © European Union, 2023

Path: G:\7_Cables\ASN_Meta_Denmark\Workspaces\Phase 1\DENMARK v1\SP04\ASN_Meta_DK_route_shipping_20240528 aprx / DK_Shipping_A01

ASSESSMENT OF SAFETY OF NAVIGATION IN CONNECTION WITH MARINE CONSTRUCTION WORKS – Aurora Project in Danish waters.

5. Period during which the activity is expected to be carried out:

Activity	**Estimated date period for activity** *(dates are subject to weather, vessel availability and progress)*	**Working hours**
Route Clearance and Pre-lay Grapnel Run	11 April 2027 to 8 July 2027	24 hours per day
Pre-lay Shore End (including in-shore burials)	24 May 2027 to 2 June 2027	24 hours per day
Main Lay (including Plough Burials)	4 July 2027 to 20 July 2027	24 hours per day
Post-lay Inspection & Burials	22 August 2027 to 17 October 2027	24 hours per day