

Outer Dowsing Offshore Wind

Environmental Statement

Chapter 4: Site Selection and Consideration of Alternatives Volume 1 Chapters

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Acronyms & Definitions

Abbreviations / Acronyms

Abbreviation / Acronym	Description
AfL	Agreement for Lease
AQMA	Air Quality Management Areas
BEIS	Business, Enterprise Energy and Industrial Strategy
BRAG	Black, Red, Amber, Green
CDG	Central Design Group
CES	Crown Estate Scotland
CION	Connection and Infrastructure Options Note
COLREGS	International Regulations for Preventing Collisions at Sea
DCO	Development Consent Order
Defra	Department for the Environment, Farming and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DLUHC	Department for Levelling Up, Housing and Communities
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
ES	Environmental Statement
ETG	Expert Topic Groups
GW	Gigawatts
HND	Holistic Network Design
HRA	Habitats Regulations Assessment
IDRBNR	Inner Dowsing, Race Bank and Saturn Reef
km	Kilometers
kV	Kilovolts
LCoE	Levelised Cost of Energy
MARPOL	International Convention for the Prevention of Pollution from Ships
MCA	Maritime and Coastguard Agency
MW	Megawatts
NGET	National Grid Electricity Transmission
NGESO	National Grid Energy Systems Operator
NGSS	National Grid Onshore Substation
NOA	Network Options Assessment
NPS	National Policy Statement
ODOW	Outer Dowsing Offshore Wind
Ofgem	Office of Gas and Electricity Markets
OnSS	Onshore Substation
ORCP	Offshore Reactive Compensation Platforms
OSS	Offshore Substation
OTNR	Offshore Transmission Network Review
PEIR	Preliminary Environmental Information Report
Ramsar	Wetlands of international importance designated under the Ramsar

Abbreviation / Acronym	Description
	Convention
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TCE	The Crown Estate
TO	Transmission Operators
ToR	Terms of Reference

Terminology

Term	Definition
400kV cables	High-voltage cables linking the OnSS to the NGSS.
400kV cable corridor	The 400kV cable corridor is the area within which the 400kV cables connecting the onshore substation to the NGSS will be situated.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, Tota Energies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
AfL array area	The area of the seabed awarded to GT R4 Ltd. Through an Agreement for Lease (AfL) for the development of an offshore wind farm, as part of The Crown Estate's Offshore Wind Leasing Round 4.
Array area	The area offshore within which the generating station (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling will be positioned.
Baseline	The status of the environment at the time of assessment without the development in place.
Cable Circuit	A number of electrical conductors necessary to transmit electricity between two points bundled as one cable or taking the form of separate cables, and may include one or more auxiliary cables (normally fibre optic cables).
Connection Area	An indicative search area for the NGSS.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the sensitivity of the receptor, in accordance with defined significance criteria.
EIA Directive	European Union 2011/92/EU (as amended)

Term	Definition
	by Directive 2014/52/EU).
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	The suite of documents that detail the processes and results of the EIA.
Evidence Plan	A voluntary process of stakeholder consultation with appropriate Expert Topic Groups (ETGs) that discusses and, where possible, agrees the detailed approach to the Environmental Impact Assessment (EIA) and information to support Habitats Regulations Assessment (HRA) for those relevant topics included in the process, undertaken during the pre-application period.
Export cables	High voltage cables which transmit power from the Offshore Substations (OSS) to the Onshore Substation (OnSS) via an Offshore Reactive Compensation Platform (ORCP) if required, which may include one or more auxiliary cables (normally fibre optic cables).
Grid connection cable	Cable which connects the project Onshore Substation (OnSS) with the National Grid Substation.
Habitats Regulations Assessment (HRA)	A process which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European conservation sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of overriding public interest (IROPI) and compensatory measures.
Haul Road	The track within the onshore ECC which the construction traffic would use to facilitate construction.
High Voltage Alternating Current (HVAC)	High voltage alternating current is the bulk transmission of electricity by alternating current (AC), whereby the flow of electric charge periodically reverses direction.
High Voltage Direct Current (HVDC)	High voltage direct current is the bulk transmission of electricity by direct current (DC), whereby the flow of electric charge is in one direction.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Inter-array cables	Cable which connects the wind turbines to each other and to the offshore substation(s), which may include one or more auxiliary cables (normally fibre optic cables).
Interlink cables	Cable which connects the Offshore Substations (OSS) to one another,

Term	Definition
	which may include one or more auxiliary cables (normally fibre optic cables).
Intertidal	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS)
Joint bays	An excavation formed with a buried concrete slab at sufficient depth to enable the jointing of high voltage power cables.
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
Maximum Design Scenario	The project design parameters, or a combination of project design parameters that are likely to result in the greatest potential for change in relation to each impact assessed
Mitigation	Mitigation measures are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
National Grid Onshore Substation (NGSS)	The National Grid substation and associated enabling works to be developed by the National Grid Electricity Transmission (NGET) into which the Project's 400kV Cables would connect.
National Policy Statement (NPS)	A document setting out national policy against which proposals for Nationally Significant Infrastructure Projects (NSIPs) will be assessed and decided upon
Offshore Export Cable Corridor (ECC)	The Offshore Export Cable Corridor (Offshore ECC) is the area within the Order Limits within which the export cables running from the array to landfall will be situated.
Offshore Reactive Compensation Platform (ORCP)	A structure attached to the seabed by means of a foundation, with one or more decks and a helicopter platform (including bird deterrents) housing electrical reactors and switchgear for the purpose of the efficient transfer of power in the course of HVAC transmission by providing reactive compensation
Offshore Substation (OSS)	A structure attached to the seabed by means of a foundation, with one or more decks and a helicopter platform (including bird deterrents), containing— (a) electrical equipment required to switch, transform, convert electricity generated at the wind turbine generators to a higher voltage and provide reactive power compensation; and (b) housing accommodation, storage, workshop auxiliary equipment, radar and facilities for operating, maintaining and controlling the substation or wind turbine generators
Onshore Export Cable Corridor (ECC)	The Onshore Export Cable Corridor (Onshore ECC) is the area within which, the export cables running from the landfall to the onshore substation will be situated.
Onshore Infrastructure	The combined name for all onshore infrastructure associated with the Project from landfall to grid connection.
Onshore substation	The Project's onshore HVAC substation, containing electrical equipment,

Term	Definition
(OnSS)	control buildings, lightning protection masts, communications masts, access, fencing and other associated equipment, structures or buildings; to enable connection to the National Grid
Outer Dowsing Offshore Wind (ODOW)	The Project.
Order Limits:	The area subject to the application for development consent, The limits shown on the works plans within which the Project may be carried out.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Pre-construction and post-construction	The phases of the Project before and after construction takes place.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft ES and provided information to support and inform the statutory consultation process in the pre-application phase. Following that consultation, the PEIR documentation has been updated to produce the Project's ES that will accompany the application for the Development Consent Order (DCO).
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.
Project design envelope	A description of the range of possible elements that make up the Project's design options under consideration, as set out in detail in the project description. This envelope is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorized further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Statutory consultee	Organisations that are required to be consulted by the Applicant, the Local Planning Authorities and/or The Planning Inspectorate during the pre-application and/or examination phases, and who also have a statutory responsibility in some form that may be relevant to the Project and the DCO application. This includes those bodies and interests prescribed under Section 42 of the Planning Act 2008.
Study Area	Area(s) within which environmental impact may occur – to be defined on a receptor-by-receptor basis by the relevant technical specialist.
Subsea	Subsea comprises everything existing or occurring below the surface of the sea.
Transition Joint Bay (TJBs)	The offshore and onshore cable circuits are jointed on the landward side of the sea defences/beach in a Transition Joint Bay (TJB). The TJB is an underground chamber constructed of reinforced concrete which

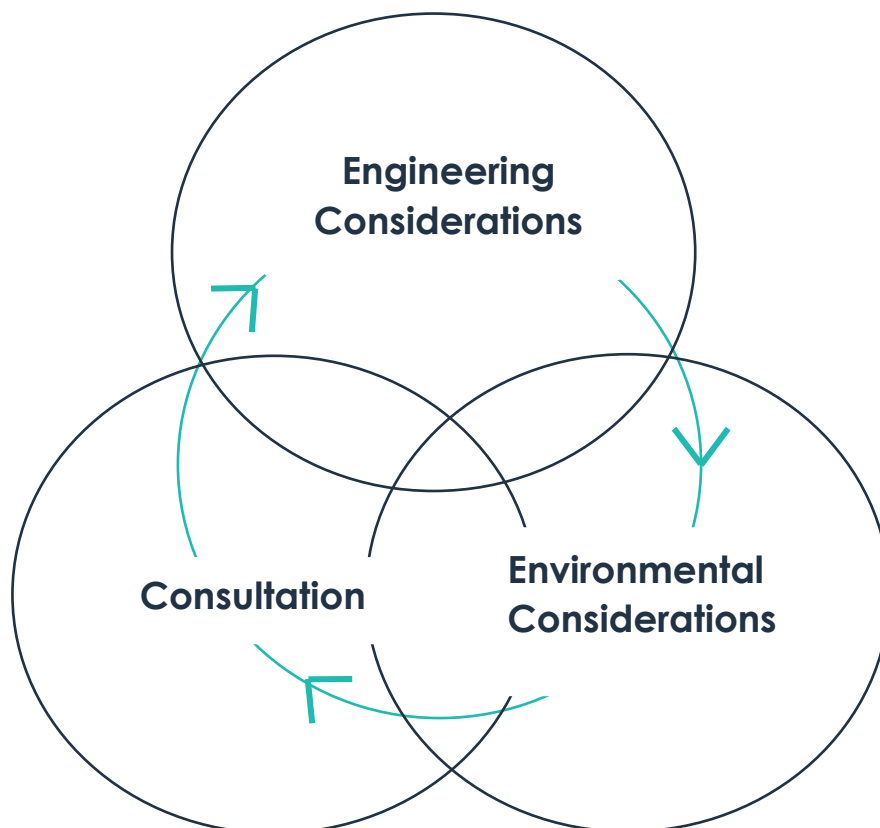
Term	Definition
	provides a secure and stable environment for the cable.
Trenched technique	Trenching is a construction excavation technique that involves digging a trench in the ground for the installation, maintenance, or inspection of pipelines, conduits, or cables.
Trenchless technique	Trenchless technology is an underground construction method of installing, repairing and renewing underground pipes, ducts and cables using techniques which minimize or eliminate the need for excavation. Trenchless technologies involve methods of new pipe installation with minimum surface and environmental disruptions. These techniques may include Horizontal Directional Drilling (HDD), thrust boring, auger boring, and pipe ramming, which allow ducts to be installed under an obstruction without breaking open ground and digging a trench.
Wind turbine generator (WTG)	A structure comprising a tower, rotor with three blades connected at the hub, nacelle and ancillary electrical and other equipment which may include J-tube(s), transition piece, access and rest platforms, access ladders, boat access systems, corrosion protection systems, fenders and maintenance equipment, helicopter landing facilities and other associated equipment, fixed to a foundation

Reference Documentation

Document Number	Title
5.1	Consultation Report
6.1.2	Chapter 2: Need, Policy and Legislation
6.1.3	Chapter 3: Project Description
7.5	Without Prejudice Derogation Case
9.1	The Planning Statement
9.1.1	Policy Compliance Document

Executive Summary

1. This chapter of the Environmental Statement (ES) provides a description of the site selection process and the approach followed by GTR4 Limited (trading as Outer Dowsing Offshore Wind) hereafter referred to as the ‘Applicant’. This chapter also provides information on the alternatives considered for both the onshore and offshore elements of the Project.
2. The Applicant took a reactive and dynamic approach to the site selection process in both the consideration of alternatives and in the final refinement of the Order Limits for both the offshore and onshore elements of the Project. While there are a multitude of factors that are considered in this process, these can be summarised into three driving principles:
 - **Engineering considerations** – what infrastructure is required to achieve an economic and efficient development.
 - **Environmental considerations** – how can the engineering be achieved to avoid or minimise adverse impacts on the environment without compromising the Project’s overall purpose.
 - **Consultation** – how has the Applicant taken on board the feedback from stakeholders and the local communities in developing the Project.



1 Introduction

3. The Applicant is proposing to develop the Project. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm) located approximately 54km from the Lincolnshire coast, offshore substations, an accommodation platform, inter-array cables, interlink cables, offshore export cables to landfall, onshore export cables to the Onshore Substation (OnSS), and 400kV cables connecting the OnSS to a National Grid Substation (NGSS¹) to facilitate connection to the electricity transmission network, and ancillary and associated development (see Volume 1, Chapter 3: Project Description for full details (document reference 6.1.3)).
4. This chapter outlines the staged approach to defining the spatial boundaries and constituent parts of the Project. It also explains and details the main alternatives considered for the Project, including location and infrastructure options, in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the EIA Regulations.). Whilst there is no legal requirement to consider alternatives for the purposes of an EIA, where they have been considered, the Environmental Impact Assessment (EIA) Regulations require that these should be described and the main reasons for the choice between alternative options provided (including for example, relevant environmental, social, technical and economic factors). The Overarching National Policy Statement for Energy (NPS EN-1) highlights the approach to the consideration of alternatives under the applicable EIA Regulations.
5. More detail on the legislative obligations and the information to be provided is set out in Volume 1, Chapter 2: Need, Policy and Legislation (document reference 6.1.2), and throughout this chapter where relevant to the consideration of site selection and alternatives.
6. Consideration of alternative solutions for the purposes of the Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017 is set out in the Without Prejudice Derogation Case (document reference 7.5).

1.1 Site and Route Selection Overview and Background

1.1.1 Selection of the Project Array Area

7. In October 2019, The Crown Estate (TCE) launched the Offshore Wind Leasing Round 4 (commonly referred to as Round 4) for seabed rights to develop offshore wind projects in English waters. The Round 4 leasing process offered seabed rights for offshore wind development within four bidding regions (North Wales & Irish Sea, Eastern, South East, and Dogger Bank)—with a minimum target capacity of at least 7 giga Watts (GW). The process consisted of three stages.

¹ The NGSS will be consented, built, owned, and operated by National Grid Electricity Transmission (NGET) and will be subject to a separate consent application promoted by NGET.

8. Following an initial prequalification stage, at Stage 1 eligible bidders were required to identify sites on which they may choose to bid in each and any of the bidding regions and within a set of rules established by TCE (including an evaluation of environmental constraints measured against environmental characterisation for each region provided by TCE). Stage 2 saw bids being placed in a competitive auction process for areas up to 500km² and for a development capacity of up to 1500MW.
9. Following the Stage 2 auction process, the Applicant was awarded Preferred Bidder status for the Project AfL array area, located in the Eastern bidding region, in February 2021.
10. TCE subsequently undertook a plan-level Habitats Regulations Assessment (HRA) for Round 4 that was completed in July 2022 (following the approval of a Derogation Notice by the Secretary of State). The Agreement for Lease (AfL) for the Project was signed by the Applicant in January 2023.
11. Since being awarded Preferred Bidder status in February 2021, the Applicant has been progressing the development of the Project, with survey campaigns commencing in March 2021 (aerial ornithology and marine mammal surveys), the EIA Scoping Report for the Project being published in July 2022 (ODOW, 2022) and the Preliminary Environmental Information Report (PEIR) published in June 2023 (ODOW,2023).
12. The acquisition of site survey data and extensive stakeholder engagement since 2021 has enabled the Applicant to bring together a comprehensive evidence base to ensure that the development, design and construction of the project will be based on the best available understanding of the site conditions and other marine users.

1.1.2 Route and Site Selection of the Electrical Transmission Infrastructure

13. Subsequent to the award of Preferred Bidder status, the Applicant commenced work to determine options for the connection of the Project to the National Electricity Transmission System, through the development of offshore and onshore export cable route options, cable landfall options and grid connection options (interface points with the transmission network).
14. To a great extent the export cable routing and onshore substation siting has been predominantly driven by the Offshore Transmission Network Review (OTNR)² which was launched by UK Government in July 2020. The OTNR evaluated grid connection options for all Round 4 projects, leading to a Holistic Network Design (HND)³ and identification of specific grid connection options for the Applicant.
15. The Applicant was initially provided two potential grid connection options following the initial conclusions of the OTNR as published in the HND Report by National Grid ESO (NGESO, 2022⁴). The Applicant initially progressed with the evaluation of, and consultation on, substation sites in

² OTNR Pathway to 2030 Central Design Group and Network Design Terms of Reference (May 2023).

³ Pathway to 2030: Holistic Network Design Report (July 2022).

line with these two connection options proposed by National Grid, which were referred to as Lincolnshire Node and Weston Marsh.

16. Following the HND, in August 2023 the Applicant received confirmation from National Grid Energy Systems Operator (NGESO) that the confirmed grid connection for the Applicant would be Weston Marsh. This confirmation came following the publication of the PEIR and therefore, at this point the Applicant issued a Press Release and was able to confirm that the Lincolnshire Node connection option for the Project would no longer be pursued.
17. The HND recognised that if an earlier connection can be achieved, there is a potential overall benefit to the consumer. The Earliest In-Service Date (EISD) for the Lincs Node connection would be 2033 whereas an earlier connection date for Weston Marsh would be 2030.
18. The HND methodology assessed the impact of the offshore, landfall and onshore cables in accordance to the HND design objectives which considered the following:
 - Economic costs: the network design should be economic and efficient;
 - Deliverability and Operability: the network design should be deliverable by 2030 and the resulting system should be safe, reliable and operable; and
 - Environmental impact: environmental impacts should be avoided, minimised or mitigated by the network design, and best practice in environmental management incorporated in the network design.
19. Local communities' impact – impacts on local communities should be avoided, minimised or mitigated by the network design.
20. This assessment provided an assessment for Environment, Community, Deliverability impacts with an Economic assessment for each connection option. The total cost for the Weston Marsh connection was lower in all four scenarios and therefore the recommendation was for a connection to Weston Marsh in 2030.
21. This Chapter therefore focuses on the site selection consideration of alternatives, approaches, assessments and conclusions of relevance to the Weston Marsh connection option. While the Lincolnshire Node Connection option was pursued in line with the Weston Marsh Connection Option up to the point of confirmation in August 2023 (following publication of the PEIR), this decision was outwith the Project's site selection process (See Section 1.2). The separation distance and opposing geographical locations relative to the landfall for each of the connection options meant that the majority of the site selection work undertaken for Lincolnshire Node was not relevant to Weston Marsh and therefore only that which was relevant has been included in this report, namely the identification of the landfall, which as described in Section 5 was identified as common to both connection options.
22. In addition, the TCE Plan level HRA (The Crown Estate, 2022), whilst concluding that it was not possible to undertake a reasonable and meaningful assessment of potential export cables related to the Project, nonetheless gave high-level consideration to offshore export cabling, and the conclusions and outcomes of the Plan level HRA were relevant to developing and evaluating the offshore export cable route options.

1.2 Offshore Transmission Network Review (OTNR) and the Pathway to 2030

Holistic Network Design (HND)

23. For offshore wind projects developed under previous leasing rounds, the onshore grid connection location had been determined by National Grid following a grid connection application made by a project, through the Connection and Infrastructure Options Note (CION) process, with the applicant developing the offshore and onshore cable route and selecting the OnSS site following confirmation of the grid connection point determined by the CION process.
24. However, this process has now been superseded by the OTNR process initiated by the UK Government in response to the Committee for Climate Change 2020 call to *‘Develop a strategy to coordinate interconnectors and offshore networks for wind farms and their connections to the onshore network and bring forward any legislation necessary to enable coordination’*.
25. The OTNR was established by the then Secretary of State for the Department of Business, Energy and Industrial Strategy (BEIS) (now the Department for Energy Security and Net Zero (DESNZ)) in July 2020 to look into the way that the offshore transmission network is designed and delivered, consistent with the ambition to deliver net zero emissions by 2050 and more immediately the Government’s ambition to deliver 50GW of offshore wind by 2030.
26. BEIS (now DESNZ) led the OTNR with support from a range of government and industrial bodies, including TCE and Crown Estate Scotland (CES), the Department for the Environment, Farming and Rural Affairs (Defra), Marine Scotland, the Marine Management Organisation (MMO), the Ministry of Housing, Communities and Local Government (now Department for Levelling Up, Housing and Communities (DLUHC)), National Grid Electrical System Operator (NGESO), the Office of Gas and Electricity Markets (Ofgem) and Welsh Government. An advisory group was established which additionally included offshore wind developers, network operators, technical and environmental advisers and stakeholders.
27. The OTNR established four workstreams looking at the delivery of offshore wind to meet the 2050 targets, as follows (summarised from BEIS OTNR presentation, December 2020⁵):

Table 1.1 The four established workstreams of the OTNR

Workstream	Description
Early Opportunities	<ul style="list-style-type: none"> ▪ Identify inflight projects which could be coordinated by leveraging flexibility within the existing regime or by making small changes to current processes. ▪ Some projects are likely to be too far in the development process to implement changes without major commercial consequences.

⁵https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/946574/presentation-17-10-20.pdf

Workstream	Description
Pathway to 2030	<ul style="list-style-type: none"> Support the achievement of 40GW⁶ of offshore wind generation by 2030 through exploring opportunities for centralised planning and delivery of onshore and offshore grid infrastructure. Focus on a subset of existing planned and possibly new projects with connections planned in the late 2020s and early 2030s.
Enduring Regime	<ul style="list-style-type: none"> Developing options for the enduring regime as well as designing and implementing regulatory changes to current frameworks required to enable coordination. Enduring regime will apply to projects coming through from future seabed leasing, with the potential also to benefit projects emerging from Leasing Round 4 and ScotWind (2021).
Multi-purpose interconnectors	<ul style="list-style-type: none"> Making tactical changes to enable the delivery of early opportunity Multi-Purpose interconnectors. Developing an enduring regime to effectively deliver projects from 2030 onwards.

28. Alongside the OTNR, Ofgem undertook a consultation on the regulatory regime to deliver changes to the transmission regime aligned with the themes of the OTNR.

29. BEIS and Ofgem requested that NGENSO undertake a HND process in consultation with a Central Design Group (CDG) and working under a Terms of Reference⁷ (ToR). The HND ToR required NGENSO to deliver an HND that considered the onshore and offshore network required to connect offshore wind and required the HND to be economic and efficient, deliverable and operable, and minimise the impact on the environment and local communities.

30. More specifically, the purpose of the Pathway to 2030 HND was to provide a recommended onshore and offshore design for a 2030 network that would facilitate the UK Government ambition for 50GW of offshore wind in Great Britain by 2030⁸. In line with the ToR, the HND connects 23GW of offshore wind, which combined with the existing and planned offshore wind projects that are out-of-scope of the HND, facilitates the connection of up to 50GW by 2030. The HND was informed by the Network Options Assessment (NOA, July 2022), which identified the wider network reinforcements needed to improve the capability of the network. The NOA 2021/22 publication⁹ has been refreshed to integrate the offshore network design and provide an updated view on the required onshore network reinforcements necessary to produce the HND.

31. The HND has been delivered by NGENSO in consultation with the CDG. The onshore Transmission

⁶ Whilst the presentation states 40GW, the British Energy Security Strategy (April 2022) confirmed the ambition to achieve 50GW by 2030.

⁷ OTNR Pathway to 2030 Central Design Group and Network Design Terms of Reference (May 2023).

⁸ British Energy Security Strategy (April 2022).

⁹ Network Options Assessment 2021/22 Refresh (July 2022).

Operators (TOs) have also played a key role in the process, by identifying onshore interface options and providing options and cost estimates for wider network reinforcements.

32. Of importance to the Applicant is that the HND specifically covers the connection of all Round 4 projects (i.e. incorporating Round 4 into the capacity to be connected as part of the pathway to 2030 workstream of the OTNR), as well as a proportion of ScotWind projects and capacities for future development in certain other regions and locations.
33. The HND process considered a "radial"¹⁰ and a "coordinated"¹¹ option for each project and at a number of potential connection locations (plus noting any wider reinforcement works required to facilitate) and undertook a comparative evaluation for each option equally weighting economic cost, deliverability and operability, and environmental and societal impacts.
34. At an early stage NGESO identified a study area for the East coast projects of relevance to the HND (including the Project), which encompassed grid connection options across Yorkshire, Lincolnshire, and Norfolk (discussed in Section 5). These were refined as the HND study progressed with the HND recommendations being published in July 2022¹², identifying two possible connection options for the Project in Lincolnshire: one at the 'Lincolnshire Node', and one at Weston Marsh (discussed in Section 6.2.5).
35. The Applicant was in discussion with the HND throughout the development of the process and provided information to support the HND work. In parallel the Applicant progressed a number of options for the grid connection and associated cable route and substation sites, aligned with the options that were developed and evaluated by the HND, in order to ensure the development could progress, as far as possible, in parallel with the HND process. This site selection and alternatives report sets out the detail of those options and their evaluation focusing on the grid connection locations that were ultimately identified by the HND.
36. In August 2023, the Applicant received a Grid Connection Offer from NGESO for a connection at Weston Marsh. This enabled the Applicant to confirm that the Lincolnshire Node connection option would no longer be pursued. The Applicant confirmed it would continue development activities at the two study areas for the substation site, one in the Surfleet Marsh area (previously referred to as Weston Marsh North) and one in the Weston Marsh area (previously referred to as Weston Marsh South).
37. Based on the outcome of surveys and consultations, the Applicant also confirmed in August 2023 that the Project will reach the connection point via the cable route labelled 1a (the route further away from the coast, west of the A52). The Applicant ceased development activities along the cable route 1 option (the route closer to the coast, east of the A52).

¹⁰ Radial connection is a term used to describe a dedicated point to point connection to transfer all of the available electricity from the generation asset (wind farm) to the 400kV network.

¹¹ Coordinated connection is a term used to describe additional connectivity to other generation or transmission assets through a multiple node configuration that enables different pathways to transmit generation to the 400kV network.

¹² Pathway to 2030: Holistic Network Design Report (July 2022).

1.3 Round 4 Plan-Level HRA Cable Routing Considerations

38. Due to the uncertainty associated with the potential grid connection locations at the time of the Round 4 leasing process as well as the offshore export cable routing between the Round 4 projects and the grid, the TCE Plan level HRA concluded that it could not undertake a reasonable and meaningful assessment of potential impacts of export cable infrastructure related to the Round 4 plan. However, TCE did undertake some high-level determination and appraisal of offshore cabling constraints for the Round 4 plan (TCE,2022) using assumed broad ‘cable regions’ to ensure that the Plan-Level HRA had considered potential impacts arising from the plan.
39. To enable this, TCE defined a study area for the expected cable routes from each of the Round 4 project array areas to the adjacent coastline. For the Applicant, this study area comprised an area of sea from the array area to both the Lincolnshire and southern Yorkshire coastlines as shown in Figure 4.1 (document reference 6.2.4.1).
40. The plan-level HRA (TCE, 2022) was able to conclude that no adverse effects on the National Site Network would occur as a result of offshore export cable connections for all but one of the Round 4 projects. The plan level HRA did not replace the information requirements of project level HRA and did not attempt to pre-empt project level conclusions as TCE concluded it was not possible to undertake a reasonable and meaningful assessment of export cable infrastructure associated with the Project (TCE, 2022). Mitigations identified by TCE that apply to ECC initial route selection therefore formed relevant considerations when identifying and evaluating potential offshore export cable routes for the Project. The mitigations apply to sites depending on the classification of their listed features as Black, Red, Amber or Green (BRAG) as below – the classification of relevant SACs are presented within the plan level HRA (TCE, 2022).

1.4 Statutory and Policy Context

1.4.1 EIA Regulations

41. Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (hereafter the EIA Regulations) requires that an Environmental Statement includes:

“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”.

42. There is no requirement in the EIA Regulations to assess all potential options, only to provide a description of those that have been considered.

43. This chapter of the ES provides a description of the reasonable spatial alternatives that have been considered by the Applicant and, where appropriate, presents a comparison of the environmental effects and technical and/or commercial feasibility of the various options. In some cases (for example, the array layout) alternative options form part of the proposal at this stage and assessment of the range of development detail proposed within the design envelope (as set out in Volume 1, Chapter 3: Project Description) has been considered in detail in the relevant chapters of this ES.

44. Consideration of alternative solutions for the purposes of the Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017 is set out within the Derogation Case (document reference 7.5).

1.4.2 Planning Inspectorate Advice Notes

45. The Planning Act 2008 (as amended) (2008 Act), and related secondary legislation, establishes the legislative requirements in relation to applications for orders granting development consent for Nationally Significant Infrastructure Projects (NSIPs) (for further detail refer to Volume 1, Chapter 2: Need, Policy and Legislative Context (document reference 6.1.2)).

46. The Planning Inspectorate (The Inspectorate) Advice Note Seven: Environmental Impact Assessment (The Inspectorate, 2020) suggests that the EIA needs to explain:

“the reasonable alternatives considered and the reasons for the chosen option taking into account the effects of the Proposed Development on the environment”.

1.4.3 National Policy Statements

47. From a policy perspective, the National Policy Statement (NPS) for Renewable Energy Infrastructure (NPS EN-3, 2023) does not contain a general requirement to consider alternatives or to establish whether the proposed project represents the best option.

48. However, consideration is given in paragraphs 4.2.15 and 4.2.16 of NPS EN-1 (2023) to the requirements under the EIA Regulations regarding the consideration of alternatives, notably:

“ Applicants are obliged to include in their ES, information about the reasonable alternatives they

have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility."

"In some circumstances, the NPSs may impose a policy requirement to consider alternatives."

49. Requirements under the Habitats Regulations and the Offshore Habitats Regulations will be addressed in the draft Report to Inform Appropriate Assessment (RIAA) and Without Prejudice Derogation Case. Where there is a policy or legal requirement to consider alternatives, paragraphs 4.2.22 to 4.2.28 of NPS EN-1 (2023) highlights other guiding principles that the Secretary of State should consider when deciding what weight should be given to alternatives, specifically:

"...the consideration of alternatives in order to comply with policy requirements should be carried out in a proportionate manner;

The Secretary of State should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the same infrastructure capacity (including energy security, climate change, and other environmental benefits) in the same timescale as the proposed development;

The Secretary of State should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the same infrastructure capacity (including energy security, climate change, and other environmental benefits) in the same timescale as the proposed development.

The Secretary of State should not refuse an application for development on one site simply because fewer adverse impacts would result from developing similar infrastructure on another suitable site, and it should have regard as appropriate to the possibility that all suitable sites for energy infrastructure of the type proposed may be needed for future proposals.

Alternatives not among the main alternatives studied by the applicant (as reflected in the ES) should only be considered to the extent that the Secretary of State thinks they are both important and relevant to the decision.

As the Secretary of State must assess an application in accordance with the relevant NPS (subject to the exceptions set out in section 104 of the Planning Act 2008), if the Secretary of State concludes that a decision to grant consent to a hypothetical alternative proposal would not be in accordance with the policies set out in the relevant NPS, the existence of that alternative is unlikely to be important and relevant to the Secretary of State's decision.

Alternative proposals which mean the necessary development could not proceed, for example because the alternative proposals are not commercially viable or alternative proposals for sites would not be physically suitable, can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision.

Alternative proposals which are vague or inchoate can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision.

It is intended that potential alternatives to a proposed development should, wherever possible, be identified before an application is made to the Secretary of State (so as to allow appropriate consultation and the development of a suitable evidence base in relation to any alternatives which are particularly relevant). Therefore, where an alternative is first put forward by a third party after an application has been made, the Secretary of State may place the onus on the person proposing the alternative to provide the evidence for its suitability as such and the Secretary of State should not necessarily expect the applicant to have assessed it..”

50. and at paragraph 4.2.29:

“Through the Environment Act 2021 the Government has set 13 legally binding targets for England covering the areas of: biodiversity; air quality; water; resource efficiency and waste reduction; tree and woodland.”

51. The NPS for Renewable Energy Infrastructure (NPS EN-3, 2023) states at paragraph 3.8.138 that the applicant should include an assessment of the effects of installing cable across the intertidal zone which should include information, where relevant, about:

" any alternative landfall sites that have been considered by the applicant during the design phase and an explanation for the final choice "; and

" any alternative cable installation methods that have been considered by the applicant during the design phase and an explanation for the final choice."

52. The NPS for electricity networks infrastructure (EN-5, 2023) states the following, at paragraph 2.13.9:

" Radial offshore transmission options to single windfarms should only be proposed where options assessment work identifies that a co-ordinated solution is not feasible. For projects which had firm connection agreements in place prior to completion of the HND (formerly known as ‘Early Opportunities’ projects), co-ordinated design work should be brought forward by applicants."

53. In March 2022 Ofgem confirmed that the connection for the Project should be a radial connection, and that, as such, no opportunities for coordination with other projects are possible.

1.5 Marine Policy Statement

54. The Marine Policy Statement (MPS) adopted by all UK administrations in March 2011 provides the policy framework for the preparation of marine plans, establishing how decisions affecting the marine area should be made in order to enable sustainable development. The Marine Policy Statement sets out detailed policy considerations in relation to a range of impacts on the marine environment which should be taken into consideration from the start of any project.

55. The objectives of the East Inshore and East Offshore Marine Plans (adopted in 2014) (and relevant policies established under them) are relevant to decision making and should be

considered from the outset of development to ensure policy compliance. Refer to the Planning Statement (document reference 9.1) and the Policy Compliance Document (document reference 9.1.1).

1.6 The Horlock and Holford Rules

56. For the OnSS site selection, reference has been made to the National Grid Guidelines on Substation Siting and Design ('The Horlock Rules') (National Grid, undated(a)). These guidelines document National Grid's best practice for the consideration of relevant constraints associated with the siting of electricity network infrastructure.
57. In addition, National Grid employs the 'Holford Rules' (National Grid, undated(b)) as guidelines on overhead line routing. Whilst environmental assessment for overhead lines addresses wider topics than the visual amenity issue on which the Rules concentrate, they remain a valuable tool in selecting and assessing potential onshore route options as part of the environmental assessment process. They also provide the context which supports the Applicant's decision to underground the cables, rather than develop overhead lines, for connection to the National Grid substation connection point.

1.7 Other Relevant Guidance

58. Offshore site selection options have had due regard to the following guidance:
- The Crown Estate (2012) Guidance on the Principles of Cable Routeing and Spacing;
 - The Crown Estate (2022) Plan-level Habitats Regulations Assessment for Round 4; and
 - The Crown Estate (2021) Cable Route Identification and Leasing Guidelines: Transmission Assets Infrastructure for Offshore Renewable Installations.

2 Consultation

2.1 Overview

59. This ES is supported by the Consultation Report (document 5.1), which outlines the Applicant's consultation to date and provides details of the Project's entire pre-application process. The feedback from the Project's consultation phases and how they have influenced the siting of and design aspects of the Project is summarised throughout this section.
60. As with all major infrastructure development projects, the site selection and design process for the Project has undergone various iterations, involving early engagement with stakeholders, communities, and landowners to seek input to refine the key elements of the Project.
61. The Applicant has actively sought feedback through statutory and non-statutory consultation with land interest parties, statutory and non-statutory consultees, at Scoping, PEIR, Section 42 and 47 consultations and through informal land interest engagement, respectively. This engagement has been diverse in its nature and has taken place in the form of landowner meetings, questionnaires, letters, the EPP (Evidence Plan Process) including Expert Topic Group (ETG) meetings as well as several Community Liaison Groups (CLGs) and public consultation events. The Applicant has given due consideration to all feedback received, resulting in changes being made to route planning and site selection as documented throughout the remainder of this section of the report.
62. A summary of the Project's technical consultation are presented within Chapter 6 Technical Consultation (document 6.1.6) and is accompanied by an Appendix 6.1 Evidence Plan (document 6.3.6.1) which provides a summary of the key issues raised during the Evidence Plan Process (EPP).

2.2 Consultation Responses

63. A summary of consultation responses directly relevant to the Project's site selection and consideration of alternatives process is included in Table 2.1. This table includes comments made in relation to the Weston Marsh Connection option only (See Section 191.2).
64. A complete list of consultation responses received to each of the Project's Section 47 and Section 42 Consultations and how the Project have had due regard of these is included in the Consultation Report (Part 5, document reference 5.1), specifically Appendix 5.1.4 (document reference 5.1.4).

2.3 Consultation and Refinement phases of the Offshore Elements of the Project

Table 2.1 Summary of Consultation Responses Regarding Site Selection and Assessment of Alternatives (Offshore Project elements)

Consultees(s)	Date/ Document	Topic	Comment	Project Response
Scoping Opinion				
Natural England	09 September 2022 Scoping Opinion	Compliance with Schedule 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2017 / Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (Regulation 10)	An assessment of alternatives and clear reasoning as to why the preferred option has been chosen	The site selection process and assessment of alternatives is set out in this chapter of the ES.
Natural England	09 September 2022	General	Natural England highlights Inner Silver Pit South candidate HPMA is out for public consultation, and it is therefore a material consideration in planning, especially has the	Defra confirmed on 28 February 2023 that Inner Silver Pit South will not be designated.

Consultees(s)	Date/ Document	Topic	Comment	Project Response
	Scoping Opinion		ECC search area overlaps with candidate HPMA	
Natural England	09 September 2022 Scoping Opinion	Project array boundary	We support that “The distance from adjacent coastlines and in particular areas subject to landscape designations” was used to define the project array area (i.e., the “site boundary” shown on Image 1.5.1).	Noted.
Natural England	09 September 2022 Scoping Opinion	Area of Search (AoS) and Preliminary Site Selection	The Area of Search (AoS) within which cable landfall options will be evaluated is wide.	A wide area of search was used at Scoping due to the uncertainty regarding landfalls and cable routing at that stage. Following Scoping, and the detailed landfall and cable routing (onshore and offshore) feasibility assessment (as set out herein), the landfall at Wolla Bank was selected for PEIR, and further refined for the DCO Application.
Phase 2 Consultation (Comments received under Section 42 Consultation)				
Historic England	21 st July 2023 S42 response	Marine and Intertidal Archaeology	There are presently no identified sites as could be subject to the provisions of the Protection of Military Remains Act 1986.	Noted.
Orsted Entities S42 Response	21 st July 2023 S42 response	Shipping and Navigation	We note that impacts on vessel displacement and restriction of adverse weather routeing post PEIR will be revisited once array reductions have been applied. Once this information has been provided we would appreciate the opportunity to properly	An assessment of potential impacts to shipping and navigation, including potential vessel displacement, restriction of adverse weather routeing, and potential cumulative effects, is provided in Chapter 15: Shipping and Navigation (document reference

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			understand and respond to the potential impacts and mitigations being proposed.	6.1.15).
Orsted Entities	21st July 2023 S42 response	Shipping and Navigation	The area of the proposed Outer Dowsing Windfarm Project has significant amounts of existing shipping activity. We note that impacts on vessel displacement and restriction of adverse weather routeing post PEIR will be revisited once array reductions have been applied. Once this information has been provided we would appreciate the opportunity to properly understand and respond to the potential impacts and mitigations being proposed.	An assessment of potential impacts to shipping and navigation, including potential vessel displacement, restriction of adverse weather routeing, and potential cumulative effects, is provided in Chapter 15: Shipping and Navigation (document reference 6.1.15).
Orsted Entities	21st July 2023 S42 response	Shipping and Navigation	"As set out, the proposed Outer Dowsing Wind Project array is 21.4km from Hornsea 1. Due to this proximity, there is significant potential for the Outer Dowsing Offshore Wind Project turbines to interfere with wind speed or wind direction of Hornsea 1 and thus cause a reduction in energy output from the Hornsea 1 turbines. This requires to be accurately assessed, appropriate mitigation applied with any remaining adverse effects appropriately compensated for the duration of the consents and licences."	The Project has been sited in accordance with requirements of The Crown Estate's Offshore Wind Leasing Round 4 process, including that projects may not be located within 7.5km of an existing OWF unless the owner of the OWF has given their written consent.
Orsted	21st July	Shipping and	As set out, the proposed Outer Dowsing Wind	The Project has been sited in accordance

Consultees(s)	Date/ Document	Topic	Comment	Project Response
Entities	2023 S42 response	Navigation	Project array is 17.7km from Hornsea 2. Due to this proximity, there is significant potential for the Outer Dowsing Offshore Wind Project turbines to interfere with wind speed or wind direction of Hornsea 2 and thus cause a reduction in energy output from the Hornsea 2 turbines. This requires to be accurately assessed, appropriate mitigation applied with any remaining adverse effects appropriately compensated for the duration of the consents and licences.	with requirements of The Crown Estate's Offshore Wind Leasing Round 4 process, including that projects may not be located within 7.5km of an existing OWF unless the owner of the OWF has given their written consent.
The UK Chamber of Shipping	27th July S42 response	Shipping and Navigation	The Chamber notes that the two proposed developments of DBS have a total power rating of 1500MW and areas for lease of approximately 500km ² . This equates to an energy generating density of approximately 3MW per km ² , which by present development standards in the UK EEZ is a low density and may be considered unnecessarily so given other developments are working to 5 or more MW per km ² . With regards to the specifics of the site, referring to Array Area Boundary Key Coordinates included within the NRA, the Chamber recommends two areas for reductions in the RLB. Firstly, the A-B northerly extent has the most interaction to	The northern and western boundaries have both been reduced post PEIR to reduce impacts to shipping and navigation users. These changes were presented to key stakeholders including the CoS.

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			<p>high density traffic routes and the most impact upon navigational squeeze and accordingly safety. The Chamber also suggests that B and the resulting right angle creates a sharp turn and collision hot spot as identified in Figure 15.2 of the NRA, with the result being that a drawing in of the boundary at B be recommended to reduce the direct nature of vessel interaction.</p> <p>Secondly, the G-H westerly extent of the development as it abuts into the Outer Dowsing Channel. The Chamber acknowledges the 10m contour as being the defining depth for the majority of traffic using the Outer Dowsing Channel but does not agree that building to the edge of 10m contour is in the best interest of navigational safety given the recommended sailing distance of 2nm from the edge of a wind farm development.</p>	
Maritime & Coastguard Agency	5th July 2023 S42 response	Shipping and Navigation	<p>Various stakeholders have raised concerns with other project interactions in the area. Of note are Hornsea Three due its potential impact with the Immingham to Cuxhaven route (Route 7, Figure 10.2) the loss of the optional shallow track post construction with current boundaries (Route 9, Figure 10.2) east of the Outer Dowsing Shoal and the Dudgeon North</p>	<p>The NRA (document reference 6.3.15.1) includes full cumulative risk assessment of screened in projects including those referenced by the MCA.</p>

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			extension with its protentional 'line up' with the western extent of the current Outer Dowsing array area as presented.	
Maritime & Coastguard Agency	5th July 2023 S42 response	Shipping and Navigation	PEIR Chapter 1 paragraph 1.1.32, Chapter 15 Paragraph 15.5.2, and Paragraph 587 of the NRA state it is intended that a reduction of the array boundary from 500km ² to 300km ² will be presented for DCO Application. We understand that the cumulative impacts will be re-assessed post PEIR, where we will provide further comments following an additional assessment of the updated NRA. Considering the intended array boundary change, Para 588 asks: "Do you have any feedback on the array area boundaries from a shipping and navigation perspective?" An initial preference would be for a reduction to the western boundary to the extent that the optional shallow route (route 9, Figure 10.2) would remain viable and the lining up of the potential western edge of Dudgeon North Extension and the Outer Dowsing array area is avoided. A reduction to this western boundary would also increase the safety clearance of the traffic using the Outer Dowsing Channel.	The western boundary has been reduced post PEIR (as has the northern boundary). The MCA confirmed during the second hazard workshop on 23 rd November 2023 they were generally content with the refinements.
Autumn Consultation (Comments received under section 47)				
NATS	1st		En-route RADAR Technical Assessment	The Applicant confirms that the relevant

Consultees(s)	Date/ Document	Topic	Comment	Project Response
	November 2023		<p>Predicted Impact on Claxby RADAR Using the theory as described in Appendix A and development specific propagation profile it has been determined that the terrain screening available will not adequately attenuate the signal, and therefore this development is likely to cause false primary plots to be generated. A reduction in the RADAR’s probability of detection, for real aircraft, is also anticipated.</p> <p>Predicted Impact on Cromer RADAR Using the theory as described in Appendix A and development specific propagation profile it has been determined that the terrain screening available will not adequately attenuate the signal, and therefore this development is likely to cause false primary plots to be generated. A reduction in the RADAR’s probability of detection, for real aircraft, is also anticipated.</p> <p>En-route operational assessment of RADAR impact Where an assessment reveals a technical impact on a specific NATS’ RADAR, the users of that RADAR are consulted to ascertain whether the anticipated impact is acceptable to their operations or not.</p> <ul style="list-style-type: none"> • Aberdeen ATC Unacceptable • Prestwick Centre ATC Unacceptable 	<p>Radar sites have been considered within the ES. The Applicant has engaged with NATS to seek to agree appropriate mitigation, noting that the Applicant has identified an extension of the existing Transponder Mandatory Zones as a potential mitigation measure. The Applicant will continue to engage with NATS to agree a suitable mitigation measure.</p>

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			<ul style="list-style-type: none"> • Swanwick ATC Unacceptable • Military ATC Unacceptable <p>Note: The technical impact, as detailed above, has also been passed to non-NATS users of the affected RADAR, this may have included other planning consultees such as the MOD or other airports. Should these users consider the impact to be unacceptable it is expected that they will contact the planning authority directly to raise their concerns</p>	
NATS	1st November 2023		<p>En-route Navigational Aid Assessment Predicted Impact on Navigation Aids No impact is anticipated on NATS' navigation aids</p>	Noted.
NATS	1st November 2023		<p>En-route Radio Communication Assessment Predicted Impact on the Radio Communications Infrastructure No impact is anticipated on NATS' radio communications infrastructure</p>	Noted.
NATS	1st November 2023		<p>Conclusions En-route Consultation The proposed development has been examined by technical and operational safeguarding teams. A technical impact is anticipated, this has been deemed to be unacceptable.</p>	The Applicant has identified an extension of the existing Transponder Mandatory Zones as a potential mitigation measure. The Applicant will continue to engage with NATS to agree a suitable mitigation measure.

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			Refer to Appendix A - Background RADAR Theory within the consultaiton response	

2.4 Consultation and Refinement phases of the Onshore Elements of the Project

Table 2.2 Summary of Consultation Responses Regarding Site Selection and Assessment of Alternatives (Onshore Project Elements)

Consultees(s)	Date/ Document	Topic	Comment	Project Response
Scoping Opinion				
Lincolnshire County Council	09 September 2022 Scoping Opinion	Consideration of Alternatives – Onshore ECC	Section 4 Alternatives – welcome the approach to alternatives which should be set out in detail in the Environmental Statement so a clear justification for the onshore cable route chosen is provided to give confidence and credibility that other options were considered before the preferred route was confirmed.	The Applicant has undergone a rigorous selection and consideration of alternatives process in relation to the siting of the Project’s infrastructure and this is detailed throughout this report.
Natural England	09 September 2022 Scoping Opinion	Compliance with Schedule 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2017 / Infrastructure Planning (Environmental Impact	An assessment of alternatives and clear reasoning as to why the preferred option has been chosen.	The Applicant has undergone a rigorous selection and consideration of alternatives process in relation to the siting of the Project’s infrastructure and this is detailed throughout this report.

Consultees(s)	Date/ Document	Topic	Comment	Project Response
		Assessment) Regulations 2009 (Regulation 10)		
Phase 1 (Comments received under Section 47 Consultation)				
Member of Public	Phase Feedback Form	1 Protected Sites	Please ensure this or other sections of the search zone do not go anywhere near RSPB Frampton marshes. What plans are in place to eliminate disruption to this very important site?	The RSPB Reserves at Frampton Marsh and Freiston Shore have been taken into consideration during the design process to ensure these sites are avoided. Other potential impacts, including impacts to functionally linked land, have been assessed within ES Chapter 22 Onshore Ornithology (document reference 6.1.22).
Member of Public	Phase Feedback Form	1 Location of the cable route	In response to <i>“Do you agree that the optimum search zones for the onshore electrical cable corridors to the potential grid connections have been selected?”</i> No. I think if the site is to be near Spalding the cable should be all undersea. Efforts should be made to negotiate a way through the Wash and up the River Witham. I understand the SSSI status of the Wash but exceptions should be made.	The designation of the Wash SPA and its SSSI status meant the Applicant was unable to take forward for consideration the option of siting the cable corridor under the Wash due to the likely adverse effects on integrity on the SPA.
Member of Public	Phase Feedback Form	1 Proximity of the cable route to residential	In response to <i>“Do you agree that the optimum search zones for the onshore electrical cable corridors to the potential grid</i>	Noted. An underpinning design phase that enabled the first phase and influenced the following iterations of the project

Consultees(s)	Date/ Document	Topic	Comment	Project Response
		receptors	<i>connections have been selected?"</i> Not too near houses on the whole.	boundaries was the environmental constraints mapping (which took consideration of proximity to residential receptors) which ensured that the Project was designed to avoid or minimise impacts as much as reasonably practicable from the initial design through each phase of refinement. See Section 9.2 for further details.
Phase 1A (Comments received under Section 47 Consultation)				
Member of Public	Phase 1A Feedback Form	Proximity of the cable route to residential receptors	In response to <i>"Do you have any thoughts, feedback or local knowledge that you would like to share in relation to the Alternative Route Option Search Zone and our indicative Cable Corridor as shown within it?"</i> This alternative route will cross more domestic and small holders land and cause I believe more damage to the local communities and environments.	Constraints mapping that included proximity to residential receptors was undertaken when identifying both route options; while there are more residential receptors near to the alternative route option, it was concluded that the engineering challenges and subsequent environmental considerations (including impacts on the local communities and environment) would be significantly reduced by adopting the alternative route option. See Section 9.3 for further details.
Member of Public	Phase 1A Feedback Form	Proximity of the cable route to community areas	In response to <i>"Do you have any thoughts, feedback or local knowledge that you would like to share in relation to the Alternative Route Option Search Zone and our indicative Cable Corridor as shown within it?"</i>	The Applicant was able to microsite the cable route within the Phase 1a search zone to avoid potential impacts on the area of St, Mary Church Wainfleet as was presented in the PEIR and can be seen in the Project's

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			These were shared at the meeting. However, there is an issue around the area of St, Mary Church Wainfleet, where there may need to be a slight movement in the route.	Onshore Order Limits (Figure 4.26 (document reference 6.2.4.26)).
Phase 2 (Comments received under Section 47 Consultation)				
Member of Public	Phase 2 ODOW Web Contact Form	Location of the cable route	The most effective/efficient way to bring the power ashore to the Spalding area is to lay cables under the Wash.	The designation of the Wash SPA and its SSSI status meant the Applicant was unable to take forward for consideration the option of siting the cable corridor under the Wash due to the likely adverse effects on integrity on the SPA.
Member of Public	Phase 2 ODOW Web Contact Form	Location of the Landfall Site	I do not want you here at Anderby creek. We had 4 years of Triton Knoll and that was more than enough. Go somewhere else.	The Project's Landfall site is at Wolla Bank located approximately 1km South of Anderby Creek Village (Figure 4.26 (document reference 6.2.4.26)). The Applicant has removed the access through Anderby Creek village in response to stakeholder feedback and has committed to no construction works on the beach. The Applicant has undergone a rigorous selection and consideration of alternatives process in relation to the adopted Landfall site, see Table 2.3 and Section 5.4 for further details.
Member of Public	Phase 2 ODOW Web	Proximity of the cable route	The original option went through agricultural land with very few houses and	The constraints mapping that included proximity to residential receptors was

Consultees(s)	Date/ Document	Topic	Comment	Project Response
	Contact Form	to residential receptors	next to no public access. The alternative route goes through a number of villages and roads, as well as affecting agricultural areas. I am confused as to why this is even an argument: surely the original option, which causes the least disruption, should be the obvious one to pick? Seriously, I appreciate that consultations are an essential part of the democratic process, but this seems just silly. Go through the least populated, least used area.	undertaken when identifying both route options; while there are more residential receptors near to the alternative route option, it was concluded that the engineering challenges and subsequent environmental considerations (including impacts on the local communities and environment) would be significantly reduced by adopting the alternative route option. See Section 9.3 for further details.
Member of Public	Phase 2 Feedback Form	Location of the OnSS	Understand the need for easier power. Also see the need to utilise wind power and safe delivery of said power to the National Grid. Looking at the maps featuring the impact on the surrounding countryside I do feel that of the three suggested sites, the most obvious would be North of the Welland with access from the A16. This allows proximity to N9 and negates the need to burrow under the River Welland.	Noted. The Applicant's adopted site is Surfleet Marsh (north of the Welland) and will take advantage of the access off the A16 as shown in Figure 4.19 (document reference 6.2.4.19) and discussed in Section 8.
Member of Public	Phase 2 Feedback Form	Location of the OnSS	Probably the site north of the Welland would be much easier to use. You would not need to come under the River Welland or build a long access road. These pylons buzz and crackle in the cold weather which would be very worrying. The impact on the wildlife	Noted. The Applicant's adopted site is Surfleet Marsh (north of the Welland) as shown in Figure 4.19 (document reference 6.2.4.19) and discussed in Section 8. The Applicant have committed to burying

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			would be destructive. The migrating geese use the marsh as a flight path - is it possible to visit an existing site?	their onshore cables. The Applicant has taken consideration of the migrating geese taking account of survey data and engagement with nature conservation bodies as discussed and assessed within ES Chapter 22 Onshore Ornithology (document reference 6.1.22).
Member of Public	Phase 2 Feedback Form	Location of the OnSS, impact on local businesses	Reasons for going to A16 site opposed to Spalding Marsh. A16 trunk road for site traffic. No road to be built from A17 to Spalding Marsh site. No big problems drilling under River Welland with running silt problems, wigwam holiday site is a well known site for people to relax and be at one with nature.	<p>Noted. The Applicant's adopted site is Surfleet Marsh (A16 site, north of the Welland) and will take advantage of a remote and suitable access off the A16 as shown in Figure 4.19 (document reference 6.2.4.19) and discussed in Section 8.</p> <p>While the Project will be required to drill under the river Welland with 400kV cables to connect the OnSS with the NGSS, a geotechnical study is to be completed to assist on the technical design requirements for the trenchless crossing works through complex ground.</p> <p>The Applicant has consulted with the owners of the Wigwam Crowtree glamping site. The Project team used a 3D computer generated indicative model of the OnSS and proposed landscaping during a Public Information</p>

Consultees(s)	Date/ Document	Topic	Comment	Project Response
				Event at Fosdyke Village Hall to demonstrate to the owners that the proposed location and landscaping of the OnSS would appropriately mitigate any significant impacts on their business.
Member of Public	Phase 2 Feedback Form	Location of the OnSS, impact on local businesses	I am concerned as to the impact on my business if this goes ahead. Surely Surfleet Marsh is the better site in relation to the A16 and general access. The drilling of cables under the Welland River and the remoteness of Weston Marsh is a significant disadvantage.	<p>Noted. The Applicant's adopted site is Surfleet Marsh (north of the Welland) as shown in Figure 4.19 (document reference 6.2.4.19) and discussed in Section 8.</p> <p>While the Project will be required to drill under the river Welland with 400kV cables to connect the OnSS with the NGSS, a geotechnical study is to be completed and confirm the nature of the ground at route crossing point. This will give more information for engineering to determine the technology requirements to manage TC through the complex ground at this location.</p> <p>s.</p> <p>The Applicant has consulted with all local businesses in the consultation area.</p>
Members of Public	Phase 2 Feedback Form	Impacts on grade II Listed receptors from	Concerns regarding proximity of Grade II Listed housing to construction works (traffic, noise, water, dust).	The constraints mapping that was undertaken as part of the siting process for onshore infrastructure included proximity to

Consultees(s)	Date/ Document	Topic	Comment	Project Response
		construction works		heritage receptors (including Grade II listed houses), traffic, noise, hydrology and air quality impacts (See Section 8 and 9). There are no Grade II listed houses within 85m of any construction works. Potential impacts are assessed in ES Chapter 20 Onshore Archaeology and Cultural Heritage (document reference 6.1.20).
Members of Public	Phase 2 Feedback Form		Try and avoid the best double cropping brassicas land which is the most eastern route. Also running silts make trench depths difficult with high water levels (sea and rainfall). Best land is the seaside of A52 to 'Roman' bank. Nearer the sea the land is heavier and less veg.	Noted. The Applicant's adopted route is the most westerly route (landward side/ north of the A52) as shown in Figure 4.26 (document reference 6.2.4.26) and discussed in Section 9.3 which provides details with respect to running silts.
Phase 2 Consultation (Comments received under Section 42 Consultation)				
Boston Borough Council	28/07/2023 Phase 2 Section 42 Consultation on the PEIR	Impacts on residential receptors, BMV land and flood risk	Impact on Freiston. Whilst I understand the need to route the cable south of Boston, I find the route of the cable is unnecessarily disruptive to both the local people and farmers. The cable cuts through the village and several high quality fields. On this basis I do not understand why a less disruptive route could not be found, the obvious course if the cable runs north of the A52 would be to take it to the Hob Hole drain and then run it along the drain. This is a much	The adopted cable route runs east of Frieston village, noting it is constrained to the East by Butterwick village. The cable route was refined significantly since the PEIR which showed a typical 300m corridor, noting the corridor has been refined down to an approximate 80m width and will not directly impact the village. The Applicant did not take the option of running the cable along hobhole drain forward due to it not being practicable from an engineering

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			<p>simpler route that will not affect the village and local farmers over a period of 2 to 3 years.</p> <p>In summary whilst I understand the need for renewable energy systems, I am extremely concerned with the proposed routing of this cable south of the A52 through the UKs finest soils and food production areas, but also along a bank that has a known and serious tidal flood risk. This flooding risk will only worsen with climate change, as the sea level rises, and climate variance becomes more extreme</p>	<p>perspective as the Hobhole drain is only circa 25m wide and the permeant easement required by the Project is 60m. It should also be noted that the Hobhole drain is a Local Wildlife Site and Local Geological site.</p> <p>Flood risk has been a guiding influence on the siting of the onshore infrastructure as discussed in sections 8.3 (OnSS) and 9.2 (Onshore ECC).</p> <p>An Outline Surface Water and Drainage Strategy (SWDS) (document 8.1.4) has been submitted as part of the Outline Code of Construction Practice (document 8.1), the Outline SWDS sets out the principles and protocols to address potential drainage and flooding issues during construction.</p>
National Farmers' Union	20/07/2023 Phase 2 Section 42 Consultation on the PEIR	Multiple route options and landowner engagement	The NFU is pleased to see that the Outer Dowsing project has begun to liaise with landowners affected by the indicative 300m corridor, both by sending introductory letters and following up with in-person meetings to discuss route feasibility. It is also good that the project team has had three meetings with the landowner interest group and the NFU understands that discussions	The Applicant engaged extensively with landowners throughout the pre-application phase. The Applicant were unable to confirm the grid connection option until this was provided by the National Grid (See section 1.2). The confirmation of the Project's grid connection option was announced publicly in August 2023 in addition to being communicated to all stakeholders and those

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			<p>are on-going, with the intention to try to finalise voluntary head of terms.</p> <p>Our members have raised concerns that three route corridors are still being consulted on due to no decision by National Grid as to which substation Outer Dowsing will connect to for the final transmission. Please can you keep the NFU informed of any decision on the final connection point, as members still do not know whether they will be affected.</p>	<p>who had participated in the preceding rounds of consultation. Details on the Project's landowner engagement is detailed in Section 9 of the Consultation Report (document reference 5.1).</p>
National Farmers' Union	28/07/2023 Phase 2 Section 42 Consultation on the PEIR	Siting of the OnSS and landowner engagement	<p>The Project Description states that an onshore export cable corridor will link the landfall with the newly constructed onshore substations, with two options being considered:</p> <p>Option 1, approximately 1.5km south of the village of Wainfleet All Saints; and Option 2 approximately 1.5km north of the village of Fosdyke.</p> <p>Please can you keep the NFU informed in regard to the development of the substation. With both options covering an area of approx. 180,000m² and requiring new access roads, Outer Dowsing should already be in full negotiations with landowners affected by the proposed sites</p>	<p>The Applicant engaged extensively with landowners throughout the pre-application phase.</p> <p>The location of the OnSS was confirmed in October 2023 as part of their Autumn Consultation) and the Applicant continued to engage with landowners in respect of this.</p>

Consultees(s)	Date/ Document	Topic	Comment	Project Response
East Lindsey District Council	20/07/2023 Phase 2 Section 42 Consultation on the PEIR	Siting of the Landfall and consideration of alternatives, Impacts on LWS, biodiversity, tourism and flood risk.	<p>for both options, and if not, should make such engagement a priority.</p> <p>Planning Policy The key considerations from East Lindsey District Council’s perspective will relate to the landfall and undergrounding of the cables to support the project. Paragraphs 4.5.7 - 4.5.9 deal with defining the area of search but this does not appear to include a consideration of whether or not other areas of search along the coast were considered as potential sites for the landfall. Previous energy developments have involved the undergrounding of cables and the Triton Knoll scheme made landfall just to the North of Anderby Creek, whereas this project makes landfall just to the south of Anderby Creek. The coast is a valuable asset for wildlife and a tourism resource and there does not appear to be any justification provided for disturbing two areas so close together, particularly given the proximity of both locations to Local Wildlife Sites (LWs). This especially difficult to understand as the cable route for Outer Dowsing joins that for Triton Knoll a little further south, round Hogsthorpe.</p>	<p>The Applicant has undergone a rigorous selection and consideration of alternatives process in relation to the adopted Landfall site, see Table 2.3 and Section 5.4 for further details.</p> <p>The Applicant has committed to utilising HDD (horizontal directional drilling technology) at the Landfall and siting their compound west of Roman Bank road so as the drill will travel underneath, the beach, the dunes, Anderby Marsh LNR and Roman Bank road. The Applicant has engaged with the Lincolnshire Wildlife Trust (LWT) in respect to Anderby Marsh LNR including several site visits to ensure the appropriate siting of construction areas and any additional mitigation measures are incorporated.</p> <p>The landfall construction area will be set back a minimum of 80m from the Anderby Marsh LWT Reserve. A 4m high earth bund will be constructed on three sides of the landfall construction area to provide noise</p>

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			<p>An additional point of note in respect of this is in paragraph 3.6.4 where the PEIR says that landfall installation may also require some form of beach access for construction vehicles, depending on the preferred method of installation identified and the preferred landfall location. This is already available at the point that the Triton Knoll scheme made landfall but not in the area 80m cable corridor proposed by the Outer Dowsing Scheme so a new access point may need to be created. The 80m and 300m cable corridors are within the Anderby Creek Sand Dunes LWS and creation of an access could potentially disturb the biodiversity of this dune and dune grassland area. Additionally, the dunes form part of the sea defences of the Lincolnshire Coast and there are potential risks if there are works which could undermine their long term stability. Currently, the only access in the 300m Cable corridor is at Wolla Bank and this is a popular carpark for visitors to the Coast and is loss for the lengthy construction period would be undesirable.</p>	<p>attenuation to mitigate potential disturbance to ornithological receptors at Anderby Marsh LNR (additional to the existing Roman Bank landscape feature) (See Chapter 22 Onshore Ornithology (document reference 6.1.22 for further details).</p> <p>The Applicant has committed to not taking construction access to the beach and there are no planned construction works less than 300m from the toe of the defence. HDD is a proven technique in the coastal area and has been successfully utilised on the Triton Knoll and Viking Link Projects with no adverse impacts on the sea defences, and the detailed design of the HDD will be based on geotechnical survey data.</p>
National Farmers'	20/07/2023	Impacts on environmental	Paragraph 8.3.20 says that Specific details on LWS within the AoS were not obtained as	The Applicant has been in regular consultation with the Lincolnshire Wildlife

Consultees(s)	Date/ Document	Topic	Comment	Project Response
Union	Phase 2 Section 42 Consultation on the PEIR	receptors and Land Use at the landfall, Impacts on agricultural drainage	<p>part of the scoping study however these will be obtained during later stages of the assessment but given that the point of landfall is within a LWS, this is somewhat disappointing. This carries through to table 8.3.4, where it is suggested that habitat loss or damage can be avoided but without a proper understanding of the habitat, that is an assumption. There are others better placed than myself to determine whether the list of species is sufficiently comprehensive and if the mitigation methods would be appropriate. Similarly, there are others better placed to assess the baseline of heritage assets for the Historic Environment.</p> <p>Paragraph 8.8.16 should mention the Lincolnshire Coastal Path. All the relevant issues appear to have been scoped in, albeit some of them at a very strategic level, and I do not disagree with most of the issues that have been scoped out. I am slightly concerned that the land use section scoped out drainage in respect of the potential impacts on agricultural drainage systems, which could lead to a loss of agricultural productivity. East Lindsey is a water stressed</p>	<p>Trust regarding the proximity of the Landfall Compound to the Anderby Marsh LNR and the mitigation measures proposed (including the construction of a 4m high noise bund to assist in the noise attenuation of the landfall works). See Chapter 22 Onshore Ornithology (document reference 6.1.22 for further details).</p> <p>The constraints mapping that was undertaken as part of the siting process for onshore infrastructure included proximity to heritage receptors and land use (including Public Rights of Way) (See Section 8 and 9).</p> <p>Impacts on heritage assets have been considered as part of the site selection process and assessed in ES Chapter 20 Onshore Archaeology and Cultural Heritage (document reference 6.1.20).</p> <p>Impacts on the Lincolnshire Coastal Path are considered in Chapter 25 Land Use (document reference 6.2.25), noting there will be no closure or diversions in relation to this footpath and the Applicant has committed to no construction access to the</p>

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			<p>area and additional water scarcity for agricultural holdings resulting in loss of productivity could undermine viability of agricultural businesses particularly considering the effects of climate change.</p>	<p>beach.</p> <p>Impacts in agricultural drainage have been assessed in the ES Chapter 23 Geology and Ground Conditions (document 6.2.23), with any relevant impacts or mitigation used to inform the Land Use Chapter (document reference 6.1.25) where necessary. The Project have also appointed a local drainage contractor to ensure the Project’s pre and post construction drainage schemes are designed in a harmonic way with existing drainage systems.</p>
<p>Environment Agency</p>	<p>20/07/2023 Phase 2 Section 42 Consultation on the PEIR</p>	<p>Flood Risk</p>	<p>Where possible, all works should be located outside of Flood Zones 2 and 3. If this is not possible the applicant should consider the nature of the risk and ensure there is suitable mitigation in place. Works should also be sufficiently set back from any main river and or the toe of any flood defences.</p>	<p>Flood risk has been a guiding influence on the siting of the onshore infrastructure and the Applicant has undertaken sequential testing in relation to Flood Zones 2 and 3 as discussed in sections 8.3 (OnSS) and 9.2 (Onshore ECC). Exceptions Tests are included in the Flood Risk Assessments submitted alongside ES Chapter 24 Hydrology and Flood Risk (document reference 6.2.42) as contained in Appendices 24.2 Flood Risk Assessment (Onshore ECC and 400Kv cable corridor and 24.3 Flood Risk Assessment (OnSS) (document references 6.2.42 and 6.2.43 respectively).</p>

Consultees(s)	Date/ Document	Topic	Comment	Project Response
Natural England	20/07/2023 Phase 2 Section 42 Consultation on the PEIR	Potential for frack out at the Landfall	<p>Comment - Horizontal Direction Drilling (HDD) at landfall - Natural England notes that there were unforeseen complications and impacts that occurred during the installation of the Triton Knoll offshore windfarm cables at the landfall location at Anderby Creek.</p> <p>Natural England advises that similar incidents in the intertidal and immediate subtidal should be avoided as much as possible by ODOW.</p> <p>Recommendation - Natural England advises working with RWE to undertake a lessons learnt exercise and implement measures to avoid impacts occurring. A more detailed plan of landfall construction methodology should be defined and any refinement to the Project Description assessed in the ES.</p>	<p>The Project have also taken consideration of the proximity of works in relation to main rivers and existing flood defences in their siting considerations (See in particular, sections 8.3).</p> <p>The Applicant has employed an onshore engineer who worked with RWE on the Triton Knoll project as the lead Civil Engineer and is now employed by Outer Dowsing in the same role and has worked closely with stakeholders on the design of landfall drill. has been considering the lessons learned from Triton Knoll & Viking Link, and similar projects.</p> <p>The landfall design has been refined following PEIR and is detailed in ES Chapter 3 Project Description (document reference 6.1.3). The refinements have taken account of feedback in relation to potential frack out and impacts on environmental receptors. The drilling methodology will consider lessons learned from similar project through detailed engineering. Aspects such as the placement of temporary steel casing down to competent ground, the review of the down hole mud design, mud management,</p>

Consultees(s)	Date/ Document	Topic	Comment	Project Response
				drill press and drilling methods are all to be scrutinized for the drill operations .
Autumn Consultation (Comments received under section 47)				
Member of Public	Autumn Consultation Email	Adoption of the alternative route option (Onshore ECC)	Can you please provide some detail on what supports your decision on the chosen route and why? My reason for asking is that the route nearer the coast, in my opinion, appears to be far less disruptive (almost no population disturbance), much fewer obstacles (such as roads, houses, railway lines etc), less risk to the schedule and less risk to the budget.	Constraints mapping that included proximity to residential receptors was undertaken when identifying both route options; while there are more residential receptors near to the alternative route option, it was concluded that the engineering challenges and subsequent environmental considerations (including impacts on the local communities and environment) would be significantly reduced by adopting the alternative route option. See Section 9.3 for further details.
Member of Public	Autumn Consultation Email	Impacts on BMV land	Placing the substations at Surfleet Marsh and West Marsh will irrevocably destroy several 100 acres of the most product farm land in the UK, even the world. The cable route from Skegness into the fens will do likewise. Viking link did the same. Natural England's recommendations for major infrastructure projects is that they are carried out on Grade 3 land wherever possible.	The Applicant's adopted site is Surfleet Marsh (north of the Welland) as shown in Figure 4.19 (document reference 6.2.4.19) and discussed in Section 8. Following the preliminary outcomes of the OTNR (as described in Section 1.2), the Applicant was provided with two possible connection points, it was later confirmed by the National Grid that the Project's connection option would be Weston Marsh. The productivity of the farmland has been considered (see section 8.4), it is noted that all land within a

Consultees(s)	Date/ Document	Topic	Comment	Project Response
				<p>c.6km radius of connection point is classified as Agricultural Land Classification (ALC) Grade 1, the highest and most valuable grading (as identified in ES Chapter 25 Land Use (document 6.1.25) and presented in Figure 25.2 (document reference 6.2.25.2). As such, applying the search area as defined in Section 8.2 Table 8.1, all land in this search area is ALC grade 1 and therefore could not be avoided when identifying potential OnSS locations at Weston Marsh.</p> <p>Constraints mapping that included proximity to Land Use (and ALC) was undertaken when identifying route options and the selected alternative route option impacted less grade 1 land than the original route option - see Section 9.3 for further details.</p>
Member of Public	Autumn Consultation Email	Location of the Landfall and onshore ECC	<p>Whilst I think connection to an area near Boston is a huge mistake, have you considered laying the cable on the sea bed to the connection location?</p> <ol style="list-style-type: none"> 1. The cost would be very much lower 2. There would be no upset from the residents, who have had no say in this matter. 3. Perhaps most obviously, the Outer 	<p>The connection options for the Project were provided by the NGESO following the outcomes of the OTNR process, See section 1.2, and ultimately the grid connection offer from to Weston Marsh.</p> <p>The designation of the Wash SPA and its SSSI status meant the Applicant was unable to take forward for consideration the option of</p>

Consultees(s)	Date/ Document	Topic	Comment	Project Response
			Dowsing area is in the sea!	siting the cable corridor under the Wash due to the likely adverse effects on integrity on the SPA.
Member of Public	Autumn Consultation Online Exhibition Response	Adoption of the alternative route option (Onshore ECC) and impacts on residential receptors and road users	I don't understand why you decided to route the cable through a bunch of roads and villages instead of opting for the route through the farmland nearer the sea	The constraints mapping that included proximity to residential receptors was undertaken when identifying both route options; while there are more residential receptors near to the alternative route option, it was concluded that the engineering challenges and subsequent environmental considerations (including impacts on the local communities and environment) would be significantly reduced by adopting the alternative route option. See Section 9.3 for further details.

Autumn Consultation (Comments received under section 42)

No consultation responses that directly relate to the Applicant's site selection and consideration of alternatives process were received as part of the Autumn Consultation from Section 42 consultees. Consultation responses that were received in direct relation to an EIA topic are considered in the relevant technical chapter (for example, those responses received in relation to the OnSS landscaping are included in the ES Chapter 28 Landscape and Visual Impact Assessment (LVIA) (document reference 6.1.28).

A complete list of consultation responses received to each of the Project's Section 47 and Section 42 Consultations and how the Project have had due regard of these is included in the Consultation Report (Part 5, document reference 5.1), specifically Appendix 5.1.4 (document reference 5.1.4).

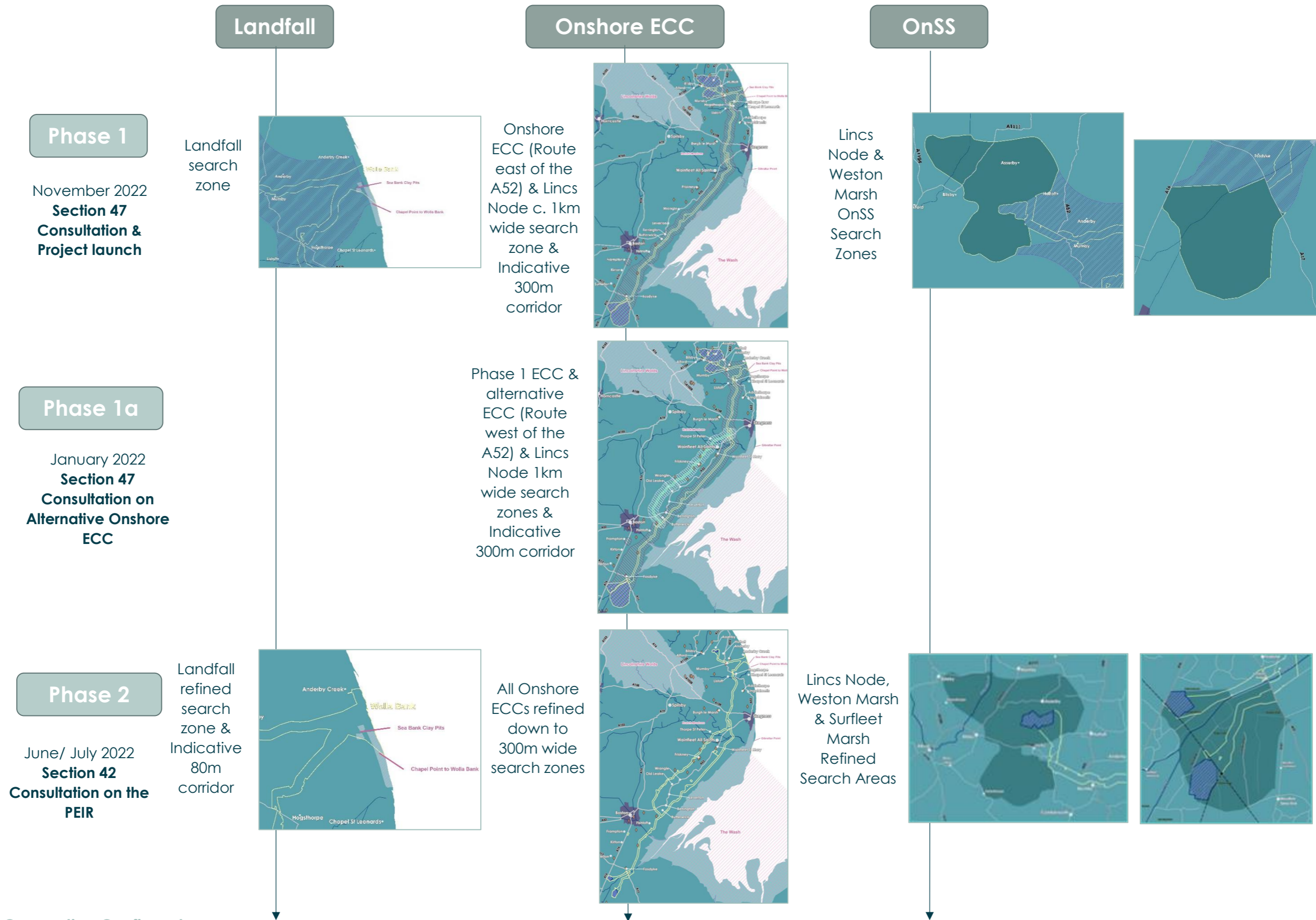
Consultees(s)	Date/ Document	Topic	Comment	Project Response
Winter Targeted Consultation (Comments received under section 42)				
No consultation responses in relation to Site Selection and Consideration of Alternatives that directly relate to the Applicant's site selection and consideration of alternatives process were received as part of the Winter Targeted Consultation.				

2.4.1 Consultation Phases and Onshore Design Development

Plate 2.1 Consultation Phases and Onshore Design Development

Project Component

Project's Consultation Phases



Grid Connection Confirmed
August 2023

Environmental Statement

Project Component

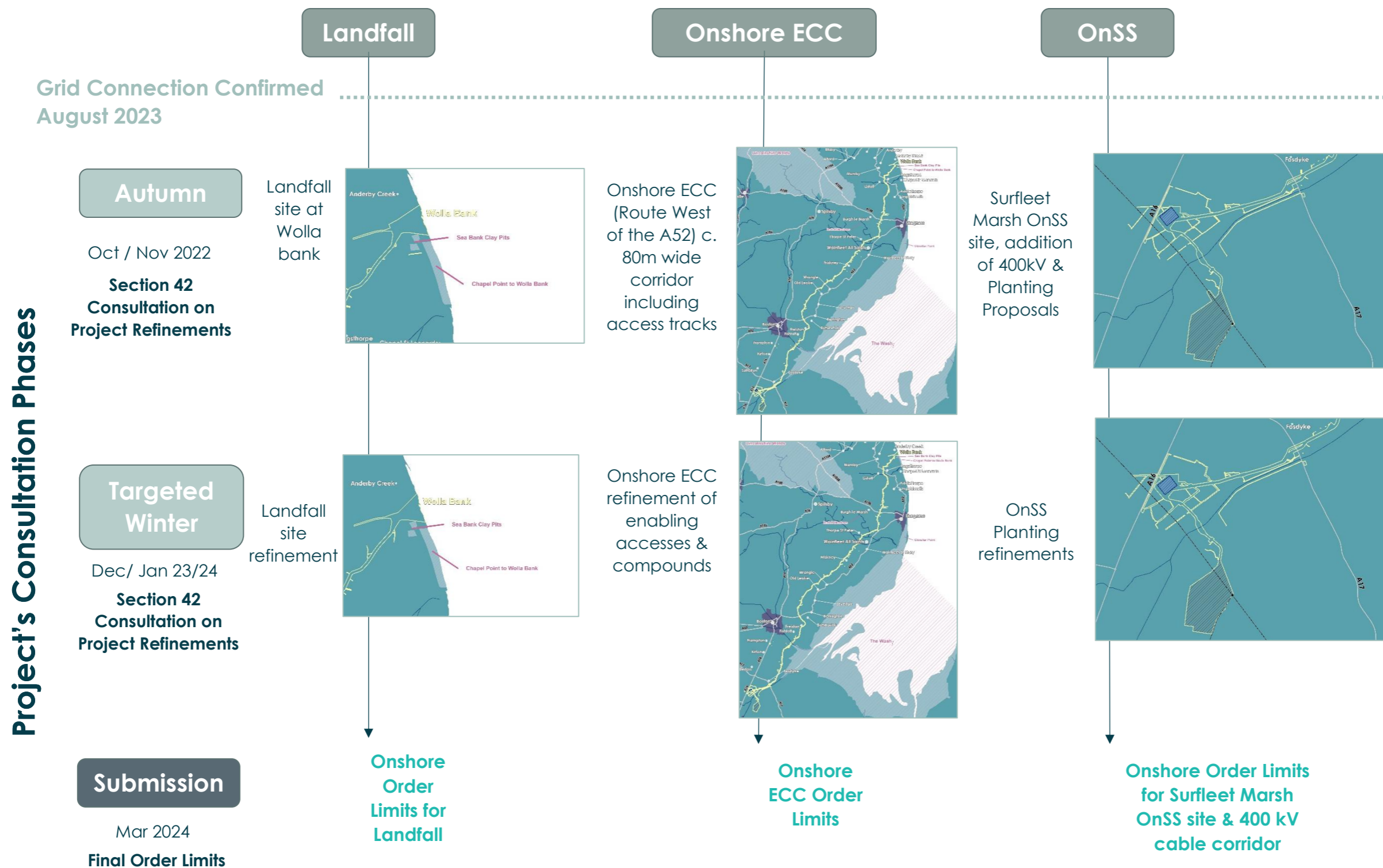


Table 2.3 Onshore Project Refinement and key Consultation Feedback in relation to design elements

	Landfall		Onshore ECC		OnSS, Landscaping & 400kV Cable Corridor	
	Key Feedback	Key Refinements made following feedback	Key Feedback	Key Refinements made following feedback	Key Feedback	Key Refinements made following feedback
<p>Phase 1 (Section 47)</p> <p>November 2022 Project launch</p>	<p>It was highlighted by Lincolnshire Wildlife Trust (LWT) that the Anderby Marsh Local Nature Reserve (LNR) will need to be assessed for potential impacts from the HDD.</p> <p>There were concerns around the impact of the landfall on the beach in relation to tourism and that the landfall area was located in the Lincolnshire Coastal Country Park (LCCP).</p>	<p>The Applicant committed to working with LWT to ensure the management of impacts on ornithological features of Anderby Marsh Local Nature Reserve (LNR).</p> <p>The refinements were made with the feedback in mind and the Applicant reinforced the commitment that they would HDD under the beach, Anderby Marsh LNR and Roman Bank road to avoid direct impacts on tourism and the LCCP.</p>	<p>Landowners & Members of the Public highlighted the presence of “running silts” within the central portion of the Onshore ECC search zone presented.</p> <p>Landowners & Cllrs highlighted concerns with the amount of Grade 1 & “Toft” Land that would be affected by this route.</p>	<p>It was noted that should the presence of running silts be verified by ground investigations this could alter the anticipated engineering and environmental considerations.</p> <p>An Alternative Route was therefore proposed. This route also affected less Grade 1 land than the original route. Both routes were taken forward for assessment.</p>	<p>At this early stage, the Applicant was in the early phases of the OnSS site selection and consultation was based on relatively wide search zones.</p> <p>The feedback from the community was primarily centred around visual impacts and how this will be mitigated within the local landscape and the Applicant explained that this will be done through further siting refinements and development of a landscaping plan.</p>	<p>Further environmental and engineering studies were undertaken to help refine the search zones for the PEIR assessments and Phase 2 Consultation.</p> <p>These refinements were made with LVIA as one of many driving factors to ensure the refined search zones reflected the feedback received.</p>
<p>Phase 1a (section 47)</p> <p>Jan 2022 Alternative Onshore ECC to Weston Marsh</p>	<p>This consultation was targeted on the Onshore ECC Weston Marsh alternative route option</p>		<p>Landowners & Members of the public were generally receptive to the proposed alternative route and concerns were focussed around potential impacts of noise and traffic and micro-siting of the alternative route option.</p>	<p>The Applicant undertook refinement works based on feedback for the two Weston Marsh onshore ECC Routes.</p> <p>Following the generally positive and receptive feedback to the alternative route it was agreed to take both route options to a point of equivalence in terms of consultation, survey data and assessment to help inform which route should be adopted.</p>	<p>This consultation was targeted on the Onshore ECC Weston Marsh alternative route option</p>	
<p>Phase 2 (Section 42)</p> <p>June/ July 2022 Section 42 Consultation on the PEIR</p>	<p>Concerns were focussed around the beach access shown passing in proximity to Anderby Creek Village.</p> <p>It was noted that a SSSI area of geological interest was located within the landfall zone.</p> <p>Concerns around the impacts of noise on the Anderby Marsh LNR.</p>	<p>The Applicant committed to no construction access to the beach and removed the access entirely from the project envelope.</p> <p>The Applicant committed to avoidance of the SSSI and this was embedded within the Project design.</p> <p>The Applicant undertook further detailed assessments and has included the construction of a noise bund in the Landfall compound area (in the agricultural land west of Roman Bank road)</p> <p>The Applicant also noted that if the duct is to be “pushed” from the landward side, a linear compound would facilitate this work and therefore the Applicant included a duct assembly compound at the landfall.</p>	<p>The key local feedback focussed on micro-siting of the route to optimise and minimise impacts on landowners.</p> <p>There was also feedback relating to concerns around impacts from traffic and transport on the local road network in particular traffic at Wainfleet.</p> <p>Landowner concerns were centred around agricultural drainage and soil management</p> <p>Queries were raised about how land parcels would be accessed prior to the development of the haul road.</p> <p>It was highlighted that the site went through an unscheduled area of Archaeological interest – Slackholme Village.</p>	<p>The Applicant finalised their Ground Investigation campaign and environmental assessments and confirmed that the alternative Weston Marsh route option would be taken forward.</p> <p>The Applicant undertook further transport optimisation studies following additional survey data and managed to avoid Wainfleet in its entirety.</p> <p>These studies also allowed for the inclusion of passing bays, widening of accesses and visibility splays to reduce potential impacts on traffic and transport.</p> <p>The Applicant committed to utilising trenchless techniques to avoid Slackholme village, with the entry/ exit pits to be informed archaeological investigation.</p>	<p>Key feedback in relation to LVIA was centred around the importance of the landscaping for the screening of the substation and to ensure the planting comprises of native species.</p> <p>Queries were raised about how the Applicant would champion biodiversity.</p> <p>How flood risk is being taken account of in the siting of the OnSS was queried.</p>	<p>The Applicant was able to refine the location of the OnSS following further studies and engagement in relation to flood risk and following the confirmation in August of the grid connection option being located in the vicinity of Weston Marsh and following further engagement with the National Grid.</p> <p>Planting proposals were developed which considered offsite planting, the Applicant is committed to pursuing extensive offsite planting which would both provide effective screening for the OnSS and enhance the diversity of the local area.</p>
<p>August 2022 - Confirmation of Grid Connection at Weston Marsh</p>						

	Landfall		Onshore ECC		OnSS, Landscaping & 400kV Cable Corridor	
<p>Autumn (Section 42)</p> <p>Oct / Nov 2022 Section 42 Consultation on Project Refinements</p>	<p>Concerns around the use of the Roman Bank road by construction vehicles.</p>	<p>As a result of further engineering studies, refinements to the location of the Transition Joint Bays (TJBs) were made which reduced the overall proposed landfall footprint.</p> <p>It was clarified that the haul road between the A52 and the landfall will be the main construction access for the landfall works. The use of Roman Bank road will be limited to enabling works and the construction of the noise bund as this is seasonally constrained. A bell mouth will be constructed off Roman Bank Road into the landfall area and following completion of the HDD and reinstatement works, the bell mouth will be retained to allow for operational access to facilitate routine maintenance activities.</p>	<p>Following the Autumn Consultation phase, the Applicant received feedback from landowners that the suitability of a number of accesses could be improved.</p> <p>It was raised as part of the Autumn Consultation phase that two of the proposed construction compounds could be refined to reduce severance of surrounding land.</p>	<p>This has resulted in the removal, addition, and re-location of a number of accesses. In some instances, the access has been amended to abut the extent of the publicly maintainable highway.</p> <p>The Applicant also undertook more detailed ground truthing site visits that helped inform the removal of some of the accesses and corroborate the refinements as proposed in the feedback.</p> <p>As a result, the Applicant relocated two construction compounds and were able to remove two construction compounds from the Project Design Envelope.</p> <p>In response to avoiding sensitive locations, a small number of passing places were re-designed or removed from the Order limits.</p>	<p>It was highlighted by a number of landowners that in some instances the landscaping areas proposed could be adjusted to better align with the landownership boundaries and prevent severance of agricultural land.</p> <p>It was also raised that due to the scale and type of planting proposed there was the possibility for potential impacts on agricultural drainage.</p> <p>The communities were receptive to the landscaping proposals and species list proposed and feedback in relation to this was focussed on ensuring the inclusion of native species.</p>	<p>As a result, the landscaping areas have been moved slightly to better align with landownership boundaries.</p> <p>Where an IDB drain is present, a buffer of 9m is required for access by the IDBs for maintenance activities. In these instances, the planting strips were refined to accommodate this with an additional 1m buffer.</p> <p>It was identified by the Applicant that the landscaping proposed may not allow access for maintenance activities related to the landscaping. As a result, the Order limits for the Project now incorporate sufficient land to allow access for maintenance.</p> <p>Additional areas were also identified for drainage.</p>
<p>Targeted (Section 42)</p> <p>Dec/ Jan 23/24 Targeted Section 42 Consultation on Project Refinements</p>	<p>No consultation responses in relation to Site Selection and Consideration of Alternatives received.</p>					
<p>Submission</p>						

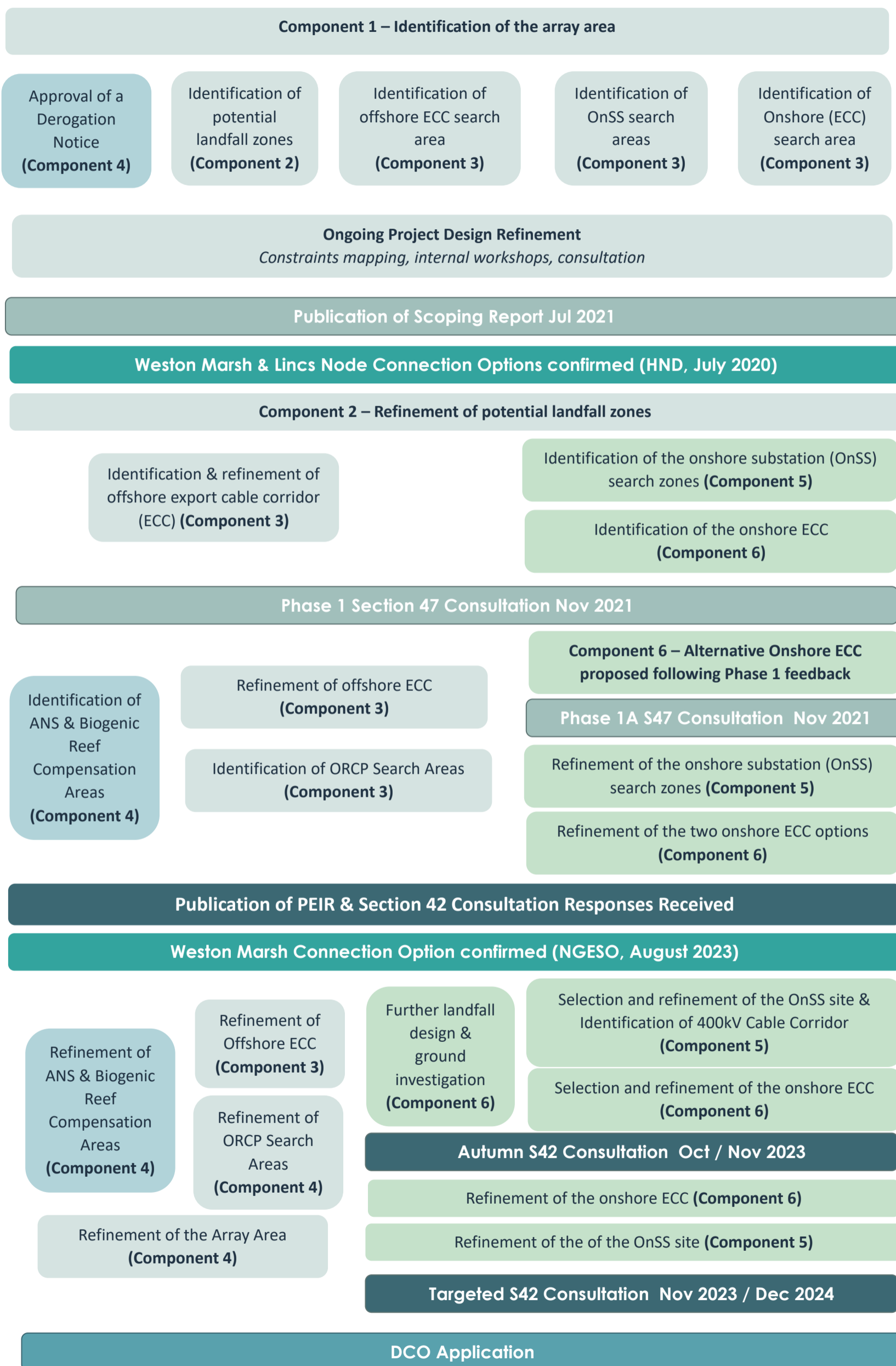
3 Site Selection and Alternatives Approach

3.1 Guiding Principles

65. In addition to the specific constraints for the infrastructure elements as discussed throughout this chapter, a number of fundamental principles have been applied to the site selection process. These are drawn from the experience of the Applicant and based on the technical expertise of consultants supporting the process and include, but are not limited to:
- A preference for the shortest route for cable routing to reduce environmental and social impacts by minimising footprint for the offshore and onshore ECCs, as well as minimising cost (*ultimately reducing the cost of energy to the consumer*) and minimising transmission losses;
 - Avoidance, wherever feasible, of key sensitive features and where not feasible, seeking to mitigate any resulting impacts;
 - Minimising the disruption to populated areas; and
 - The need to accommodate the Maximum Design Scenario (MDS) for each of the Project elements.
66. The site selection process for the Project has been iterative, taking account of key locational decisions. This process began with the identification of the Project's array location and, with the identification by NGENSO of the two connection options proposed as a result of the HND (Lincolnshire Node and Weston Marsh) and ultimately the grid connection offer from NGENSO to Weston Marsh. This in turn informed the location of the onshore infrastructure. The iterative process of constraints mapping, assessment and continued consultation undertaken to has been key in the identification and refinement of the project's siting.
67. The overall aim of the process was to understand the relevant constraints (environmental, engineering/technical and economic) to ensure that the adopted locations are robust and deliverable. The final design of the Project will aim to minimise impacts on the environment and communities whilst ensuring that the lowest cost of energy will be passed to consumers.
68. Prior to starting each stage of the site selection process the key design principles as identified in paragraph 65 were consulted alongside the identified engineering assumptions relevant to each Project Element.
69. Plate 3.1 provides a schematic of the main steps for the Applicant's site selection and Project design process for each of the primary project components. Additional information is considered at each stage in the process to further refine the options to those where the environmental and social effects are considered manageable (i.e., where fewer sensitive or valued receptors could be affected) and the technical and cost implications are acceptable. The utilisation of a detailed black, red, amber, green (BRAG) assessment (Appendix 6.2.4.1) has been used as one of a number of tools (including site visits, workshops, and professional experience from other offshore wind projects) to quantitatively, where possible, indicate the magnitude of

constraints associated with each site and route option, and thus ensure consideration of the alternatives and assist in the selection (and subsequent design and mitigation refinements) of the preferred options.

Design Development Components



Ongoing Design Refinements based on:

- Ongoing Technical Surveys and Assessment
- Ongoing consultation: Evidence Plan Process (EPP) (ES Chapter 6 Technical Consultation Appendix 6.1 document 6.3.6.1)
- Bilateral Engagement (See relevant ES technical chapters (documents 6.7 – 6.29) & the Consultation Report (document 5.1))

3.2 Key Components and Development Phases

70. The development of options has been subject to consultation with a variety of key statutory and non-statutory stakeholders and, particularly with regard to onshore aspects, with relevant local communities and landowner interests (see Section 2).
71. The following stages are presented in this report to present the site selection process:
- Component 1 – Identification of the array area;
 - Component 2 – Identification of the landfall zones;
 - Component 3 – Identification of offshore export cable corridor (ECC), including the offshore reactive compensation platform (ORCP) search area
 - Component 4 – Offshore refinements;
 - Component 5 – Identification of the onshore substation (OnSS) site & 400kV cable corridor; and
 - Component 6 – Identification of the onshore ECC.
72. Development of the Project has continued since the publication of the PEIR in June 2023 and has been informed by engagement with stakeholders, ongoing engineering design and feasibility work, consideration of additional survey data and assessment outcomes, and consideration of statutory consultation responses.. The Consultation Report (document reference 5.1) provides a record of how the Applicant has had regard to the responses received to the consultation.
73. An overview of the process of site selection, and the associated consultation that has informed the Project design is illustrated in Plate 3.1.
74. It is important to note that whilst the site selection process is illustrated and described as a linear approach in this chapter for ease of presentation, the reality of any project development is that site selection is an ongoing, inter-related and iterative process with decisions made having considered multiple factors. Decisions on site selection are required at various stages to enable the Project to progress and are based on the best information available at the time.
75. Alternative options for methods of construction, operation and maintenance (O&M) and decommissioning have been considered alongside different technologies and materials within each individual ES chapter (Volume 1, Chapters 7 to 31) in order to assess and compare the potential environmental effects.
76. In relation to the selection of the array area, offshore reactive compensation platform location, offshore and onshore export cable routes and landfall options, and the selection of onshore substation site options and the evaluation of the alternative options considered, Plate 3.1 summarises the process undertaken.

4 Component 1 – Identification of the Array Area

4.1 Overview

77. As noted previously, the design process is often illustrated as a linear or multi-linear process for the purposes of presentation. It is however important to note that the Project has undergone an iterative design and site selection process, to ensure the Applicant can make the greatest contribution to renewable energy targets as possible, whilst minimising environmental impacts and following principles of good design.
78. The following section describes the process of identifying and refining the array boundary through the Round 4 leasing process and through the initial development phases.
79. Following the statutory consultation process, and to align with the requirements of TCE to increase the minimum power density from 3MW per km² to 5MW per km² prior to construction, the Applicant has further revised the Array area through the consideration of consultation responses and consideration of technical and environmental factors, while retaining the flexibility needed at this stage to develop the Project given that detailed engineering design has not yet been undertaken.

4.2 Agreement for Lease (AfL) Boundary - Site Selection

80. As noted in section 1.1.1 of this chapter, the AfL array area was selected in response to the Round 4 leasing process adopted by TCE to issue rights to develop at least 7GW of offshore wind in four bidding regions (North Wales & Irish Sea, Eastern, South East, and Dogger Bank).
81. As part of the process, TCE undertook a detailed characterisation of the bidding areas and amended the boundaries within which sites could be located through an iterative process; the bidding areas were subject to environmental characterisation by TCE which identified, on a bidding region scale, some of the key environmental constraints that might be encountered. The Round Four Bidding Regions are shown in Figure 4.2 (document reference 6.2.4.2).
82. In response, the Applicant undertook GIS based constraints mapping and evaluation to mirror the process completed by TCE and to identify the Project AfL array area. This included an evaluation of potential environmental constraints and issues (adopting TCE's own environmental characterisation as a framework (TCE, 2019a)).
83. The Applicant identified the site for bidding using a GIS based constraints mapping process but also more broadly considering potential issues for the consenting process, including an evaluation of possible HRA risk (i.e. potential effects on designated sites) and likely requirements for mitigation and compensation. This evaluation followed a step-wise process to identify the Project array area (including consideration of boundary placement and alignment), as shown in Plate 4.1.

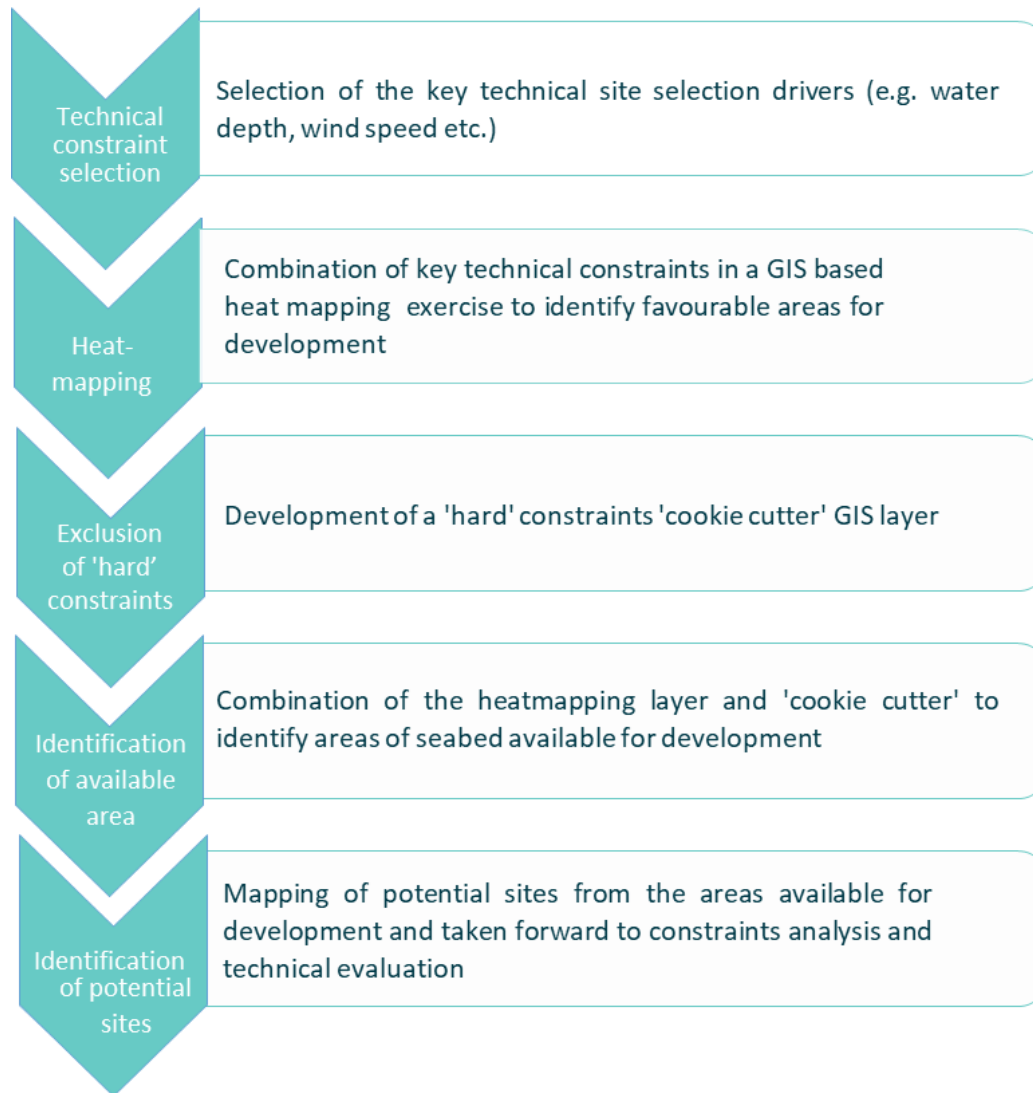


Plate 4.1 AfL Array Area - Site Selection Methodology Process

84. 'Hard' constraints were selected as areas within the TCE bidding regions that were excluded from consideration and included:

- Existing or proposed offshore wind farms plus buffer;
- Existing or proposed aggregate dredging areas plus buffer;
- Oil and gas platforms and other assets plus buffer;
- Areas close to the coast;
- Areas designated for seabed interest (e.g. Special Areas of Conservation (SACs) for benthic habitats and Marine Conservation Zones (MCZs)); and
- Shipping routeing measures (International Maritime Organisation (IMO) designated) and areas of high shipping density (based on available Automatic Identification System data).

85. Areas selected were then evaluated for 'soft' environmental constraints for features such as:

- Fishing activity;
- Presence of subsea cables and pipelines;
- Presence of known wrecks or archaeological features;
- Oil and gas activity (including licence blocks);
- Ministry of Defence (MoD) activity (Practice and Exercise Areas (PEXA), firing ranges, etc.);
- MoD and National Air Traffic Services (NATS) radar;
- Proximity to designated sites (excluding those identified above as hard constraints)
- Seascape and landscape visual impacts;
- Fish spawning areas; and
- HRA risk (effects on mobile species – seabirds and marine mammals).

86. Additionally, the site was evaluated with regard to feasibility and cost of project development (incorporating elements such as design and cost of wind turbine foundation, electrical transmission infrastructure including proximity to grid connection, wind yield and O&M) to produce a Levelised Cost of Energy (LCoE) value as a metric for the relative technical and commercial evaluation.

87. For the Project AfL array area, particular focus was given to existing constraints in the area which were factors in developing the array area boundary, specifically:

- Busy shipping routes to the west and north of the area;
- Existing oil and gas platforms to the south and east of the area (with predicted ongoing production and no known or planned decommissioning), as well as a number of platforms within the area; and
- An existing aggregate dredging licence area to the south-west.

88. The Project was identified through this evaluation process as a preferred site for bidding in the Stage 2 auction process, with the Applicant successful in the auction process in February 2021 and being awarded Preferred Bidder status by TCE. Following completion of the Plan-Level HRA by TCE, the Applicant signed the AfL for the Project in January 2023.

5 Component 2 – Identification of the Landfall Zones and Export Cable Landfall Options

5.1 Overview

89. The Pathway to 2030 HND report¹³ (July 2022) concluded that connection options for the Project should be located at either Lincolnshire Node (a new connection point to be developed by National Grid) or a connection in the vicinity of the existing overhead lines at Weston Marsh. Those options remained subject to further evaluation by NGENSO prior to a grid connection offer being made.
90. In order to progress development work in parallel with the completion of the Pathway to 2030 HND process, the Applicant chose to progress a landfall assessment to consider landfall options (and associated offshore and onshore cable route options) for the grid connection interface points identified by the HND, and ultimately focusing on the proposed grid connection options at Lincolnshire Node or Weston Marsh.
91. The study area for the landfall assessment was therefore determined by the initial study area identified by the HND for the east coast Round 4 projects; this covered a large proportion of the central east coast of England, from the Yorkshire coast (south of Flamborough Head) down to the north coast of Norfolk.
92. However, once the grid connection options for the Project were confirmed by National Grid, the Applicant was able to focus on the evaluation of landfall options along the Lincolnshire Coastline, which would be the most economically and environmentally viable landfall options for the Project. This section therefore focuses on this part of the assessment, with the full landfall assessment and detailed methodology included for reference in Appendix 6.2.4.1.
93. The initial landfall assessment considered landfall character and opportunity across the study area, undertaking a BRAG assessment utilising the method described in Appendix 6.2.4.1. Key areas such as the Wash and the Humber Estuary were eliminated by the Applicant at a relatively early stage due to their constrained nature and the presence of a number of important environmental designations (SPA, Ramsar, SSSI).
94. The preliminary BRAG assessments, based on GIS data analysis and desk top study were validated by site visits by the Applicant development team and technical advisers to the most promising landfall locations across Lincolnshire, as identified by the preliminary BRAG Analysis (Appendix 6.2.4.1).
95. The landfall appraisal also took account of the environment immediately landward and seaward of the coast to evaluate any constraints on the onwards routing of cables from the identified landfall. For example, landward constraints included urban areas, caravan parks, SSSIs, SPA,

¹³ Pathway to 2030: Holistic Network Design Report (July 2022).
Chapter 4 Site Selection and Consideration of Alternatives
Environmental Statement
Document Reference: 6.1.4

Ramsar, recreational areas and seaward constraints included the presence of wrecks or other obstructions, shipping activity or sites used for aggregate dredging or disposal in the nearshore were considered when assessing the suitability of a landfall for an offshore cable laying operation. Ultimately, the suitability of any given landfall also relies on the ability to bring an offshore cable route to the coast at that point, and the ability to route a cable route onshore towards the grid connection location. See Appendix 6.2.4.1 for the detailed assessment.

5.1.1 Recommendations for Landfall Options

96. The combination of the BRAG matrix, site visits, feasibility of the cable routing to and from the landfall and expert opinion, led to a short-list of recommended landfall options being taken forward for further appraisal and refinement.
97. The short-listed landfalls for the Lincolnshire coastline are outlined Figure 4.3 (Document Reference 6.2.4.3) and the evaluation of these is described throughout the remainder of this section.

5.2 Lincolnshire Landfall Evaluation

5.2.1 Location 1 – LC-44

98. Section LC-44 was initially classified Amber, having a medium scoring for engineering constraints, with the main environmental constraint being the presence of the Humber Estuary SAC, SPA and Ramsar.
99. A site visit was undertaken from the Horseshoe Point carpark walking north along the sea defence.
100. Section LC-44 are all characterised by an extensive sandy/muddy beach (up to 2km intertidal area), backed by saltmarsh and sand dunes and a man-made sea defence. There is good access to the rear of the sea defence via metalled roads.

5.2.1.1 Environmental Considerations

101. Section LC-44 is bounded to the north by the limits of the study area (Grimsby Unitary Council boundary) and the Hornsea One and Two OWF export cables to the south. The section has a small saltmarsh and sand dune present at the southern extent, with the saltmarsh not present and much more extensive sand dunes present at the north of the site. The section is situated within the Humber Estuary SAC which includes saltmarsh and sand dune features amongst other features. It is also situated within the Humber Estuary SPA, which is an important area for overwintering birds.
102. The offshore cable routes approaching this landfall may need to pass through a number of designated sites in the immediate offshore environment including, potentially, the Holderness Offshore MCZ, the Greater Wash SPA and the Humber Estuary SAC, SPA and Ramsar. At the north of this section, there may be constraints related to the Humber Approaches Traffic Separation Scheme (TSS) which controls traffic entering and leaving the Humber estuary as well as interactions with other sea users, including a need to avoid the offshore Tetney pipeline mooring point and designated anchorages in the approaches to the Humber. A military firing range is present just offshore of the more southerly sectors of this area.
103. This landfall is also heavily constrained in the immediate landward area by a combination of SSSI, SAC and Ramsar designations, and the presence of flood zone 3. There are no obvious routes away from the coast that can avoid these designated areas.
104. Arable fields are present landward of the sea defence. Due to the nature of the sea defence and designated features, accessibility arrangements for access to the intertidal are considered challenging.

5.2.1.2 Engineering Considerations

105. This potential landfall location features a generally low-lying morphology facing an extended muddy/sandy intertidal flat constrained by environmental designations and the presence of a military firing range which are classified as obstructions at landfall. Although there seems to be a sufficient area for TJB construction across the beach, the intertidal area and

environmental designations will inevitably constrain the construction works. There is the potential for trenchless drilling and open cut trenching landfall construction methods to be feasible, however this will most likely be more challenging compared with other potential landfalls. It is worth noting that trenchless drilling will most likely approach the limit in terms of borepath length due to the entry point having to be located back towards the fields.

5.2.2 Location 2 – LC-38

106. Section LC-38 was initially classified Red, having a high scoring for engineering constraints and with the main environmental constraint being the presence of the Humber Estuary SAC, SPA and Ramsar.

107. A site visit was made to the Donna Nook carpark. The site is characterised by extensive sand dunes, with saltmarsh seaward of the dunes, with a wide extensive intertidal area. Access is possible to the beach via existing tracks.

5.2.2.1 Environmental Considerations

108. Section LC-38 is bounded by the Hornsea cables to the north and the village of Saltfleet to the south. The section has extensive sand dunes and saltmarsh habitats visible at the coast. The Donna Nook seal colony is also located within Section LC-38.

109. Donna Nook is part of the training area for the Royal Air Force (RAF), designated as an MoD firing range, with targets used in training clearly visible within the section, directly offshore.

110. The section is situated within the Humber Estuary SAC and SPA, and would likely be subject to restrictions on works during sensitive periods for the features of these sites, including seals, due to the proximity of this section to haul out and breeding sites.

111. The offshore cable routes for this landfall would also likely be required to pass through a number of designated sites in the immediate offshore area, including those for seabed features. Specifically, the offshore cable routes may be required to pass through the Holderness Offshore MCZ, the Greater Wash SPA and the Humber Estuary SAC, SPA and Ramsar. Some cabling options for this sector may also pass through the Silver Pit, a deep-water channel due east of the Humber estuary which although not currently designated is known to be of conservation interest and also an area used extensively by the commercial fishing industry.

112. This landfall is heavily constrained in the immediate landward area by a combination of SSSI, SAC and Ramsar designations, and the presence of the flood zone. There are no obvious routes away from the coast that can avoid these designated areas.

5.2.2.2 Engineering Considerations

113. This potential landfall location features a generally low-lying morphology, with large fields facing very extended muddy/sandy intertidal flats in the nearshore, limiting installation methodologies. There is a sufficient area for TJB construction across the large agricultural fields adjacent to the beach, with trenchless and open cut construction methods potentially feasible.

114. Approaching the landfall and across the beach there is evidence of wrecks showing a

portion of hull or superstructure. This feature might increase the degree of complexity for the cable pull in.

5.2.3 Location 3 – LC-35

115. Section LC-35 was initially classified Amber, having a medium scoring for engineering constraints, with the main environmental constraint being the presence of the Humber Estuary SAC, SPA and Ramsar.
116. A site visit was made to the beach from Crook Bank carpark. The site is characterised by extensive sand dunes at the rear of the beach, with extensive intertidal sandflats. Following the site visit, the scoring classification was refined to green.

5.2.3.1 Environmental Considerations

117. The section is bounded by the Donna Nook MoD military danger area to the north and the Theddlethorpe pipelines to the south.
118. The section is situated within the Humber Estuary SAC and Saltfleet- Theddlethorpe Dunes and Gibraltar Point SAC which includes the sand dune feature amongst other designations. It is also situated within the Humber Estuary SPA.
119. The offshore cable routes for this landfall would be required to pass through a number of designated sites in the near offshore environment, including those for seabed features. Specifically, the cable routes may be required to pass through the Holderness Offshore MCZ, the Greater Wash SPA and the Humber Estuary SAC, SPA and Ramsar. Some cabling options for this sector also pass through the Silver Pit.
120. This landfall sector is also heavily constrained in the near landward area by a combination of SSSI, SAC and Ramsar designations, and the presence of the flood zone. There are no obvious routes away from the coast that can avoid these designated areas.

5.2.3.2 Engineering Considerations

121. This potential landfall location features a generally low-lying morphology, with large fields facing extended muddy/sandy intertidal flats. There is a sufficient area for TJB construction across the large agricultural fields adjacent to the beach, with trenchless drilling and open cut trenching landfall construction methods considered to be potentially feasible.
122. Approaching the southern portion of the landfall there is evidence of wrecks showing a portion of hull or superstructure in proximity of the Theddlethorpe pipelines landing area. The presence of the Theddlethorpe pipelines and the wreck in the southern portion of the landfall will reduce the feasible cable landing area.

5.2.4 Location 4 – LB-32 and LB-33

123. Sections LB-32 and LB-33 were classified Green, having a low scoring for engineering and environmental constraints. A black area separates these sections due to existing beach access.
124. A site visit was made via the footpath adjacent to the Seal Sanctuary Wildlife Centre. The site is characterised by a high dune system and a medium width intertidal area.

5.2.4.1 Environmental Considerations

125. The sections are bounded by the Theddlethorpe pipelines to the north and the town of Mablethorpe to the south. The Haven/Golden Sands Holiday Park is just inland of section LB-33, with possible recreational land landward of section LB-32.
126. The landfall sectors in this area are not situated within any designated sites, although there are extensive dune systems backing the beach with a reasonably high elevation.
127. The offshore export cable routes for this landfall would be required to pass through a number of designated sites in the near offshore environment, including those for seabed features. Specifically, the offshore export cable routes may be required to pass through the Inner Dowsing, Race Bank and North Ridge (IDRBNR) SAC and the Greater Wash SPA. Some cabling options for this sector also pass through the Silver Pit.
128. Potential offshore cable routes may also require relatively nearshore cable crossings due to the existing infrastructure within the area, including the Viking Link subsea interconnector cables and the Triton Knoll offshore wind farm export cables.
129. The immediate onshore area landward of the landfalls in this sector is identified as restorable habitat and Network Enhancement Zone 1, which could be crossed with suitable mitigation. Beyond this there is a potential onshore cable route, noting that this could not avoid existing large caravan parks.

5.2.4.2 Engineering Considerations

130. The landfall features an open low-lying beach backed by sand dune systems while the northern area features large intertidal flats. The southern portion of the landfall features a limited area to locate the TJB, therefore if this landfall is taken forward the TJB will need to be located within a caravan park adjacent to the beach. From a nearshore vessel accessibility perspective, the presence of the out of service Theddlethorpe pipeline will restrict the cable landing corridor area.

5.2.5 Location 5 – LB-24 to LB-19

131. Sections LB-24 to LB-19 were classified Green, having a low scoring for engineering and environmental constraints. A black area separates these sections due to the presence of the landfall for the Viking Link subsea interconnector cables, with Amber areas adjacent to the Viking Link indicating the required buffer area.
132. Site visits were made to sections LB-24 to LB-19 from the carpark south of Sutton-on-Sea and accessed via the sea wall. The area is characterised by a man-made sea wall backing the beach with small, semi-stabilised sand dunes seaward of this.

5.2.5.1 Environmental Considerations

133. The sections are bounded by the urban area of Sutton-on-Sea to the north and the Triton Knoll offshore wind farm export cables to the south. Inland of the seawall from sections LB-24 to LB-19, publicly available mapping (Ordnance Survey) suggests that there is a golf course, but

the site visit confirmed that this now appears to be disused (for an extensive period of time) and is now being used as a public access recreational area. Signs of possible use of this area as a landfill were noted, but this was not confirmed and would require further evaluation.

134. The area is not within any designated sites, although small sand dunes were present seaward of the sea wall and appeared to be stabilising.
135. The offshore export cable routes for this landfall would be required to pass through a number of designated sites in the near offshore environment, including those for seabed features. Specifically, the offshore export cable routes may be required to pass through the IDRBNR SAC and the Greater Wash SPA. Some cabling options for this sector also pass through the Silver Pit.
136. Potential routes may also require relatively nearshore cable crossings due to the existing infrastructure within the area, including the Viking Link subsea interconnector cables and the Triton Knoll offshore wind farm export cables.
137. Much of the study area landward of the landfall sector is dominated by flood zone and sand dunes, with the Sea Bank Clay Pits SSSI immediately inland from the coast. However, there is a possible export cable route away from the coast leading towards the southwest. This route would avoid the SSSI and the large concentration of potentially sensitive receptors identified further to the north.

5.2.5.2 Engineering Considerations

138. The landfall features an open and low-lying sandy beach backed by a concrete dyke. There is a large agricultural field located approximately 500m landward from the dyke adjacent to the location of the Viking Link subsea interconnector TJB. Given the presence of the Viking Link cables it can be concluded that this area has already proven to be feasible for trenchless drilling and therefore there is the likelihood that the same construction method could be undertaken without major issues.

5.2.6 Location 6 – LB-10 and LB-9

139. Sections LB-10 and LB-9 were initially classified as Amber, having a medium scoring for engineering constraints, with the main environmental constraints being the Sea Bank Clay Pits SSSI and the Chapel Point to Wolla Bank SSSI.
140. Site visits were made to sections LB-10 and LB-9 from the Wolla Bank carpark. The area is characterised by tall sand dunes backing the beach. Following the site visit, the scoring classification was refined to Green.

5.2.6.1 Environmental Considerations

141. This section of coast is bounded by Chapel St Leonards to the south and the residential and holiday properties at Anderby Creek to the north. The entire length of this section of beach is lined by tall sand dunes, which are protected by a programme of artificial beach nourishment/replenishment undertaken in the spring/summer for the past eight years. To the

west of the dunes, much of the area is wetland, which is important bird habitat, before passing into intensely farmed agricultural land on the west side of Roman Bank/Anderby Road. Through discussion with the beach replenishment contractors, the Applicant was made aware of the presence of a 600m long 800mm diameter pipe that is buried along the length of the beach in this location, which is used for the annual replenishment programme. This is a hazard that would need to be accounted for when considering the area as a landfall for export cable installation.

142. The offshore cable routes for this landfall would be required to pass through a number of designated sites in the near offshore environment, including those for seabed features. Specifically, the offshore export cable routes may be required to pass through the IDRBNR SAC and the Greater Wash SPA.

143. The landfall is situated adjacent to the wetlands south of Anderby Creek which are a designated local wildlife site, specifically Anderby Marsh Local Nature Reserve (LNR) and Wolla Bank LNR, whilst further south, the Sea Bank Clay Pits SSSI spans both sides of the main road. Any cable routes within this sector would need to be installed by trenchless drilling from the west side of Roman Bank to avoid any direct impact on the LNR, SSSI and sand dune ecosystems.

5.2.6.2 Engineering Considerations

144. Wolla Bank landfall features an open and low-lying sandy beach stretching for approximately 2km in length south of Anderby Creek. The landfall is backed by sand dune systems facing a relatively extended and flat agricultural land.

145. South of Anderby Creek across the Wolla Bank beach there is a distinctive seasonal shift in the foreshore width, the timing of this shift is affected by nourishment activities.

146. There is evidence of localised tidal ponds and groynes which appear to be covered by sand. The area behind the sand dune features a relatively extended sea bank with drains.

147. North of the landfall, in proximity to the boundary with Anderby Creek, there is an outfall pipe owned by the Environment Agency and marked with a permanent buoy.

5.2.7 Location 7 – LB-B13 and LB-B12

148. Sections LB-B13 and LB-B12 were originally classified as Black due to the extensive caravan parks situated landward of the coast and the associated constraints relating to available space for the TJB and onwards onshore routeing.

149. Site visits were made to sections LB-B12 and LB-B13 from the end of Trunch Lane by the Golden Anchor Holiday Park and a carpark by Lakeside Leisure. The landfall was characterised by a sandy beach backed by small sand dunes and a man-made sea wall.

5.2.7.1 Environmental Considerations

150. The sections are bounded by Chapel St Leonards to the north and the Butlins holiday resort to the south. The whole length of this section is backed by caravan parks landward of the

concrete sea wall. At the north of LB-B12, there appeared to be a gap in the caravan parks, with only a small number of caravans between the coast and arable land. However, from site visit observations, it was noted that there appeared to be continued development of this area. Furthermore, there are ponds which are possibly linked to drainage adjacent to the sea wall.

151. The area is not within any designated sites, however small sand dunes were present seaward of the sea wall and appeared to be stabilising.
152. The offshore cable routes for this landfall would be required to pass through a number of designated sites in the near offshore environment, including those for seabed features. Specifically, the cable routes may be required to pass through the IDRBNR SAC and the Greater Wash SPA.

5.2.7.2 Engineering Considerations

153. The landfall features an open and low-lying sandy beach in proximity of a residential area. The landfall features a limited area to locate the TJB, therefore if this landfall is shortlisted, the TJB compound will need to be located within a caravan park adjacent to the beach. Only Trenchless drilling installation would be feasible at this location due to the highly developed nature of this area, its public use and the presence of caravan parks

5.2.8 Location 8 – LA-1

154. Section LA-1 was classified as Amber, having a low scoring for engineering constraints, with the main environmental constraint being the presence of the Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC and Gibraltar Point SSSI.
155. A site visit was made to the north of the section, via a footpath from Seacroft Esplanade. The landfall was characterised by relatively extensive intertidal area with a very large dune system.

5.2.8.1 Environmental Considerations

156. The section is bounded by Skegness to the north and the boundary of the Wash SPA. Immediately landward of the dune system is a residential road and large residential properties, behind which is the Seacroft Golf Club.
157. The section is situated within the Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC and Gibraltar Point SSSI which is designated in part for the sand dune system.
158. The offshore cable routes for this landfall would be required to pass through a number of designated sites in the near offshore environment, including those for seabed features. Specifically, the cable routes may be required to pass through the IDRBNR SAC and the Greater Wash SPA.
159. This section is dominated by the presence of the Gibraltar Point area, designated as SSSI, SPA Ramsar and a National Nature Reserve (NNR). These areas are further constrained in the landward environment by Flood Zone 3 and the presence of a Source Protection Zone (SPZ) throughout as well as the presence of the coastal saltmarsh. There is no obvious route away

from the coast at this location that can avoid these designated sites.

5.2.8.2 Engineering Considerations

160. The landfall features a relatively large and extended muddy intertidal region with sufficient access to the beach from the southern direction. There is sufficient space to locate the TJB compound in the field behind Drummond Road, however, this will affect the Trenchless drilling pull in length, which may be beyond the design limit. Due to the coastal morphology and the presence of residential areas facing the landfall, it is unlikely that an open cut trench solution would be feasible. This would also result in a more complex onshore routing, due to the presence of the golf course and residential properties, which would increase the overall cost of installation.

5.3 Preferred Landfall Options

161. Following the BRAG analysis and site visits for the landfall appraisals, a number of landfall sectors were identified as preferred options for the various assumed grid connection options for the Project and therefore the focus for associated offshore and onshore cable routeing to the grid connection options being considered separately by the HND process, namely:

- Lincolnshire Node and Weston Marsh (Lincolnshire – sector LB):

Landfall sections LB-24 to LB-19 and LB-10 and LB-9 were all identified as preferred landfall locations for a connection at either the Lincolnshire Node or Weston Marsh locations being considered by the HND (and subsequently confirmed as the preferred options for the Project by the Pathway to 2030 HND report). These sections were all identified as having comparatively limited engineering and environmental constraints, with any constraints being considered to be localised and largely avoidable through the micro-siting of the landfall and associated works (e.g. small SSSIs or outfall pipes), with a high degree of optionality for the onwards onshore routeing towards either of the grid connection locations.

- Weston Marsh (south Lincolnshire – sector LA):

Landfall sector LA has a very limited number of feasible landfall options, with all of these being relatively highly constrained from both an engineering and environmental perspective. LA-1 is the only viable landfall option within this sector and would only be considered further for southern Lincolnshire connection options where more northerly options were deemed unfeasible due to either offshore or onshore cable routeing constraints.

5.4 Selection of the Project Landfall location and Offshore Cable Route

162. In July 2022, NGENO published the preliminary outcomes of the HND, which confirmed that two connection options remained under consideration for the Project; Lincolnshire Node and Weston Marsh.

163. Following confirmation from the HND, only landfall options and associated ECCs within landfall sector LB were considered suitable for a connection to either of the two grid connection

locations and were considered unlikely to result in potentially significant effects to designated sites at the landfall.

164. To ensure the most favourable export cable route was taken forward, considering engineering and environmental constraints, it was necessary to take a holistic approach to the selection of the preferred combination of landfall and offshore export cable route.
165. Export cable routes L3 and L4 (Figure 4.5 (document reference 6.2.4.5) and Figure 4.6 (document reference 6.2.4.6)) respectively both provide for connections to all of the LB sector landfalls, however, L3 results in a comparatively reduced overlap with the IDRBNR SAC and as such was identified as the preferred option to that landfall sector, following confirmation of export cable route L2 being unfeasible due to the engineering and siting challenges (See section 6).
166. Whilst export cable route L3 allows for connection to all landfall options within sector LB, the majority of the cable deviations to the northerly landfalls in the sector would require crossing the existing Triton Knoll offshore wind farm export cables and the Viking Link subsea interconnector cables in the nearshore area. Due to the shallow bathymetry of this area, it was considered that these crossings would be a high risk from a consenting perspective, as well as being a commercial constraint with regard to the need to instigate crossing agreements with the asset owners.
167. The two preferred landfall options within sector LB, LB-9 and LB-10, were scored as being of a relatively low constraint for both engineering and environmental factors, however, option LB-10 (Wolla Bank) provides benefits over LB-9 by being sufficiently large to enable avoidance of the SSSIs at the landfall and onshore.
168. Therefore, the combination of the L3 export cable route with the landfall section LB-10 was identified as the most feasible routeing option for the Project.
169. Following publication of the preferred offshore cable route several minor refinements were made to the route to ensure no overlap with existing assets or areas with seabed rights from TCE. This refinement process has been informed by consultation feedback and engagement with relevant asset owners and operators. This included the addition of an additional route option to the south of L3, following engagement with TCE and Hanson in relation to aggregate area 1805. This additional ECC and ORCP area was presented at PEIR and is shown in Figure 4.10 (document reference 6.2.4.10).

6 Component 3 – Identification of the Offshore ECC Route Options

6.1 Overview

170. Export cable routing for the Project has been broadly considered at a high level through a number of third-party studies; specifically, and at a conceptual level, by the Round 4 Plan-Level HRA process and as part of the HND process. The study area for the Project's offshore ECC routing has been informed by the study areas developed for offshore ECC routing by both the Round 4 Plan-Level HRA and the HND and through the ongoing discussions with NGENSO over the developing grid connection options as the HND study progressed.
171. As a consequence of the high degree of optionality for potential grid connection options identified at the start of the HND process, and consequent evaluation of the landfall options for the Project, a number of landfall "sectors" were delineated to enable targeted and robust offshore ECC optioneering to take place (see section 4.5 above for details of preferred landfall sectors). These preferred landfall sectors were each selected to enable routing to specific grid connection options being considered by the HND (at the time connections in both Yorkshire and Lincolnshire were still being evaluated by the HND), based on proximity to the connection points, with the intention that excessively long onshore cable routes and associated impacts on communities were avoided.
172. A single study area for the Yorkshire coast landfall options and the Lincolnshire coast options was considered with the detailed assessment and methodology included in Appendix 6.2.4.1. This section outlines the assessment relating to the Lincolnshire coastline which, for purposes of assessment was split into three sectors: LA, LB and LC. Only Sectors LB and LA were considered for landfall options for the Project once the grid connection options were confirmed at Weston Marsh and therefore only the assessment on these sectors have been included in this chapter. The full assessment of all the Offshore ECC routes assessed for the project prior to the outcomes of the HND being published can be found in Appendix 6.2.4.1.

6.1.1 Lincolnshire

173. Five offshore export cable corridor options were identified to the preferred landfall options identified on the Lincolnshire coastline for the Weston Marsh and Lincolnshire Node connection options; these were split between the landfall sectors LA and LB (Figure 4.3 (document 6.2.4.3)). The routing to the Lincolnshire landfall sectors was highly constrained in particular by a combination of the Inner Dowsing, Race Bank and North Ridge SAC, known wrecks, other marine users and the Inner Silver Pit bathymetric feature.
174. The analysis of the export cable corridor options, comprising consideration of the engineering feasibility and the environmental constraints, is presented in the following sections.

6.2 Lincolnshire Route Analysis

6.2.1 Lincolnshire 3 (L3)

175. This offshore export cable route corridor was designed to reach landfalls which would be appropriate for onward routing to a grid connection location at or in the vicinity of either the Lincolnshire Node or Weston Marsh. This offshore export cable route option is up to approximately 80km and has a maximum water depth of approximately 35m and is shown in Figure 4.5 (document reference 6.2.4.5).

6.2.1.1 Designated Sites

176. Offshore export cable route option L3 passes through the IDRBNR SAC. In defining the proposed route corridor, any known areas of *Sabellaria spinulosa* reef were mapped and avoided; however, it was not possible to fully avoid the sandbank features of the site, with part of the North Ridge sandbank at the eastern extent of the SAC being unavoidable for this route. At the western edge of the SAC, there are two offshore export cable route sub-options that have been designed to meet the landfall deviations, with these sub-options having been developed to potentially avoid the presence of an aggregates dredging licence option and exploration area (known as aggregates area 1805). Where a Marine Licence application is not submitted by the operator prior to the expiry of the Option agreement, it may be possible to avoid the Inner Dowsing sandbank by routing through the aggregate area. However, in the event that it is not possible to route through the aggregates option area, it would be necessary to also cross the Inner Dowsing sandbank at the western edge of the SAC.

177. Whilst the L3 export cable route option has been designed to avoid any known areas of *Sabellaria spinulosa* reef within the SAC, it is nonetheless recognised that it is possible that there will be areas of confirmed or potential biogenic reef identified prior to construction beyond those currently known/mapped. To provide sufficient flexibility for the Project to avoid impacts to this feature, a 2km cable corridor is proposed to allow for micro-siting of cable routes around identified areas of reef.

178. The L3 export cable route option also crosses the Greater Wash SPA, which cannot be avoided should this route option be taken forward. However, the route passes through an area of lower density for both red-throated diver and common scoter.

6.2.1.2 Non-Designated Sensitive Habitats

179. Export cable route L3 passes through the Banks herring ground. Whilst there is overlap with the historical spawning ground, recent data from IHLS suggests that active spawning grounds are situated to the east and north of Flamborough Head. Nonetheless, any percussive piling from the installation of an ORCP within the export cable route corridor, may lead to concerns over impacts on spawning herring.

180. Natural England has advised that other projects that have been developed off this part of the Lincolnshire coast have identified extensive areas of geogenic reef. It is likely that some

potential reef would be recorded along the L3 offshore export cable route option (within and outside the IDRBNR SAC). As habitats protected under the Natural Environment and Rural Communities Act 2006, best efforts would need to be made to avoid these habitats, both within and outside any designated sites, which could constrain the offshore export cable route. It is likely that some reef could be recorded along the L3 route option; therefore, a 2km width cable corridor is proposed to provide sufficient flexibility to avoid such features through micrositing of the cable within the corridor.

6.2.1.3 Other Marine Users

181. One of the deviations for this offshore export cable route overlaps with the corner of a marine aggregate exploration and option lease area (Area 1805) which it is understood is due to apply to the MMO for a Marine Licence in quarter one of 2024 (TCE, pers comm, 2023). If the option is not progressed by the option lease holder, this would not then be a constraint on the Project routing offshore export cables through this area. If the option is progressed, it is possible that the overlap area would not be progressed to licensing (e.g., if it was shown the area was not a focus for the aggregates resource) or that the route could be micro-sited around this lease area.
182. The aggregate option lease area also overlaps with an inactive disposal site, which the L3 export cable route option would also pass through. This disposal site may pose some constraint on the potential designation of the cable route as disposal areas for use by the Project during construction as it is understood that overlap between disposal areas is not permitted.
183. The proximity of the offshore export cable route corridor to the existing Race Bank and proposed Dudgeon Extension offshore wind farms increases the likelihood of higher vessel traffic within the region.
184. The two more northerly landfall options (LB32 and LB19) would require relatively nearshore crossings of existing subsea cables (i.e., the Triton Knoll offshore wind farm export cable and the Viking Link subsea interconnector cables). For this reason, the southern deviation to LB 9 and LB10 at Wolla Bank is preferred. Please refer (Figure 4.3 (document reference 6.2.4.3) to see the landfall location options.

6.2.1.4 Cable Installation and Technical Risks

185. Whilst most wrecks and seabed obstructions are located outside of the buffer zone around the route corridor, in some of the most congested zones, the wrecks and obstruction do lie near the boundaries of the buffer zone. However, the minimum distance between the export cable route centreline and the nearest wreck is around 700m, which is a substantial distance and therefore wrecks are not considered to be a major constraint. The proposed 2km cable corridor width allows for sufficient micrositing to avoid any archaeological exclusion areas which may be defined.
186. The offshore export cable route corridor has a relatively small number of crossings with other existing seabed assets but, for large sections, it lies in relatively close proximity to existing

subsea pipelines.

187. Some areas are relatively shallow and may mean that extra precaution needs to be taken with cable installation vessel selection (shallow draught, ability to ground, etc.) and/or timing of installation relative to tidal heights.

6.2.2 Lincolnshire 4 (L4)

188. The L4 offshore export cable route option was designed to reach landfalls which would be appropriate for onwards routing to a grid connection location at or in the vicinity of either the Lincolnshire Node or Weston Marsh connections. This offshore export cable route option is up to approximately 90km in length and has a maximum water depth of approximately 30m and is shown in Figure 4.6 (document reference 6.2.4.6).

6.2.2.1 Designated Sites

189. Offshore export cable route option L4 passes through the IDRBNR SAC. This offshore export cable route was designed to avoid any known areas of *S. spinulosa* reef; however, due to this route aiming to avoid the constrained routing to the north of Race Bank offshore wind farm and in order to reach the LB landfalls, this export cable route option does cross the SAC sandbank features.
190. Whilst the L4 export cable route option has been designed to avoid any known areas of *S. spinulosa* reef with the SAC, it is recognised that it is possible that there will be areas of biogenic reef identified prior to construction. To provide sufficient flexibility for the Project to avoid impacts to this feature, a 2km cable corridor is proposed to allow for micrositing of cable routes around identified areas of reef.
191. The L4 export cable route option also crosses the Greater Wash SPA, which cannot be avoided should this route option be taken forward. However, the route passes through an area of lower density for both red-throated diver and common scoter.

6.2.2.2 Non-Designated Sensitive Habitats

192. The offshore export cable route crosses the Docking Shoal sandbank which, whilst not designated or part of the IDRBNR SAC, is an extensive sandbank of environmental interest and impacts to this sandbank may have the potential to give rise to indirect effects to designated sites in the wider area.
193. Offshore export cable route option L4 also passes through the Banks herring ground. Whilst there is overlap with the historical spawning ground, recent data from the IHLS suggests that active spawning grounds are situated to the east and north of Flamborough Head. Nonetheless, any percussive piling from the installation of an ORCP within the export cable route corridor, may lead to concerns over impacts on spawning herring.
194. Natural England have advised that other projects developed off this part of the Lincolnshire coast have identified extensive areas of geogenic reef within the nearshore region. It is possible that some reef would be recorded along the L4 export cable route option (within

and outside the IDRBNR SAC). As habitats protected under the Natural Environment and Rural Communities Act 2006, best efforts would need to be made to avoid these habitats, both within and outside any designated sites, which could constrain the final export cable route. It is likely that some reef could be recorded along the L4 export cable route option; therefore, a 2km width cable corridor is proposed to provide sufficient flexibility to avoid through micro-siting of the cable within the cable route corridor.

6.2.2.3 Other Marine Users

195. This offshore export cable route option requires a crossing of the Race Bank offshore wind farm cables on the Docking Shoal sandbank feature. Due to the shallow nature of this area, it is considered likely that this may pose a concern for navigational depth around the crossing, with a requirement to consult with MCA over any resulting navigational risk.
196. The proximity of the route to the Race Bank and Dudgeon Extension offshore wind farms also increases the likelihood of higher vessel traffic within the region.
197. The two more northerly landfall options (Landfall 32 and Landfall 19) would require relatively nearshore crossings of existing subsea cables (i.e., the Triton Knoll offshore wind farm export cables and the Viking Link interconnector cables). For this reason, Landfall 9 and Landfall 10 are preferred.

6.2.2.4 Cable Installation and Technical Risks

198. The area south of the Project array area is generally less congested with wrecks and seabed obstructions and this is therefore not as much of a primary driver in the routing as most of the other routes under consideration. For the most part, the route has plenty of space to micro-site the cable within the broader route corridor.
199. The biggest risk for this export cable route is considered to be the occasional sections of relatively shallow water depths that may cause accessibility difficulties that will restrict cable installation vessel selection.

6.2.3 Lincolnshire 5 (L5)

200. This offshore export cable route option was designed to reach a landfall which would be appropriate for onward routeing to a grid connection location at or in the vicinity of Weston Marsh. This offshore export cable route option is up to approximately 85km in length and has a maximum water depth of approximately 35 and is shown in (Figure 4.7 (document reference 6.2.4.7)).

6.2.3.1 Designated Sites

201. Offshore export cable route option L5 passes through the IDRBNR SAC. The route was designed to minimise cable route distances to reach the LA landfall sector; this offshore export cable route crosses the sandbank features of the SAC and passes through an area of known *S. spinulosa* reef in the nearshore region. Whilst it is currently assumed that much of this known reef could likely be avoided through micro-siting of the cable route, it is possible that, due to

the density of the known reef combined with the potential for further reef areas to be identified in site characterisation surveys, it may not be possible to avoid cables installation through some reef features. Whilst *S. spinulosa* reef can recover within a relatively short timescale, installation through these features and particularly placement of cable protection where this was necessary, may give rise to a further risk of adverse effects and a requirement for derogation.

202. The landfall location (LA sector) for the L5 export cable route option is located within the Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC, which is designated at Gibraltar Point for the extensive sand dune systems. These sand dunes will pose limitations on the offshore export cable installation method available at these landfalls, with the dune system at Gibraltar Point (the LA landfall) being hundreds of metres in length.
203. The L5 export cable route option also crosses the Greater Wash SPA, which cannot be avoided. The L5 export cable route option passes through an area recorded as supporting a medium to high density of common scoter and a high intensity area for red-throated diver.

6.2.3.2 Non-Designated Sensitive Habitats

204. Offshore export cable route option L5 also crosses the Docking Shoal sandbank which, whilst not designated as part of the IDRBNR SAC, is an extensive sandbank of environmental interest and impacts to this sandbank may have the potential to give rise to indirect effects to designated sites in the wider area.

6.2.3.3 Other Marine Users

205. This export cable route option requires a crossing of the Race Bank offshore wind farm cables on the Docking Shoal feature. Due to the shallow nature of this area, it is considered likely that this may pose a concern for navigational depth around the crossing, with a requirement to consult with the MCA over any resulting navigational risk.
206. The proximity of the offshore export cable route to the Race Bank and Dudgeon Extension offshore wind farms increases the likelihood of higher vessel traffic within the region.

6.2.3.4 Cable Installation and Technical Risks

207. The area south of the Array area is generally less congested with wrecks and seabed obstructions and is therefore not so constrained in terms of offshore export cable routing compared to other route options.
208. The biggest risk for this offshore export cable route is the presence of shallow water depths, especially in the approaches to the landfall and at Burnham Flats. As a result large sections of the offshore export cable route are likely to need shallow draught vessels such as Cable Lay Barges rather than more conventional cable laying vessels. Potentially, the vessel may also need to be able to ground at low tide which would severely limit the operating window for cable installation.

6.2.4 Lincolnshire 6 (L6)

209. This offshore export cable route option was designed to reach a landfall which would be

appropriate for onward routeing for a grid connection location at or in the vicinity of Weston Marsh. This offshore export cable route option is up to approximately 95km in length and has a maximum water depth of approximately 35m and is shown in (Figure 4.8 (document reference 6.2.4.8)).

6.2.4.1 Designated Sites

210. Offshore export cable route option L6 passes through the IDRBNR SAC. The offshore export cable route option was designed to avoid any sandbanks within the SAC by routing around the eastern edge of the SAC; however, it is not possible to avoid the nearshore area of known *S. spinulosa* reef at the south-western extent of the SAC on the approach to the landfall. Whilst it is currently assumed that much of this known reef could likely be avoided through micro-siting of the cable route, it is possible that, due to the density of the known reef and combined with the potential for further reef areas to be identified during characterisation surveys, it may not be possible to avoid cable installation through areas of reef. Whilst *S. spinulosa* reef can recover within a relatively short timescale, installation through these features, including the necessity to deploy cable protection, may give rise to a further risk of adverse effects and a requirement for derogation.
211. The landfall location (LA sector) for the L6 export cable route option is located within the Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC, which is designated at Gibraltar Point for the extensive sand dune systems. These sand dunes will pose limitations on the installation method available at these landfalls, with the dune system at Gibraltar Point (the LA landfall) being hundreds of metres in length.
212. The L6 offshore export cable route option also crosses the Greater Wash SPA, which cannot be avoided. The L6 export cable route option passes through an area supporting a medium to high density of common scoter and a high intensity area for red-throated diver.

6.2.4.2 Non-Designated Sensitive Habitats

213. Offshore export cable route option L6 also crosses the Docking Shoal sandbank which, whilst not designated or part of the IDRBNR SAC, is an extensive sandbank of environmental interest and impacts to this sandbank may give rise to indirect effects to designated sites in the wider area.

6.2.4.3 Other Marine Users

214. This offshore export cable route option also requires a crossing of the Race Bank offshore wind farm export cables on the Docking Shoal feature. Due to the shallow nature of this area, it is considered likely that this may pose a concern for navigational depth around the crossing, with a requirement to consult with the MCA over any resulting navigational risk.
215. The proximity of the offshore export cable route to the Race Bank and Dudgeon Extension offshore wind farms also increases the likelihood of higher vessel traffic within the region.

6.2.4.4 Cable Installation and Technical Risks

216. The area south of the Array area is generally less congested with wrecks and seabed obstructions and is therefore not so constrained in terms of offshore export cable routing compared to other route options.
217. The biggest risk for this offshore export cable route is the presence of shallow water depths, especially in the approaches to the landfall and at Burnham Flats. As a result large sections of the offshore export cable route are likely to need shallow draught vessels such as Cable Lay Barges rather than more conventional cable laying vessels. Potentially, the vessel may also need to be able to ground at low tide which would severely limit the operating window for cable installation.

6.2.5 Preferred Offshore Routes

218. Following the evaluation of the engineering and environmental constraints for the various identified offshore export cable routes, the potential offshore route corridors were compared to identify the preferred route options to each of the landfall sectors (and corresponding to the various grid connection options that were being considered by the HND at the time of the route evaluation process):

- Lincolnshire – LC sector:
 - Export cable route L1 was identified as the preferred option to the LC landfall options. However, the northerly deviation to the northerly landfalls was considered to be unviable due to the interaction with the Humber Estuary TSS. The deviations to the more southerly landfalls were deemed to be potentially viable, although the nearshore sections of the export cable routes were likely to be highly constrained due to the shallow bathymetry and the fact that the offshore export cable route would require a number of crossings of significant existing subsea infrastructure.
 - Export cable route L2a was considered not feasible as a route to the landfalls in the LC sector due to the technical challenges of routeing through the Inner Silver Pit.
- Lincolnshire – LB sector:
 - None of the identified export cable routes to the LB landfall sector avoid the IDRBNR SAC, however each has different degrees of overlap with the site and the various designated features.
 - Export cable route L2b passes through the centre of the Inner Silver Pit and was not considered feasible for cable installation; this route also passes through an area of known *S. spinulosa* reef within the IDRBNR SAC. Due to the engineering constraints within the Inner Silver Pit, export cable route L2b is not considered feasible.
 - Export cable routes L3 and L4 both pass directly through the IDRBNR SAC, crossing the sandbank features of the site to varying degrees. L3 provides for the shortest export cable route through the SAC and the least overlap with the sandbank features compared to L4. As such, L3 is considered to be the preferred offshore export cable route to landfall section LB, with the deviation to the southern landfall options

(landfalls LB9 and LB10) being preferred due to this option avoiding any nearshore cable crossings. Landfall 10 is preferred over Landfall 9 due to the greater avoidance of the coastal SSSIs.

- Lincolnshire – LA sector:
 - Export cable route L6 is the preferred route to reach landfall sector LA due to the avoidance of any overlap with the sandbank features of the SAC, albeit both L5 and L6 export cable routes unavoidably cross through a known area of *S. spinulosa* in the nearshore part of the SAC. The length of export cable route L5 and L6 may also restrict the transmission options for the Project and the crossing of the Race Bank offshore wind farm export cables on the Docking Shoal may also pose some risks. In addition, the landfall is significantly constrained by environmental designations at the coast.

7 Component 4 Offshore Refinements

7.1 Array area refinement

219. Considering the need for the Applicant to reduce the spatial extent of the array area prior to construction (post consent) in accordance with The Crown Estate's Minimum Power Density requirements, following PEIR and further stakeholder engagement, the Project AfL array area was refined to reduce potential impacts on shipping and navigation receptors and ornithological receptors as shown in Figure 4.9 (document reference 6.2.4.9).
220. The AfL array area was adjacent to and overlapped with two separate shipping routes which run between the Humber and Cuxhaven (Germany). The busier of these routes runs to the north of the AfL array area, with the lesser used route running through the northern section of the AfL array area. During consultation with shipping and navigation stakeholders, concerns were raised around a need for these routes to deviate further north, noting that following the construction of Hornsea Three OWF to the east of the Project, these same routes would then require to deviate south of the Hornsea Three OWF boundary.
221. Following the completion of the first 24 months of digital aerial survey of the AfL array area and 4km buffer to inform the ES, it was identified that the density of guillemot is highest along the northern boundary, particularly during the months with peak abundances. This distribution pattern was confirmed using both design based abundance estimates as well as model based estimates (as detailed in Volume 3, Chapter 12: Intertidal and Offshore Ornithology Technical Baseline (document reference 6.3.12.1)). The model based estimates in particular showed the highest distribution of guillemot to be positioned to the north-east corner of the AfL array area. No other such clear patterns were identified for other ornithological receptors, including species such as kittiwake, which showed a broadly even distribution across the site, often following the presence of sandbanks.
222. In cognisance of the concerns raised by shipping and navigation stakeholders regarding the future squeeze on available searoom to the north of the AfL array area, and taking note of the high density areas of guillemot, the northern boundary was reduced, with the north-eastern corner reduced further than on the western edge, to create a more sloped angle. This sloped boundary follows the current vessel route running along the northern boundary of the array area and reduces the angle of turn for any vessels sailing along that route once Hornsea Three is also built out, whilst also reducing the overlap from the array area with the highest densities of guillemot. Figure 4.14 (document reference 6.2.4.14) shows the array area and other offshore elements of the Project.

7.2 Offshore Export Cable Corridor and ORCP area refinement

223. Following PEIR and further technical consultation with relevant stakeholders several minor refinements were made to remove areas from the offshore ECC and ORCP areas, the revised ECC and ORCP areas are show in Figure 4.11 (document reference 6.2.4.11)

Part of the ECC and ORCP was removed to reduce the spatial extent of the overlap between the ECC, southern ORCP area and aggregate area 1805. Part of the ECC was removed to avoid a spatial overlap with aggregate area 515/1. Further minor refinements were also made to avoid any spatial overlap with Race Bank OWF and Triton Knoll export cable assets. An assessment of the impacts of the Project on these assets is presented in Volume 1 Chapter 18 Infrastructure and Other Marine Users.

224. The northern ORCP area has been reduced to maintain a minimum 0.5nm setback from commercial shipping routing to the east. An assessment of the impacts of the Project on shipping and navigation is presented in Volume 1 Chapter 15 Shipping and Navigation. Figure 4.14 (document reference 6.2.4.14) shows the Offshore ECC and ORCP areas and other offshore elements of the Project.

7.3 ANS Area refinement

225. Following PEIR, the spatial extent of the northern ANS area was reduced to avoid overlap with the areas being explored by Hornsea Four for their structure. Following confirmation of the final Hornsea Four structure location this area was also removed. The ANS areas as assessed within the ES remain equally suitable based on the ecological criteria used for the initial site selection, with the refinements facilitating coexistence with other developers. The ANS areas are shown in Figure 4.12 (document reference 6.2.4.12).

7.4 Biogenic Reef Area refinement

226. Following publication of the PEIR, a habitat suitability mapping exercise was undertaken on the search area as presented in PEIR, for both native oyster and blue mussel reef (as presented in Document 7.6: Benthic Compensation Strategy (document reference 7.6)). Following identification of the most ecologically suitable areas for oyster or mussel reef creation. The areas were refined to avoid overlap with existing designated features of the Inner Dowsing, Race Bank and North Ridge SAC, namely the sandbank and *S. spinulosa* reef (including areas to be managed as reef and byelaw areas). Following this, overlap with existing infrastructure, such as other OWF assets, cables and pipelines were removed.
227. Finally, the areas to be put forward for reef creation as part of the ES were rationalised to create distinct areas. The biogenic reef areas are shown in Figure 4.13 (document reference 6.2.4.13).

7.5 Offshore Design Refinements

228. Following PEIR the project made several offshore design refinements that were presented in the autumn consultation.
229. Following a supply chain review, and to ensure the Project remains deliverable, the maximum number of WTGs was increased from 93 to 100 so that the Maximum Design Scenario presented in this Environmental Statement incorporates the size and scale of WTGs expected to be available to the Project.

230. In response to feedback received from stakeholders the Project undertook a review of the design parameters for Gravity Base System (GBS) foundations, including a review of available geophysical and geotechnical data. The Project has therefore been able to reduce the number of GBS foundations from 100% of all foundations to a maximum of 50% of foundations for WTGs and offshore platforms.
231. To minimise the impacts of the Project on bird species the Project has embedded a minimum blade tip height of 40m above Mean Sea Level (MSL). The assessment of impacts from the Project on birds is presented in Volume 1 Chapter 12 Offshore and Intertidal Ornithology (document reference 6.1.12).

8 Component 5 – Identification of the Onshore Substation (OnSS) Site & 400kV cable corridor

8.1 Overview

232. As noted in Section 1.2, the location of grid connection options, and therefore the areas of search for the OnSS were dictated by the preliminary results of the OTNR as published in the HND Report by National Grid ESO (NGESO, 2022). The Applicant therefore progressed the evaluation of substation sites in line with the connection options proposed by National Grid, Lincolnshire Node (northwest of the preferred Wolla Bank landfall) (Landfall 10)) and Weston Marsh (to the south of Boston).
233. Following the publication of the HND in August 2023 the Applicant received confirmation from the NGESO that the confirmed grid connection for the Project would be at Weston Marsh. This confirmation came after the publication of the Project’s PEIR and therefore, at this point the Project issued a Press Release and were able to confirm that the Lincolnshire Node connection option for the Project would no longer be pursued.
234. Subsequently, the following sections refer only to the site selection and consideration of alternatives in relation to the Weston Marsh Connection Option (See Section 3 for more information).

8.2 Initial Search Area Key Criteria

235. Prior to reviewing potential sites, a number of key factors were considered in order to first identify a suitable search area for the OnSS for the grid connection location at Weston Marsh. The initial basis for this definition was based upon the information available with respect to the Maximum Design Parameters of the OnSS as defined at PEIR stage (Outer Dowsing Offshore Wind, 2023). Table 8.1 outlines the key criteria for defining the initial OnSS search zone for the Weston Marsh Connection Option.

Table 8.1 Criteria defining the Initial OnSS Search Area

Key Information	Weston Marsh Connection Option
Grid Connection Information available and basis of evaluation	Results of the HND and subsequent communications between ODOV and National Grid refer to the location “Weston Marsh” where there is existing overhead line structures.
Proximity to National Grid substation (NGSS) to connect into the National Grid Transmission System. The Applicant’s OnSS would need to connect into the NGSS that would be sited in the vicinity of the confirmed grid connection location. This connection would be facilitated by	The understanding at this stage, was that the Project would connect into the grid at a location in the vicinity of the “T Junction” of the overhead lines at Weston Marsh (see Figure 4.15 (document reference 6.2.4.15)). The Applicant therefore adopted an initial search area

Key Information	Weston Marsh Connection Option
400kV underground cables.	metric of c.3.5km ¹⁴ ; which was determined by technical and efficiency constraints and relevant environmental factors.

236. While the exact position of the NGSS was, and is at the time of writing, not yet known, it is understood that it will be in close proximity to the overhead line T-junction at Weston Marsh (within an indicative search area now defined by the Project as the ‘Connection Area’ (See Section 8.6.2 and Figure 4.18 (document reference 6.2.4.18)). The initial search area was identified by a maximum distance from the T-junction (Table 8.1).
237. The Applicant initially selected an area of search to achieve a 400kV connection (i.e. the underground cables between the OnSS and the NGSS) that was technically deliverable both during construction and the operation period and took into account environmental & preservation of amenity considerations as required by the Project Generation Licence (Schedule 9 of the Electricity Act 1989).
238. Increasing the distance of the 400kV connection outside of the search area radius of 3.5km has implications for the maximum power transfer that can be achieved and the quantity of reactive compensation equipment required.
239. This initial search area was then interrogated to ensure the deliverability of the overall electrical system. The key constraints were:
- The electrical system -
 - This is a key contributing factor to the viability of sites in relation to the length of the entire electrical system (inclusive of the 275kV and 400kV cable from the Offshore Array Area to the Connection Point); this led to a refinement of the search area, which in particular constrained the search area to the south and south west of the T junction (Figure 4.16 (document reference 6.2.4.16)).
 - The length of the overall electrical transmission system is at the bounds of what has been achieved across the offshore wind industry to date. It was determined that increasing the length of the onshore component of the system beyond 64km would create material technical risks with any mitigations materially increasing the components and Project footprint, and therefore the environmental impact.
 - Potential for micrositing -
 - It was considered important to identify sites that allowed adequate micrositing to overcome constraints that arise during detailed site investigation and design.
 - Furthermore, sites must be able to respond to electrical requirements in terms of cable entry routes and electrical compound layouts as well as existing constraints

¹⁴ This search radius is in line with that utilised by recent Offshore Wind Developments of a similar nature (with a linear cable route) such as; Hornsea Project Four (3km), Sheringham and Dudgeon Extension projects (3km); and Awel Y Mor (3km).

such as existing overhead lines, railways and high pressure gas mains and associated buffers.

8.3 Flood Risk

8.3.1 The Sequential Test (OnSS)

240. As set out within National Policy Statement (NPS) EN-1 (and discussed in the NPPF and guidance to which EN-1 refers¹⁵) flood risk is a key consideration in the decision-making process for all types of development. When developing new infrastructure, projects must demonstrate that a sequential approach to site selection has been taken (the 'Sequential Test'). Under section 5.8, and specifically 5.8.10, the Applicant requires to consider whether there are reasonably available, lower risk sites appropriate for the development which would not present a clear reason for refusing development:

“The Exception Test is only appropriate for use where the Sequential Test alone cannot deliver an acceptable site. It would only be appropriate to move onto the Exception Test when the Sequential Test has identified reasonably available, lower risk sites appropriate for the proposed development where, accounting for wider sustainable development objectives, application of relevant policies would provide a clear reason for refusing development in any alternative locations identified”.

241. Where this is not possible, it is necessary for the development to demonstrate that it can operate safely during flood conditions, for the whole of its design life, whilst not increasing the risk of flooding to other areas and including measures to reduce flood risk where possible. This process is known as the 'Exception Test', under which two elements require to be fulfilled: (a) the project would provide wider sustainability benefits to the community that outweigh flood risk; and (b) the project will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible will reduce flood risk elsewhere.

242. As shown in Figure 4.16.1 (document references 6.2.4.16) the area within the vicinity of the connection point is characterised by Flood Zones 3, with only a small number of pocket areas which are designated as Flood Zone 1 and 2. There were no sites large enough of flood zone 1 and 2 to accommodate the OnSS in its entirety. Each of the pocket areas were reviewed, and in comparison to the adopted site, were either considered to have a higher flood risk due to their proximity to the River Welland (and therefore at higher flood risk in a breach scenario); or, were unable to accommodate the OnSS due to size constraints.

243. The Applicant, while not able to wholly apportion their site on flood risk zone 1 or 2, continued to consider the small pockets of lower flood risk while also consulting supporting data and materials to aid in a site definition with the best possible flood resilience and did

¹⁵ EN-1 refers at 5.8.16 to guidance including the Planning Practice Guidance Flood Risk and Coastal Change section. Chapter 4 Site Selection and Consideration of Alternatives
Environmental Statement
Document Reference: 6.1.4

identify a suitable site partially in flood zone 2.

244. The Sequential Test is considered to have been passed, without identifying any reasonably available, lower risk sites appropriate for the proposed development, and the next stage of the process was to identify a suitable site which can be developed whilst meeting the requirements of the exception test.

8.3.2 Flood Resilience

245. The Applicant consulted the Long-Term Flood Risk Maps (Figure 4.16.2) produced by the Environment Agency¹⁶; while these maps show the sensitivity of areas to flooding, they are modelled to include the flood defences (unlike the Flood Zone maps). They are still considered supportive and relevant and demonstrate that the adopted site is at low risk of long-term flooding.
246. A detailed Flood Risk Assessment (FRA) for the adopted site for the OnSS has been undertaken in consultation with the Environment Agency and can be found in ES Chapter 24 Hydrology and Flood Risk, Appendix 3 (document reference 6.3.24.3). This includes bespoke modelling of flooding scenarios, included in Annex 1 of the FRA.
247. The Exception Test has been applied and passed through the completion of detailed hydraulic modelling of the OnSS site as reported in the FRA (document 6.3.24.3). As the site is in an area which is benefiting from existing flood defences, the modelling considered both the residual risk of overtopping the defences, and breach of the defences during the 1 in 1,000 years (0.1% AEP) plus climate change flood event.

8.4 Best and Most Versatile Agricultural Land

248. Planning policy also highlights the importance of food security¹⁷ in the UK, and the need to preserve the Best and Most Versatile (BMV) agricultural land.
249. At Weston Marsh, all land within a c.6km radius of the National Grid T-Junction is classified as Agricultural Land Classification (ALC) Grade 1, the highest and most valuable grading. As such, applying the search area as defined in Section 8.2 Table 8.1, all land in this search area is ALC grade 1 and therefore could not be avoided when identifying potential OnSS locations at Weston Marsh.

8.5 The OnSS Search Zone and Study Areas

250. Weston Marsh is an area defined by flat agricultural land to the south of Boston and to the northeast of Spalding. It is an area dominated by agriculture, with a series of 400kV National Grid transmission towers and overhead lines that pass across the area from the existing Bicker Fen Substation to the existing Walpole Substation, and also serving Spalding Power Station and

¹⁶ <https://www.gov.uk/check-long-term-flood-risk>

¹⁷ UK Government Food Strategy (Defra, 2022)

400kV Substation.

251. Following the search criteria as defined in Section 8.2, the next phase was to identify potentially developable sites that met the further key principles established by the Applicant:
- Providing an area of land large enough to meet the requirements of the Project OnSS, with a footprint of 144,000m² (14.4Ha)¹⁸ and ability to accommodate micro-siting and mitigation as required following detailed design;
 - As far as possible, free from environmentally sensitive receptors; and
 - Not within 200m of any occupied building.
252. Following application of the above principles as well as undertaking a series of workshops with representatives from all of the relevant environmental specialisms, together with the consents team, engineers, and land specialists, a short list of potential OnSS site areas were identified.
253. For the purposes of assisting in the analysis of the shortlist, a scoring system was applied to the site areas and the sum of the scores was ranked and used to establish an overall comparative ranking for each option to help inform which site(s) should be taken forward for further consideration (Table 8.2).
254. It should be noted that while the ranking and sifting exercises help to highlight the key areas of consideration for each of the sites; the overall process took a holistic view of the results of this analysis alongside site visits to ground truth and professional judgement. The workshops are therefore key to this process to ensure that the Applicant demonstrates due regard to the constraints and considerations for each site as a whole and in the wider context of the Project's overall footprint.

¹⁸ At PEIR Stage (Phase 2 Consultation) the anticipated OnSS footprint was 80,000m² (8Ha). This was increased as part of the Autumn Consultation Phase. As part of the Project's grid connection confirmation in August 2023; the number of substation bays that will be available to the Project was refined from that which was previously anticipated. To reduce the number of feeding circuits, the Project needed to increase the number of connection bays at the OnSS thus expanding the footprint required.

Table 8.2 Table Ranking of OnSS site options

OnSS Option	Rank**	Score*									
		Air Quality	Archaeology and Cultural Heritage	Ecology and Ornithology	Geology and Ground Conditions	Hydrology and Flood Risk	Land Use	Noise and Vibration	Traffic and Transport	Landscape and Visual Assessment	Planning
OnSS WM 1	5	5	2	2	3	2	1	1	3	3	5
OnSS WM 2	3	5	3	2	5	2	1	3	4	3	5
OnSS WM 3	4	5	2	4	4	2	1	1	3	1	5
OnSS WM 4 WM south 'Weston Marsh'	2	5	5	3	4	3	2	3	3	4	4
OnSS WM 5 WM north 'Surfleet Marsh'	1	5	4	5	4	4	2	4	5	5	5

*Score system 1- Likely to result in adverse significant adverse effects (Unlikely to be readily mitigated), 2 – Likely to result in adverse significant effects (Mitigatable), 3- Likely to result in Moderate Adverse effects (Mitigatable), 4- Likely to result in Minor Adverse effects (Mitigatable), 5- Likely to result in Negligible effects.

**Rank – The Scores were then summed and ranked showing 5 – least favorable and 1 – most favorable.

255. As shown in Table 8.2, the site that performed best in relation to the scoring exercise was OnSS WM 10 (known later to the Project as 'Weston Marsh') and OnSS WM north (known later to the Project as 'Surfleet Marsh' – the adopted site).

256. Following this appraisal two study areas were taken forward for the PEIR and are presented in Figure 4.17 (document reference 6.2.4.17). These study areas took consideration of the additional footprint that might be required to facilitate the Project's connection into the National Grid transmission system as well as that required mitigation, micro-siting and for temporary construction works and access.

8.6 Selection of the OnSS Site

8.6.1 Overview

257. Following the Phase 2 Consultation on the PEIR (Section 2.4) which assessed the OnSS study areas identified in Figure 4.17 (document reference 6.2.4.17) and taking consideration of additional engineering and environmental survey data available, the Applicant was able to undertake further site refinement for the OnSS.

The OnSS purpose and requirements

258. The OnSS will contain the electrical components that are needed to transform and convert the power from the wind turbines to match the power in the National Grid Transmission System. The Applicant's precise connection point will be the National Grid substation (NGSS) that will be developed by the National Grid. The OnSS will connect into the NGSS using 400kV underground cables.

259. While the precise location of the NGSS was not defined (and is not at the time of writing), its approximate location and specification played an important part in the decision-making process which was followed to define the location of the OnSS.

8.6.2 The National Grid Substation (NGSS) and Connection Area

260. Following further engagement with National Grid, the Applicant was informed that the study area identified by the Applicant at PEIR as "Weston Marsh South" as shown in Figure 4.17 (document reference 6.2.4.17) is considered to be the indicative search (as identified by National grid) for its NGSS infrastructure.

261. It is the responsibility of the National Grid Energy System Operator (NGESO) to provide Projects (or, customers) with connection options. The Applicant, as a customer of NGESO, was subject to the OTNR and subsequent HND process as described in Section 1.2. Subsequent analysis by the NGESO concluded that the Weston Marsh connection option would be confirmed for the Project to be made available by the year 2030.

262. It is the responsibility of National Grid Electricity Transmission (NGET) to determine how the connection will be facilitated. The NGSS will be built, owned, and operated by NGET and will be subject to its own consenting process. The NGSS is in an earlier development phase than the Project and underwent an initial non statutory consultation phase in January 2024.

263. It is understood that the NGSS will not only deliver a connection for the Project but will also be built to provide connections for future projects. Therefore, noting the large scale development that will be required to facilitate these future projects, and taking consideration of the extent of temporary works, interface arrangements, construction traffic and overhead line modifications that could be required to facilitate the connection to the existing overhead lines, the Applicant was able to conclude that the Weston Marsh South Study area would not be a feasible option for co-location of both the NGSS and the OnSS. Consequently, it was determined

that the site north of the River Welland (Weston Marsh North) at Surfleet Marsh was the most appropriate location for the OnSS to be located.

264. This conclusion is further supported when considering the potential for the Grimsby to Walpole overhead line scheme to also connect into the NGSS.
265. The Project does not require additional transmission capacity to connect into the national grid transmission system and is therefore not subject to the development timeline of the Grimsby to Walpole overhead line scheme.
266. The Applicant was therefore able to select Weston Marsh North Figure 4.17 (document reference 6.2.4.17) renamed “Surfleet Marsh” as the optimum study area for the OnSS and consequently, the Applicant then referred to the Weston Marsh South (the indicative search area for the NGSS) as the “Connection Area”.

8.6.3 The 400 kV Cable Corridor

267. Following confirmation that the site for the OnSS would be located within the Surfleet Marsh study area (Figure 4.17 (document reference 6.2.4.17)) and the location of the Connection Area was understood, it was necessary to determine the optimal routing for the 400kV cable corridor to connect the OnSS to the NGSS.
268. The interface of the entry / exit out of the OnSS and into the Connection Area was a key consideration when undertaking the refining of the site within the within the Surfleet Marsh Study Area and therefore a holistic approach to the site definition and the 400Kv Cable corridor is discussed in Section 8.6.5.

8.6.4 Refining the OnSS Site

269. When determining the location of the OnSS within the Surfleet Marsh study area, the Applicant took into consideration the key factors that would need to, at this stage of the site definition, influence the location of the site within the study area.
270. These key considerations are outlined in Table 8.3. All other influential factors relevant to the placement of the OnSS within the study area were found to have no material differentiating factors.

Table 8.3 Technical considerations within the OnSS Surfleet Marsh search zone

Environmental discipline	Technical consideration in decision making
Landscape & Visual	The option to orientate the OnSS oblique to both the Risegate Eau, and the A16 was strategic, allowing for sufficient depth of landscape planting along these two linear features to be able to adequately mitigate the visual effects of the OnSS which would not have been possible if it were orientated parallel to either of these features.

Environmental discipline	Technical consideration in decision making
Noise & Vibration	By locating the OnSS towards the north of the search area, and closer to the A16, the positioning of the OnSS is such that it represents the optimal location between the closest noise sensitive receptors to the south and the main existing baseline noise source (the A16). This position, allowed for the least number of sensitive receptors to be affected, and the greatest likelihood that such effects could be adequately mitigated.
Flood Risk	As discussed in section 8.3 the majority of the study area is located within Flood Zone 3 with small, isolated pockets in Flood Zone 2 and is protected by existing defences. The study area is also on an area of very low to low long term flood risk. The siting of the OnSS within the study area was such that it was as far north, away from the main risk of flooding (the River Welland) as possible and orientated away from the Risegate Eau located to the north. This area at the north of the study area also benefits from small pockets of Flood Risk Zone 2. From a flood risk perspective, this was considered the most optimal location for the OnSS within the study area.
Engineering Design	As well as those engineering considerations related to optimising the flood resilience to determine the optimum finished floor level for safe and controlled operations of the facility through extreme weather conditions. By locating the OnSS towards the north of the search area this allowed for optimised layout arrangements including access from the primary highway network, drainage discharge and system (adopted SUDS principles), adoption and utilisation of existing access roads (to minimise land disturbance) and avoidance of any critical infrastructure, e.g. overhead transmission lines and existing utilities.

271. The refined site area as presented for the Autumn Consultation alongside landscaping proposals are presented in Figure 4.18 (document reference 6.2.4.18).

8.6.5 Further Refinement of the Surfleet Marsh OnSS Site (Section 42 Targeted Consultation)

272. Following feedback from the Autumn Consultation, the Project responded by making a number of minor amendments to the planting areas around the OnSS (Section 2.4). These refinements are summarised as follows:

- Refinement of the planting scheme to better accommodate landownership boundaries to prevent severed land and enable access for maintenance; and

- Addition of drainage rights to the planting scheme to mitigate landowner concerns of potential impacts of planting on land drainage.

273. There were no further updates made to the onshore Order Limits (OnSS Site and Landscaping) following this consultation and is as per the 'Order Limits' as presented in Figure 4.19 (document reference 6.2.4.19).

9 Component 6 – Identification of the Onshore Export Cable Corridor (Onshore ECC)

9.1 Overview

274. The process to identify the Onshore ECC commenced following the completion of the HND, once it had been established that the OnSS would be located at either Lincolnshire Node or Weston Marsh (See Section 1.2).
275. The guiding principles for locating the Project’s Onshore ECC was to identify an economic and efficient cable route corridor (i.e., as close as possible to the grid connection point and in as direct a line from the landfall to the grid connection point as possible) that does not, as far as possible, give rise to significant adverse environmental impacts.
276. The method for identifying the Onshore ECC utilised a two-stage process as follows:
- Step 1 - Manual GIS based mapping, followed by;
 - Step 2 - Quantitative analytics, to provide each route option with a rank score.
277. Step 1 of the process involved the manual identification of potential centrelines of routes from the landfall to the Connection Point at Weston Marsh. These centrelines were informed with the use of mapped environmental constraints data (see Figure 4.20 (document reference 6.2.4.20))¹⁹ which was used to identify a number of paths between these constraints. The constraints data used covered the environmental assessment criteria of Archaeology and Cultural Heritage, Landscape and Visual, Noise and Vibration, Socio-economics, Traffic and Transport, Water Resources and Flood Risk, Ecology, Ornithology and HRA.
278. Using environmental constraints data as the basis of the routing process helped the Applicant to embed the minimisation of environmental effects of the Project at the earliest possible stage. This is a process that has underpinned design refinements at each phase taking account of new engineering, environmental survey data and consultation feedback.
279. Having identified the potential routing centrelines (Figure 4.20 (document reference 6.2.4.20)), a GIS analytics mapping tool was utilised to quantify the environmental constraints within 150m of the centreline (creating a 300m wide Onshore ECC). Each constraint was quantified, either by total integer (e.g., number of listed buildings, number of watercourse crossings etc) or area within the Onshore ECC (e.g., total area in hectares of SSSIs). These values were then ranked by environmental discipline and aggregated to provide an overall environmental ranking to help inform the routing process.

¹⁹ A full list of environmental constraints data used in the routing can be found in Annex B – List of data sources used in ECC quantitative assessment.

280. The process for this ranking exercise is illustrated in Plate 9.1 Plate 2.1 and the results are presented in Annex A – Onshore ECC Quantitative Analysis.

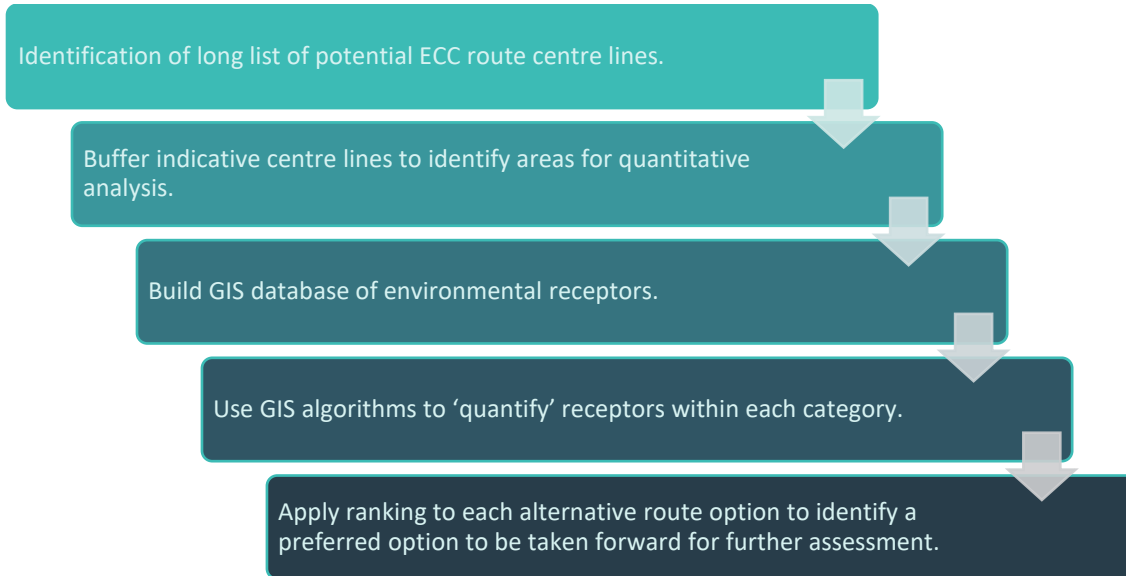


Plate 9.1 Process followed for ranking of Onshore ECC routes

9.2 Initial Route optioneering

9.2.1 The Sequential Test (Onshore ECC)

281. Having established the preferred broad landfall area on the East coast of Lincolnshire between Chapel St Leonards and Anderby Creek (Section 5), a number of potential onshore ECCs were identified between this area of the coast and the preferred OnSS location at Weston Marsh.

282. As set out within National Policy Statement (NPS) EN-1 (and discussed in the NPPF and guidance to which EN-1 refers²⁰) flood risk is a key consideration in the decision-making process for all types of development. Further details on this Policy are included in Section 8.3.

283. The Applicant reviewed the Flood Zone map for the area between the Landfall and Weston Marsh; as shown on Figure 4.20 (document reference 6.2.4.20). It can be seen that the viable corridor footprint (a near- direct route between the landfall and Weston marsh), will, given any deviation, be almost entirely in Flood Zone 3. For the Project to locate itself outside of this flood zone would require a significant diversion (with an approximate 20km of additional cable) which would not be technically deliverable (Section Initial Search Area Key Criteria8.2).

²⁰ EN-1 refers at 5.8.16 to guidance including the Planning Practice Guidance Flood Risk and Coastal Change section.

9.2.2 Initial Onshore ECC Options (Phase 1 Consultation)

284. Three main route options that were identified and evaluated following the method described in Section 9.1, these are shown in Figure 4.20 (document reference 6.2.4.20):

- The first option (Option 1 (blue line) on Figure 4.20) originates at the landfall location at Wolla Bank, south of Anderby Creek, and follows a southerly direction, to the east of Burgh Le Marsh and Wainfleet All Saints, before crossing agricultural land to the south of the A52. The ECC then passes to the south of Boston, crossing the Haven, River Welland and A17.
- The second option (Option 2 (purple line) on Figure 4.20) originates from the landfall point north of Anderby Creek and takes a more northerly direction to the northwest of Burgh Le Marsh. The ECC then runs parallel to the Boston to Friskney rail line before passing around the north of Boston, and circumnavigating the town in an anticlockwise direction. This option then joins the ECC of option 1 to the north of Fosdyke.
- The third option (Option 3 (green line) on Figure 4.20) follows the same route as option 2 until it reaches Spilsby, at which point the ECC turns southeast to circumnavigate Boston in a clockwise direction. This option runs to the west of the Hobhole Drain before joining the ECC of option 1 to the north of Fishtoft.

285. Detailed quantitative analysis of each of these options is presented in Annex A – Onshore ECC Quantitative Analysis. The analysis shows that option 1 (Wolla Bank to Weston Marsh) was the preferred option as it is the most direct route and is likely to result in the fewest environmental effects.

286. This was further supported by the Electrical System Study equipment (Volume 3, Appendix 4.2 (document reference 6.3.4.2)) which was undertaken for purposes of the OnSS siting (Section 8), however demonstrated that longer cable lengths would likely require provision of additional reactive power compensation.

287. The landfall option at Wolla Bank (landfall section LB9 and LB10) (See Section 5) was also considered the most appropriate landfall to facilitate the connection to both of the OnSS connection options provided by National Grid.

288. This Option is shown in Figure 4.21 (document reference 6.4.21) (inclusive of a c. 500m buffer either side to enable for design refinements) was therefore presented at the Project's Section 47 (Phase 1 Consultation).

9.3 Alternative Onshore ECC (Phase 1A Consultation)

9.3.1 Identification of an alternative onshore ECC option

289. Following the Phase 1 public consultation held in October 2022 questions were raised by landowners and members of the public relating to the onshore ECC being routed across the agricultural land south of the A52. This feedback is summarised in Section 2.4 (specifically in Table 2.3 Table 2.3 Onshore Project Refinement and key Consultation Feedback in relation to design elements) and a complete list of consultation responses received to the Phase 1

Consultation is included in the Consultation Report (Part 5, document reference 5.1), specifically Appendix 5.1.4A (document reference 5.1.4).

290. These questions were related to:

Potential geotechnical complications due to the presence of ‘running silts²¹’ which could affect the future depth of cover to the cable, trenches stability that would require for more complex and extensive trench shoring methods; and, ability to run heavy machinery across the area during construction;

- Drainage complications due to the presence of a large networks of agricultural field drains; and
- The potential economic effect from damage to high value crop land.

291. It was noted that should the presence of running silts (also referred to as “running sands”) be verified by ground investigations this could alter the anticipated engineering and environmental considerations.

292. A key criterion for the original search for the onshore ECC was adopting as direct a route as possible to minimise impacts. Following this feedback, the Applicant reviewed slightly less direct routes, west of the A52 to see if these constraints could be avoided while maintaining, to a large enough degree, the economic efficiencies and environmental considerations of a direct route.

293. Following detailed review of this area the Applicant developed a number of alternative onshore ECC routes to avoid the key environmental and engineering constraints referred to in the consultation feedback (paragraph 290) where possible. Figure 4.22 (document reference 6.2.4.22) illustrates the “review” stage for the further six route options that were considered when studying alternatives to the original ECC route.

294. As with the initial onshore ECC options; these ECCs were subject to the same quantitative analysis as illustrated in Section 9.2. The results of which are presented in Annex A – Onshore ECC Quantitative Analysis. The findings of this analysis were such that ECC option 2 (Route Option 2 (green line) on Figure 4.22) was the preferred alternative route to be taken forward for consultation (Phase 1A).

295. The selected alternative route option also affected less Grade 1 Best and Most Versatile (BMV) agricultural land than the original route. The Applicant proceeded to consult stakeholders on this alternative route option (Section 2.4) as presented in Figure 2.23 (document reference 6.2.4.23).

²¹ These are also often referred to as ‘running sands’.

9.4 Refinement of the Onshore ECCs (Phase 2 Consultation and the PEIR)

296. The Applicant received positive feedback from the Phase 1a consultation on the alternative route option as summarised in Section 2.4 (specifically Table 2.3). It was therefore agreed to proceed with both route options to a point of equivalence in terms of consultation, survey data and assessment to help inform which route should be adopted.
297. Taking account of feedback from the Phase 1 and Phase 1a consultation and incorporating additional environmental and engineering data and studies available, the Applicant was able to refine the onshore ECC search areas down from an approximate 1km width as presented in the Phase 1a Consultation (Figure 2.23 (document reference 6.2.4.23)) to an approximate 300m width (the PEIR Boundary).
298. In order to assist with the next phase of refinement, the Applicant also proposed an indicative 80m corridor within the 300m PEIR boundary which took account of existing engineering and environmental constraints data and feedback from the Phase 1 and 1a consultations.
299. The onshore ECC PEIR boundaries and indicative 80m corridors are illustrated in Figure 4.24 (document reference 6.2.4.24). Selection and refinement of the onshore ECC (Autumn Consultation)
300. As well as route optimisation along the entirety of the onshore ECC, the key decision to be made was which route should be adopted of the two alternative route options (Figure 4.24 (document reference 6.2.4.24)).
301. The Applicant took consideration of the Phase 2 Section 42 and Section 47 Consultation Responses as summarised in Section 2.4 (specifically Table 2.3). A complete list of consultation responses received to the Phase 2 Consultation is included in the Consultation Report (Part 5, document reference 5.1), specifically Appendix 5.1.4 (document reference 5.1.4).
302. It was concluded that the engineering challenges and subsequent environmental considerations would be significantly reduced by adopting the route north of the A52 as discussed in Section 9.4.1 below.

9.4.1 Route South of the A52 (Original Route) Vs Route North of the A52 (Alternative Route Option)

303. The Applicant undertook an engineering and environmental constraints appraisal with representatives from all the relevant environmental specialisms, together with the consents team, engineers, and land specialists. This workshop utilised professional judgement, consideration of the feedback from the three phases of Consultation (Phase 1, Phase 1A and Phase 2) as well as the preliminary results of the engineering ground conditions survey including further information obtained from additional sites visits and environmental surveys.
304. Each of the specialists presented their appraisal of the two cable routes and their recommendation for a preferred route using a combination of quantitative and qualitative

professional judgement.

9.4.1.1 Engineering Considerations

305. A geotechnical study was undertaken that comprised collecting both trenches and borehole data at key points along the onshore ECC for the purpose of testing the ground conditions across the two route options.
306. It was found that at these test locations along the route south of the A52 (original route) the nature and structure of the soils at and below cable laying depths led to a tendency for the trenches to “collapse” due to the poor integrity of the sub-soils, demonstrating a requirement for alternative methods of trenching to be adopted. It was concluded that the development of this route would therefore require the use of additional temporary works such as trench boxes, additional aggregate, personnel, machinery, welfare facilities, a likely increased construction footprint and a more difficult reinstatement campaign in sensitive land.
307. There were a number of efficiencies that were demonstrated by the original route such as a shorter overall length of the onshore ECC; a marginal decrease in relative proximity to urbanised areas; and a marginal decrease in the number of trenchless crossings that would be required.
308. It was concluded that the key advantages of the route north of the A52 (alternative route), from an engineering perspective outweighed those demonstrated by the route south of the A52.

9.4.1.2 Environmental Considerations

309. The findings of the Ground investigation survey suggest that construction of the ECC through the Grade 1 ‘toft land’ south of the A52, although technically achievable, would be considerably more complex, with a heightened risk of trench collapse, resulting in the widening of the working footprint and an overall more difficult working environment. This would likely result in longer construction timelines and increase the likelihood of dewatering being required.
310. The complex construction techniques required would likely involve extensive temporary works, such as trench boxes, and a greater degree of sub-surface management, such as ground stabilisation methods (dewatering). The construction related impacts would be:
- Reduced rate of excavation thus impacting the installation programme;
 - larger workforce with multiple teams required to complete the same take-to-meet programme;
 - more complex work site drainage solutions and pollution prevention mitigation requirements;
 - greater numbers of vehicle movements, personnel, and construction site management activity required;

- due to the softer ground, it is likely that the construction of the temporary haul road across this type of land would require a greater depth of aggregate substrate. This again would require a greater number of vehicle movements to deliver and remove that material; and
- Complex location for the management of suitable ground/trench reinstatement to meet the ground classification.

311. This increase in personnel and traffic movements was considered to result in greater environmental impacts relating to traffic, air quality (traffic and dust), noise (traffic and works duration), water pollution, and land reinstatement / future soil productivity.

312. While it is acknowledged that these challenges will likely be encountered in other sections of the route, and will need to be sufficiently mitigated, on balance, and in the interest of reducing environmental risk, it was considered that from an environmental perspective the route north of the A52 performed better.

313. It was also raised during the consultation phases (Consultation Report Document Reference 5.1), noting the prevalence of Grade 1 Agricultural land on the route south of the A52, that this route contains 88% grade 1 land whilst the route north of the A52 contains 23% Grade 1 Land.

314. The Applicant notes that National Planning Policy advocates schemes to avoid Best and Most Versatile (BMV) land classification where there are suitable alternatives. While the Applicant is not able to avoid impacting BMV land, it considers that the adoption of the alternative route option supports these policy requirements.

9.4.2 Refinement of the adopted onshore ECC

315. The refinement of the adopted onshore ECC within the 300m PEIR Boundary comprised the following;

- Updated traffic survey information and analysis was utilised to help inform the location of highway alteration works, accesses and the optimum traffic routes for the Project;
- Refinement of the location of construction infrastructure at the Landfall; and,
- Identification and refinement of the location of construction infrastructure along the Onshore ECC (such as the identification of construction compound areas).

316. The refined boundary for the adopted Onshore ECC ('north of the A52') was presented at the Autumn Consultation and is shown in Figure 4.25 (document reference 6.2.4.25).

9.5 Further refinement of the Onshore ECC (Section 42 Targeted Consultation)

317. The responses received as part of the Autumn Consultation are summarised in Section 2.4 (specifically Table 2.3). A complete list of consultation responses received as part of the Autumn Consultation is included in the Consultation Report (Part 5, document reference 5.1), specifically Appendix 5.1.4 (document reference 5.1.4).

318. The Applicant has been dedicated to incorporating feedback wherever practicable, taking a

holistic view of the implications it would have on the overall Project design, feasibility and environmental impact. The feedback was centred around minor refinements to the Order Limits to better accommodate the existing land use and reduce impacts on agricultural practices. The refinements made in response to this are summarised as follows;

- Amendments to accesses following landowner consultation;
- Refinement of enabling access routes following landowner consultation;
- Re-location and removal of passing places following design optimisation studies;
- Refinement of landfall works to accommodate optimised engineering design and environmental mitigation; and
- Removal and re-location of construction compounds based on engineering refinements and landowner feedback.

319. Given the localised impact of these minor amendments to the Order Limits, The Applicant underwent a Targeted Section 42 Consultation.

10 Conclusions

10.1 Summary

320. The outcomes of the site selection process undertaken for the Project have defined the description of the Project for assessment, including the current engineering design, total footprint, and construction, operation and maintenance and decommissioning activities. Wherever possible and practicable, the Applicant has sought to accommodate preferences and concerns raised by stakeholders through the site selection process whether by adjustments to the Order limits, areas of works or designs being considered.
321. The site selection process and alternatives considered have been through a process of detailed analysis of environmental, social and engineering constraints, with key feasible alternatives taken forward for consideration.
322. As detailed in Volume 1, Chapter 3: Project Description, the Applicant has employed a Maximum Design Scenario (MDS) approach. Therefore, it is recognised that whilst the site selection process undertaken has included a number of refinements to the Project envelope so far as practical, there remains some areas of flexibility to allow for detailed engineering and design post consent.

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Annex A – Onshore ECC Quantitative Analysis

Table 4B.1: Quantitative analysis of environmental constraints along each initial 300m wide Weston Marsh ECC route option (absolute values and ranks)²²

EIA Topic	Environmental Constraints	Area	ha	Absolute Values			Ranks		
				Huttoft Bank Weston Marsh (Boston Northern Option)	Huttoft Bank Weston Marsh (Boston Southern Option)	Wolla Bank - Weston Marsh	Huttoft Bank Weston Marsh (Boston Northern Option)	Huttoft Bank Weston Marsh (Boston Southern Option)	Wolla Bank - Weston Marsh
Ground Conditions and Contaminated Land	Historic Landfills	Area	ha	0	0	0	1	1	1
	Average of ranks within topic:			1			1		
Archaeology and Cultural Heritage	Listed Buildings (England)	Number	No	1	0	0	1	1	1
	Registered Battlefields	Number	No	1	0	0	1	1	1
	Registered Parks and Gardens	Number	No	1	0	0	1	1	1
	Scheduled Monuments	Number	No	1	0	0	1	1	1
	World Heritage Sites (England) [†]	Number	No	1	0	0	1	1	1
	Heritage Coast	Number	No	1	0	0	1	1	1
Average of ranks within topic:				1			1		
Landscape and Visual	PROW	Area	km	8	6.2	3.4	3	2	1
	National Trails (England)	Area	km	0	0	0	1	1	1
	Areas of Outstanding Natural Beauty (England) [†]	Area	ha	0	0	0	1	1	1
	National Parks	Area	ha	0	0	0	1	1	1
Average of ranks within topic:				1.5			1.25		
Noise and Vibration	Potential Sensitive Receptors	Number	No	125	104	52	3	2	1
Average of ranks within topic:				3			2		
Socio-economics	Potential Sensitive Receptors	Number	No	125	104	52	3	2	1
	Agricultural Land Classification - Provisional (England)	Area of 1	ha	445.5	435.9	862.6	2	1	3
		Area of 2	ha	367.9	476.6	0	2	3	1
		Area of 3	ha	466.7	466.7	0	2	3	1
	Felling Licence Agreements (England)	Area	ha	1.1	1.1	0.2	2	2	1
	England Coast Path Route	Length	km	0.2	0.2	0	2	2	1
	PROW	Length	km	8	6.2	3.4	3	2	1
	Forest Plans (England)	Area	ha	0	0	0	1	1	1
	National Trust Always Open Land	Area	ha	0	0	0	1	1	1
	National Trust Limited Access Land	Area	ha	0	0	0	1	1	1
	Allotments or Community Growing Spaces	Number	No	0	0	0	1	1	1
		Area	ha	0	0	0	1	1	1
	Golf Course	Number	No	0	1	1	1	2	2
		Area	ha	0	1.4	3.4	1	2	3
	Religious Grounds	Number	No	0	0	0	1	1	1
		Area	ha	0	0	0	1	1	1
Cemeteries	Number	No	0	0	0	1	1	1	
	Area	ha	0	0	0	1	1	1	
Average of ranks within topic:				1.58			1.58		
Average of ranks within topic:				1.58			1.26		

²² In some instances, absolute values in this table may be the same, but result in different ranks. This is because the values have had to be rounded for presentation purposes.

EIA Topic Environmental Constraints				Huttoft Bank Weston Marsh (Boston Northern Option)	Huttoft Bank Weston Marsh (Boston Southern Option)	Wolla Bank - Weston Marsh	Huttoft Bank Weston Marsh (Boston Northern Option)	Huttoft Bank Weston Marsh (Boston Southern Option)	Wolla Bank - Weston Marsh
Traffic and Transport	Roads	Length	km	1.2	1.5	0.2	2	3	1
	Railway	Length	km	11	11.1	0	2	3	1
	Sustrans Cycle Routes	Length	km	0	0.2	0	1	3	1
	Reclassified Cycle Routes	Length	km	0.3	0.7	0.3	1	3	1
Traffic and Transport		Average of ranks within topic:		1.5		3	1		
Water Resources and Flood Risk	Flood Zones 2 and 3	Area	ha	1108.6	1210.7	868.1	2	3	1
	Source Protection Zones (Total Areas)	Area	ha	0	367.1	0	1	3	1
	Drinking Water Safeguard Zones (Surface Water)	Area	ha	0	0	0	1	1	1
	Statutory Main Rivers	Count	No	5	6	3	2	3	1
		Length	km	1.3	1.3	0.6	2	3	1
	Ordinary Watercourses	Count	No	161	160	45	3	2	1
Length		km	19.9	19.7	5.4	3	2	1	
Waterbodies	Area	ha	19.1	21.6	13.5	2	3	1	
Water Resources and Flood Risk		Average of ranks within topic:		1.75		2.57	1		
Ecology and HRA	Ancient Woodland	Area	ha	0	0	0	1	1	1
	Conservation and Enhancement Agreements (England)	Area	ha	0	0	0	1	1	1
	Country Parks (England)	Area	ha	0	0	0	1	1	1
	Countryside Stewardship Agreement Management Areas (England)	Area	ha	0	0	0	1	1	1
	Great Crested Newt Class Survey Licence Returns (England)	Number	No	0	0	0	1	1	1
	Higher Level Stewardship Target Areas (England)	Area	ha	0	0	0	1	1	1
	Important Bird Areas (GB)	Area	ha	0	0	0	1	1	1
	Local Nature Reserves	Area	ha	0.8	0	0.8	2	1	2
	National Nature Reserves	Area	ha	0	0	0.6	1	1	3
	Non-Designated Woodland	Area	ha	6.6	8.9	2	2	3	1
	Priority Habitat Inventory (Total of all Areas)	Area	ha	34	31.5	12.6	3	2	1
	Ramsar Sites	Area	ha	0	0	0.6	1	1	3
	RSPB Reserves	Area	ha	0	0	0	1	1	1
	Sites of Special Scientific Interest	Area	ha	0	0	5.1	1	1	3
	Special Areas of Conservation	Area	ha	0	0	5.1	1	1	3
Special Protection Areas	Area	ha	0	0	0.6	1	2	3	
Wild Bird General Licence Exclusion Zone (England)	Area	ha	0	0	0	1	1	1	
Ecology and HRA		Average of ranks within topic:		1.24		1.24	1.65		
Totalled Average Rank Score		6.99		7.61		5.92			
Total Ranking		2		3		1			

Note: Rank orders are from lowest to highest, where the lowest number of potential receptors will be given the lowest rank (1) and the highest number of potential receptors is given the highest rank (3).

Table 4B.2: Quantitative analysis of environmental constraints along each alternative 300m wide Weston Marsh ECC route option (absolute values and ranks)

EIA Topic / Environmental Constraints				Absolute Values						Ranks					
				Baseline Route	Route Option 1M	Route Option 2A	Route Option 3Q	Route Option 4	Route Option 5	Baseline Route	Route Option 1M	Route Option 2A	Route Option 3Q	Route Option 4	Route Option 5
Ground Conditions and Contaminated Land	Historic Landfills	Area	ha	0	0	0.06	0	0	0	1	1	6	1	1	1
	Ground Conditions and Contaminated Land				Average of ranks within topic:						1	1	6	1	1
Archaeology and Cultural Heritage	Listed Buildings (England)	No	No	0	2	0	1	1	2	1	5	1	3	3	5
	Registered Battlefields	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Registered Parks and Gardens	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Scheduled Monuments	Area	ha	0.35	2.22	1.53	0.35	0.35	0	2	6	5	2	2	1
	World Heritage Sites (England)†	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Heritage Coast	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
Archaeology and Cultural Heritage				Average of ranks within topic:						1.14	2.29	2.29	1.43	1.43	1.57
Landscape and Visual	PROW	Length	km	5.23	4.75	5.51	9.42	7.41	0.381	3	2	4	6	5	1
		Count	No	18	15	20	30	24	15	3	1	4	6	5	1
	National Trails (England)	Area	km	0	0	0	0	0	0	1	1	1	1	1	1
	Areas of Outstanding Natural Beauty (England)†	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	National Parks	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
Landscape and Visual Average				Average of ranks within topic:						1.80	1.20	2.20	3	2.60	1
Noise and Vibration	Potential Sensitive Receptors	No	No	19	116	108	228	201	184	1	3	2	6	5	4
Noise and Vibration				Average of ranks within topic:						1	3	2	6	5	4
Socio-economics	Potential Sensitive Receptors	No	No	19	116	108	228	201	184	1	3	2	6	5	4
	Agricultural Land Classification - Provisional (England)	Area of 1	ha	1047	534	544	930	520	517.03	6	3	4	5	2	1
		Area of 2	ha	73	502	578	232	551	714.84	1	3	5	2	4	6
		Area of 3	ha	120	285	166	153	353	353	1	4	3	2	5	5
	Felling Licence Agreements (England)	Area	ha	0.2	0	0	0	3	3	4	1	1	1	5	5
	England Coast Path Route	Length	km	0	0	0	0	0	0	1	1	1	1	1	1
	PROW	Length	km	5	4	5	9	7	0.3	3	2	4	6	5	1
		Number	No	18	15	20	30	24	15	3	1	4	6	5	1
	Forest Plans (England)	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	National Trust Always Open Land	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	National Trust Limited Access Land	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Allotments or Community Growing Spaces	No	No	0	0	0	0	0	0	1	1	1	1	1	1
		Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Golf Course	No	No	0	0	0	0	0	1	1	1	1	1	1	6
		Area	ha	0	0	0	0	0	2.605	1	1	1	1	1	6
	Religious Grounds	No	No	0	1	0	0	0	0	1	6	1	1	1	1
Area		ha	0	0.8	0	0	0	0	1	6	1	1	1	1	
Cemeteries	No	No	0	0	0	0	0	0	1	1	1	1	1	1	
	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1	
Socio-economics Average				Average of ranks within topic						1.60	2.10	1.85	2.30	2.40	2.45
Traffic and Transport	Roads	Count	No	67	102	109	118	103	90	1	3	5	6	4	2
		Length	km	15	20	24	23	20	20	1	2	6	5	4	3
	Railway	Count	No	1	1	2	3	15	15	1	1	3	4	5	5
		Length	km	0.29	0.3	0.3	0.32	11	11	1	2	2	4	5	6
	Sustrans Cycle Routes	Count	No	0	0	0	0	0	1	1	1	1	1	1	6
		Length	km	0	0	0	0	0	0.34	1	1	1	1	1	6
	Reclassified Cycle Routes	Count	No	0	0	0	0	0	1	1	1	1	1	1	6
		Length	km	0	0	0	0	0	0.34	1	1	1	1	1	6

EIA Topic / Environmental Constraints				Absolute Values						Ranks					
				Baseline Route	Route Option 1M	Route Option 2A	Route Option 3Q	Route Option 4	Route Option 5	Baseline Route	Route Option 1M	Route Option 2A	Route Option 3Q	Route Option 4	Route Option 5
Traffic and Transport Average				Average of ranks within topic						1	1.50	2.50	2.88	2.75	5
Water Resources and Flood Risk	Flood Zones	Area of Zone 2 and 3	ha	1236	1316	1284	1309	1188	1344	2	5	3	4	1	6
	Source Protection Zones (Total Areas)	Area	ha	122	153	143	139	151	151	1	6	3	2	4	4
	Drinking Water Safeguard Zones (Surface Water)	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Statutory Main Rivers	Count	No	2	4	5	4	12	14	1	2	4	2	5	6
		Length	km	0.73	1.35	1.28	1.39	1.94	2.72	1	3	2	4	5	6
	Ordinary Watercourses	Count	No	11	8	9	9	11	11	4	1	2	2	4	4
		Length	km	5.16	3.77	3.7	3.87	5.58	3.26	5	3	2	4	6	1
	Waterbodies	Area	ha	24	28	27	26	27	30	1	5	3	2	4	6
	IDB Drains	Count	No	10	10	10	10	10	14	1	1	1	1	1	6
		Length	km	5	5	5	5	5	5.2	1	1	1	1	1	6
	IDB Sewers	Count	No	36	48	51	43	40	33	2	5	6	4	3	1
		Length	km	13	18	20	15	16	10	2	5	6	3	4	1
	IMDB Piped Lengths	Count	No	0	1	1	0	7	7	1	3	3	1	5	5
Length		km	0	0.06	0.11	0	0.2	0.2	1	3	4	1	5	5	
IDB Maintained Watercourses	Count	No	24	18	20	17	12	12	6	4	5	3	1	1	
	Length	km	9.93	6.48	8.21	8.5	5.15	5.15	6	3	4	5	1	1	
Hydrology Average				Average of ranks within topic						2.18	3.06	3	2.41	3.06	3.59
Ecology and HRA	Ancient Woodland	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Conservation and Enhancement Agreements (England)	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Country Parks (England)	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Countryside Stewardship Agreement Management Areas (England)	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Great Crested Newt Class Survey Licence Returns (England)	No	No	0	0	0	0	2	2	1	1	1	1	5	5
	Higher Level Stewardship Target Areas (England)	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Important Bird Areas (GB)	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Local Nature Reserves	Area	ha	1.12	1.12	1.12	1.12	1.12	1.12	1	1	1	1	1	1
	National Nature Reserves	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Non-Designated Woodland	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Priority Habitat Inventory (Total of all Areas)	Area	ha	9.6	50.53	28	7	23.1	18.19	1	6	5	4	3	2
	Ramsar Sites	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	RSPB Reserves	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Sites of Special Scientific Interest	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Special Areas of Conservation	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Special Protection Areas	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
	Wild Bird General Licence Exclusion Zone (England)	Area	ha	0	0	0	0	0	0	1	1	1	1	1	1
Local Wildlife Sites	Area	ha	7.6	7.79	7.79	7.6	13.3	7.6	1	4	4	1	6	1	
Ecology Average				Average of ranks within topic						1	N/A	1.39	1.17	1.61	1.28
Sum										8.72	14.14	13.84	15.02	17.24	19.61
Overall Route Area Ranking										1	3	2	4	5	6

Annex B – List of data sources used in ECC quantitative assessment

Table 4C. 1: List of data sources used in ECC quantitative assessment

Environmental Discipline	Dataset
Archaeology and Cultural Heritage	Listed Buildings (England)
	Registered Battlefields
	Registered Parks and Gardens
	Scheduled Monuments
	World Heritage Sites (England)†
	Heritage Coast
Landscape and Visual	PROW
	National Trails (England)
	Areas of Outstanding Natural Beauty (England)†
	National Parks
Noise and Vibration	Potential Sensitive Receptors
Socio-economics	Potential Sensitive Receptors
	Agricultural Land Classification - Provisional (England)
	Felling Licence Agreements (England)
	England Coast Path Route
	PROW
	Forest Plans (England)
	National Trust Always Open Land
	National Trust Limited Access Land
	Allotments or Community Growing Spaces
	Golf Course
	Religious Grounds
	Cemeteries
Traffic and Transport	Roads
	Railway
	Sustrans Cycle Routes
	Reclassified Cycle Routes
Water Resources and Flood Risk	Flood Zones 2 and 3
	Source Protection Zones (Total Areas)
	Drinking Water Safeguard Zones (Surface Water)
	Statutory Main Rivers
	Ordinary Watercourses
	Waterbodies
Ecology and HRA	Ancient Woodland
	Conservation and Enhancement Agreements (England)
	Country Parks (England)
	Countryside Stewardship Agreement Management Areas

Environmental Discipline	Dataset
	(England)
	Great Crested Newt Class Survey Licence Returns (England)
	Higher Level Stewardship Target Areas (England)
	Important Bird Areas (GB)
	Local Nature Reserves
	National Nature Reserves
	Non-Designated Woodland
	Priority Habitat Inventory (Total of all Areas)
	Ramsar Sites
	RSPB Reserves
	Sites of Special Scientific Interest
	Special Areas of Conservation
	Special Protection Areas
	Wild Bird General Licence Exclusion Zone (England)