



Cambois Connection – Marine Scheme

Volume 3

Appendix 3.5: Intertidal Considerations – Marine Scheme and Onshore Scheme

	Cambois Connection – Marine Scheme	Appendix 3.5
	Appendix 3.5: Intertidal Considerations	
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Acronyms


Acronym	Description
AEZ	Archaeological Exclusion Zones
BBWF	Berwick Bank Wind Farm
BBWFL	Berwick Bank Wind Farm Limited
CEMP	Construction Environmental Management Plan
CEA	Cumulative Effects Assessment
ECoW	Ecological Clerk Of Works
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ES	Environmental Statement
HRA	Habitat Regulations Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Directional Current
HDD	Horizontal Directional Drilling
LPA	Local Planning Authority
LAT	Lowest Astronomical Tide
MCZ	Marine Conservation Zones
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
NSL	North Sea Link
NCC	Northumberland County Council
OCSP	Offshore Converter Station Platforms
OCT	Open Cut Trench
PLONAR	Pose Little Or No Risk
PDE	Project Design Envelope
PAD	Protocol For Archaeological Discoveries
RIAA	Report To Inform Appropriate Assessment

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Acronym	Description
SSSI	Sites Of Special Scientific Interest
SPA	Special Protection Area
SSER	SSE Renewables
TJB	Transition Joint Bays

Units

Unit	Description
km	Kilometres
m	Metres


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3. Intertidal Considerations – Marine Scheme and Onshore Scheme

3.1. Introduction and Purpose of this document

1. Berwick Bank Wind Farm Limited (BBWFL) is a wholly owned subsidiary of SSE Renewables (SSER) (hereafter referred to as ‘the Applicant’). The Applicant is proposing the development of Offshore Export Cables, Onshore Export Cables, an Onshore Converter Station and associated grid connection at National Grid Substation in Blyth, Northumberland (the Cambois Connection, hereafter referred to as ‘the Project’).
2. The purpose of this infrastructure is to facilitate the export of green energy from the generation assets associated with the Berwick Bank Wind Farm (BBWF), located in the outer Firth of Forth. A separate application for developing a grid connection to Branxton, East Lothian, has been included as part of the Applicant’s application for consent for the BBWF, currently being determined separately¹. The Project will enable the BBWF to reach full generating capacity by 2030.
3. The Project comprises two distinct proposals, or ‘Schemes’, which will require three separate consents. For the onshore components of the Project located landward of mean low water springs (MLWS) (‘the Onshore Scheme’), consent will be sought via a planning application to Northumberland County Council (NCC) as the local planning authority (LPA) under Section 57 of the Town and Country Planning Act 1990.
4. The offshore components of the Project seaward of Marine High Water Springs (MHWS) (the Marine Scheme) are located within both Scottish and English waters. In Scotland, the Marine Scheme is entirely within offshore waters (i.e., between the 12 nautical miles (nm) limit and the outer limits of the Scottish Exclusive Economic Zone (EEZ)). In England, the Marine Scheme is within offshore waters and inshore waters, as illustrated in Volume 4, Figure 1.1. Plate 3-1 displays an overview of the key components of the Project.
5. This ES has considered the Marine Scheme only (all infrastructure and associated works seaward of MHWS). The Onshore Scheme (all infrastructure and associated works landward of Mean Low Water Springs (MLWS)) will be considered within a separate ES prepared in support of an application for planning permission to NCC which is expected to be submitted in Q4 2023.
6. The ES for the Marine Scheme has considered the Marine Scheme, as well as the Onshore Scheme in two respects – (i) as part of the cumulative effects assessment (CEA); and (ii) in respect of the extent to which the Marine Scheme and Onshore Scheme redline boundaries both include the area between MLWS and MHWS, i.e. the intertidal area.
 - i. Cumulative effects assessment - the Environmental Impact Assessment (EIA) for the Marine Scheme has included the Onshore Scheme within the CEA. Whilst the Onshore Scheme application will be submitted later than the Marine Scheme, sufficient information is available for assessing the Marine Scheme cumulatively with the Onshore Scheme, as part of the cumulative impacts assessment of the Marine Scheme against other neighbouring developments.
 - ii. Intertidal area – there is a necessary overlap between the Marine Scheme and the Onshore Scheme between MHWS and MMLWS. As the proposed works under the

¹ BBWF is subject to a separate consenting process. An application for consent under Section 36 of the Electricity Act 1989 (as amended) and associated Marine Licences was submitted to MD-LOT and accepted in December 2022.

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Marine Scheme in the area seawards of MHWS are included in the marine Licence Application , these works are included within the Marine Scheme EIA.

7. This approach is in accordance with the applicable legislation, the Marine Works (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 and Conservation of Habitats and Species Regulations 2017 (together the Habitats Regulations) and reflects the separate consenting processes for the Marine Scheme and Onshore Scheme application, as outlined within the Applicant’s Scoping Report (BBWFL, 2022) and throughout all pre-application consultation with stakeholders.
8. In particular, this approach allows each regulator under the Marine Scheme application and the Onshore Scheme application (i.e. the MMO and NCC, respectively) to determine the application submitted to them in accordance with their statutory role and functions and appropriate areas of competence under the EIA Regulations (and the TCPA (EIA) Regulations 2017 in the case of NCC and the Onshore Scheme) and the Habitats Regulations. The Applicant notes that NCC has agreed to the approach outlined by the Applicant as presented here.
9. The purpose of this document is to summarise for the benefit of the Marine Scheme application the key parameters of the Marine Scheme and the Onshore Scheme within the intertidal area, outline how the intertidal area has been assessed with in the Marine Scheme ES and how the Onshore Scheme and Marine Scheme have been assessed cumulatively within this Marine Scheme ES.
10. This document summaries and signposts to information already provided within the Marine Scheme ES (with the exception of information regarding to the Onshore Scheme parameters) and does not provide any new or additional information regarding conclusions from assessments.
11. As detailed within this document, the Applicant’s commitment to trenchless technology at the Landfall means that there is no potential for any direct interaction with the intertidal area for both the Marine Scheme and Onshore Scheme. The trenchless technology ducts will pass beneath the intertidal area from a point at least 250 m seawards of MLWS to a location onshore landwards of the dune system, and there is no above ground infrastructure located within the intertidal area.

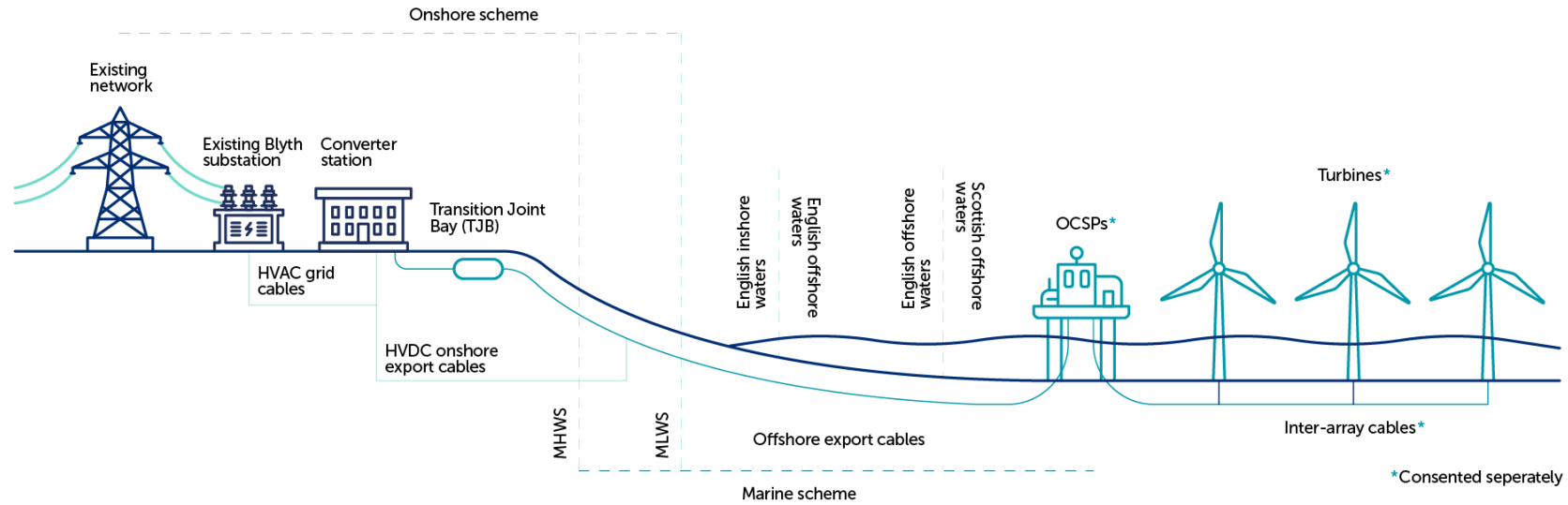



Plate 3-1 Overview of the key components of the Cambois Connection

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3.2. Cambois Connection

3.2.1. Offshore Scheme Overview


12. The Marine Scheme is a proposal for the construction, operation and maintenance, and decommissioning of up to four high voltage direct current (HVDC) Offshore Export Cables from up to two Offshore Converter Station Platforms (OCSPs)² within the BBWF array area to MHWS of the Landfall location near Cambois, Northumberland. The Marine Scheme includes all aspects of the Project seaward of MHWS.
13. Volume 2, Chapter 5 Project Description provides a detailed description of all parameters and infrastructure associated with the construction, operation and maintenance and decommissioning of the Marine Scheme.

3.2.2. Onshore Scheme Overview

14. As outlined above the Onshore Scheme (all infrastructure and associated works landward of MLWS) will be considered within a separate ES to be submitted in support of the Onshore Scheme application, which will be determined by Northumberland County Council as the relevant Local Planning Authority. However further details regarding the Onshore Scheme are included within the Marine Scheme ES where appropriate in order to provide context with regards to the intertidal area and for consideration within any cumulative assessments within the Marine Scheme ES. Figure 1 shows the boundary of the Onshore Scheme
15. The Onshore Scheme includes up to four underground High Voltage Directional Current (HVDC) export cables which be located within an onshore cable corridor between the Landfall, Transition Joint Bays (TJBs) and the onshore converter station location (further information regarding the installation of the onshore export cables at landfall is provided in section 5.8.2 of Volume 2, Chapter 5 Project Description).
16. The onshore HVDC export cables will extend from up to four TJBs, within a temporary onshore construction compound (located landwards of the Cambois Beach dune system), and will connect into an Onshore Converter Station, proposed to be located adjacent to the existing converter station for North Sea Link. From the Onshore Converter Station up to twelve High Voltage Alternating Current (HVAC) grid connection cables will provide a connection from the Onshore Converter Station into the existing Blyth National Grid Substation. The Onshore Scheme will also include the construction of temporary and permanent access routes, including the improvements of existing roads in the area. All of these works are located landwards of MHWS.
17. The Onshore Scheme construction programme is anticipated to take up to 5 years commencing in 2025 and completed by Q4 2029 with Landfall construction anticipated to take approximately 2 years.
18. Figure 1 provides an overview of indicative infrastructure zones within the Onshore Scheme in which particular infrastructure associated with the Onshore Scheme may be located³. Table 3.1 outlines

² It is important to note that whilst the Marine Scheme boundary overlaps with the BBWF array area, this is only to accommodate the Offshore Export Cables and supporting works for the Marine Scheme; no OCSPs or generation assets are included within the scope of the Marine Scheme.

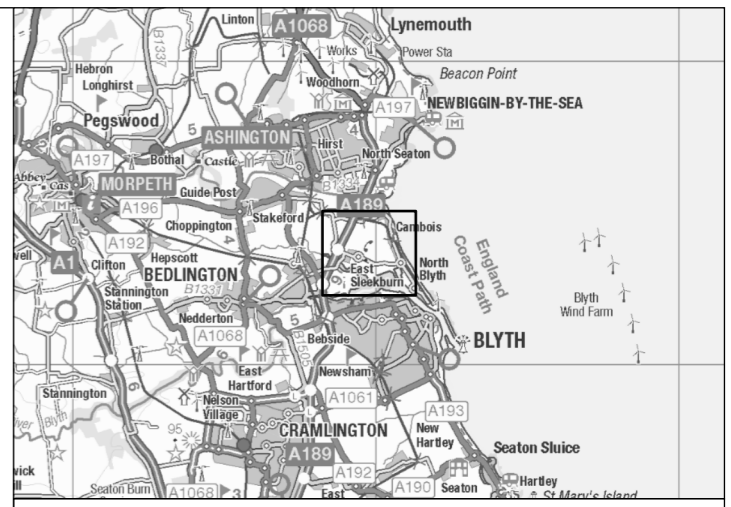
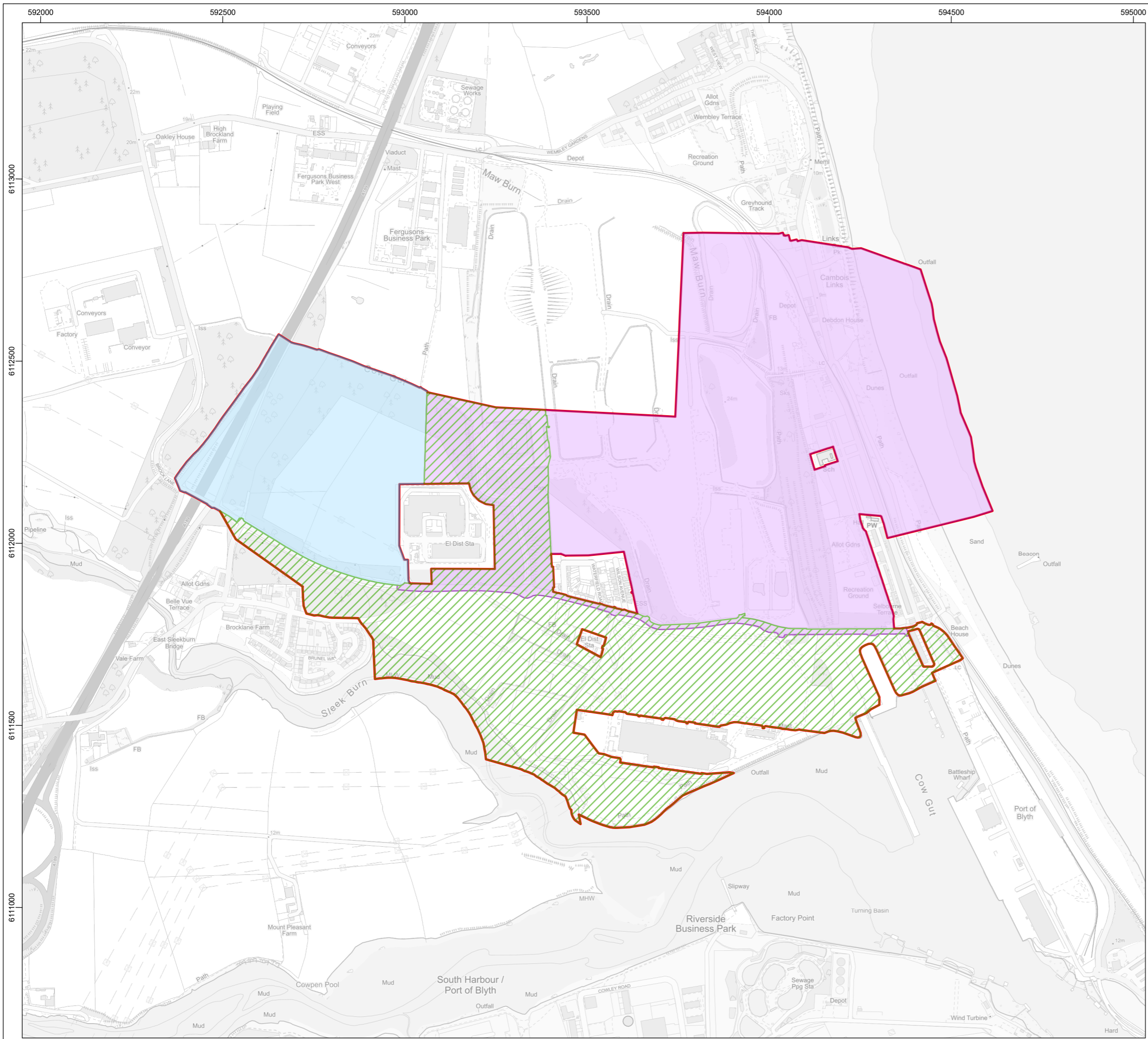
³ It should be noted that these onshore infrastructure zones are indicative at this stage and have been used for assessment purposes within the Onshore Scheme ES and for consideration within the CEA for the Marine Scheme.

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some of the key parameters and infrastructure associated with the Onshore Scheme. Information relating to Onshore Scheme infrastructure associated with Landfall is provided in section 3.3.1 below.

Table 3.1 PDE for Key Onshore Scheme parameters

Parameter	Maximum value	Description
HVDC Cables	Up to 4	The HVDC cables will be located underground connecting the transition joint bays at Landfall to the onshore converter station running through the Landfall HVDC zone to within the converter station zone shown in Figure 1.
Onshore converter station	One	This will be located within the converter station zone shown in Figure 1. The converter station will be located on land at East Sleekburn, and is approximately 1.5 km northeast of Blyth on the northern side of the Blyth Estuary. The converter station site is situated immediately to the west of the North Sea Link (NSL) converter station.
HVAC Cables	Up to 12	The HVAC cables will be located underground connecting the onshore converter station to the existing Blyth substation running from within the converter station zone to the HVAC zone shown in Figure 1.



Legend

- Cambois Connection Onshore Scheme Boundary
- Landfall HVDC Zone
- HVAC Zone
- Converter Station Zone

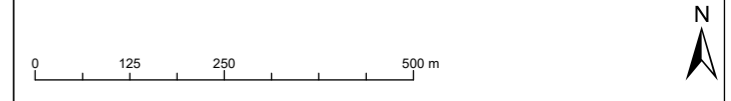
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Project **CAMBOIS CONNECTION**

Title **FIGURE 1
INDICATIVE ONSHORE
ZONES OF INFRASTRUCTURE**



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Scale	Plot Size	Datum	Projection
1:10,000	A3	OSGB36	BNG
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3.3. Intertidal Area and Landfall

20. The Landfall is part of the Marine Scheme in English (inshore) waters only.
21. The landfall location at Cambois forms the interface between the Marine Scheme and Onshore Scheme where the Offshore Export Cables will be brought ashore, as shown in Figure 2. The Offshore Export Cable Corridor approaching Landfall is approximately 1.5 km wide at Cambois beach, at the widest point between the River Wansbeck and the Port of Blyth. The final location of the Landfall at Cambois is still to be determined but will be located within this wider Landfall corridor. This will accommodate a trenchless technique (such as horizontal directional drilling (HDD)) to bring up to four HVDC Offshore Export Cables ashore.
22. The development of the Landfall will require construction work within the marine environment (i.e., below MHWS) as well as onshore work (i.e., above MLWS). As mentioned above, works landward of MLWS are described and assessed in the Onshore Scheme ES, to be submitted to NCC as the relevant Local Planning Authority in Q4 2023, and are assessed cumulatively with the Marine Scheme in this Marine Scheme ES.
23. The Offshore Export Cables will be installed at the Landfall using a trenchless technology such as HDD. This involves installing an underground cable duct by drilling a bore from one point to another. The Offshore Export Cables are then installed through the duct(s). It is likely that the bores will be drilled from a trenchless technology compound which will be located above MHWS (onshore) to an agreed 'punch out' location in the nearshore marine area (below MLWS), therefore completely bypassing the intertidal area, as outlined in Figure 2.
24. The drill rig required to create the trenchless technology boreholes will be located onshore, landward of MHWS, as outlined in Figure 2. A temporary construction compound will be established containing the drill rig, an electrical generator, water tank, mud recycling unit, other construction equipment and machinery, storage areas, a temporary site office, car parking and welfare facilities. The drilling installation would commence from above the MHWS, with the trenchless technique exit point (punch out location) located at least 250 m seaward of MLWS (as outlined in Figure 2). There will be up to five exit pits, each 20 x 5 m, for up to four cable ducts (with one spare in case of failure) due to trenchless cable installation at the Landfall.
25. The trenchless technique exit pits are expected to be located between the -2.5 m Lowest Astronomical Tide (LAT) and -10 m LATs, at least 250m seawards of MLWS. As such, no works are planned to take place in the intertidal area (Figure 2). Given that there will be no requirement to excavate an open trench at any location between MLWS and MHWS, any interactions with the intertidal zone will be avoided (Figure 2).
26. Once the cable ducts have been drilled, the Offshore Export Cables will be brought ashore, pulling the cables through the ducts from a barge that will be located in the nearshore area. Once onshore, the Offshore Export Cables will be connected to the Onshore Export Cables in underground chambers (TJBs). These will be located landward of the MHWS and therefore comprise part of the Onshore Scheme. Up to four TJBs will be required (one per cable). These will be permanent structures which will be installed at locations within the wider temporary Landfall construction compound. Once installed the TJBs will be completely buried once installed except for manhole covers for the link and communications boxes to provide access for maintenance and repairs.


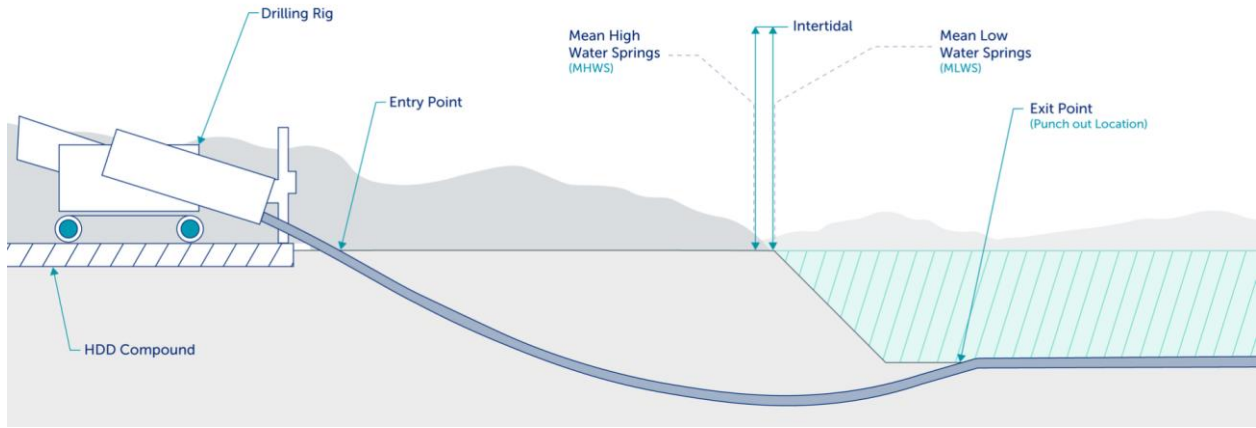
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Plate 3-2 Depiction of HDD (indicative trenchless installation methodology)



3.3.1. Marine Scheme Parameters

27. The Project Design Envelope (PDE) for Marine Scheme Landfall installation parameters using trenchless technology are provided in Table 3.2 below, it should be noted these are subject to further refinement post consent.


Table 3.2 PDE for Marine Scheme Landfall parameters

Parameter	Maximum value
Maximum number of trenchless cable ducts*	4
Diameter of cable ducts (m)	0.3 – 2.5
Maximum length of cable ducts (per duct) (m)	2,400
Estimated maximum trenchless burial depth (m) (intertidal)	30
Dimension of exit punches out (m) (subtidal)	20 x 5

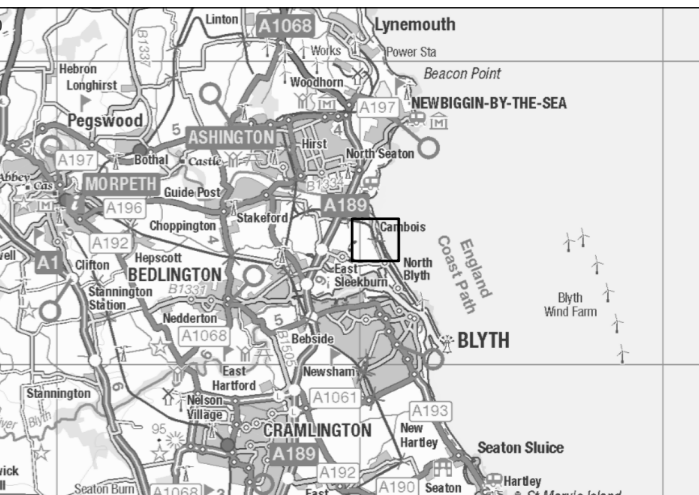
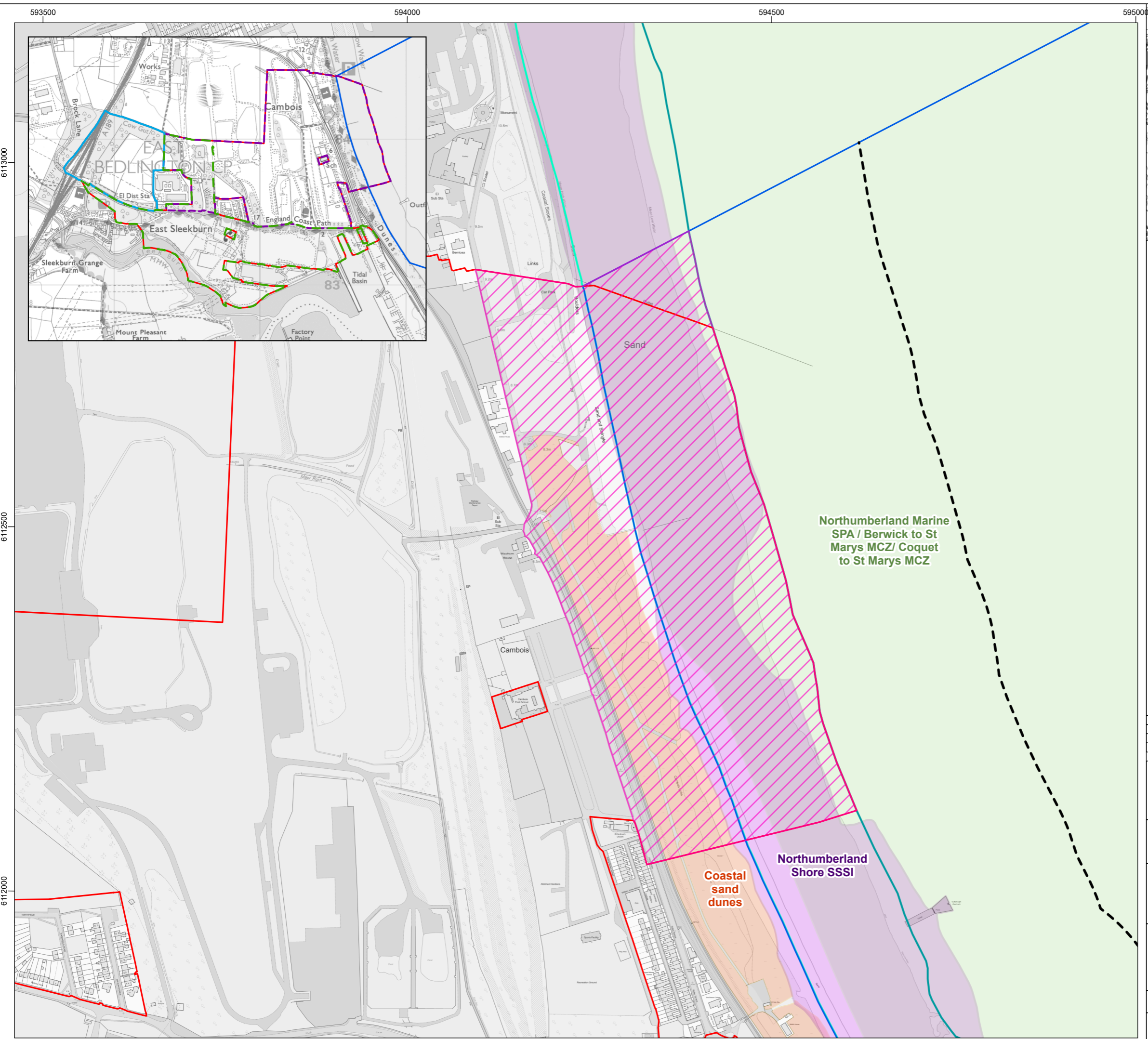
* Maximum number of permanent trenchless cable ducts assumed. Should during trenchless landfall installation a bore fail through encounter of unforeseen ground conditions or other failure, a spare bore may be required.

28. Landfall specific measures incorporated as part of the Marine Scheme’s design (referred to as ‘designed in measures’) and measures which will be implemented regardless of the impact assessment (referred to as ‘tertiary mitigation’) are outlined below. As there is a commitment to implementing these measures, they are considered inherently part of the design of the Marine Scheme and have therefore been considered in the assessment presented in technical chapters. These include:

- Trenchless techniques, such as HDD will be used at the Landfall for the construction of the Marine Scheme. Works associated with Landfall construction activities will avoid any works in the intertidal environment and will reduce the potential for sediment disturbance.
- During trenchless installation activities at Landfall, there will be an interface between the sea and the drilling fluids used to create the exit pits at the breakouts. Small quantities of drilling fluids may be discharged to the marine environment, however best practice mitigation will be implemented to reduce the amount of drill mud / cuttings released in the event of a release. To limit environmental damage, only biologically inert PLONOR (Pose Little or No Risk) listed drilling fluid will be used.

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29. It should be noted that the offshore trenchless technology exit pits have an exit point at least 250 m seaward of MLWS, thus completely bypassing the intertidal area. There is no permanent above ground infrastructure associated with the Marine Scheme at Landfall.



- Legend**
- Cambois Connection Onshore Scheme Boundary
 - Marine Scheme
 - Minimum Exit Location for Cable
 - Mean High Water Springs
 - Mean Low Water Springs
 - No Above Ground Infrastructure
 - Landfall HVDC Zone
 - HVAC Zone
 - Converter Station Zone
- Environmental Designations**
- Site of Special Scientific Interest (SSSI)
 - Special Protection Area (SPA) / Marine Conservation Zone (MCZ)
 - Priority Habitat Inventory - Sand Dunes

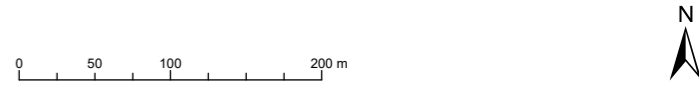
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Project
CAMBOIS CONNECTION

Title
**FIGURE 2
CAMBOIS CONNECTION INTERTIDAL AREA**



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Scale	Plot Size	Datum	Projection
1:5,000	A3	OSGB36	BNG
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3.3.2. Onshore Scheme Parameters

30. The PDE for Onshore Scheme Landfall installation parameters using trenchless technology e.g. HDD are provided in Table 3.2 below, it should be noted these are subject to further refinement post consent.

Table 3.3 PDE for Onshore Scheme Landfall parameters

Parameter	Maximum value
Maximum number of HVDC cables	4
Maximum number of transition joint bays (TJBs)	4
Maximum number of trenchless technology ducts	4
Maximum diameter of trenchless technology ducts (per duct) (m)	0.3 - 2.5
Maximum footprint of trenchless technology / TJB construction compound (m ²)	15,000

31. Landfall specific measures incorporated as part of the Onshore Scheme’s design (referred to as ‘designed in measures’) and measures which will be implemented regardless of the impact assessment (referred to as ‘tertiary mitigation’) are outlined below.

- Trenchless techniques, such as HDD will be used at the Landfall for the construction of the Onshore Scheme. Works associated with Landfall construction activities will avoid any works in the intertidal environment and will reduce the potential for localised disturbance in this area or any restrictions on access to the beach for leisure and recreational purposes.


32. It should be noted that the onshore works associated with Landfall installation will be located landwards of MHWS outwith the dune system associated with Cambois beach, thus completely bypassing the intertidal area and adjacent dunes. There is no permanent above ground infrastructure associated with the Onshore Scheme from MLWS nor within the coastal sand dunes, as clearly shown on Figure 2.

3.4. Consideration of Intertidal Area within this Marine Scheme ES

33. As an Open Cut Trench (OCT) solution for bringing the Offshore Export Cables ashore at the Landfall is no longer included as an option for the Project (removed from both the Marine Scheme and the Onshore Scheme) there is very limited potential for any interaction with receptors in the intertidal area. This is on the basis that all onshore works associated with the trenchless technology solution will be located landward of MHWS. The onshore works are therefore principally assessed in the Onshore Scheme ES, in addition to being assessed cumulatively in the Marine Scheme ES. This includes an assessment of effects of the onshore works (landward of MWHS) on the intertidal area.

34. The offshore trenchless technology exit pits have an exit point at least 250 m seaward of MLWS, thus completely bypassing the intertidal zone. This is shown in Figure 2 which depicts the intertidal area as overlapped by both the Marine Scheme and Onshore Scheme boundaries. As shown in this figure there is a large area with no above ground infrastructure located therefore there is no opportunity for direct interaction between the Marine Scheme and Onshore Scheme in the intertidal area.

35. There are potential impact pathways associated with the Marine Scheme on receptors in the intertidal area and these have been assessed with each relevant ES chapter and are not discussed further here. As presented in Figure 2 there are designated sites within the intertidal area. These designated sites are listed in Table 3.4 to provide a summary and signpost as to how and where these sites have been considered within various parts of the Marine Scheme ES and supporting assessments.

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- Likely significant effects of the Marine Scheme (and cumulative likely significant effects in relation to the Onshore Scheme where relevant) on Sites of Special Scientific Interest (SSSI) are assessed within ES chapters of relevance to their qualifying interest feature (for example Chapter 7 Physical Environment and Seabed Conditions, Chapter 8 Benthic and Intertidal Ecology and Chapter 10 Offshore and Intertidal Ornithology).
- Likely significant effects of the Marine Scheme (and likely significant effects in-combination with the Onshore Scheme where relevant) on the Special Protection Area (SPA)/Ramsar sites listed in Table 3.4 are assessed as part of the Habitat Regulations Assessment (HRA) process, conclusions from which are presented in the Marine Scheme Report to Inform Appropriate Assessment (RIAA).
- Likely significant effects of the Marine Scheme (and likely significant effects in-combination with the Onshore Scheme where relevant) on Marine Conservation Zones (MCZ) are assessed in the Marine Scheme MCZ/MPA Assessment, and depending on their relevant qualifying feature, also within the ES (for example Chapter 7 Physical Environment and Seabed Conditions, Chapter 8 Benthic and Intertidal Ecology and Chapter 10 Offshore and Intertidal Ornithology).

36. It should be noted that any likely significant effects from the Onshore Scheme on the onshore designated sites will be included within the separate ES and RIAA for the Onshore Scheme.




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Table 3.4 Designated sites within intertidal area and summary of assessment conclusions

Designated Site	Distance	Relevant Qualifying Feature(s)	Summary of Assessment Conclusions
Northumberland Shore SSSI	0 km (Overlaps with Marine Scheme and Onshore Scheme)	<ul style="list-style-type: none"> Sandy bays separated by rocky headlands with wave-cut platforms; Estuarine intertidal mudflats; and Estuarine intertidal saltmarsh. Aggregations of non-breeding birds including Golden Plover, Purple Sandpiper, Redshank, Ringer Plover, Sanderling and Turnstone 	<p>Although the Marine Scheme at the Landfall directly overlaps this designated site as illustrated in Volume 4, Figure 7.4, it should be noted that trenchless technologies are being applied for the Landfall, with the minimum exit depth being completely subtidal at approximately 10 m LAT. Therefore, it is the case that the trenchless technology method will completely pass under this designated site, with the exit being beyond the seaward boundary of the SSSI. There are no requirements to excavate an open trench or install any above ground infrastructure at any location within the boundary of the SSSI. It is therefore concluded that there will be no direct disturbance to this site.</p> <p>All onshore infrastructure associated with the Landfall and Onshore Scheme will be located above MHWS. Although there is potential for localised disturbance (noise and presence of equipment/machinery) from the onshore Landfall construction compound there is no pathway for an effect on qualifying features of the SSSI. Designed in mitigation measures, such as a Construction Environmental Management Plan (CEMP) and use of an Ecological Clerk of Works (ECoW) will be implemented to minimise any potential emissions (dust and water runoff) from the Onshore Scheme Landfall Construction Compound allow any potential effects on the SSSI are avoided.</p> <p>The footprint of the Marine Scheme within the designated site is approximately 0.23 km², equating to approximately 1% of the designated site. Although 0.18 km of the Offshore Export Cables (within the Marine Scheme) overlaps the SSSI, the cables would be drilled beneath the site, without any direct impact. The assessment conclusion concluded minor adverse significance, which is not significant in EIA terms.</p> <p>Bird species which are qualifying features of the SSSI have been assessed in Volume 10 Chapter 10 Offshore Ornithology. It was concluded in Volume 2, Chapter 10 Offshore and Intertidal Ornithology that given that there will be no construction works within the intertidal area, there is no potential for any direct effects on intertidal species in terms of direct disturbance. It was also concluded that although there is potential for birds using the intertidal area to be disturbed by activities at the Landfall construction compound (onshore above MHWS), the level of disturbance based on the duration and nature of the works and the background of existing high levels of reactional activity on Cambois Beach (dog walking etc.), the magnitude of the impact would be negligible.</p>
Coquet to St Mary's MCZ	0 km (Overlaps)	<ul style="list-style-type: none"> Low energy tidal rock 	<p>The Marine Scheme directly overlaps this designated site at Landfall as illustrated in Volume 4, Figure 7.4, with an area of 4.5 km², equating to approximately 2.3% of the designated site. Approximately 3.9</p>

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Designated Site	Distance	Relevant Qualifying Feature(s)	Summary of Assessment Conclusions
	with Marine Scheme only)	<ul style="list-style-type: none"> Moderate energy intertidal rock High energy intertidal rock Intertidal mixed sediments Intertidal coarse sediments Intertidal sand and muddy sand Intertidal mud Intertidal under boulder communities Peat and clay exposures Moderate energy infralittoral rock High energy infralittoral rock Moderate energy circalittoral rock Subtidal coarse sediment Subtidal sand Subtidal mixed sediments Subtidal mud 	<p>km of the Offshore Export Cables (within the Marine Scheme) is located within the designated site. However, this area of disturbance will be located at least 250 m seaward of the MLWS (in the nearshore area). As discussed above, given that trenchless technology will be used at the Landfall there is no potential for any direct interaction with the intertidal area (the trenchless technology ducts will pass beneath the intertidal area). There are also no requirements to excavate an open trench in the intertidal area.</p> <p>Potential effects of the Marine Scheme (all infrastructure and works seaward of MHWS) on the MCZ have been assessed in the MCZ/MPA Assessment which will be submitted with this ES to support the Marine Licence application.</p> <p>Based on the disturbance footprint of 25 m per cable for four cables, approximately 0.4 km² would be directly disturbed, in addition to the 500 m² from the footprint of the exit pits, which equates to 0.2% of the designated site.</p> <p>Based on the information presented for all features, conservation objectives and attributes set out within the MCZ/MPA assessment, it was concluded that there will be no significant risk of hindering the achievement of the conservation objectives for all features of the Coquet to St Mary's MCZ.</p> <p>All onshore infrastructure associated with the Landfall and Onshore Scheme will be located above MHWS. Although there is potential for localised disturbance (noise and presence of equipment/machinery) from the onshore Landfall construction compound there is no pathway for an effect on protected features of the Coquet to St Mary's MCZ. Therefore, it is concluded that there will be no significant risk of the Onshore Scheme hindering the achievement of the conservation objectives for all features of the Coquet to St Mary's MCZ.</p>
Berwick to St Mary's MCZ	0 km (Overlaps with Marine	<ul style="list-style-type: none"> Common eider (<i>Somateria mollissima</i>) 	As with the Coquet to St Mary's MCZ, the Marine Scheme directly overlaps the Berwick to St Mary's MCZ at the Landfall. The maximum area of seabed habitat that will be disturbed by construction activity and that is in waters of <20 m depth is approximately 0.3 km ² . This represents less than 0.05%

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Designated Site	Distance	Relevant Qualifying Feature(s)	Summary of Assessment Conclusions
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of the potential foraging habitat available to the common eider receptor population. However, this is in the nearshore area only, at least 250 m seaward from the MLWS.

The use of trenchless technology at the Landfall means that there is no potential for any direct interaction with the intertidal area (the trenchless technology ducts will pass beneath the intertidal area from a point above MHWS to below (seaward of MLWS). There are also no requirements to excavate an open trench in the intertidal area.


Potential effects of the Marine Scheme on the common eider feature of the Berwick to St Mary's MCZ have been assessed in Volume 2, Chapter 10 Offshore and Intertidal Ornithology and the MCZ/MPA Assessment. The EIA assessment concluded that there are no significant effects in EIA terms.

Based on the information presented for the common eider feature, conservation objectives and attributes set out within the MCZ/MPA assessment, there will be no significant risk of hindering the achievement of the conservation objectives for all features of the Berwick to St Mary's MCZ.

Both the EIA assessment and the MCZ/MPA assessment also considered potential cumulative effects on the common eider from the Onshore Scheme.


Given that there will be no construction works within the intertidal area, there is no potential for any direct effects on intertidal species in terms of direct disturbance. However, there is potential for birds in the intertidal area to be disturbed by construction works in the nearshore area and from construction activities associated with the Onshore Scheme (located landward of MHWS) associated with the trenchless technology construction compounds required to install the ducts and bring the Offshore Export Cables to shore where they will be connected to the Onshore HVDC Cables.

It was concluded in Volume 2, Chapter 10 Offshore and Intertidal Ornithology that given that there will be no construction works within the intertidal area, there is no potential for any direct effects on intertidal species in terms of direct disturbance. It was also concluded that although there is potential for birds using the intertidal area to be disturbed by activities at the Landfall construction compound (onshore above MHWS), the level of disturbance based on the duration and nature of the works and the background of existing high levels of recreational activity on Cambois Beach (dog walking etc.), the magnitude of the impact would be negligible. Although common eider is considered to have medium sensitivity to disturbance, as a sea duck, the species is anticipated to favour the coastal waters as opposed to regularly frequenting the dune structure at Cambois. The potential for any disturbance from the Onshore Scheme to affect birds in the coastal waters is limited. It was therefore concluded that, the Marine Scheme when considered cumulatively with the Onshore Scheme would not have a


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Designated Site	Distance	Relevant Qualifying Feature(s)	Summary of Assessment Conclusions
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			<p>significant effect on the common eider feature of the Berwick to St Mary's MCZ and would not hinder the conservation objectives for this feature.</p>
Northumberland Marine SPA	0 km (Overlaps with Marine Scheme only)	<ul style="list-style-type: none"> • Guillemot (<i>Uria aalge</i>) (Breeding) • Common tern (<i>Sterna hirundo</i>) (Breeding) • Little tern (<i>Sterna albifrons</i>) (Breeding) • Sandwich tern (<i>Sterna sandvicensis</i>) (Breeding) • Arctic tern (<i>Sterna paradisaea</i>) (Breeding) • Puffin (<i>Fratercula arctica</i>) (Breeding) • Roseate tern (<i>Sterna dougallii</i>) (Breeding) • Seabird assemblage (breeding) including the components: <ul style="list-style-type: none"> ○ Cormorant (<i>Phalacrocorax carbo</i>) ○ Shag (<i>Gulosus aristotelis</i>) ○ Black-headed gull (<i>Chroicocephalus ridibundus</i>) • Kittiwake (<i>Rissa tridactyla</i>) 	<p>The Marine Scheme directly overlaps this designated site at Landfall, as illustrated in Figure 2 in Part One of the RIAA, with an area of 4.5 km², equating to approximately 0.5% of the designated site. Approximately 3.9 km of the Offshore Export Cables (within the Marine Scheme) is located within the designated site. Based on the disturbance footprint of 25 m per cable for four cables, approximately 0.4 km² would be directly disturbed, in addition to the 500 m² from the footprint of the exit pits, which equates to 0.4% of the designated site.</p> <p>It is concluded that there is no potential for an adverse effect on the qualifying features of the Northumbria Coast SPA due to the effects from the Marine Scheme alone or in-combination with other plans and projects. Consequently, it is concluded that there is no potential for an Adverse Effects on Integrity of the Northumberland Marine SPA.</p> <p>The Northumberland Marine SPA provides protection to key foraging areas used by seabirds associated with breeding colonies located at the Farne Island SPA, Coquet Island SPA, Lindisfarne SPA and the Northumbria Coast SPA. Seabird populations associated with these breeding colony SPAs are considered to be functionally linked to the Northumberland Marine SPA. It was concluded in the Marine Scheme RIAA Part Two that there would be no adverse effects on the integrity of any of the breeding seabird SPAs that are functionally linked to the Northumberland Marine SPA. Therefore, it can also be concluded that there is no potential for any adverse effects on any of the qualifying features of this site therefore, it is concluded that there is no potential for an Adverse Effects on Integrity of the Northumberland Marine SPA.</p>

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Designated Site	Distance	Relevant Qualifying Feature(s)	Summary of Assessment Conclusions
Northumbria Coast SPA/Ramsar	500m S of Marine Scheme (no overlap with Onshore Scheme)	<ul style="list-style-type: none"> • Little tern (Breeding) • Turnstone (<i>Arenaria interpres</i>) (Non-breeding) • Purple sandpiper (<i>Calidris maritima</i>) (Non-breeding) <ul style="list-style-type: none"> • Arctic tern (Breeding) 	<p>Although the Marine Scheme does not directly overlap with the Northumbria Coast SPA there is potential for qualifying features associated with this site to be present / forage within in the intertidal area associated with the Marine Scheme and Onshore Scheme. As concluded in the Marine Scheme RIAA Part Two, there is no potential for the little tern feature to the present on the basis that the Landfall is beyond the foraging range for little tern from the breeding colony at Newton Links/Long Nanny (Beadnell Bay).</p> <p>It was also concluded in the RIAA that although there is potential for Arctic tern associated with the Northumbria Coast SPA to be present along the southern end of the Marine Scheme and near the Landfall (in English Waters), given the highly localised and temporary nature of potential disturbance and any effects on prey species together with the availability of alternative foraging habitat in the waters adjacent to the Northumbria Coast SPA, there is no potential for construction or decommissioning related changes in prey availability to lead to an adverse effect on the Northumbria Coast SPA Arctic tern population.</p> <p>Potential effects of the Marine Scheme in combination with the Onshore Scheme on the purple sandpiper and turnstone features of the Northumbria Marine SPA have been assessed in the Volume 2, Chapter 10 Offshore and Intertidal Ornithology and the RIAA (Part Two).</p> <p>Given that there will be no construction works within the intertidal area (trenchless technology will bypass the intertidal area), there is no potential for any direct effects on either species in terms of direct disturbance. However, there is potential for purple sandpiper and turnstone the intertidal area to be disturbed by construction works in the nearshore area and from construction activities associated with the Onshore Scheme (located landward of MHWS) associated with the trenchless technology construction compounds required to install the ducts and bring the Offshore Export Cables to shore where they will be connected to the Onshore HVDC Cables.</p> <p>It was concluded in ES Volume 2, Chapter 10 Offshore and Intertidal Ornithology that given that there will be no construction works within the intertidal area, there is no potential for any direct effects on purple sandpiper and turnstone in terms of direct disturbance. It was also concluded that although there is potential for birds using the intertidal area to be disturbed by activities at the Landfall construction compound (onshore above MHWS), the level of disturbance based on the duration and nature of the works and the background of existing high levels of reactional activity on Cambois Beach (dog walking etc.), the magnitude of the impact would be negligible.</p>

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Designated Site	Distance	Relevant Qualifying Feature(s)	Summary of Assessment Conclusions
			<p>Purple sandpiper is considered to have low to medium sensitivity to disturbance, and turnstone has low sensitivity. Purple sandpiper also favours rocky shorelines and therefore is not expected to be present on areas of intertidal muds or sands or the Cambois Beach. Turnstone is also restricted to rocky shoreline. It was therefore concluded that, given the limited potential for either species to be present on the upper (less rocky) parts of the intertidal area and the temporary nature of the construction works, the Marine Scheme when considered in combination with the Onshore Scheme would not have an adverse effect on either the purple sandpiper or turnstone feature of this site. Consequently, it is concluded that there is no potential for an Adverse Effects on Integrity of the Northumbria Coast SPA.</p>

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37. As outlined above the Marine Scheme has considered the Onshore Scheme within the assessments supporting the Marine Licence Applications. To assist stakeholders and organisations which are interested in the Onshore Scheme application the below table provides a summary of all EIA topics being assessed for the Onshore Scheme and whether these topics interact with or have been considered within the Marine Scheme EIA. Importantly this table also highlights where there is no potential for interaction with the Marine Scheme and therefore the topic is assessed with the Onshore Scheme ES.

Table 3.5 Onshore Scheme EIA Topics and Interaction with Marine Scheme EIA Topics

Onshore Scheme EIA Topics	Interaction with Marine Scheme EIA Topics	Commentary
Landscape and Visual Amenity	N	<p>This topic was scoped out of the EIA for the Marine Scheme.</p> <p>Given there will be no construction works associated with the Onshore Scheme within the intertidal area, and as trenchless technology will be employed to bring the Offshore Export Cable ashore no physical disturbance of the beach or intertidal area is predicted and as a result, there would be no physical landscape effect on the intertidal area.</p>
Archaeology and Cultural Heritage	Y	<p>As outlined in Volume 2 Chapter 14 Marine Archaeology and Cultural Heritage There is one known site within the intertidal area (Volume 4, Figure 14.4). The site (WA1003) consists of a Second World War trench located on Cambois Beach. However, according to HER record, this has since been demolished. This trench is considered to have low value. During the intertidal walkover survey, no additional sites or features of archaeological interest were observed (Volume 4, Figure 14.4).</p> <p>As trenchless techniques (such as HDD) are being applied for Landfall installation, impacts to unknown intertidal heritage receptors would be minimal as the ducts will pass underneath the intertidal area. The application of designed in mitigation, including the implementation of Archaeological Exclusion Zones (AEZs), further assessment of identified features, and a Protocol for Archaeological Discoveries (PAD), means that all direct impacts to known receptors would be avoided. The assessment concluded no significant effects in EIA terms for the Marine Scheme.</p> <p>Given there will be no construction works associated with the Onshore Scheme within the intertidal area, and as trenchless technology will be employed to bring the Offshore Export Cable ashore no physical disturbance of the beach or intertidal area is predicted. Impacts from the Onshore Scheme to unknown intertidal heritage receptors would be minimal as the ducts will pass underneath the intertidal area. Similar to the Marine Scheme the implementation of a PAD as designed in mitigation reduces the potential effect therefore there would be very limited potential for interaction with archaeological receptors in the nearshore area from both the Onshore Scheme and the Marine Scheme.</p>
Terrestrial Ecology and Ornithology	Y	<p>As discussed in Table 3.3 there is no potential for any direct effect on birds associated with the intertidal area at the Landfall on the basis that the cables will pass beneath the intertidal area and there is no requirement to excavate any open trenches in the intertidal area. However, there is potential for birds in the intertidal area to be disturbed by activities in the nearshore area (at least 250 m from MLWS) associated with the Marine Scheme and activities landward of MHWS associated with the Onshore Scheme including the Landfall construction compound.</p>

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Onshore Scheme EIA Topics	Interaction with Marine Scheme EIA Topics	Commentary
		<p>The potential effects of both the Marine Scheme and Onshore Scheme on birds associated with the intertidal area have been assessed as part of the Marine Scheme ES – Volume 2, Chapter 10 Offshore and Intertidal Ornithology, the Cambois Connection Marine Scheme RIAA and the Cambois Connection MCZ/MPA Assessment. These assessments concluded no significant effects in EIA terms and no Adverse Effects on Site Integrity respectively.</p>
Geology and Soils	N	<p>Given there will be no construction works associated with the Onshore Scheme within the intertidal area, and as trenchless technology will be used to bring the Offshore Export Cable ashore there is no potential for any interaction with the Marine Scheme. Potential effects of the Marine Scheme on physical processes and seabed conditions offshore and at the coast have been assessed in the ES Volume 2, Chapter 7 Physical Environment and Seabed Conditions. This identifies that there are no impact pathways between the Marine Scheme and the Onshore Scheme and there is no potential for the Marine Scheme and the Onshore Scheme to cumulatively effects on geology soils / sediment at the Landfall or intertidal area.</p>
Hydrology and Hydrogeology	Y	<p>The Offshore Physical Environment and Seabed Conditions Study Area includes the intertidal area. This intertidal area overlaps with the Onshore topic of Geology and Soils, and Hydrology and Hydrogeology</p> <p>Given there will be no construction works associated with the Onshore Scheme within the intertidal area, and as trenchless technology will be employed to bring the Offshore Export Cable ashore there is no potential for any interaction with the Marine Scheme.</p> <p>Potential effects of the Marine Scheme on waterbodies were assessed as part of the Water Framework Directive (WFD) Assessment. This concluded that Marine Scheme would not have any impact on waterbodies along the coast (within 1 nm) this includes the Landfall and punch out locations. Given the onshore infrastructure will be located landward of the MHWS it is concluded that there is limited potential for the Marine Scheme and Onshore Scheme to have cumulative effects on coastal hydrological features.</p>
Traffic and Access	N	<p>All vehicle movements associated with the Onshore Scheme will be located onshore utilising existing access routes where possible e.g. local road network. Therefore, there is no potential for any interaction with the Marine Scheme. Where there is potential for traffic and access to lead to localised disturbance at the Landfall, the potential cumulative effects with the Marine Scheme have been considered on a receptor-by-receptor basis e.g. ornithology</p>
Noise and Vibration	N	<p>This topic was scoped out of the EIA for the Marine Scheme. Where there is potential for activities at the Landfall (onshore) to lead to localised disturbance due to noise and vibration at the Landfall, the potential cumulative effects with the Marine Scheme have been considered on a receptor-by-receptor basis e.g. ornithology (see above).</p>
Air Quality	N	<p>This topic was scoped out of the EIA for the Marine Scheme. No potential cumulative effects on specific receptors have been identified when considering the Onshore Scheme cumulatively with the Marine Scheme.</p>

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Onshore Scheme EIA Topics	Interaction with Marine Scheme EIA Topics	Commentary
Socioeconomics, Recreation and Tourism	Y	<p>This topic was scoped out of the EIA for the Marine Scheme.</p> <p>Impacts on recreation and tourism is addressed separately to socio-economics in a dedicated assessment provided in Volume 2, Chapter 15 Other Sea Users. No impact pathways were identified with regard to potential cumulative effects with the Onshore Scheme.</p> <p>Impacts on commercial fisheries is addressed separately to socio-economics in a dedicated appraisal provided in Volume 2, Chapter 12 Commercial Fisheries. No impact pathways were identified with regard to potential cumulative effects with the Onshore Scheme.</p>

3.5. Conclusions

38. The ES for the Marine Scheme has considered the Marine Scheme, as well as the Onshore Scheme in two respects – (i) as part of the cumulative effects assessment (CEA); and (ii) in respect of the extent to which the Marine Scheme and Onshore Scheme redline boundaries both include the area between MLWS and MHWS, i.e. the intertidal area.
39. This approach is in accordance with the applicable legislation, the Marine Works (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 and Conservation of Habitats and Species Regulations 2017 (together the Habitats Regulations) and reflects the separate consenting processes for the Marine Scheme and Onshore Scheme application, as outlined within the Applicant’s Scoping Report (BBWFL, 2022) and throughout all pre-application consultation with stakeholders.
40. In particular, this approach allows each regulator under the Marine Scheme application and the Onshore Scheme application (i.e. the MMO and NCC, respectively) to determine the application submitted to them in accordance with their statutory role and functions and appropriate areas of competence under the EIA Regulations (and the TCPA (EIA) Regulations 2017 in the case of NCC and the Onshore Scheme) and the Habitats Regulations. The Applicant notes that NCC has agreed to the approach outlined by the Applicant as presented here.
41. The Applicant’s commitment to trenchless technology at the Landfall means that there is no potential for any direct interaction with the intertidal area for both the Marine Scheme and Onshore Scheme. The trenchless technology ducts will pass beneath the intertidal area from a point at least 250 m seawards of MLWS to a location onshore landwards of the dune system, and there is no above ground infrastructure located within the intertidal area, as shown in Figure 2.
42. The Marine Scheme ES predicted no significant effects (alone or cumulatively with the Marine Scheme) within intertidal area and the RIAA and MCZ assessment concluded no AEoSI nor impacts on conservation objectives alone or in combination with the Onshore Scheme for any designated sites in proximity to or overlapping the Landfall.

3.6. References

Berwick Bank Wind Farm Limited (2022) Cambois Connection Marine Scheme Scoping Report