Eastern Green Link 3 (EGL 3)

Marine Route Options Appraisal

Non-Technical Summary

Prepared for: National Grid Electricity Transmission (NGET) and Scottish and Southern Electricity Networks (SSEN-T) - Transmission

collaborative environmental advisers

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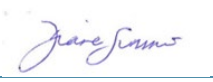
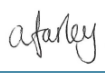
Content	Environmental Consultant	Diane Summers	22/02/2024	
Checked & Approved	Director	Anna Farley	06/03/2024	
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Abbreviations/Glossary

AONB	Area of Outstanding Natural Beauty
CPRSS	Corridor and Preliminary Routeing and Siting Study
EGL 3	Eastern Green Link 3
EIA	Environmental Impact Assessment
GCR	Geological Conservation Review
GW	Gigawatt
HPMA	Highly Protected Marine Area
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IBA	Important Bird Area
km	Kilometre
LLA	Local Landscape Area
LLD	Local Landscape Designation
MCZ	Marine Conservation Zone
MNR	Marine Nature Reserve
MoD	Ministry of Defence
MPA	Marine Protected Area
NCMPA	Nature Conservation Marine Protected Area
NGET	National Grid Electricity Transmission
NNRs	National Nature Reserve
NPS	National Policy Statements
NSA	National Scenic Area
OWF	Offshore Windfarm
PEXA	Practice and Exercise Area
PMF	Priority Marine Feature
SAC	Special Area of Conservation
SOCI	Species of Conservation Interest
SPA	Special Protection Area
SSEN-T	Scottish and Southern Electricity Network – Transmission
SSSI	Site of Special Scientific Interest
TSS	Traffic Separation Scheme
UK	United Kingdom
UKHO	UK Hydrographic Office
WHS	World Heritage Site

1. Overview and Purpose

The Eastern Green Link 3 (EGL 3) project is being developed as a joint venture by National Grid Electricity Transmission (NGET) and Scottish and Southern Electricity Network – Transmission (SSEN-T) (the Applicants). The project comprises a 2-gigawatt (GW) high voltage direct current (HVDC) system linking Peterhead, Aberdeenshire in Scotland and Lincolnshire in England. The project will include the construction of new infrastructure consisting of underground terrestrial and submarine HVDC cables, onshore converter stations, high voltage alternating current (HVAC) overhead lines or underground cables, as well as potentially new substations or substation extension/upgrade works.

The British Energy Security Strategy set out the United Kingdom (UK) Government's ambition to connect up to 50 GW of offshore generation to the electricity network by 2030. To achieve this target, it will require additional network capacity and greater power transfer capability across the Anglo-Scottish border. EGL 3 is part of this major reinforcement plan of the electricity transmission system that will allow renewable power to reach consumers. It has been identified in the initial list of Accelerated Strategic Transmission Investment projects by Ofgem, the UK energy regulator. The National Policy Statements (NPSs) published in January 2024 identifies projects involving low carbon infrastructure (such as EGL 3) are as National Critical Priority Infrastructure.

The marine elements of EGL 3 will not require a statutory Environmental Impact Assessment (EIA) under the EIA Regulations in England[1] and Scotland[2]. However, NGET and SSEN-T as a matter of best practice, and in line with their obligations under the Schedule 9 of the Electricity Act 1989, and the English and Scottish Habitats Regulations and UK Offshore Habitats Regulations[3], have committed to undertake environmental assessments to the same standard. As such the Applicants should be able to demonstrate that all reasonable feasible alternatives have been assessed and that the least damaging option has been selected.

The Applicants undertook a Marine Route Options Appraisal to identify the emerging preferred marine cable route and landfall site. This document is a non-technical summary of the Marine Route Options Appraisal. It details the approach taken by the Applicants, the environmental, socio-economic and technical constraints considered, and the work undertaken (including consultation with stakeholders) to evaluate and appraise the individual options, that concluded with the identification of an emerging preference.

The emerging preference for EGL 3 may be subject to modification following further consultation with stakeholders, technical/engineering feasibility studies, marine survey results and public consultation.

This document should be read in conjunction with the Corridor and Preliminary Routeing and Siting study (CPRSS) for England and the Landfall and Corridor Selection Report for Scotland, the three documents collectively will inform the preferred end-to-end solution for the Project.

2. Options Appraisal Approach

An options appraisal is used to consider the implications of the selection of certain options when developing infrastructure projects. NGET and SSEN-T have developed a set of over-arching guiding principles for option appraisals. These principles assist in the decision-making process by helping achieve an appropriate balance between the different competing interests that need to be looked at during an options appraisal. There is no hierarchy in the principles, and they are as follows:

- Using or adapting existing infrastructure will generally be given priority over creating new infrastructure.
- Shorter routes will generally be given priority over longer ones, as smaller-scale infrastructure projects are likely to have lower environmental, safety, sustainability and cost implications (for comparable technology options).
- Financially less-expensive options, both in terms of capital and lifetime cost, will generally be given priority, as these support National Grid's statutory duty to develop and maintain an 'efficient, coordinated and economical' network.
- Options which avoid or minimise and mitigate impacts on environmental or socio-economic constraints will generally be given priority over those which have likely significant residual effects, as less environmentally and/or socially damaging routes support National Grid's statutory duty to '*have regard to the desirability of preserving amenity*' and will more readily achieve consent.

Four topic areas were considered during the option appraisal process: environment, socio-economic, technical and cost. Within these topic areas there are a list of sub-topics which align with best practice informed by the requirements of the EIA Regulations. Table 2-1 shows the sub-topics used in the marine options appraisal.

[1] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)
[2] The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
[3] Conservation of Habitats and Species Regulations 2017 (as amended) (England) and Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (Scotland) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended)

Table 2-1: Topics used during the marine options appraisal

Sub-topic	Constraints
Biological Environment	• Highly Protected Marine Areas (HPMAs) • European Sites: Special Area of Conservation (SACs), Special Protection Areas (SPAs), Ramsar Sites • Marine Protected Areas (MPA): Marine Conservation Zones (MCZ), Nature Conservation Marine Protected Area (NCMPA) • Sites of Special Scientific Interest (SSSI) • Geological Conservation Review (GCR) sites • National Nature Reserves (NNRs)/Marine Nature Reserves (MNRs) • National Parks • Areas of Outstanding Natural Beauty (AONBs)/National Scenic Areas (NSAs) • World Heritage Sites (WHS) • UNESCO Biosphere Reserves • Heritage Coasts • Local Landscape Areas (LLAs) Scotland • Local Landscape Designations (LLD) England (various names) • Important Bird Areas (IBAs) • Annex I Habitat • Priority Marine Features (PMF)/Species of Conservation Interest (SOCI)/Priority Coastal Habitats • Sensitive Fish Habitat
Historic Environment	• Protected Wrecks • Charted Wrecks
Physical Environment	• Sub Cropping or Outcropping Bedrock • Superficial Sediments • Mobile Sediments e.g., sandbanks, sand waves • Bathymetric Features e.g., large intertidal expanse, bathymetric deeps, steep slopes
Socio-Economic Environment	• Infrastructure (existing, consented or planned) e.g., offshore wind farms, pipelines, cables, oil and gas structures. • Shipping and Navigation e.g., shipping lanes/density, traffic separation schemes, restricted navigation channels, anchorages, port limits, navigation lines, pilotage stations • Restricted Areas e.g., military practice and exercise areas, marine aggregate areas, carbon capture and storage areas, geological disposal facilities. • Commercial Fisheries e.g., bottom drift netting areas, static gear areas, shellfish waters • Recreational activities, tourism, and bathing waters • Marine Planning • Major Projects

The appraisal process was completed in three stages as shown Figure 2-1 below.

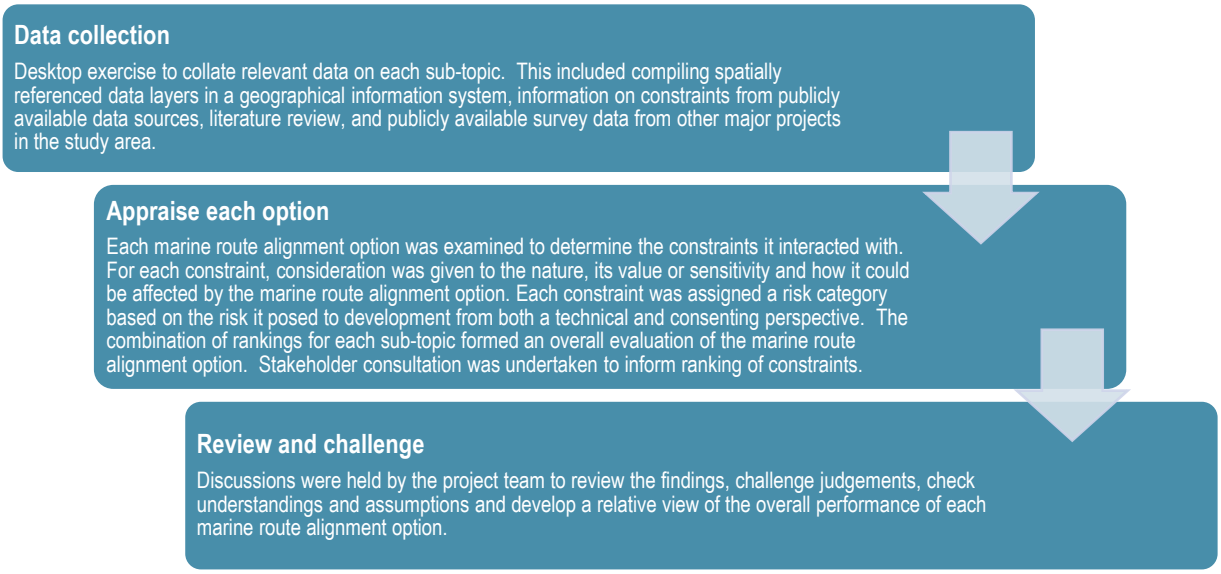


Figure 2-1: Appraisal process

The risk that each sub-topic presented to the viability of the development from either a technical or consenting perspective was assessed by the project team. The categories used were:

Showstopper	Very High Risk	Medium – High Risk	Medium Risk	Low Risk	Very Low Risk

Several feasible England to Scotland marine route alignments were developed. As many routes shared areas of commonality, these routes were segmented into marine route alignments, with the appraisal carried out on each marine route alignment. This allowed marine route alignments to be grouped together (e.g., English Landfall alignment, Offshore Route alignment and Scottish Landfall alignment) to assess multiple Scotland to England end-to-end marine cable route options.

An iterative, phased process was used to assess these marine route alignments which consisted of workshops (including input from technical and environmental disciplines from both the marine and terrestrial teams), key marine statutory stakeholders and industries consultation followed by either a second set of workshops or refinement of marine route alignments with further targeted stakeholder engagement and follow-up decision-making workshop. This phased process resulted in the development and appraisal of two phases of marine route alignments before the emerging preferred marine cable route option was selected.

3. Landfall and Route Corridor Identification Process

The first stage of the project development process was to identify where the cables could connect into the transmission networks in Scotland and England. The transmission operators identified Peterhead in Scotland and South Humber in England as being the best connection points for this project. Therefore, the marine and terrestrial technical experts focussed on these areas to find potential landfall sites.

In England a preliminary search area from the Humber to the Wash was identified, with the aim for the cable to connect to the transmission network at Walpole. This search identified three potential landfall sites namely, Horseshoe Point, Theddlethorpe beach and Anderby Creek. Marine route alignments were developed to the three potential landfall sites for appraisal.

In Scotland, a preliminary search area from Aberdeen to Fraserburgh was identified with the aim for the cable to connect to the network at the proposed hub at Netherton. This initial search identified 12 potential landfall sites, which were assessed based on the constructability at the landfall site looking at potential technical and environmental constraints. The initial appraisal removed eight sites, resulting in a short list of four landfall sites namely, Sandford Bay, Cruden Bay, and two landfalls at Scotstown Beach. Marine route alignments were developed to these four landfall sites for appraisal.

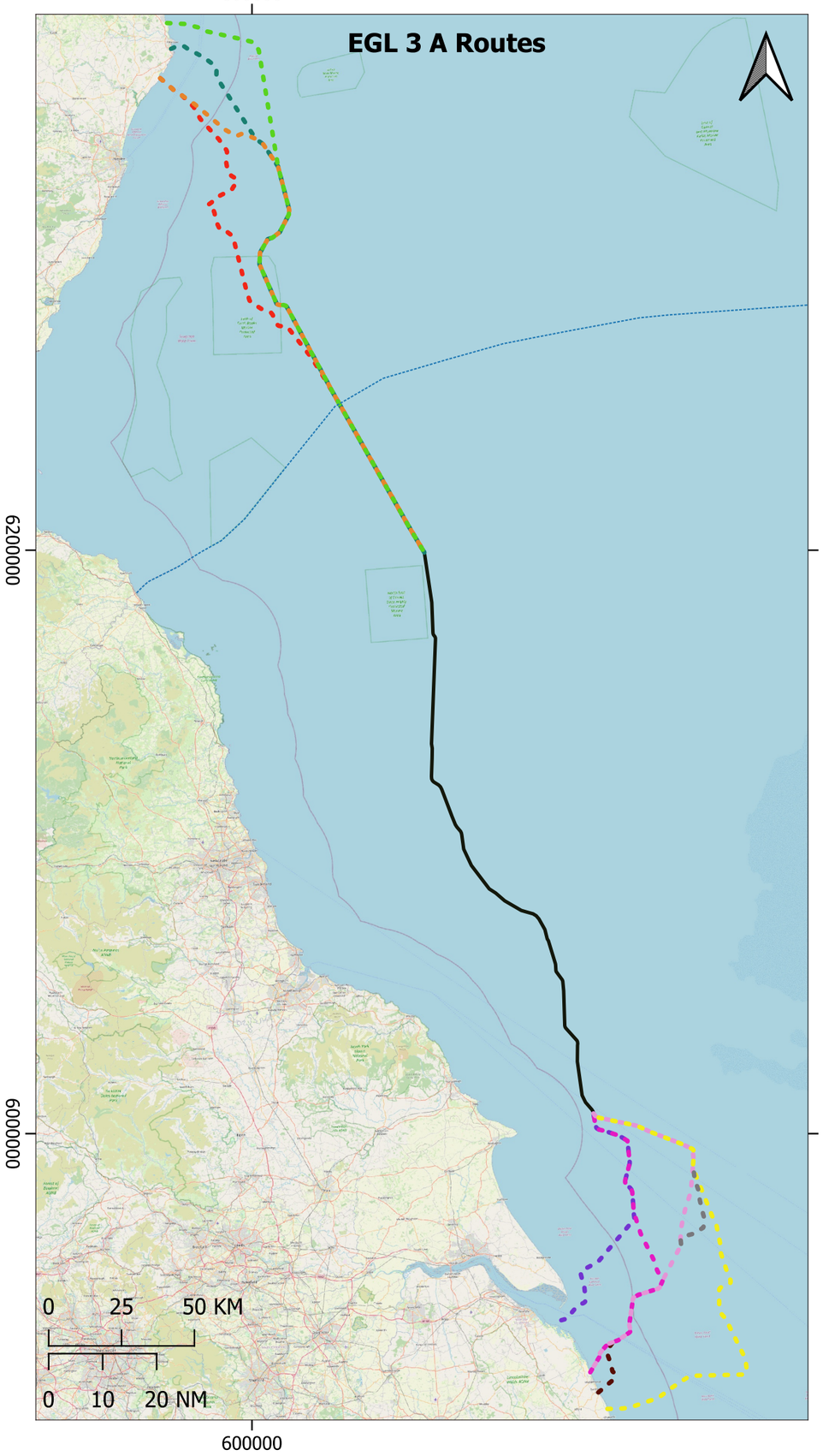
Marine route alignments were designed to each of the potential landfalls in England and Scotland that were technically suitable and avoided key constraints where possible. The primary principle of the exercise was to design a cable route that is technically feasible between the two connection points to deliver the objective of the project. However, within this parameter the aim was to create the shortest marine cable route possible which will minimise the length of cable needed, reduce the manufacturing and installation costs, and minimise the environmental footprint of the project. They were also designed with the following principles in mind:

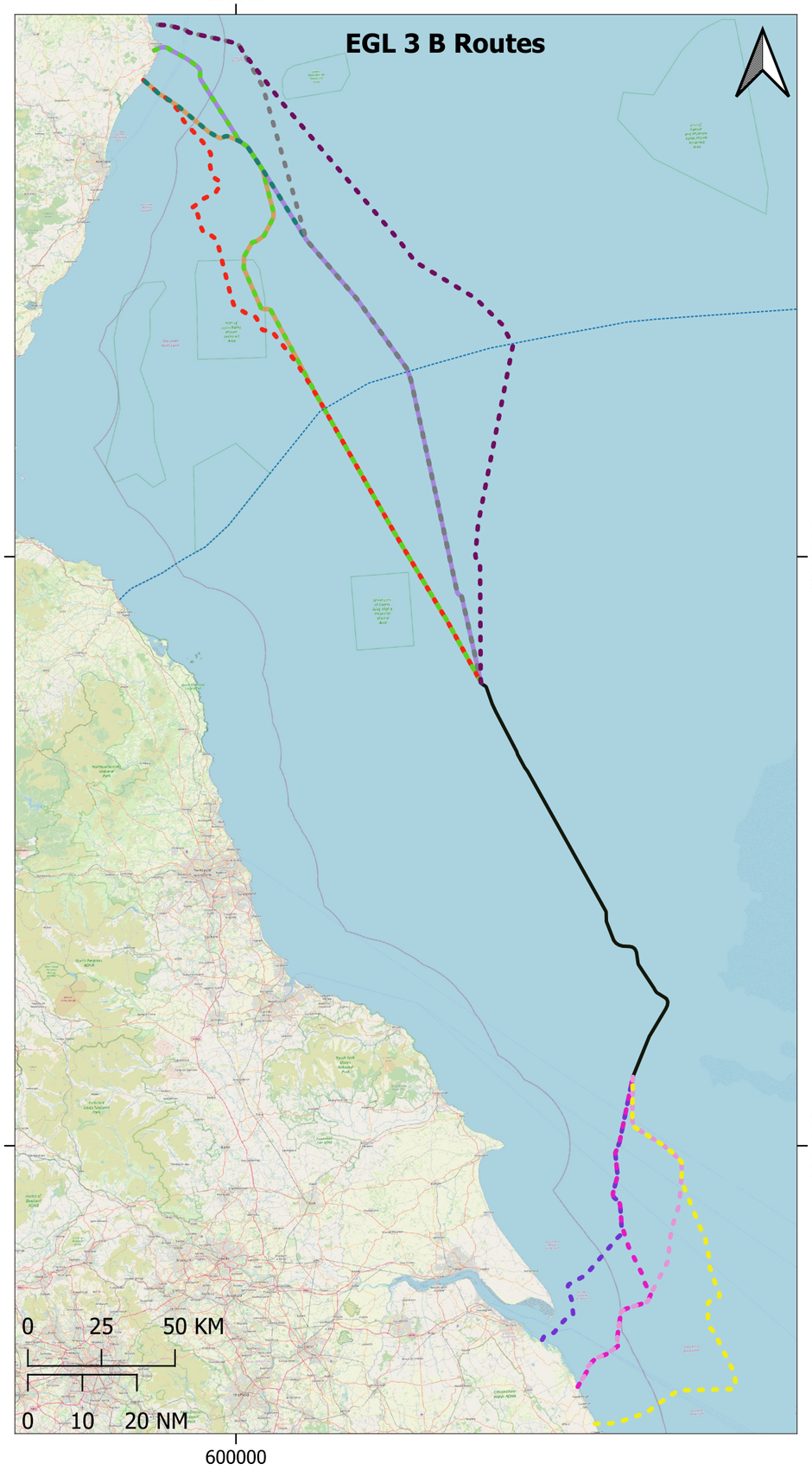
- Avoid environmentally sensitive areas, where possible.

- Avoid areas which would represent restrictions to vessel movement e.g., anchorages, restricted navigation channels, where possible.
- Avoid areas of archaeological importance and wrecks, where possible.
- Avoid existing offshore infrastructure, where possible.
- Avoid and then minimise the crossing of in-service cables and pipelines. Where it is not possible to avoid a crossing altogether, then to seek to optimise the crossing angle and to ensure that navigational safety or water depth is not adversely affected.
- Avoid hazardous seabed e.g., mobile sediments or bedrock outcrops and sub crops.
- Avoid and then minimise any impact on third party considerations such as seasonal fishing activities or local tourism.

Figure 3-1 illustrates the marine route alignments developed during Phase 1. Two offshore marine route alignments were identified, Offshore Route A and Offshore Route B. These offshore marine route alignments were then linked to the English and Scottish landfall by various options which were developed to avoid key constraints in different manners. Four marine route alignments were identified from the English landfalls to link to Offshore Route A and four to link to Offshore Route B. In Scotland four marine route alignments were identified to link into Offshore Route A and seven to Offshore Route B.

The review and challenge stage of the options appraisal for Phase 1 routes, led to the removal of Horseshoe Point landfall in England and Cruden Bay and Scotstown Beach in Scotland from the appraisal process and the development of further marine route alignments from Offshore Route A to address stakeholder feedback. Phase 2 marine route alignments are illustrated in Figure 3-2.





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Marine Route Alignments Phase I

C01494-EGL3-LOC-012-B

Scottish Adjacent Waters

EGL3 A Routes
- EGL3 Offshore Route A
- EGL3 ENG Route Option 1
- EGL3 ENG Route Option 2
- EGL3 SCOT Route A.1
- EGL3 SCOT Route A.2
- EGL3 SCOT Route A.3
- EGL3 SCOT Route A.4
- EGL3 ENG Route A.1
- EGL3 ENG Route A.2
- EGL3 ENG Route A.3
- EGL3 ENG Route A.4

EGL3 B Routes
- EGL3 Offshore Route B
- EGL3 SCOT Route B.1
- EGL3 SCOT Route B.3
- EGL3 SCOT Route B.4
- EGL3 SCOT Route B.5
- EGL3 SCOT Route B.6
- EGL3 SCOT Route B.7
- EGL3 ENG Route B.1
- EGL3 ENG Route B.2
- EGL3 ENG Route B.3
- EGL3 ENG Route B.4
- EGL3 SCOT Route B.2

Note: All landfall segments are connected to the relevant Offshore Route segment. Due to several segments taking a common route at points not all coloured lines may be visible if several are overlain.

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Unit	meters
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Created	J Cunningham
Reviewed	S Pearce
Authorised	A Farley

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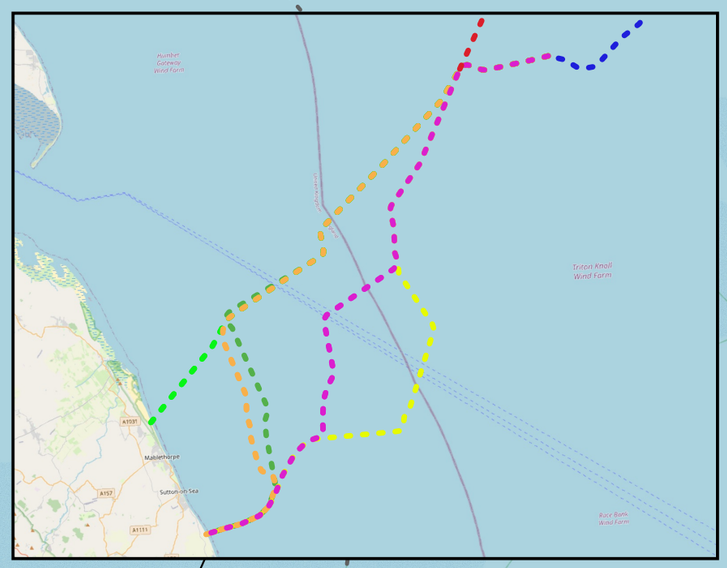

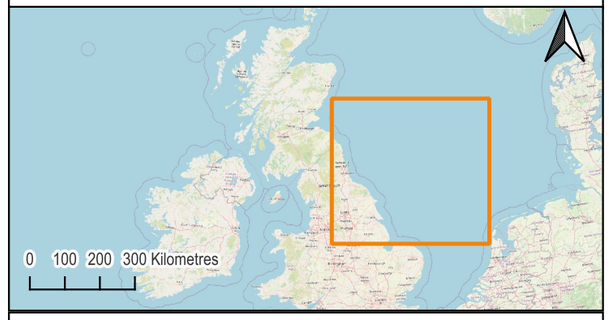

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0 10 20 NM

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Marine Route Alignments Phase 2

C01494-EGL3-LOC-013-C

- Exclusive Economic Zone Limit (EEZ)
- Scottish Adjacent Waters
- Anderby Creek 1
- Anderby Creek 2
- Anderby Creek 3
- Anderby Creek 4
- Theddlethorpe
- Offshore Route A
- ENG Nearshore Approach A
- ENG Nearshore Approach B

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Reviewed	S Pearce
Authorised	A Farley

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4. Environmental and Socio-Economic Constraints

The Scottish and English landfall areas and marine route alignments are heavily constrained by both environmental and socio-economic aspects. Table 4-1 summarises these constraints for the different jurisdictions or jointly where relevant.

Table 4-1: Environmental and socio-economic constraints

Topic	Subtopic/constraint	Summary of constraints within English Waters	Summary of constraints within Scottish Waters
Biological Environment	Designated sites with marine components	Marine route alignments interact with: 4 SAC, 2 SPA, 1 MCZ, 2 SSSI These sites protect harbour porpoise, wintering bird species and broadscale habitats. The marine route alignments avoided a further 20 designated sites.	Marine route alignments interact with: 1 SAC, 2 SPA, 2 MPA, 1 SSSI These sites protect species such as minke whale, wintering birds, ocean quahog and broadscale habitats. The marine route alignments avoided a further 19 designated sites.
	Designated sites - terrestrial	Marine route alignments interact with: 2 NNR	Marine route alignments interact with: 2 LLA, 1 GCR site
	Annex I Habitats	Marine route alignments interact with: 1110 – Sandbanks which are slightly covered by sea water all the time. 1170 – Reef i.e., rocky marine habitats or biological concretions that rise from the seabed.	
	Priority Coastal Habitats	Marine route alignments interact with: Coastal Lagoons – present at Theddlethorpe landfall site Fixed dunes with herbaceous vegetation (`grey dunes`) - present at Theddlethorpe landfall site	
	Priority Marine Features/Biodiversity Action Plan Priority Habitats/Sensitive Fish Habitat	Marine route alignments interact with: Sandeel habitat and herring spawning and nursery grounds Donna Nook seal haul out site	
Historic Environment	Protected Wrecks Charted Wrecks	No protected wrecks within or in close proximity to marine route alignments. Over 94,000 wrecks or obstructions found around the UK, a 250 m buffer was used in development of marine alignments to avoid interaction with known/charted wrecks.	
Physical Environment	Sub Cropping or Outcropping Bedrock Superficial Sediments Mobile Sediments Bathymetric Features	A data set which shows area of hard substrate was used in conjunction with the high-resolution UKHO bathymetry data set to identify areas of potential subcropping/outcropping, mobile sediments and bathymetric features which were avoided by the marine route alignments.	
Socio-economic Environment	Infrastructure Offshore Wind Farms	9 operational OWFs 9 OWFs in planning/construction stage	3 operational OWFs 8 OWFs in planning/construction stage
	Cables	Marine route alignments interact with: 2 operational interconnectors, 5 planned reinforcement cable projects or interconnectors, 10 operational telecommunication cables, 8 operational OWF export cables	
	Oil & Gas	Marine route alignments interact with: 16 active pipelines and 13 not in use or abandoned pipelines	
	Shipping and Navigation	The route engineering has designed crossings to avoid any TSSs and high-density shipping areas. Crossing within shipping lanes perpendicular to minimise distance through these areas and to minimise disruption to shipping during the survey and	

Topic	Subtopic/constraint	Summary of constraints within English Waters	Summary of constraints within Scottish Waters
		installation campaign. Consideration has been given to the design of cable crossings in shallow water so that they are designed to keep under keel clearance of vessels to a maximum to minimise impact to shipping and navigation especially in those areas of high intensity. Marine route alignments were designed to be a minimum of 50 m away from any navigation buoys and point infrastructure such as harbour facilities including posts/stakes and outfall pipe diffusers.	
	Restricted areas	No aquaculture sites 15 aggregate extraction sites 11 dredging, spoil and dumping grounds 4 small explosive dumping grounds 41 MoD PEXA, including Donna Nook Firing range, England	
	Commercial fisheries	A preliminary review of commercial fishing activity was undertaken on all of the proposed marine route alignments	
	Marine planning	Consideration given to: North East Offshore Marine Plan East Inshore and Offshore Marine Plan	Consideration given to: Scottish National Marine Plan
	Major projects in planning	Geological Disposal Facility 2 Carbon Capture and Storage projects Horseshoe Point - pilot project for reinstatement and regeneration of seagrass, native oyster and saltmarsh. South Humber Gateway Strategy	

5. Assessment Summary

5.1. Phase 1

The Phase 1 marine route alignments were split into three groups: English landfalls, Offshore route and Scottish landfalls. Table 5-1 presents the Phase 1 appraisal of the English landfall marine route alignments.

Table 5-1: Phase 1 appraisal for English landfalls

	Horseshoe Point		Theddlethorpe Beach				Anderby Creek	
	ENG Route A.1	ENG Route B.1	ENG Route A.2	ENG Route A.3	ENG Route B.2	ENG Route B.3	ENG Route A.4	ENG Route B.4
Route length (km)	95	105	112	128	122	128	171	171
No. of crossings	8 (3)*	9 (3)*	13 (3)*	15 (3)*	14 (3)*	14 (3)*	22 (3)*	21 (3)*
No. of crossings in designated sites^	5	5	5	6	9	6	4	4
Biological Environment								
Historic Environment								
Physical Environment								
Socio-Economic Environment								
Overall Environmental Implications								

* numbers in bracket indicate potential crossings with major developments if infrastructure is constructed in advance of EGL 3.
^ designated sites include MCZ's and European sites (SAC, SPA, and Ramsar sites)

Key to Risk Categories	Showstopper	Very High Risk	Medium – High Risk	Medium Risk	Low Risk	Very Low Risk

The Phase 1 appraisal of the English landfall marine route alignments concluded:

- ENG Route A.1, B.1, A.2, B.2, A.3, B.3, A.4 and B.4, all the marine route alignments were assessed as being a very high risk under the biological environment category as they cross the Southern North Sea SAC, Humber Estuary SAC, SPA, SSSI, Greater Wash SPA, Holderness Offshore MCZ, Saltfleetby – Theddlethorpe Dunes to Gibraltar SAC. It should be noted not all of the marine route alignments cross all the designated sites.
- ENG Route A.1, B.1, A.2, B.2, A.3, B.3, A.4 and B.4, all the marine route alignments require a minimum of four and maximum of nine crossings within designated sites which would lead to permanent habitat loss.
- ENG Route A.1 and B.1 to Horseshoe Point would be heavily constrained due to the existing export cables for the Hornsea 1 and 2 OWFs. The marine route alignments would also cross the main shipping channel into the Humber Estuary and the ports of Grimsby, Immingham, Hull and Goole and were therefore ruled out.
- ENG Route A.2, A.3, B.2 and B.3 to Theddlethorpe and ENG Route A.4 and B.4 to Anderby Creek shared several constraints. There are several excellent rated bathing water areas on the coastline which are managed by the Environment Agency for the purposes of coastal protection. The coastline here is also being looked at by several other major projects as potential landfall locations. The ENG A.4 and B.4 routes were the least preferred due to the marine route alignment crossing the Inner Dowsing, Race Bank and North Ridge SAC, however it was suggested if an alternative marine route alignment could be found to avoid the SAC, Anderby Creek could potentially be the preferred landfall.
- Marine route alignments to Theddlethorpe e.g., ENG Route A.2, A.3, B.2 and B.3 were identified as preferrable to those marine route alignments to Anderby Creek following the Phase 1 assessment, however all marine route alignments still had a significant number of consenting challenges.

As the options appraisal could not identify a marine route alignment to an English landfall which did not have any Very high-risk constraints, the decision was taken to refine and identify new marine route alignments and subsequently a Phase 2 assessment was undertaken.

Table 5-2 presents the appraisal of the Offshore marine route alignments.

Table 5-2: Phase 1 appraisal for Offshore marine alignments

	OFFSHORE ROUTE A	OFFSHORE ROUTE B
Route length (km)	213	157
No. of crossings	16 (4)*	14 (4)*
No. of crossings in designated sites ^	0	3 (3)
Biological Environment		
Historic Environment		
Physical Environment		
Socio-Economic Environment		
Overall Environmental Implications		
* numbers in bracket indicate potential crossings with major developments if infrastructure is constructed in advance of EGL 3. Figures assume Dogger Bank A & B cables will be constructed in 2024. ^ designated sites include MCZ's and European sites (SAC, SPA, and Ramsar sites)		

Key to Risk Categories	Showstopper	Very High Risk	Medium – High Risk	Medium Risk	Low Risk	Very Low Risk

The Phase 1 appraisal concludes that, despite Offshore Route A being considerably longer, it emerged as the preferred route as it avoided the need for any third-party infrastructure crossings within any designated sites.

Table 5-3 presents the appraisal of the Phase 1 marine route alignment for the Scottish landfalls.

Table 5-3: Phase 1 appraisal for Scottish landfalls

	Cruden Bay					Sandford Bay			Scotstown Beach		
	SCOT Route A.1	SCOT Route B.1	SCOT Route A.2	SCOT Route B.2	SCOT Route B.3	SCOT Route A.3	SCOT Route B.4	SCOT Route B.5	SCOT Route A.4	SCOT Route B.6	SCOT Route B.7
Route length (km)	204	252	205	260	246	211	260	252	227	267	287
No. of crossings	1 (1)*	1 (1)*	1 (3)*	2 (3)*	2 (1)*	4 (2)*	5 (2)*	5	4 (3)*	6 (1)*	5 (1)*
No. of crossings in designated sites^	0	0	0	0	0	0	0	0	0 (1)*	0 (1)*	0 (1)*
Biological Environment											
Historic Environment											
Physical Environment											
Socio-Economic Environment											
Overall Environmental Implications											

* Numbers in bracket indicate potential crossings with major developments if infrastructure is constructed in advance of EGL 3.
^ designated sites include MCZ's and European sites (SAC, SPA, and Ramsar sites)

Key to Risk Categories	Showstopper	Very High Risk	Medium – High Risk	Medium Risk	Low Risk	Very Low Risk

The Phase 1 appraisal of the Scottish landfall marine route alignments concluded:

- SCOT Route A.1, B.1, A.2, B.2, A.3, B.4 and A.4 were assessed as having a very high risk under the biological environment category as they cross the Firth of Forth Complex MPA. The appraisal concluded that cable installation within the MPA could hinder the achievement of the site's conservation objectives. As there are alternative marine route alignments with a potentially lower environmental impact, these seven marine route alignments were ruled out.
- SCOT Route B.3 (the remaining marine route alignment to Cruden Bay) was ruled out as the route crosses the Buchan Ness to Collieston Coast SPA and Ythan Estuary/Sands of Forvie and Meikle Loch SPA. Other marine route alignments could avoid interactions with European sites.
- SCOT Route B.6 and B.7 to Scotstown Beach were ranked in second place, behind SCOT Route B.5 to Sandford Bay. The marine route alignments cross into the Southern Trench NCMPA and will likely require an infrastructure crossing within the site. SCOT Route B.5 can potentially avoid entering the Southern Trench NCMPA and therefore will potentially have a lower environmental impact.

Following the Phase 1 appraisal, Sandford Bay SCOT Route B.5 emerged as the preferred option.

5.2. Phase 2

Following stakeholder feedback, the design objective for Phase 2 was to identify marine route alignments to Anderby Creek and Theddlethorpe that avoided the Inner Dowsing, Race Bank and North Ridge SAC, Saltfleetby – Theddlethorpe Dunes to Gibraltar Point SAC, and the Holderness Offshore MCZ. If a route around the Holderness Offshore MCZ could not be developed, then design sought to avoid the potential for the deposit of external cable protection within the site e.g., by avoiding infrastructure crossings.

Four new marine route alignments were developed to Anderby Creek and one to Theddlethorpe. These marine route alignments merged to a single point from which two nearshore approach marine route alignments were designed around and through Holderness Offshore MCZ to join the emerging preferred offshore marine route alignment Offshore Route A.

Table 5.4 presents the appraisal of the nearshore approach marine route alignments. Table 5-5 presents the appraisal of the Phase 2 landfall marine route alignments.

Table 5-4: Phase 2 appraisal near shore approach marine route alignments

	ENG Nearshore Approach A (around Holderness Offshore MCZ)	ENG Nearshore Approach B (through Holderness Offshore MCZ) -
Route length (km)	82.8	73
No. of crossings	9 (5)*	10 (5)*
No. of crossings in designated sites	4 (5)*	2 (5)*
Biological Environment		
Historic Environment		
Physical Environment		
Socio-Economic Environment		
Overall Environmental Implications		
* numbers in bracket indicate potential crossings with major developments if infrastructure is constructed in advance of EGL 3. ^ designated sites include MCZ's and European sites (SAC, SPA, and Ramsar sites)		
Key to Risk Categories	**Showstopper**	**Very High Risk**	**Medium – High Risk**	**Medium Risk**	**Low Risk**	**Very Low Risk**

Table 5-5: Phase 2 appraisal English landfall marine route alignments

	Theddlethorpe	Anderby Creek 1	Anderby Creek 2	Anderby Creek 3	Anderby Creek 4
Route length	50.17	62.61	62.87	63.53	59.17
No. of crossings	11	17	17	17	17
No. of crossings in designated sites	0	7	6	6	6
Biological Environment					
Historic Environment					
Physical Environment					
Socio-Economic Environment					
Overall Environmental Implications					
Key to Risk Categories	**Showstopper**	**Very High Risk**	**Medium – High Risk**	**Medium Risk**	**Low Risk**	**Very Low Risk**

The Phase 2 appraisal of marine route alignments concluded:

- ENG Nearshore Approach A was the emerging preference as it avoided the Holderness Offshore MCZ by routeing around the edge of it rather than through the site like ENG Nearshore Approach B.
- All four of the Anderby Creek marine route alignments would require third-party infrastructure crossings within the Greater Wash SPA with the associated permanent loss of supporting habitat.
- Anderby Creek 4 was the least preferred of the Phase 2 marine route alignments due the route crossing an area of current and future marine aggregate production. Consultation with the marine aggregate industry concluded that this was not currently feasible. Anderby Creek 3 was also ruled out following information provided by the marine aggregate industry confirming that high levels of *Sabellaria spinulosa* reef along the proposed marine route alignment.
- The remaining three marine route alignments were very similar based on the offshore constraints. Theddlethorpe was the shortest marine route alignment however it does have more challenging onshore constraints associated with the presence of the Saltfleetby - Theddlethorpe Dunes & Gibraltar Point SAC. Although it is considered possible a technical solution that mitigates impacts on site integrity may be possible. The remaining Anderby Creek marine route alignments do not have this onshore constraint although they would need to navigate coastal defences and beach nourishment schemes. The landfall may therefore not be as technically challenging. All route marine route alignments required six third-party crossings with the Greater Wash SPA.
- Whilst marine route alignments Anderby Creek 1 and 2 have similar constraints, Anderby Creek 1 was ranked as the emerging preference.

6. Emerging Preference

The marine route options appraisal concluded that the following marine route alignments represent the emerging preferred marine route:

- Landfall at Sandford Bay, Scotland
- SCOT Route B.5 (refined to connect to Offshore Route A)
- Offshore Route A
- ENG Nearshore Approach A
- Anderby Creek 1
- Landfall at Anderby Creek, England

It should be noted that the emerging preferences may change following the geophysical, geotechnical and environmental survey which are due to be undertaken for the project. Should something unexpected emerge from these surveys, the route designs will be revisited.

The emerging preference for EGL 3 is the marine cable route as presented in Figure 6-1, subject to the following conditions:

- Following the geophysical, geotechnical and environmental survey and further engagement with stakeholders the consent challenges around ENG Nearshore Approach B should be re-appraised. If the consent challenges can be de-risked or mitigated ENG Nearshore Approach B could be a feasible alternative.
- At present, the Theddlethorpe landfall is the least preferred English landfall due to the proximity to Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC, though from a nearshore perspective is advantageous due to not requiring any third-party crossings within the Greater Wash SPA which would be required for Anderby Creek. On balance, due the concerns about potential impacts on integrity of the Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC, Anderby Creek is the most preferable from a landfall perspective. However, engineering studies may identify a design solution that mitigates the potential impact in which case Theddlethorpe and Anderby Creek 1 marine route alignments should be re-appraised.

Emerging Preference

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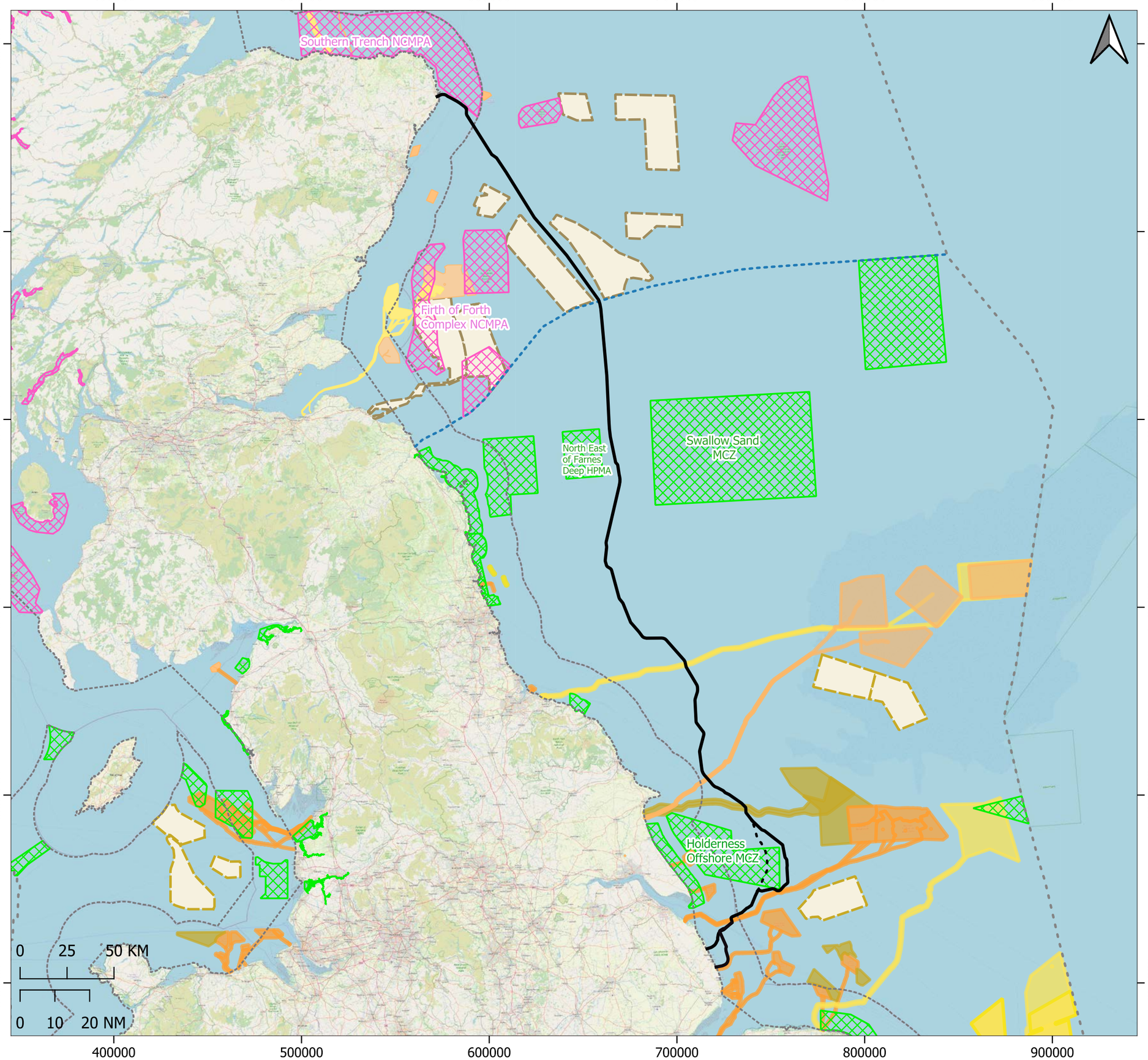

- Exclusive Economic Zone Limit (EEZ)
- Scottish Adjacent Waters
- 12NM Limit
- Emerging Preference
- Holderness Offshore MCZ Option
- Nature Conservation Marine Protected Area (NCMPA)
- Marine Conservation Zone (MCZ)/ Highly Protected Marine Area (HPMA)

Wind Site Agreements

- Active/In Operation
- Under Construction
- Consented
- In Planning
- Inactive/Decommissioned
- Pre-planning Application

Note: All landfall segments are connected to the relevant Offshore Route segment. Due to several segments taking a common route at points not all coloured lines may be visible if several are overlain.

Date	23/08/2023
Coordinate System	WGS 84 / UTM zone 30N
Projection	Universal Transverse Mercator (UTM)
Unit	meters
Scale at A3	1:2,000,000
Created	J Cunningham
Reviewed	S Pearce
Authorised	A Farley

Document Path: X:\GIS\GIS_PROJECTS\C01494_EAGL3&4\Project\QGS\EGL3\06_PROT\C01494_EGL3_PROT_006.qgzExport Date: 23/08/2023

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