




## **Cambois Connection – Onshore Scheme**

### **Environmental Statement Volume 2**

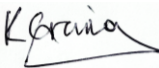
#### **Chapter 4: Site Selection and Consideration of Alternatives**


	<p align="center"><b>Cambois Connection - Onshore Scheme</b></p> <p align="center"><b>ES Chapter 4: Site Selection and Consideration of Alternatives</b></p>	<p>Doc No: A100796-S01 – Site Selection and Consideration of Alternatives</p>
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**Approval for Issue**

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## 4. Site Selection and Consideration of Alternatives

### 4.1. Introduction

1. This chapter of the Onshore Environmental Statement (ES) provides an overview of the site selection process and the reasonable alternatives which have been considered by the Applicant in reaching the Onshore Scheme design.
2. Specifically, this chapter considers the Onshore Scheme site selection and consideration of alternatives associated with aspects of the Cambois Connection (the Project), which are landward of Mean Low Water Springs (MLWS) (the Onshore Scheme).
3. The current design for the Onshore Scheme is the outcome of an iterative process that commenced when the opportunity to develop an additional connection from BBWF to a Landfall in England was initially identified with the objective to accelerate BBWF reaching its full generation capacity by the early 2030s. The additional grid connection was confirmed by the National Grid Electricity System Operator (NGESO) in July 2022. A wide range of environmental, technical and commercial considerations have influenced the optioneering and design evolution process. Alongside this, the formal consultation process (including a formal request for a Scoping Opinion in November 2022 (BBWFL, 2022a)) and technical engagement with key stakeholders has informed the development of the Onshore Scheme.
4. This chapter presents the site selection that has been undertaken based on a grid connection agreement with NGESO for 1.8GW to the National Grid Electricity Transmission (NGET) substation in Blyth (See Table 6.1). There is a strong technical and environmental preference to bring the power generated by the offshore wind farm to a Landfall as close as possible to the onshore grid connection point.

#### 4.1.1. Project objectives

5. The development of the Onshore Scheme will enable the BBWF to reach its full generating capacity by 2030. The urgent need for the Project is encompassed by five clear objectives which the Onshore Scheme will support:
  - **Decarbonisation:** the Onshore Scheme as part of the Cambois Connection will help deliver significant quantities of low-carbon electricity from BBWF's full generation capacity as early as 2030, making a significant and timely contribution to both the Scottish target of achieving Net Zero by 2045 and the UK target for achieving Net Zero by 2050. This is in line with the UK's Committee on Climate Change (CCC)'s recent identification of the need for urgent action to increase the pace of decarbonisation in the Great Britain (GB) electricity sector (CCC, 2023);
  - **Wind generated electricity:** the Onshore Scheme will help deliver more energy generation from offshore wind; this is recognised by Government as being critical for helping to decarbonise the electricity system. Greater energy generation from offshore wind is critical for both the reduction of electricity related emissions as well as providing a timely contribution to a substantial increase in electricity demand due to electrification of transport, heat and industrial demand. The Cambois Connection would deliver electricity from BBWF and BBWF would make a significant contribution to delivering Scotland's ambitions for 11 GW of offshore wind capacity to be in operation in Scottish waters by 2030 (Scottish Government, 2020) and UK targets of 50 GW of offshore wind by 2030 as set out in the British Energy Security Strategy (HM Government, 2022). This increase of 10 GW on the 40 GW by 2030 target established by the Ten Point Plan (HM Government,

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2020) and committed to in the UK Offshore Wind Sector Deal (HM Government, 2019) reflects findings from National Grid ESO (NGESO)’s Future Energy Scenarios (FES) which detail that to achieve Net Zero targets, offshore wind capacities will be required at 40 – 51 GW in 2030, at 84 – 91 GW in 2040, and at 89 – 110 GW by 2050 (National Grid, 2021). In every scenario, a pathway to Net Zero includes a significant increase of offshore wind capacity beyond that predicated in the Sector Deal. The increased target also builds on the UK CCC’s 2019 Report, where they advise that consistently strong deployment of low-carbon generation in the lead up to 2050 will be required to meet Net Zero, including “...at least 75GW of offshore wind.” (CCC, 2019);

- **Energy security and resilience of the electricity system:** the Onshore Scheme as part of the Cambois Connection will help deliver the significant contribution made by the BBWF to the UK’s energy security from 2030. By being connected at the transmission system level, the Onshore Scheme will play an important role in the resilience of the GB electricity system from an adequacy and system operation perspective;
- **Energy at scale:** the Onshore Scheme will be essential for the delivery of the Cambois Connection, a transmission project which represents a substantial infrastructure asset capable of delivering significant quantities of low-carbon electricity from the BBWF by 2030 to the benefit of all GB consumers; and
- **Competitive:** The Onshore Scheme will help supply the UK network with competitive and non-volatile (to fuel price fluctuations) electricity from renewable energy (wind). The competitive Contract for Difference (CfD) allocations up to 2022 saw offshore wind development costs falling by two thirds in the last five years, which accelerated the deployment of offshore wind.


## 4.2. Purpose of this Chapter

6. This chapter:

- Presents a summary of the legislative requirements for the consideration of alternative options for delivering the Onshore Scheme objectives;
- Outlines how the Onshore Scheme has evolved, including how the converter station location and Landfall location has been appraised;
- Provides a chronological record of the evolution of the Onshore Scheme, including how consultation and feedback obtained during engagement with stakeholders has informed the process; and
- Provides a summary of the main reasons for why the Onshore Scheme which is the subject of this ES has been selected, including a comparison of environmental effects of the options studied, as well as consideration of technical and commercial factors.

## 4.3. Grid Connections

7. The Applicant has three signed grid connection agreements with the network operator (NGESO). Two agreements are for connection at a point close to the existing Branxton cable sealing end compound in East Lothian, around 8 km south-west of Dunbar on the East Lothian coast with a third additional connection at the existing National Grid substation in Blyth, Northumberland (referred to as the Cambois Connection). The Branxton grid connections were first secured in 2011.
8. The third (and additional) connection agreement (the Cambois Connection) was confirmed in July 2022 following NGESO’s Holistic Network Design (HND) Review (National Grid ESO, 2022). The Cambois Connection provides an earlier connection date than had initially been offered to the Applicant for a

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third connection in the Branxton area, therefore enabling the BBWF to reach full generating capacity by 2030.

#### 4.4. Legislation and Policy


9. A detailed assessment of the Onshore Scheme in relation to current and future policy is presented in the Planning Statement which accompanies this application. Policy considerations are also outlined in Volume 1, Chapter 2 Policy and Legislation.
10. The requirement to consider reasonable alternatives is contained within Schedule 4 (2) of the EIA Regulations. This states that: ‘A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects’.
11. The information provided in this chapter sets out the approach taken to meet the requirements of the above regulations.

#### 4.5. Stakeholder Engagement

12. Consultation with the public and stakeholders around site selection undertaken to date is summarised in Table 4.1 below.

**Table 4.1: Site Selection Consultation**

Event/Stakeholder	Summary
Northumberland County Council (NCC)	<ul style="list-style-type: none"> <li>• The Applicant held an introductory meeting with NCC, as the Local Planning Authority (LPA) for the Onshore Scheme of the Cambois Connection. Owing to the requirement for a landfall along the Cambois coastline, the approach to the impact assessment for this area was discussed (including in terms of specific sensitivities and any potential overlap in assessments for the Marine Scheme and the Onshore Scheme). Advice from NCC was used to inform the Landfall selection process.</li> <li>• The preferred converter station was shown within the scoping report and within the pre-application report submitted in March 2023. The case officer report stated that the principle of development in policy terms is supported by the policies in the development plan and material considerations, on the condition that any impacts are considered acceptable.</li> <li>• The Southern Landfall Area and the deselected Northern Landfall were discussed in a meeting with NCC in February 2023. It was confirmed that further feasibility studies would be focussed on the southern landfall area.</li> <li>• It was discussed that any landfall in the southern landfall area would be in close proximity with Cambois Primary school. The case officer confirmed they did not see any immediate issues with this and would encourage SSER to engage directly with the school.</li> </ul>
Cambois Primary School	<ul style="list-style-type: none"> <li>• A meeting with the headteacher took place online on 10 March 2023. Its key focus was to highlight potential onshore cable proximity to school. A follow up meeting was held in-person with the headteacher 12 July 2023 to update the school on the project and proposed GI works.</li> </ul>

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Event/Stakeholder	Summary
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Public Consultation	<ul style="list-style-type: none"> <li>An in person public exhibition was held on 11 May 2023 in East Bedlington to introduce and update members of the public on the progress of the Project. Approximately 50 attendees joined this event which allowed the Project team to respond to any queries and questions the public had on the proposals.</li> <li>A second public consultation event was held on 26 September 2023 in Cambois Primary School to update members of the public on the progress of the Project. Further information is provided in Volume 2, Chapter 4 Consultation and Engagement.</li> </ul>
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## 4.6. Site Selection Overview

13. As part of the site selection and consideration of alternatives process the Applicant considered Onshore Converter Station and Landfall options, taking into consideration the wider environment for cable routing, within the vicinity of the grid connection at Blyth Substation. These were evaluated from an engineering, consents (planning and environment), commercial and land use perspective. This approach is summarised in Table 4.2 below. A summary of the outcomes of the three-stage process is also presented in Plate 1 below.


14. The remainder of this chapter provides a detailed account of the site selection and consideration of alternatives structured around the staged process described in Table 4.2.

**Table 4.2 Approach to Site selection and Assessment of Alternatives**

Stage Description	Summary
Consideration of the 'do nothing' scenario and 'proposed scenario'	<p>BBWFL cooperated with the NGENSO on a connection to Blyth substation (Cambois Connection) as part of the NGENSO's Holistic Network Design (HND) process which formed part of the UK Government's Offshore Transmission Network Review (OTNR) of the upcoming grid connections. Work commenced in 2021 resulting in a link between the BBWF and a grid connection at the Blyth substation to enable the BBWF to achieve full generation capacity by early 2030 (refer to Stage One row below).</p> <p>After detailed analysis by the NGENSO, no other grid connection points were offered to the Applicant. With sufficient capacity to support the connection of an export cable from BBWF within the project timescales required, this was therefore the only grid connection option taken forward.</p> <p>As part of the evaluation of the Cambois Connection as an option (the 'proposed scenario') it was necessary to consider this option against the 'do nothing' scenario and implications that 'do nothing' would have on enabling the BBWF to achieve key Project objectives (as set out in Section 6.1), in particular with regards to achieving Scottish and UK 2030 targets for offshore wind deployment, i.e. 11GW of offshore wind in Scottish waters (Scottish Government, 2020b) and 50 GW of offshore wind in UK waters (HM Government, 2022).</p>

**Stage 1:** Desktop studies to identify and evaluate converter station sites.

This stage involved various desktop studies to evaluate potential options for locating the Onshore Converter Station. This included:

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Stage Description	Summary
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Preferred Onshore Converter Station option taken forward.

- Identification of Onshore Areas of Search and selection of a refined Onshore Area of Search
- Identification of possible Onshore Converter Station options.
- Undertaking a Red Amber Green Assessment and consideration of each Onshore Converter Station option based on proximity to grid connection at Blyth substation, site topography environmental constraints, size and availability of land.
- Preferred Onshore Converter Station option selected.
- Preferred Onshore Converter Station option informing the red line boundart presented in the Scoping Report (BBWFL, 2022).
- Alternatives to design and implementation of designed in measures within the Onshore Converter Station zone.
- Onshore Converter Station zone presented, along with the preferred Landfall and onshore cable zones, in this Onshore ES (Chapter 5 - Project Description).

**Stage 2:** Identification and evaluation of Landfall areas.

This stage involved various desktop studies to evaluate potential Landfall options for brining the offshore export cables ashore in a location in close proximity to the potential Onshore Converter Station area of search . This included:

Landfall options taken forward.

- Identification of potential Landfall areas.
- Consideration of engineering, technical,environmental consents and land use constraints.
- Alternatives and preferred options presented at consultation, with feedback considered.
- Selection of the preferred Landfall area.
- Alternatives to design and implementation of designed in measures.
- Landfall zone presented, along with the preferred Onshore Converter Station Zone and onshore cbale zones, in this Onshore ES Report (Chapter 5 - Project Description).

**Stage 3:** Refinement of red line boundary

Following submission of the Scoping Report in November 2022 the red line boundary was refined from the scoping boundary to enable survey work to commence and assessments to inform the EIA.


Zones of infrastructure developed and used in assessment

The boundary and extent of the Onshore Scheme have been the subject of discussions with NCC. There are some design details related to the Onshore Scheme that are still to be finalised due to further ground investigations required, ongoing engineering design work and the procurement of cable and converter station suppliers which will define the final specification. The Site boundary has been chosen to allow flexibility to accommodate design details which will be subject to future Reserved Matters application(s) to NCC.

For the purposes of this outline planning application a zonal approach to the EIA has been presented as the exact locations of the HVDC and HVAC cable routes are not yet known. The zones display areas within the Site within which particular infrastructure associated with the Onshore Scheme will be located. This includes:

- The Landfall/HVDC Zone where the offshore export cables reach land and the onshore export cables will connect into the Onshore Converter Station;
- The Onshore Converter Station Zone where the Onshore Converter Station will be located; and



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Stage Description	Summary
	<p>The HVAC Zone where the grid cables from the Onshore Converter Station connect to the existing Blyth substation.</p>

## 4.7. Consideration of the ‘Do Nothing’ Scenario and Proposed Scenario

15. The approach taken to Onshore Scheme site selection and subsequent assessment of alternative options for delivery of the Onshore Scheme and the Cambois Connection as a whole has been based on the core objective of developing a viable connection between the BBWF and existing grid network to maximise export capacity, thereby delivering a significant volume of new low-carbon electricity as soon as possible, with a substantial contribution to the national grid before 2030.

### 4.7.1. ‘Do Nothing’ Scenario [

16. The ‘do nothing’ option considers a scenario in which the Onshore Scheme is not developed. In such a scenario, the onshore converter station and cables between the BBWF and the grid connection to the Blyth substation are not developed, meaning there is insufficient infrastructure in place to export all renewable electricity from the full generation capacity of BBWF and within the time required to enable BBWF to contribute meeting Scottish and UK Government targets for offshore wind deployment by 2030, as further set out below. This would not achieve the primary objective of the Cambois Connection, as described in section 6.1.1.


17. One of the key risks with the ‘do nothing’ scenario is being unable to contribute to addressing the climate change emergency and the resulting need for rapid decarbonisation. Climate change is the defining challenge of our time. Human-induced global warming has reached approximately 1°C above pre-industrial levels and without a significant and rapid decline in carbon emissions across all sectors, global warming is not likely to be contained (IPCC, 2021).

18. In response, Scotland, and the wider UK, have declared a global climate change emergency which, by definition, is a grave situation demanding an urgent response. Associated commitments and legal obligations are as follows:

- The United Nations Framework Convention on Climate Change led Paris Agreement (2015);
- The Climate Change Act 2008 (as amended) and the Glasgow Climate Pact (2021) (including Scotland and the UK); and
- Climate Change (Scotland) Act 2009 and the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

19. These legal instruments provide the commitments to become carbon neutral (i.e. to reach “Net Zero” by 2045 in Scotland and 2050 in the UK) with interim targets. However, review by the Committee on Climate Change (CCC) has reported that whilst the UK has so far outperformed its budgets, progress is slowing and the country is not on track to meet its future budgets or the overall reduction target, according to the most recent Progress Report to Parliament by the CCC (CCC, 2023).

20. Rapid decarbonisation is critical to tackling the climate emergency and the cost-of-living crisis by reducing Scotland’s and the UK’s reliance on natural gas. The BBWF is within one of the few remaining areas in Scottish waters where offshore wind can be delivered at scale and crucially, through the Cambois Connection, connect to the grid network in timescales that are essential for not just achieving

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but accelerating Scotland’s and the UK’s path to net zero and realising Scotland’s ambitions for 11 GW offshore wind connected to the grid by 2030 as set out in the Scottish Government’s Sectoral Marine Plan (SMP) for Offshore Wind (Scottish Government, 2020), and UK targets of 50 GW of offshore wind by 2030 as set out in the British Energy Security Strategy (HM Government, 2022).

21. Under the ‘do nothing’ scenario, any contribution which the Cambois Connection would make towards tackling the global climate change emergency and towards UK targets of becoming Net Zero in all greenhouse gas emissions by 2050, and by 2045 for Scotland, would not be realised. As a further consequence, a tangible improvement to the efficiency of UK energy generation and transmission would not be delivered, leading (indirectly) to potential additional management challenges on the UK electricity grid (such as increased constraints and associated payments).


#### 4.7.2. Proposed Scenario – Development of the Cambois Connection

22. Developing the Cambois Connection, as the proposed scenario, would enable the export of renewable electricity from BBWF to the national grid in order to provide green generation input to the electricity network to address the climate emergency at a substantially earlier date than the BBWF capacity would otherwise be able to reach the grid. Consideration has been given to alternative design options for delivering this connection between Scotland and England, including selection of the most appropriate technology for the Onshore Scheme, a range of potential Landfall options along the Northumberland coastline which would facilitate access to the grid connection at Blyth.
23. For these reasons the ‘do nothing’ alternative scenario is not considered appropriate and it has been detailed as part of the baseline conditions in the ES. The ‘proposed scenario’ was taken forward by the Applicant and forms the basis for the remainder of this chapter.


### 4.8. Stage 1: Onshore Converter Station Site Selection

#### 4.8.1. Identification and Evaluation of Onshore Converter Station Options

24. Stage one commenced in 2021. At this stage the main focus for the Project was to identify a potential Onshore Converter Station area of search that would facilitate a connection into National Grid’s substation at Blyth.
25. Locations for the Onshore Converter Station were driven by the following:
  - Proximity to the grid connection in Blyth, to limit the extent of onshore cable routes (HDVC and HVAC);
  - Site topography;
  - Identifying areas suitable to contain the assumed approximate 350 m x 250 m footprint;
  - Availability of land;
  - Engineering feasibility; and
  - Technical and environmental constraints (including landscape and visual context, designated sites, protected species and habitats, cultural heritage, residential properties and other sensitive receptors, land ownership and use; access and road use; planning policy and stakeholder preference.)
26. During stage one, which was an iterative process, a total of four areas of search for the Onshore Converter Station were identified and considered, these areas of search are illustrated in Figure 6.1.

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- **2021 – Original Onshore area of search** to identify a potential Onshore Converter Station area of search that would facilitate a connection into National Grid’s substation at Blyth.
  - **April 2022 – Extended Onshore area of search** –extending from the Port of Blyth to a location south of Lynemouth (north of the River Wansbeck and Newbiggin-by-the-Sea) and west of the A189 to identify further potential locations for the Onshore Converter Station.
  - **May 2022 – Revised Onshore area of search** – Onshore Converter Station area of search extending from the Port of Blyth to North Seaton near Newbiggin-by-the-Sea (south of Lynemouth and north of the River Wansbeck). It was noted that any Landfall to the north of the River Wansbeck would require construction of a far longer and more complex onshore cable route which would interact with a number of conurbations, roads, other infrastructure and would require crossing of the River Wansbeck in order to access the existing Blyth substation which is located in the south-west of the onshore areas of search considered. These areas north of the River Wansbeck were subsequently discounted.
  - **June 2022 – Refined Onshore area of search** - following NGENSO’s Holistic Network Design ,the grid connection at Blyth substation was secured in 2022. Subsequently, the identification and selection of the Onshore Converter station Site and Landfall options and associated cable routing have formed an integral component of the overall Project definition and refinement of the final Onshore Scheme boundary.
27. The connection of BBWF at Blyth would form part of Northumberland Energy Park (NEP). NEP is part of the Energy Central development which is a UK based service, investment and growth cluster for companies supporting a green energy strategy. Energy Central will be developed in three phases with these phases being NEP1, NEP2 and NEP3.
28. The NGET substation is located within the NEP 1 development area. The substation contains both 275kV and 400kV connection equipment and is to be extended to include additional 400kV equipment for the connection of BBWF. Remaining land in this area is to be used for the construction of a manufacturing plant and the expansion of the substation as informed by Advanced Northumberland.
29. NEP 3 had already been sold to British Volt and was not available for development, although there was an area identified within the Masterplan referred to as ‘a future development plot’.
30. The key constraint to identifying potential locations for the Onshore Converter Station in proximity to the existing Blyth substation was the lack of suitable available land. There is a scarce amount of available land (i.e. without existing/consented development) to the east of the A189. Availability of land is seen as a ‘hard’ constraint to any future development and therefore other sites to the east of the A189 were not appraised against planning and environmental considerations (See Figure 4, Barton Willmore, 2022). A sequential assessment was undertaken to identify potential land parcels to the west of the A189 which were of sufficient size to accommodate the proposed development. The key criterion for any land to the west of the A189 was a lack of built development and proximity to the coast and any likely landfall area.
31. Within the Refined Onshore area of search and the boundary which was presented within the Scoping Report, three locations were considered for the Onshore Converter Station. These locations are listed below and shown on Figure 6-2:
- Onshore Converter Station Site Option 1 (NEP 2)
  - Onshore Converter Station Site Option 2 (west of A189)
  - Onshore Converter Station Site Option 3 (north-west of A189)


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32. A Red / Amber / Green (RAG) methodology was used to carry out a high-level assessment of the three Onshore Converter Station Site options. This risk-based approach was considered appropriate for this assessment, given the ability to capture and classify the main differentiating issues in three fundamental risk categories. A RAG assessment of this type enabled a clear and direct comparison between each site option.
33. The development considerations (or constraints / risk areas) captured within the RAG assessment included relevant environmental and technical topics for large scale transmission cable projects such as the Onshore Scheme:
- Natural heritage (environmentally designated sites, protected species; habitats; ornithology and hydrology/geology);
  - Climate change (sea level rise)
  - Cultural heritage (designated, cultural heritage assets);
  - People (proximity to dwellings and sensitive receptors);
  - Landscape and visual (landscape character, visual impacts);
  - Land use (agriculture, forestry, recreation);
  - Access and road users; and
  - Planning and Policy.
34. Each development consideration was given a score of Red / Amber / Green. These scores indicated the adverse or positive attributes to development respectively. The specific definition of each Red / Amber / Green risk category is presented in Table 4.3.

**Table 4.3 RAG Assessment Scoring Criteria**


Risk Category	Definition
Low	No or small risk for any likely significant adverse environmental effects or technical risks to occur following the use of best industry practice and standard methods.
Medium	Potential for significant adverse environmental effects or technical risks to occur, the use of standard mitigation measures may reduce effects and risk to acceptable levels (not significant effects or low risk) but could require further mitigation measures.
High	High probability of significant adverse environmental effects or technical risks occurring resulting in design alterations, potential stakeholder objections, further mitigation measures being introduced and potential delay to the Onshore Scheme. The potential alterations required may not be commercially or technically viable.

35. The assessment considered all of the identified development considerations equally, i.e. there was no weighting of different development considerations relative to each other. Whilst any weighting is not incorporated in the RAG assessment findings, professional judgement, guidance and feedback through the consultation process was taken into consideration to inform decisions.
36. It should be noted technical designs were not considered for any Onshore Converter Station site options as each Onshore Converter Station site option had already been identified as being technically feasible. It is not considered that technical differences were material in carrying out the RAG assessment and deriving conclusions on the site options. .


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**Table 4.4 RAG Assessment**


Consideration	Onshore Converter Station Site Option 1 (NEP 2)	Onshore Converter Station Site Option 2 (west of A189)	Onshore Converter Station Site Option 3 (north-west of A189)
Designations	<ul style="list-style-type: none"> <li>Approximately 2km to the north-west of the Northumbria Coast Ramsar and approximately 170m to Northumberland Marine SPA.</li> <li>Approximately 1.4km to the west of the Northumberland Shore SSSI.</li> <li>No regional or local designations within close proximity.</li> </ul>	<ul style="list-style-type: none"> <li>Approximately 2.5km to the north-west of the Northumbria Coast Ramsar and SPA sites and approximately 450m to Northumberland Marine SPA.</li> <li>Approximately 1.5km to the west of the Northumberland Shore SSSI.</li> <li>Ancient woodland (Ancient Semi-Natural Woodland ASNW), Hospital Wood adjacent to the northern Onshore scoping area boundary.</li> <li>Approximately 150m to Castle Island LNR.</li> </ul>	<ul style="list-style-type: none"> <li>Approximately 3km to the north-west of the Northumbria Coast Ramsar and approximately 650 m to Northumberland Marine SPA.</li> <li>Approximately 1.4km to the west of the Northumberland Shore SSSI.</li> <li>No designations within close proximity.</li> </ul>
Protected Species	<ul style="list-style-type: none"> <li>Potential for EPS in the area.</li> <li>Potential for UK BAP species.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for EPS in the area.</li> <li>Potential for UK BAP species.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for EPS in the area.</li> <li>Potential for UK BAP species.</li> </ul>
Habitats	<ul style="list-style-type: none"> <li>Potential for Annex 1 Habitat and UKBAP Habitats in the area.</li> <li>The area is not known for peatlands or wetlands, therefore no issues with Ground Water Dependent Terrestrial Ecosystems (GWDTEs) are anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for Annex 1 Habitat and UKBAP Habitats in the area.</li> <li>The area is not known for peatlands or wetlands, therefore no issues with GWDTEs are anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for Annex 1 Habitat and UKBAP Habitats in the area.</li> <li>The area is not known for peatlands or wetlands, therefore no issues with GWDTEs are anticipated.</li> </ul>
Ornithology	<ul style="list-style-type: none"> <li>Potential for Schedule 1 Birds.</li> <li>Potential for Birds of Conservation Concern (BoCC.)</li> </ul>	<ul style="list-style-type: none"> <li>Potential for Schedule 1 Birds.</li> <li>Potential for BoCC.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for Schedule 1 Birds.</li> <li>Potential for BoCC.</li> </ul>
Hydrology/ geology	<ul style="list-style-type: none"> <li>Located within Flood Zone 1 and is considered to be at low risk of fluvial flooding.</li> </ul>	<ul style="list-style-type: none"> <li>Located within Flood Zone 1 and is considered to be at low risk of fluvial flooding.</li> </ul>	<ul style="list-style-type: none"> <li>Located within Flood Zone 1 and is considered to be at low risk of fluvial flooding.</li> </ul>

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Consideration	Onshore Converter Station Site Option 1 (NEP 2)	Onshore Converter Station Site Option 2 (west of A189)	Onshore Converter Station Site Option 3 (north-west of A189)
	<ul style="list-style-type: none"> <li>Approximately 300 m to the north of the Sleek Burn.</li> </ul>	<ul style="list-style-type: none"> <li>Approximately 150 m to the south of the River Wansbeck</li> </ul>	<ul style="list-style-type: none"> <li>Approximately 900 m to the south of the River Wansbeck.</li> <li>Approximately 600m to the north of the Sleek Burn</li> </ul>
Climate change	<ul style="list-style-type: none"> <li>No costal protection within close proximity.</li> </ul>	<ul style="list-style-type: none"> <li>No costal protection within close proximity.</li> </ul>	<ul style="list-style-type: none"> <li>No costal protection within close proximity.</li> </ul>
Cultural Heritage	<ul style="list-style-type: none"> <li>No nationally designated Heritage assets are likely to receive any significant effect on their settings.</li> <li>Grade 2 listed asset (Cambois war memorial) located approximately 1.3km to the east.</li> </ul>	<ul style="list-style-type: none"> <li>No nationally designated Heritage assets are likely to receive any significant effect on their settings.</li> <li>Grade 2 listed building (Cambois war memorial) located approximately 2150m to the south east.</li> </ul>	<ul style="list-style-type: none"> <li>No nationally designated Heritage assets are likely to receive any significant effect on their settings.</li> <li>Grade 2 listed building (Cambois war memorial) located approximately 1.9km to the east.</li> </ul>
People	<ul style="list-style-type: none"> <li>Properties within 100m</li> </ul>	<ul style="list-style-type: none"> <li>Closest property approximately 260m.</li> </ul>	<ul style="list-style-type: none"> <li>Closest property approximately 160m</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>No national or statutory landscape designations identified.</li> <li>Located within the South East Northumberland Coastal Plain National Character Area (NCA), and Landscape Character Type 41a: Developed Coast and 42a. Urban Fringe.</li> <li>Nearby settlements, primarily East Sleekburn, Cambois, Bedlington and Blyth; users of the road networks in proximity to the Onshore Scheme, primarily the A189, Brock Lane.</li> </ul>	<ul style="list-style-type: none"> <li>No national or statutory landscape designations identified.</li> <li>Located within the South East Northumberland Coastal Plain NCA, and Landscape Character Type 41a: Developed Coast.</li> <li>Nearby settlements, primarily East Sleekburn, Cambois, Bedlington and Blyth; users of the road networks in proximity to the Onshore Scheme, primarily the A189, Brock Lane</li> </ul>	<ul style="list-style-type: none"> <li>No national or statutory landscape designations identified.</li> <li>Located within the South East Northumberland Coastal Plain NCA, and Landscape Character Type 41a: Developed Coast Nearby settlements, primarily East Sleekburn, Cambois, Bedlington and Blyth; users of the road networks in proximity to the Onshore Scheme, primarily the A189, Brock Lane</li> </ul>


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Consideration	Onshore Converter Station Site Option 1 (NEP 2)	Onshore Converter Station Site Option 2 (west of A189)	Onshore Converter Station Site Option 3 (north-west of A189)
	<ul style="list-style-type: none"> <li>Proximity to the North Sea Link convertor station can allow for co-location of these two converter stations</li> </ul>		
Land Use	<ul style="list-style-type: none"> <li>Located on Agricultural Land Classification (ALC) Grade 3.</li> <li>No known commercial forestry in the area.</li> <li>Southern boundary runs parallel and intersects with National Cycle Network (NCN) Route 1.</li> <li>No public rights of way intersect the site, however, they are present across the wider area.</li> <li>No known commercial sports at or near the site.</li> <li>The site is currently greenfield land with hedgerow demarcating four field boundaries.</li> <li>Site is zoned for Industrial land within an industrial setting .</li> <li>Electricity overhead lines cross the site.</li> <li>North Sea Link bounds the eastern side of the site and intersects the site.</li> </ul>	<ul style="list-style-type: none"> <li>Located on ALC Grade 3.</li> <li>No known commercial forestry in the area.</li> <li>The site is approximately 400 m from the NCN Route 1.</li> <li>Site 20m from Wansbeck Riverside Park (OS Greenspace/ country park).</li> <li>No public rights of way intersect the site, however, they are present across the wider area.</li> <li>No known commercial sports at or near the site.</li> <li>The site comprises two fields, separated by a hedgerow.</li> <li>It is bound to the north by fields, to the east by the A189, to the south by a woodland and to the west by Brock Lane. Beyond Brock Lane to the west is an Aggregate Industries plant. Fergusons West business park is also located approximately 100m to the north.</li> </ul>	<ul style="list-style-type: none"> <li>The site is located on ALC Grade 3.</li> <li>No known commercial forestry in the area.</li> <li>The site is approximately 200 m from the NCN Route 1.</li> <li>No public rights of way intersect the site, however, they are present across the wider area.</li> <li>No known commercial sports at or near the site.</li> <li>Site 4 comprises greenfield land extending to approximately 10ha.</li> </ul>
Access and Road Users	<ul style="list-style-type: none"> <li>The A189 spine road runs through the onshore scoping area on a roughly north-south axis. Brock Lane runs from the northwest to the southeast, adjacent to the Indicative Converter Station. Webley Gardens is located to the north east, within</li> </ul>	<ul style="list-style-type: none"> <li>The A189 spine road runs through the onshore scoping area on a roughly north-south axis. Brock Lane runs from the northwest to the southeast, adjacent to the Indicative Converter Station. Webley Gardens is located to the north east, within</li> </ul>	<ul style="list-style-type: none"> <li>The A189 spine road runs through the onshore scoping area on a roughly north-south axis. Brock Lane runs from the northwest to the southeast, adjacent to the Indicative Converter Station. Webley Gardens is located to the north east, within</li> </ul>

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Consideration	Onshore Converter Station Site Option 1 (NEP 2)	Onshore Converter Station Site Option 2 (west of A189)	Onshore Converter Station Site Option 3 (north-west of A189)
	<p>Cambois. The A1147 is located outwith but abutting the onshore scoping area, to the southwest.</p> <ul style="list-style-type: none"> <li>• Access is provided from Brock Lane to the south, with existing access/egress from the NSL substation.</li> <li>• Disruption around access is anticipated to be temporary and mitigatable.</li> </ul>	<p>Cambois. The A1147 is located outwith but abutting the onshore scoping area, to the southwest.</p> <ul style="list-style-type: none"> <li>• Access is provided via Brock Lane to the west.</li> <li>• Disruption around access is anticipated to be temporary and mitigatable.</li> </ul>	<p>Cambois. The A1147 is located outwith but abutting the onshore scoping area, to the southwest.</p> <ul style="list-style-type: none"> <li>• The railway line to the direct south of the site 3 is also designated under Policy MIN6 which safeguards minerals related infrastructure.</li> <li>• .Access to the site is provided to the south-east and is shared with an aggregates facility. This access crosses the railway line.</li> <li>• Disruption around access is anticipated to be temporary and mitigatable.</li> </ul>
Planning	<ul style="list-style-type: none"> <li>• Area covered by Policy ECN 2 In Northumberland Local Plan</li> <li>• Blyth Estuary Strategic Employment Area (Strategic Policy).</li> <li>• Land at Blyth Estuary is allocated as a 'Strategic Employment Area.</li> </ul>	<ul style="list-style-type: none"> <li>• The site is outside of NEP development areas and is not allocated as industrial land.</li> </ul>	<ul style="list-style-type: none"> <li>• The site is outside of NEP development areas and is not allocated as industrial land.</li> </ul>
Other considerations	<p>This site offers potential for short onshore cable routes from proposed landfall locations and to the Blyth substation.</p> <p>Early consultation with Advance Northumberland showed preference of the converter station being developed on NEP2.</p>	<p>Locating an Onshore Converter Station in this area would involve longer onshore cable routes which would be required to cross the A189 twice, to access the site and then to connect to existing Blyth substation.</p>	<p>Locating an Onshore Converter Station in this area would involve crossing the A189 twice for cable connections to existing Blyth substation.</p>



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37. It can be concluded from the high-level RAG assessment presented in Table 4.4 that Option 1 is the preferred alternative for the Onshore Converter Station Site from an environmental and technical perspective.

#### 4.8.2. Onshore Converter Station Conclusion

38. Through consideration of technical feasibility, environmental and land constraints, the preferred Onshore Converter Station option was Onshore Converter Station Site Option 1

39. Option 1 is identified within the Policy ECN2 (Blyth Estuary Strategic Employment Area) whereby low carbon and related environmental goods and services are prioritised. Therefore the proposed development is, at a high-level, in accordance with the stated objective. Options 2 and 3 are not afforded any strategic policy allocation in the NCC Local Plan. It is also of note that Options 2 and 3 are within Minerals Safeguarding Areas and therefore would need subsequent minerals assessment to rationalise the sterilisation of any minerals resource, in alignment to Policy MIN 4. In light of this, it is considered that Site 1 has a favourable status in terms of policy allocation.

40. None of the Onshore Converter Station options lie within statutory or non-statutory designated sites but they are all in proximity to the Northumberland Shore SSSI and Northumbria Coast SPA and Ramsar site. In terms of impacts on Built Heritage, there is limited potential for impacts on designated historic assets. The shortlisted sites are not within proximity to Listed Buildings or any Scheduled Ancient Monuments.

41. Critical to the judgement of landscape impact is the relationship of the proposed development within its setting. It should be noted that the Officer's Report for the NSL submission discusses the A189 as a separating feature of the industrial areas to the east, to the built up areas and commercial land uses to the west. The massing of an Onshore Converter Station would not necessarily match that of the proximate industrial and aggregate complexes at Options 2 and 3. Therefore, Options 2 and 3 may be considered to be more sensitive to any Onshore Converter Station siting outside of the industrial landscape setting that Option 1 lies in.


42. In summary, this option was selected due to its close proximity to the grid connection and landfall, availability of land, the land being zoned for Industrial use and within NEP2. Environmental constraints and effects were generally considered to be comparable between each option.

43. This has been taken forward as part of the Onshore Scheme. Further details are provided in Volume 2, Chapter 5 Project Description.

## 4.9. Stage 2: Landfall Site Selection

### 4.9.1. Identification and Evaluation of Landfall Areas

44. Stage two commenced in 2021. At this stage the main focus for the Project was to identify a potential Onshore Converter Station area of search that would facilitate a connection into National Grid's substation at Blyth, and to identify a suitable Landfall area of search in close proximity to the potential Onshore Converter Station area of search. This involved input from both the Applicant's onshore and offshore teams, with the identification of the Landfall area of search influenced by potential Offshore Export Cable corridor / route options that would link the Landfall area of search to the BBWF array area.

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45. During stage two, which occurred alongside stage one, which was an iterative process, a total of four Landfall areas of search were identified and considered, influencing the width of the Offshore Export Cable area of search at the Landfall; these areas of search are illustrated in Volume 4, Figure 6.1:


- **2021 – Original Landfall area of search** – Landfall area of search extending from the Port of Blyth (southern boundary) to the River Wansbeck (northern boundary).
- **April 2022 – Extended Landfall area of search** – Landfall area of search extending from the Port of Blyth to a location south of Lynemouth (north of the River Wansbeck and Newbiggin-by-the-Sea).
- **May 2022 – Revised Landfall area of search** – Landfall area of search extending from the Port of Blyth to North Seaton near Newbiggin-by-the-Sea (south of Lynemouth and north of the River Wansbeck). The extended onshore area of search (identified in April 2022) was subsequently discounted.
- **June 2022 – Refined Landfall area of search** - (largely the same at the Landfall as the initial Cambois area of search).

46. The basis for the extended onshore area of search in the north was to identify further potential locations for the Onshore Converter Station. The Marine Scheme area of search was adjusted to largely correspond to the revised onshore and Landfall area of search after the furthest extension of this area of search was discounted following the initial extension. This resulted in alternative Landfall areas initially being considered from an offshore perspective, in particular along the stretch of the coastline between the River Wansbeck and Newbiggin-by-the-Sea. However, it quickly became apparent that, while potential Landfall locations may exist within the extended area of search, any Landfall to the north of the River Wansbeck would require construction of a far longer and more complex onshore cable route which would interact with a number of conurbations, roads, other infrastructure and would require crossing of the River Wansbeck in order to access the existing Blyth substation which is located in the south-west of the onshore areas of search considered.

47. Through ongoing discussions with landowners, it emerged that one of the Onshore Converter Station locations in the initial area of search could be taken forward as a preferred site for the Onshore Scheme’s onshore convertor station, as discussed in section 4.8. Therefore the Landfall area of search was refocused on the section of the Cambois coastline between the Port of Blyth and the River Wansbeck closer to the identified converter station site, with the Landfall areas of search north of the River Wansbeck removed from consideration.

48. Key environmental and technical factors associated with selecting the refined Landfall area of search are summarised below. These considered potential effects from the Onshore Scheme and the Marine Scheme:

- Whilst within a number of designated sites which include protected habitats, such as the Coquet to St. Mary’s Marine Conservation Zone (MCZ), the actual seabed conditions on the approach to the Landfall were considered likely to be favourable for burial of the Offshore Export Cables (being primarily sand, silt and mud);
- Although the Landfall area of search is within designated sites such as the Berwick to St Mary’s MCZ and the Northumberland Marine Special Protection Area (SPA) and Ramsar site, these are designated for ornithological features. Based on the nature of the Marine Scheme (i.e. a subsea cable) and the activities required in the nearshore area, industry practice and mitigation were considered highly likely to adequately mitigate potential impacts;
- The Cambois coastline has been previously used as a landfall for a number of comparable infrastructure projects; this includes the NSL interconnector (Statnett and National Grid, 2013) and the export cables for the Blyth Offshore Demonstrator Project;

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- The refined Landfall area of search would mean a short onshore cable route from the coastline to the preferred converter station location within the Cambois onshore area of search (an area bounded by the River Wansbeck to the north, the Cambois coastline to the west and the River Blyth / Sleek Burn to the south) avoiding crossing these watercourses; and
- Early discussions with both the MMO and NCC indicated that the refined Landfall area of search at Cambois would constitute a viable option for bringing the Offshore Export Cables to shore (and as described above, has been demonstrated as being effective before).

49. Key environmental and technical factors associated with removing any potential Landfall to the north of the River Wansbeck were as follows:


- A Landfall to the east of North Seaton would likely require an approach to the north-east of the River Wansbeck. In this area, there are understood to be larger volumes of intertidal rock meaning that installation of the Offshore Export Cables would be far more technically challenging;
- The selection of a method of Landfall installation would likely be more restricted at this location; owing to engineering considerations such as the cliff to the east of Sandy Bay caravan park, trenchless technologies such as Horizontal Directional Drilling (HDD) would be considered challenging;
- The onshore cable route from the Landfall would require a river crossing over the River Wansbeck resulting in significant additional technical complexity, cost and the need for additional construction activity on the north and south banks of the River Wansbeck to facilitate a river crossing; and
- Any Landfall to the north of the River Wansbeck would require construction of a far longer and more complex onshore cable which would interact with a number of conurbations, roads and other infrastructure.

#### 4.9.2. Identification and Evaluation of Refined Landfall Area

50. Following confirmation of the preferred Onshore Converter Station option and Landfall area of search in Q2 2022, a desktop study of the available historical, geological, environmental and anthropogenic constraints, within and in the immediate surrounding area of the Landfall area of search was undertaken to identify possible Landfall locations and potential onshore cable corridors. This constraints analysis and feasibility study identified a preferred broad Landfall location in the south of the Landfall area of search (Cathie Associates, 2022). This Southern Landfall Area and the deselected Northern Landfall Area are shown on Figure 4.3 in Volume 4. A summary of the main environmental and technical factors and constraints considered in the decision-making for both broad Landfall areas is set out in Table 4.5 below.

**Table 4.5: Key Evaluation of Refined Landfall Area**

Area	Key Evaluation
Northern Landfall Area	<ul style="list-style-type: none"> <li>• The Northumberland Marine SPA, Berwick to St Mary's MCZ, Coquet to St Mary's MCZ, and Northumberland Shore Site of Special Scientific Interest (SSSI) are present within this area.</li> <li>• River Wansbeck estuary (statutory main river) is located in the northern area.</li> <li>• The area hosts more residential properties than the Southern Landfall Area. The Landfall and cable route could potentially intersect residential properties.</li> </ul>

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Area	Key Evaluation
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- The area is susceptible to high coastal erosion and beach mobility. Trenched Landfall technologies are vulnerable to these coastal processes, hence trenchless cable installation techniques would be preferable to open-cut trenching
- The length of the beach in this area is significantly larger than the south option, which would require a much longer trenchless option than the southern option.
- A landfall within this area would intersect with the local railway lines and the North Sea Link (NSL) landfall and intersect the NSL onshore cable multiple times.
- Longer onshore cable route to converter station and grid connection than from the Southern Landfall Area, and therefore likely increased environmental impacts.
- Higher development risk due to coal mining related hazards.
- Underground utilities are present between the beach area and the proposed Converter Station location, including sewage pipes, telecommunications, water mains and pressurised gas pipes, which would require crossing.
- Beach, National Cycle Network Route 1, and public rights of way are present in the area.
- A Biodiversity Net Gain Area is present to the north. Onshore cables could potentially intersect the land requiring reinstatement.
- Requirement for onshore cable routing to cross and run alongside the A189.
- No cultural heritage assets are present in the area.

Southern Landfall Area


- The Northumberland Marine SPA, Berwick to St Mary's MCZ, Coquet to St Mary's MCZ, Northumberland Shore SSSI and Sand Dune Priority Habitat are present.
- The cables would cross the NSL onshore cables and NSL offshore cables.
- Fewer residential properties are located in the Southern Landfall Area and are located to the south, therefore less overall risk of disturbance.
- No known mineshafts or associated high risk areas for development.
- Issues with coastal erosion, as for the Northern Landfall Area. Trenchless cable installation techniques would be preferable to open-cut trenching (refer to paragraph 52 for further information).
- Shorter onshore cable route to converter station and grid connection than from the Northern Landfall Area, and therefore likely reduced environmental impacts.
- Underground utilities are present including sewage pipes, telecommunications, water mains and pressurised gas pipes.
- Area of Pulverised Fuel Ash (PFA) located in the onshore area.
- Beach, National Cycle Network Route 1 and public rights of way are present in the area.
- Grade 2 listed building (Cambois war memorial) is located in the area.
- Cambois Primary School and playing fields are located in the area.
- Allotments and a local church are located in the area.
- Historic mapping has shown an old reservoir is located in the area.

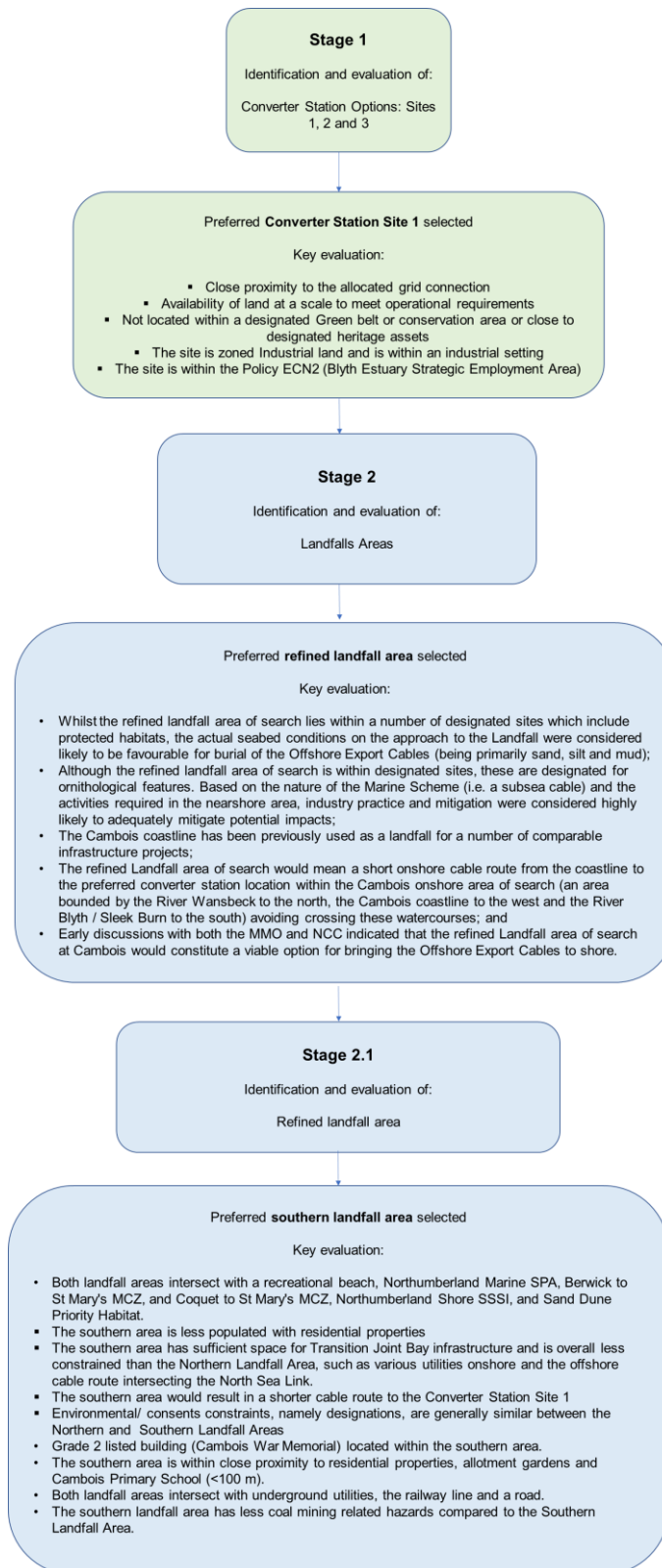
### 4.9.3. Landfall Area Conclusion

51. Through consideration of engineering, technical, consents/environmental and land constraints, the preferred landfall area was the Southern Landfall area.
52. In summary, the Southern Landfall Area is less populated with residential properties, there is sufficient space for Landfall and Onshore Cable routing infrastructure and is overall less constrained than the Northern Landfall Area, such as various utilities onshore and the offshore cable route intersecting the North Sea Link multiple times. The area would result in a shorter cable route to the selected Converter Station site. Environmental constraints, namely designations, are generally similar between the Northern and Southern Landfall Areas.


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53. In addition, a high-level options appraisal was undertaken for potential cable installation techniques for the identified southern Landfall (Cathie Associates, 2022), with both trenchless installation techniques, such as HDD, and open-cut trenching being proposed. Only trenchless techniques have been retained for the Cambois Connection. Refer to Volume 2, Chapter 5 Project Description for further details.
54. The Southern Landfall Area has been taken forward as part of the Onshore Scheme. Further details are provided in Chapter 5 – Project Description.
55. Plate 1 below provides a summary of the first two stages of the site selection process.

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**Plate 1 Site Selection Process and Key Evaluation**

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## 4.10. Stage 3: Refinement of Red Line Boundary

56. Following the confirmation that further feasibility studies would be focussed on the southern landfall area, the red line boundary was refined from the scoping boundary to enable survey work to commence. The boundary was also further refined following a high level appraisal of HAVC Cable route options from potential Landfall locations to the north of the southern Landfall area to the Onshore Converter Station Option Site 1. Potential HVAC cable routes to the North of the former British Volt Site were subsequently discounted due to numerous utilities which would need to be crossed making any potential HVAC cable route in this northern location unfeasible. This area was subsequently discounted and a refined RLB defined.
57. The refined boundary comprises land to the north of Blyth and to the East of East Sleekburn and includes a mix of coastal amenity, new and legacy industrial uses, a school and residential areas.
58. The refined boundary includes three key areas in which particular infrastructure associated with the Onshore Scheme may be located (see Figure 5.1). For the purposes of this outline planning application a zonal approach to the EIA has been presented as the exact locations of the HVDC and HVAC cable routes are not yet known. These zones include:
- **The Landfall/HVDC Zone** – The landfall is the location at which the offshore export cables come ashore and onshore 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.
  - **The Onshore Converter Station Zone** – in which the converter station will be located
  - **The HVAC Zone** - The HVAC cables will be located underground connecting the onshore converter station to the existing Blyth substation running from within the Onshore Converter Station zone to the HVAC zone.
59. The proposed Landfall is located at Cambois North Beach. The landfall location at Cambois forms the interface between the Marine Scheme and Onshore Scheme where the Offshore Export Cables will be brought ashore. The Landfall corridor is approximately 0.7 km wide at Cambois beach, at the widest point between the River Wansbeck and the Port of Blyth. Further optioneering is being carried out to refine and identify the specific Landfall location.
60. Moving westwards from the beach, Cambois Links are found at the back of the sand dunes, followed by railway tracks and a road. The road forms part of a small residential area, flanked by the Cambois Coastline to the east, and a larger brownfield construction area to the west. This area is the Site of the former Blyth Power Station (closed in 2001), situated on the Northern bank of the river Blyth, between the tidal estuary and the North Sea. Planning permission was granted to BritishVolt in 2021 for the construction of a 'GigaFactory' electric vehicle battery factory upon the grounds of the former power station. Subsequently, BritishVolt went into administration and the company, along with land upon which the factory would be built, was sold to "Recharge Industries". It has been stated by Recharge Industries that they intend to proceed with the plans for the new factory, although it is currently unknown whether an amended or reduced scheme will be proposed.
61. The Onshore Converter Station Zone is situated immediately to the west of the NSL converter station, with Brock Lane running east west along the southern boundary, the A189 forms the western boundary and the Sleekburn Business Centre lies to the north. The Onshore Converter Station Zone comprises of predominantly greenfields and existing hedgerows.

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62. The HVAC Zone extends from the south of the A189 to the River Blyth running east to west from the converter station zone to the National Grid Blyth Substation. The HVAC Zone comprises of predominantly greenfields, existing hedgerows and a residential access road.
63. The boundary and extent of the Onshore Scheme have been the subject of discussions with NCC. There are some design details related to the Onshore Scheme that are still to be finalised due to further ground investigations required, ongoing engineering design work and the procurement of cable and converter station suppliers which will define the final specification. The boundary has been chosen to allow flexibility to accommodate design details which will be subject to future Reserved Matters application(s) to NCC. The Site is approximately 188 ha in area, however, the maximum footprint of the Onshore Scheme as described in Chapter 5 Project Description will be considerably smaller than the 188 ha and therefore will not utilise the full extent of the Site. Furthermore, once installed, there will be limited permanent infrastructure that will be visible above ground.

#### 4.11. Site Selection Conclusion

64. Key drivers for the assessment of Onshore Converter Station site options were the allocation of the grid connection at Blyth substation; proximity to grid; availability and size of land required for the converter station; and a short onshore cable route to reduce impacts and disruption. Land zoned for industrial use, along with the environmental constraints (including landscape and visual context, designated sites, protected species and habitats, cultural heritage, residential properties and other sensitive receptors, land ownership and use; access and road use and planning policy) and stakeholder preference, further narrowed the site selection process resulting in the preferred location being Converter Station Site 1.
65. The coastline has limited areas to reach landfall due to environmental constraints and existing infrastructure. A higher density of residential properties and the estuary are present to the north. Environmental designations are present along the length of the coast and Sand Dune Priority Habitat to the south. Underground utilities are also present along the coast, however, are more complex in terms of engineering feasibility to the north. Through a collaborative design process open cut trenching was eliminated, therefore safeguarding the Sand Dune Priority Habitat and avoiding impact on the beach and its users.
66. The selection of the Southern Landfall Area provided shorter cable route options to the Onshore Converter Station Site and then on to the grid connection.
67. In summary, a staged site selection approach, achieves the right balance between competing technical and environmental constraints and has allowed for the most environmentally preferred options to be taken forward for assessment in this ES.


#### 4.12. Further Design Considerations

68. Alongside the refinement of the boundary for the Onshore Scheme, there have been a number of refinements made to the Project Design Envelope (PDE)<sup>1</sup> since the Applicant made a formal request

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<sup>1</sup> The Project Design Envelope refers to the set of parameters specific to the Marine Scheme which form the basis of the EIA process. In order to ensure the EIA is as robust as possible, technical assessments have been carried out based on a set of worst-



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for a Scoping Opinion to NCC, and subsequently submitted a Habitats Regulations Assessment screening request to Natural England.

69. Once the preferred options for the Onshore Converter Station and Landfalls were established, a further design exercise was undertaken to apply designed in (primary) mitigation to reduce the potential impacts on the people and the environment. These designed in measures are summarised in Table 4.6 below.


**Table 4.6 Further Design Considerations**

Component	Designed in measures
Landfall / HVDC Zone	<p>A trenchless technique, such as Horizontal Directional Drilling (HDD), will be deployed to bring the Offshore Export Cables ashore via ducts that will be installed from a point landward of Mean High Water Springs (MHWS) to an exit point at least 250 m seaward of Mean Low Water Springs (MLWS), thus completely bypassing the intertidal area. All construction works and infrastructure associated with the Onshore Scheme will be above MHWS, and landward of the dune system on Cambois beach, and therefore there is no potential for any direct interaction with the intertidal area. Direct impacts on Northumberland Shore SSSI and priority sand dune habitats will be avoided via the use of trenchless techniques such as HDD under the beach and sand dunes.</p> <p>Avoidance of sensitive habitats including areas of woodland.</p>
Onshore Converter Station Zone	<p>The Onshore Converter Station maximum design parameter for height was reduced to 30m to reduce potential visual impact experienced from residential properties to the south and east;</p> <p>Modification to drainage to reduce impacts on Sleekburn.</p> <p>Commitment to retain priority woodland habitat to the west of the Converter Station Zone and certain other areas of woodland.</p> <p>Based on the maximum design scenario assumptions, the site would need to be designed with the transformers located north of a building of 30m height, with that building providing barrier attenuation of the sources.</p>
HVAC Zone	<p>In order to avoid disturbance to wintering birds utilising the Sleekburn construction works relating to the outfall into the Sleekburn will be restricted to avoid the winter period (October to March inclusive).</p> <p>Avoidance of sensitive habitat including areas of woodland and the saltmarsh habitat</p>


### 4.13. Next Steps

70. The site selection and design process are ongoing. Optioneering for the preferred landfall and cable route options within the landfall/HVDC zone and HVAC zone will be undertaken as part of the iterative

case maximum design parameters. Please refer to Volume 2, Chapter 5: Project Description which explains and justifies this approach in further detail.

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design process and consider feedback from stakeholders and the public as part of the EIA process and future application(s) for Approval of Reserved Matters.

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## 4.14. References

BBWFL (2022) Cambois Connection Onshore Scoping Report.

Barton Willmore (2022) Cambois converter station location and connection to landfall appraisal: Planning Appraisal and Strategy

Cathie Associates (2022) Converter Station Geological Desk Study. Report No.: C9000-13-R02-02

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