The Great Grid Upgrade

Sea Link

Option Selection and Design Evolution Report

Version A

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nationalgrid

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Abbreviations

Abbreviation	Description
AIL	Abnormal Indivisible Loads
ALC	Agriculture Land Classification
AONB	Area of Outstanding Natural Beauty
BMV	Best and Most Versatile
CPRSS	Corridor and Preliminary Routeing and Siting Study
EIA	Environmental Impact Assessment
ESO	Electricity System Operator
GIL	Gas Insulated Lines
GIS	Gas Insulated Switchgear
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
HVG	Heavy Goods Vehicle
LNR	Local Nature Reserve
LV	Low Voltage
MCZ	Marine Conservation Zone
NGT	National Grid Electricity Transmission
NGV	National Grid Ventures
NNR	National Nature Reserve
NOA	Network Options Assessment
NPS	National Policy Statements
OHL	Overhead Line
OWF	Offshore Windfarm
PRoWS	Public Rights of Way
SAC	Special Area of Conservation
SPA	Special Protection Area
SPR	Scottish Power Renewables
SQSS	Security and Quality of Supply Standard
SSSI	Site of Special Scientific Interest
TJB	Transition Joint Bay
TSS	Traffic Separation Scheme

UK	United Kingdom
VSC	Voltage Source Converter

Executive Summary

National Grid Electricity Transmission plc (hereafter referred to as National Grid) is developing proposals to reinforce the high voltage power network in the South East of England and East Anglia. Sea Link (hereafter referred to as the Proposed Project) is required to accommodate additional power flows generated from renewable and low carbon energy generation, as well as additional new interconnection with mainland Europe.

Routeing and siting work was undertaken between 2021 and 2022. The outputs of this process were reported within the Sea Link Corridor and Preliminary Routeing and Siting Study (CPRSS).

In Autumn 2022, a non-statutory public consultation was held for a period of eight weeks, between 24 October 2022 and 18 December 2022. This consultation introduced the project, explained how National Grid had developed its proposals, and sought the views of the public and stakeholders. Copies of the CPRSS were made available during the 2022 non-statutory consultation.

The proposals National Grid consulted on comprised of a reinforcement of the network with a predominantly offshore High Voltage Direct Current (HVDC) Link between the proposed Friston substation in the Sizewell area of Suffolk and the existing Richborough to Canterbury 400 kV overhead line close to Richborough in Kent.

National Grid consulted on five corridor options in Suffolk, these were:

- Suffolk Site 1 Emerging Preference;
- Suffolk Site 3 Emerging Preference;
- Suffolk Site 1 Alternative;
- Suffolk Site 3 Alternative (option 1); and
- Suffolk Site 3 Alternative (option 3).

National Grid consulted on two corridor options for the marine cable, these were:

- Marine Corridor Emerging Preference; and
- Marine Corridor Alternative.

National Grid consulted one corridor in Kent, this was:

- Kent Emerging Preference corridor.

We also consulted on the technology choice in Kent for the High Voltage Alternating Current (HVAC) connection being made by either overhead line or underground cables.

Within the corridors National Grid showed a graduated swathe, which was presented at National Grid's 2022 non-statutory consultation. The darker areas of the swathe indicated, based information available at the time, a more likely location for the infrastructure within the corridors. This was indicative and subject to further assessment work, and the consultation feedback National Grid received.

The feedback received during the 2022 non-statutory consultation has been carefully reviewed and considered, alongside ongoing environmental and engineering studies. National Grid have also backchecked and reviewed its previous studies to ensure the reasons for the decisions taken have not changed following a review of the non-statutory consultation feedback.

This report provides:

- a summary of the options National Grid consulted on;
- a summary of the relevant non-statutory consultation responses which have informed the option selection and design evolution;
- an explanation of the option appraisal and selection of the preferred options; and
- an explanation of the evolution of the design of the Proposed Project from that consulted on in 2022.

In Suffolk, Site 3 Emerging Preference has been selected as the preferred option. In marine waters, the Marine Corridor Emerging Preference has been selected as the preferred option. In Kent, an overhead line has been selected as the choice of technology for the HVAC connection.

The Proposed Project involves the reinforcement of the electricity transmission network between Suffolk and Kent, predominantly via offshore High Voltage Direct Current (HVDC) link, but with onshore elements to connect into the transmission network. The proposed Project is split into three elements, as follows.

The Suffolk Onshore Scheme

- A connection from the existing transmission network via Friston Substation, including the substation itself. Friston Substation already has development consent as part of other third-party projects. If Friston Substation has already been constructed under another consent, only a connection into the substation would be constructed by the Sea Link project.
- A high voltage alternating current (HVAC) underground cable of approximately 1.7 km in length between the proposed Friston Substation and a proposed converter station (below).
- A 2 GW high voltage direct current (HVDC) converter station up to 26 m high plus external equipment (such as lightning protection & railings for walkways) near Saxmundham.
- A HVDC underground cable connection of approximately 10 km in length between the proposed converter station near Saxmundham, and a transition joint bay (TJB) approximately 900m inshore from a landfall point (below) where the cable transitions from onshore to offshore technology.
- A landfall on the Suffolk coast (between Aldeburgh and Thorpeness).

The proposals in Suffolk have been developed for Sea Link as a standalone project, but also include opportunities to co-locate infrastructure for up to two further projects at the converter station site, cable corridors and the landfall location.

The Offshore Scheme:

- Approximately 130 km of subsea HVDC cable, running between the Suffolk landfall location (between Aldeburgh and Thorpeness), and the Kent landfall location at Pegwell Bay.

The Kent Onshore Scheme:

- A landfall point on the Kent coast at Pegwell Bay.
- A TJB approximately 800m inshore to transition from offshore HVDC cable to onshore HVDC cable, before continuing underground for approximately 2 km to a new converter station (below).
- A 2 GW HVDC converter station, up to 26 m high plus external equipment (such as lightning protection & railings for walkways), near Minster. A new substation would be located immediately adjacent.
- Removal of approximately 1 km of existing HVAC overhead line, and installation of approximately 2.25 km of new HVAC overhead line from the substation near Minster and the existing Richborough to Canterbury overhead line.

The Proposed Project also includes modifications to sections of existing overhead lines in Suffolk and Kent, diversions of third-party assets, and land drainage from the construction and operational footprint. It also includes opportunities for environmental mitigation, compensation and enhancement (which could include hedgerow creation, native tree planting or funding local wildlife groups). The construction phase will involve various temporary construction activities including overhead line diversions, working areas for construction equipment and machinery, site offices, storage, accesses, bellmouths, and haul roads, as well as watercourse crossings and the diversion of public rights of way (PROWs).

The Proposed Project has been developed within the Suffolk Site 3 Emerging Preference corridor, the Marine Corridor Emerging Preference and the Kent Onshore Scheme Emerging Preference corridor as consulted on in 2022. There are however a number of locations where the draft Order Limits extend beyond these corridor extents. These are summarised in this report, along with the reasons why.

1. Introduction

1.1 Overview and Purpose

1.1.1 Sea Link (hereafter referred to as the 'Proposed Project') is a proposal by National Grid Electricity Transmission plc (hereafter referred to as National Grid) to reinforce the transmission network in the South East of England and East Anglia. The Proposed Project is required to accommodate additional power flows generated from renewable and low carbon energy generation, as well as additional new interconnection with mainland Europe.

1.1.2 National Grid owns, builds and maintains the electricity transmission network in England and Wales. Under the Electricity Act 1989, National Grid holds a transmission licence under which it is required to develop and maintain an efficient, coordinated, and economic electricity transmission system.

1.1.3 National Grid is also required, under Section 38 of the Electricity Act 1989, to comply with the provisions of Schedule 9 of the Act. Schedule 9 requires licence holders, in the formulation of proposals to transmit electricity, to:

Schedule 9(1)(a) '…have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest;' and

Schedule 9(1)(b) '…do what [it] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects'.

1.1.4 The Proposed Project is proposed to reinforce the transmission system in the South East of England and East Anglia. This would be achieved by reinforcing the network with a High Voltage Direct Current (HVDC) Link between the proposed Friston substation in the Sizewell area of Suffolk and the existing Richborough to Canterbury 400kV overhead line close to Richborough in Kent.

1.1.5 The purpose of this report is to:

- present the options appraisal process up to non-statutory consultation;
- present the outcome of the option selection process that has been undertaken following feedback from non-statutory consultation undertaken in Autumn 2022 to identify the preferred option for the Proposed Project; and
- describe how the Proposed Project has evolved from the preferred option selected for the Proposed Project to the design that is subject to statutory consultation being undertaken between 24 October 2023 and 18 December 2023.

1.2 Structure of this Report

1.2.1 This report is structured as follows:

- Section 1 – Introduction.
- Section 2 – Proposed Project Development.
- Section 3 – Summary of the Strategic Proposal.
- Section 4 – Summary of the Options Identification Stage.
- Section 5 – Summary of Non-Statutory Consultation Feedback.
- Section 6 – Option Section.
- Section 7 – Design Development of the Proposed Project.
- Section 8 – Description of the Proposed Project.
- Section 9 – Next Steps.
- Section 10 – References.

1.2.2 This report should be read in conjunction with the following figures as shown in **Appendix A – Figures**.

- **Figure 4.1: Suffolk Network Connection Points**
- **Figure 4.2: Suffolk Landfall Areas of Search - Sheets 1- 4**
- **Figure 4.3: Suffolk Converter Site Option AreaAreas - Sheets 1- 4**
- **Figure 4.4: Suffolk Terrestrial Route Corridors Sizewell Connection - Sheets 1 to 4**
- **Figure 4.5: Suffolk Terrestrial Route Corridors Proposed Friston Connection – Sheets 1 – 4**
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- **Figure 4.7: Potential Coordinated Converter Station Sites – Sheets 1 to 4**
- **Figure 4.8: Suffolk Site 1 Emerging Preference**
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- **Figure 4.13: Kent Landfall Areas of Search - Sheets 1 to 4**
- **Figure 4.14: Kent Station Site Option Areas – Sheets 1 to 4**
- **Figure 4.15: Kent Route Corridors - Sheets 1 - 4**
- **Figure 4.16: Kent Emerging Preference**
- **Figure 4.17: Marine Alignments - Sheets 1- 4**
- **Figure 4.18: Offshore Scheme Emerging Preference and Alternative**

- **Figure 6.1: Suffolk Onshore Scheme Preferred Option**
- **Figure 6.2: Kent Onshore Scheme Preferred Option**
- **Figure 6.3: Offshore Scheme Preferred Option**
- **Figure 7.1: Suffolk Onshore Scheme Design Evolution – HVAC Connection**
- **Figure 7.2: Suffolk Onshore Scheme Design Evolution – Saxmundham Converter Station**
- **Figure 7.3: Suffolk Onshore Scheme Design Evolution – Underground HVDC Cables and Landfall**
- **Figure 7.4: Suffolk Onshore Scheme – Proposed Project**
- **Figure 7.5: Kent Onshore Scheme Design Evolution – HVAC Connection**
- **Figure 7.6: Kent Onshore Scheme Design Evolution – Minter 400 kV Substation and Minster Converter Station**
- **Figure 7.7: Kent Onshore Scheme Design Evolution – Underground HVDC Cables and Landfall**
- **Figure 7.8: Kent Onshore Scheme – Proposed Project**
- **Figure 7.9: Offshore Scheme Design Evolution – Marine Cable**
- **Figure 7.10: Offshore Scheme - Proposed Project**

1.3 Background and Need

1.3.1 In June 2019, the UK became the first major economy to pass legislation to end its contribution to global warming and bring all greenhouse gas emissions to net zero by 2050, putting clean growth at the heart of our modern industrial strategy and seizing the economic opportunities that transition to a greener economy creates.

1.3.2 The Government has set out a clear and consistent set of strategic objectives and a long-term policy framework as detailed in the following publications:

- The Ten Point Plan for a Green Industrial Revolution (Ref 1);
- Net Zero Strategy: Build Back Greener (Ref 2); and
- British Energy Security Strategy (Ref 3).

1.3.3 The latest publication, that sets out the Government's blueprint for the future of energy in the country is entitled Powering Up Britain (Ref 4) and was published in March 2023. It sets out the 'Department for Energy Security and Net Zero' manifesto for the future with a focus on energy security, consumer security, climate security and economic security.

1.3.4 The department's mission is to replace imported fossil fuels with cheaper, cleaner, domestic sources of energy. Energy security and net zero are two sides of the same coin. The energy transition in line with net zero is one of the greatest economic opportunities for this country.

1.3.5 Consistent with the Government's Net Zero target, there has been, and continues to be, growth in the volume of renewable and zero carbon generation that is seeking to connect to the electricity transmission system in the East Anglia and South East regions.

1.3.6 UK Government policy clearly sets out the critical requirement for significant reinforcement of the transmission system to facilitate the connection of renewable energy sources and to transport electricity to where it is used. Electricity network infrastructure is therefore needed to ensure that energy can be transported from where it is generated to where it is used.

1.3.7 The independent review of Net Zero concluded that the transition to net zero is the economic opportunity of the 21st century, driving investment, jobs and creating significant opportunity across the UK.

1.3.8 Energy networks will be a critical enabler for the clean energy transition, however, the scale and pace of investment needed to meet the UK's decarbonisation targets are significant; for example, achieving the ambition of up to 50 GW offshore wind by 2030 requires industry to deliver over six times the amount of electricity transmission network infrastructure in the next eight years than has been built in the past 30 years.

1.3.9 National Grid sits at the heart of Britain's energy system, connecting millions of people and businesses to the energy they use every day. Overall, National Grid will be investing around £15bn in the UK over 5 years to upgrade our networks and support the UK's net zero ambition. This includes connecting low carbon sources of energy; preparing for the widespread roll out of clean transport and low-carbon heat; and innovating across new technologies needed for an increasingly flexible energy system. National Grid aim to support an affordable and fair transition to net zero, in which nobody is left behind.

1.3.10 The Great Grid Upgrade is the largest overhaul of the electricity grid in generations. National Grid's infrastructure projects across England and Wales are helping to connect more renewable energy to your homes and businesses.

1.3.11 Multiple significant reinforcements are needed to the transmission system up and down the east coast to:

- facilitate the connection of future sources of renewable and low carbon power generation along the coast, such as offshore wind farms, nuclear power, and interconnectors;
- enable the transport of all this new proposed power from where it is produced to where it is needed, to centres of demand; and
- meet security of supply quality standards and ensure National Grid can continue to play our part in connecting millions of people reliably to the energy they need every day.

1.3.12 The network is planned and operated under a set of standards designed to ensure there are no widespread electricity supply interruptions. These standards ensure that, for given operational and fault scenarios:

- the electricity system frequency is maintained within statutory limits;
- no part of the network is overloaded beyond its capability; and
- voltage performance stays within acceptable statutory limits, and the system remains electrically stable.

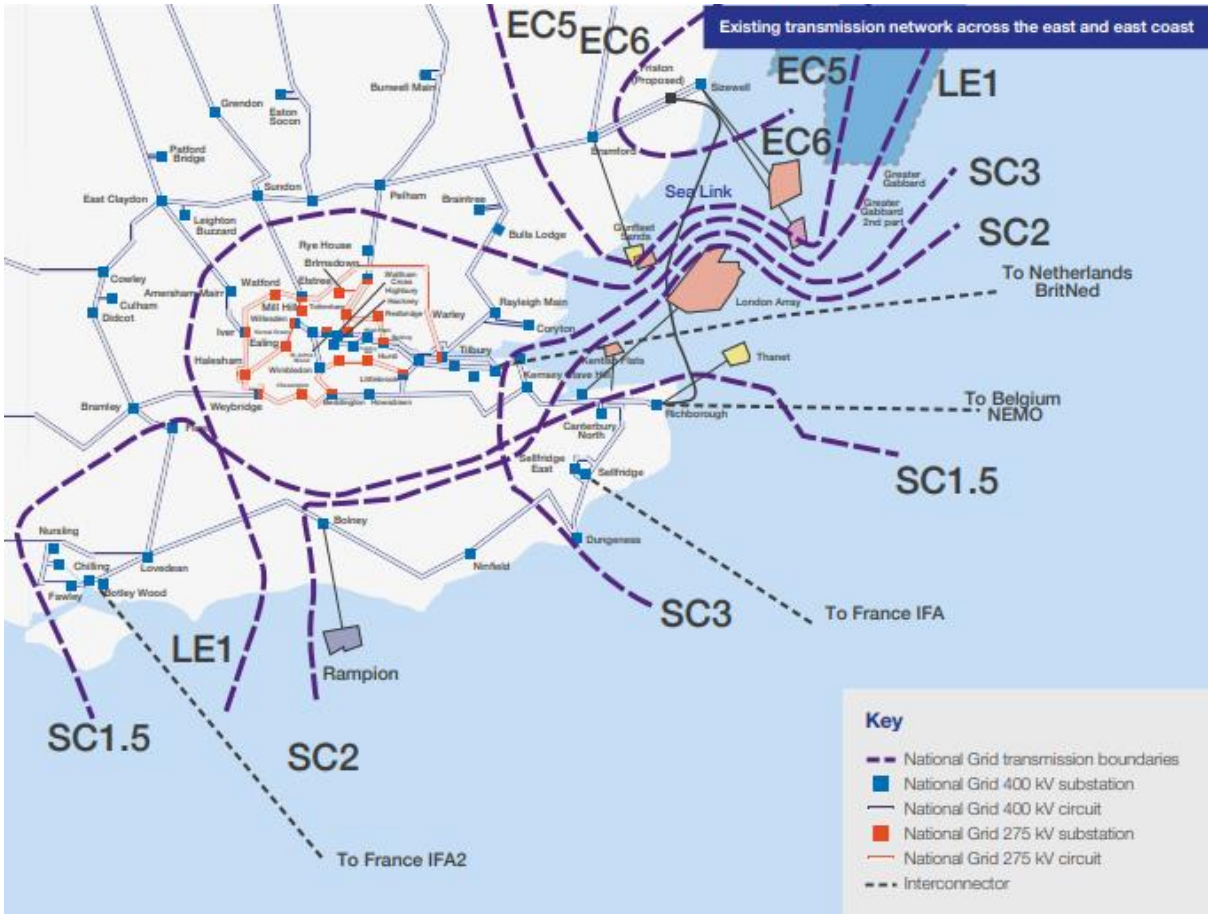
How do network boundaries work?

1.3.13 To understand current and future demands on the electricity network, the concept of network boundaries is used. A boundary splits the system into sections and shows where there are high-power flows between parts of the network. When flows across a network boundary are forecast to be above the capability of the network, there are two options to manage this:

- Pay electricity generators on one side of the boundary to reduce the energy they produce (and in turn pay generators on the other side of the boundary to compensate for the shortfall). This then reduces the flows of electricity across the boundary. When National Grid Electricity System Operator (ESO) pay generators to do this, these are called 'constraint payments'.
- Increase the capability of the network to allow more electricity to flow.

1.3.14 The relevant boundaries are illustrated on **Image 1.1**.

Image 1.1: Relevant Network Boundaries



1.3.15 The existing transmission network infrastructure in the East Anglia and South East areas was not originally designed to accommodate such large volumes of generation capacity, that is planned to connect here. The network will require significant reinforcements in the form of new substations and transmission circuits to provide both connections for these new customers, and to ensure that power can be transferred securely to the onshore demand centres to meet the needs of electricity consumers in Britain.

1.3.16 Without reinforcement, the existing network is insufficient to accommodate the connection of the proposed new power sources.

The Need for reinforcement in East Anglia

1.3.17 The national electricity transmission system in East Anglia is encompassed by the EC5 boundary.

1.3.18 Like much of the high voltage electricity transmission network across the country, the network in East Anglia was largely developed in the 1960s. It was built to supply consumer demand from homes and businesses in the region, centred around Norwich and Ipswich.

1.3.19 For many years the only significant power stations generating in the East Anglia region were the Sizewell A and the Sizewell B nuclear power stations, Spalding North and Sutton Bridge gas fired power stations, and some further smaller 132 kV connected gas fired power stations.

1.3.20 A large loop runs from Walpole in the north of the region to Pelham and Rayleigh/Tilbury in the south, via Norwich and Bramford. In addition, two 400 kV overhead lines form radial circuits that connect Sizewell B to Bramford substation, these circuits cross Sizewell Generation Group (also known as EC6). The coastline and relatively shallow waters around East Anglia are attractive for the connection of offshore wind projects, including the large East Anglia Round 3 offshore zone that lies directly to the east. The existing nuclear generation site at Sizewell is one of the approved sites selected for new nuclear generation development. New interconnector projects are also contracted to connect within this area.

1.3.21 The growth in offshore wind, nuclear generation and interconnector capacities connecting behind this boundary greatly increase the power transfer requirements out of the region as local total generation will exceed local demand. Generation capacity is expected to grow substantially in the coming years. In the East Anglia region, connection agreements have been signed for new generation; these future connection agreements comprise a large volume of offshore wind generation (including East Anglia Offshore Wind), gas-fired generation, energy storage projects, a nuclear power station (at Sizewell C) and interconnectors to Europe.

1.3.22 The existing high voltage electricity network in East Anglia does not have the capability needed to reliably and securely transport all the energy that will be connected while meeting the Security and Quality of Supply Standard (SQSS). Several network reinforcement projects are planned to address the shortfall of which Sea Link is one.

1.3.23 In addition to reinforcing the EC5 boundary, by connecting Sea Link into the transmission system at the proposed Friston substation it also reinforces the Bramford-Sizewell radial circuits, which are due to carry additional power from offshore wind, new nuclear and interconnectors, so offering additional constraint savings to the consumer.

The Need in the South East

1.3.24 The south of England transmission region includes boundaries LE1, SC1, SC1.5, SC2 and SC3. The LE1 boundary almost exclusively imports power from the north and west of England into the South East.

1.3.25 The wider South East area is made up of the 400 kV and 275 kV network which connects generation and demand in the major towns and cities of the wider South East and Midlands regions. Power flows in the region are determined by the need to meet domestic demand in the South East as well as imports and exports to Europe via interconnectors.

1.3.26 As more energy is pulled across London and into Kent, power flows across LE1 are set to increase. Demand for electricity will grow; interconnectors will exchange more energy with European countries to help balance intermittent sources of power. As a result, the electricity transmission network in the South East will need to be reinforced to ensure it is able to continue operating safely and securely.

1.3.27 Without reinforcement the capacity of the East Anglia and South East existing network is insufficient to accommodate the connection of the proposed new power sources.

2. Proposed Project Development

2.1 Introduction

2.1.1 The current stage of Proposed Project design is the result of an iterative process that commenced at project inception when the initial need to reinforce the network in the South East of England was identified in 2019. Environmental, engineering and economic considerations have influenced the optioneering and design evolution process. There have also been extensive discussions with the relevant stakeholders during the development of the Proposed Project in the early stages. The iterative design process will continue up to the application for development consent in parallel with, and informed by, a process of Environmental Impact Assessment (EIA) to identify the likely significant effects of the Proposed Project.

2.2 National Grid approach to project development and delivery

2.2.1 As part of the first stage of project development National Grid undertakes options appraisal on each new project. There are often a number of different ways that a project needs case could be met which could involve different locations, technologies or designs. Each project requires judgements and decisions to be made about the best way forward to achieve the required outcome. The options appraisal process provides information to help inform those judgements.

2.2.2 Options appraisal is a robust and transparent process that is used to compare options and to assess the positive and negative effects, those options may have across a wide range of criteria including environmental, socio-economic, technical and cost factors, as set out in National Grid's approach to options appraisal (Ref 5). Each of the options are appraised in accordance with this guidance. This guidance was developed by National Grid to provide a thorough and consistent approach to the appraisal of network reinforcement options. It represents the best practice approach to inform the decision-making process. The aim of the guidance is to ensure that decisions regarding the technology options and/or location of infrastructure are based on a full understanding of the implications of each option using a wide range of criteria.

2.2.3 Options Appraisal is underpinned by a set of overarching principles that reflect National Grid's statutory duties, which assist in decision-making and help achieve an appropriate balance between competing interests that must be considered in Options Appraisal. These principles are that:

- Using or adapting existing infrastructure will generally be of benefit/advantage compared with creating new infrastructure.
- Shorter routes will generally be of benefit/advantage compared with longer routes, as smaller scale infrastructure projects are generally likely to have lower environmental, safety, sustainability and cost implications (for comparable technology options).
- Financially less-expensive options, both in terms of capital and lifetime cost, will generally be of benefit/advantage, as these support National Grid's statutory duty under Section 9 of the Electricity Act 1989 to develop and maintain an 'efficient, co-ordinated and economical' transmission network.
- Options which avoid or reduce and mitigate impacts on environmental or socio-economic constraints will generally be of benefit/advantage compared with those which have likely significant residual effects, as less environmentally or socially damaging routes support National Grid's statutory duty under Schedule 9 of the Electricity Act 1989 to 'have regard to the desirability of preserving amenity' and will more readily achieve consent.

2.2.4 The guidance (Ref 5) sets out the topics (environment, socio-economic, technical and cost) and sub-topics that should be considered as part of the options appraisal.

2.2.5 At each stage of the options appraisal process, a clearly defined methodology has been used to inform the decision-making process. This has included technical inputs from engineers and environmental specialists to inform the decisions and design. The assessment has drawn on data and evidence collected from both, desktop studies and site visits. Decision making has also taken into account the feedback from prescribed bodies defined in the Planning Act 2008 (, and the local community, and will continue to take account of the feedback from the prescribed and non-prescribed bodies alongside feedback from the local community through an extensive programme of engagement and consultation. In addition, the Proposed Project has been subject to periodic internal challenge and review process to ensure the robustness of the decision made in the light of a changing environmental baseline related to technical, physical and economic matters.

2.2.6 Decisions about the Proposed Project have considered National Grid's statutory obligations set out in Sections 9 and 38 of the Electricity Act 1989, its licence requirements and all other relevant considerations including the relevant National Policy Statements (NPS). The options appraisal has also considered other policy and guidance when making judgements and decisions on the Proposed Project including the Horlock Rules (Ref 6) and Holford Rules (Ref 7).

2.2.7 **Image 2.1** shows where the options appraisal sits within National Grid's approach to project development and delivery, as set out in the National Grid publication 'Our Approach to Consenting' (Ref 8).

2.2.8 The Proposed Project is currently at the Defined Proposal and Statutory Consultation stage.

Image 2.1: National Grid's approach to project development and delivery

3. Summary of the Strategic Proposal

3.1 Introduction

3.1.1 A range of strategic options that might address the network reinforcement needs were identified and appraised at a strategic level. These appraisals considered the likely environmental and socio-economic effects, technical issues, and costs that would be associated with each strategic option. The network performance of each strategic option was also modelled to determine the benefits. The appraisal and modelling results informed judgements regarding the relative merits of the options and ensured that the final Strategic Proposal would meet National Grid's statutory duties under the Electricity Act 1989, including the requirement to bring forward proposals that are 'economic, efficient and coordinated' and that would comply with the relevant planning policies for which the consents would be granted.

3.1.2 A Strategic Options Report (Ref 9) has been prepared by National Grid, and has been published as part of Statutory Consultation. This sets out the strategic options that have been considered for the Proposed Project, and the reasons for the selection of the preferred strategic option. It also includes information about wider reinforcements in the East Anglia area, which are interactive with the need case.

3.2 Background to the Proposed Project

3.2.1 The strategic options considered for the Proposed Project were developed and appraised alongside the needs case to rationalise network reinforcement where possible, whilst ensuring compliance with National Grid's statutory duties.

3.2.2 Strategic options were developed that explored links between the South East of England and East Anglia that could provide the reinforcement required. This work identified that a connection between East Anglia and Richborough in Kent provided this reinforcement, this was then reflected in the 2019/2020 Network Options Assessment (NOA) (Ref 11). Solutions which resolve capacity requirements of the Sizewell Generation Group and SC2 Kent boundary are the only options that satisfy the needs case.

3.2.3 Additional network studies in East Anglia were then undertaken to confirm which connection point provided the best value to customers whilst reducing potential environmental and socio-economic impacts. These studies identified that the HVDC Link needed to connect into the Sizewell area in order to meet the needs of the Sizewell Generation Group, which would require additional infrastructure if the capacity provided by the 2GW HVDC link were not connected to the group.

3.2.4 The 2020/2021 NOA (Ref 11) also identified the reinforcements that were required to the network in East Anglia and National Grid undertook a similar exercise to investigate solutions that could provide this wider reinforcement. The Sizewell to Richborough HVDC Link (by this point named the 'Sea Link Project') was included as part of this exercise to confirm it remained the preferred solution under all scenarios.

3.3 Strategic Options Considered for the Proposed Project

3.3.1 Following the identification of the need for the reinforcement to connect into the Sizewell area in East Anglia and into the South East of England, four alternative strategic options were identified and assessed:

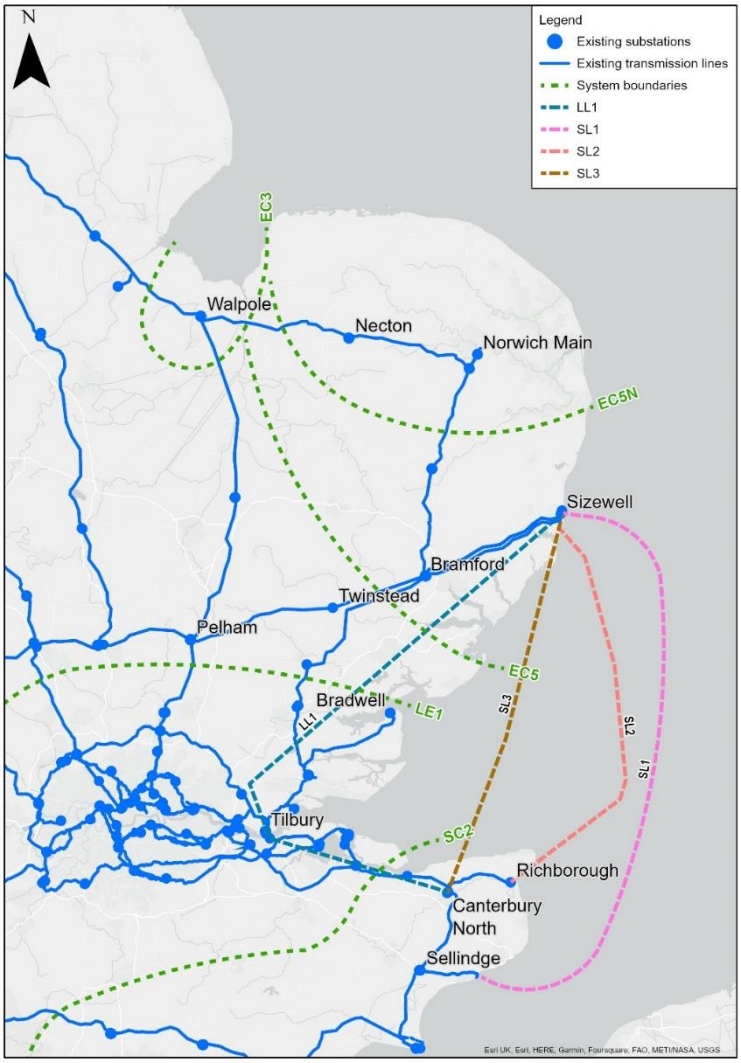
- SL1 – Sizewell area and Sellindge subsea approx. 180 km;
- SL2 – Sizewell area and Richborough subsea approx.120 km;
- SL3 – Sizewell area and Canterbury subsea approx. 120 km; and
- LL1 – Sizewell area and Canterbury onshore approx. 220 km.

3.3.2 For each of the strategic options, the technology options available for transmission system reinforcement, environmental and socio-economic constraints, lifetime costs of each technology option, as well as initial capital cost were considered.

3.3.3 Two technology options were considered for the three offshore options: AC Subsea cable and HVDC Subsea cable. Four technology options were considered for the onshore option: overhead line (OHL), underground cables, Gas Insulated Lines (GIL) and onshore HVDC.

3.3.4 The location of these four strategic options is shown on **Image 3-1.**

Image 3-1: Strategic Options considered



3.3.5 This assessment of these four strategic options considered:

- environmental and socio-economic constraints;
- technology options available and the associated technical considerations; and
- the capital and lifetime costs of each technology option.

3.3.6 The assessment of the four options concluded the following:

- Option LL1 (Sizewell to Canterbury) would have the lowest capital cost connection, but with a higher lifetime cost than the offshore HVDC solutions. Option LL1 would be subject to increased costs for crossing of the River Thames (likely by tunnel) and for any underground cable sections. Option LL1 was also found not to pass the technical and benefits filters in the options appraisal methodology, and therefore this option was not carried forward for environmental and socio-economic evaluation.
- None of the environmental and socio-economic impacts of the remaining offshore options SL1, SL2 and SL3 were considered to present in-principle issues that could not be mitigated with careful consideration of routeing and use of appropriate technologies to specific constraints, as is consistent with the existing and emerging National Policy Statements (NPSs) against which proposals for nationally significant infrastructure projects are assessed.
- The lowest cost subsea option was equal between options SL2 and SL3 (a connection from Sizewell Area to Richborough or Canterbury over a distance of 145 km utilising a 2000 MW Voltage Source Converter (VSC) HVDC connection).
- From an environmental and socio-economic perspective, option SL2 was preferred to option SL3 due to the marine constraints off the north Kent coast and onshore siting opportunities close to Richborough substation.

3.3.7 Accordingly, the assessment concluded that option SL2 would best balance overall technical, cost, environmental and socio-economic considerations.

4. Summary of the Options Identification Stage

4.1 Introduction

4.1.1 Having identified the preferred Strategic Option, National Grid undertook a Corridor and Preliminary Routeing and Siting Study (CPRSS) (Ref 12). This process is summarised below.

4.2 Approach to Routeing and Siting

4.2.1 A staged approach was adopted to identify corridors and preliminary routeing and siting options for the Proposed Project, considering environmental and socioeconomic factors as well as technical and engineering design considerations, and cost.

4.2.2 The approach was used to identify 'on-balance' preferences for landfalls, converter station sites and potential route corridors within which preliminary alignments could be developed.

4.2.3 Each of the options identified for the converter site Areas and cable route corridors were appraised in accordance with National Grid's approach to options appraisal (Ref 5).

4.2.4 In addition to above and in the absence of guidance for specific siting of converter stations, the Horlock Rules (Ref 6) have been applied. Although these were developed for the siting of substations, they were considered appropriate to use when identifying and appraising converter site Areas.

4.2.5 The steps undertaken for the Proposed Project in this staged approach are summarised below.

4.2.6 **Step 1 Identification of the Routeing and Siting Study Area**: This step sought to identify the extent of the study area within which route corridors and converter site Areas could be developed. This was based on the study area used at the strategic option stage but widened out in places to ensure route corridors could be developed that avoided environmental and socio-economic constraints as far as possible.

4.2.7 **Step 2 Data Gathering**: This step sought to build on the constraints data already obtained through the strategic options process to ensure relevant baseline information from available sources was taken into consideration in the options appraisal process.

4.2.8 **Step 3 Identification of Landfall Areas of Search:** This step involved the identification of areas of potential landfall within the study area as this is the interface between the onshore and offshore elements of the Proposed Project and therefore form the start and end points from which corridor options could be identified. The landfall areas of search were identified based on the following criteria:

- access to the proposed onshore grid connection point;
- suitability of ground conditions (e.g., areas of low elevation, avoidance of estuarine habitats);
- potential for site access;
- avoidance of existing infrastructure as well as major development either consented or currently in the application process; and
- high level consideration of potential key environmental and socio-economic constraints such as populated areas and ecological designations (landfall areas of search were not necessarily ruled out on the basis of these potential constraints and were taken forward in order to be subjected to an initial routeing and siting environmental and socio-economic options appraisal).

4.2.9 **Step 4 Identification of Route Corridors and Site Areas**: This step involved the identification of marine route corridors and alignments between the landfall areas of search in parallel with the identification of terrestrial route corridors and converter site Areas including the connection to the network.

4.2.10 **Step 5 Appraisal of Route Corridors and Site Areas:** This step involved an appraisal of the marine route corridors and alignments, terrestrial corridors, converter station siting areas and network connection options.

4.2.11 **Step 6 Identification of the Preferred end-to-end solution:** This step used the outcomes of the environmental and socio-economic and technical appraisal of the individual elements as well as a consideration of cost, to identify an on-balance preferred end-to end solution for the Project.

4.2.12 **Table 4.1** presents the topics and criteria that were considered.

Table 4.1: Appraisal Topics

Environment	Socio-economic	Technical	Cost
Landscape and visual	Settlement and Population	Technical Complexity	Capital cost
Historic environment (terrestrial and marine)	Tourism and Recreation (terrestrial and marine)	Construction / project delivery issues	Lifetime cost
Biological environment (terrestrial and marine)	Infrastructure (terrestrial and marine)	Suitability of Technology	
Physical environment (terrestrial and marine)	Land Use (ownership/type)	Network Capacity	
	Traffic and Access	Network Efficiencies/Benefits	
	Shipping and Navigation	Commercial / regulatory / third party issues	
	Planning - Future development and receptors (including planning applications and allocations, planning policy designations and marine plans)		

4.2.13 Details of the environmental and socio-economic sub-topics that were considered at the routeing and siting stage are detailed in **Appendix B.**

4.2.14 The following sections provide a summary of the outcome of routeing and siting process in Suffolk (hereafter referred to as the Suffolk Onshore Scheme), Kent (hereafter referred to as the Kent Onshore Scheme) and in marine waters (hereafter referred to as the Offshore Scheme) and a summary of the options that were consulted on as part of non-statutory consultation.

4.3 Suffolk Onshore Scheme

Network connection points considered

4.3.1 The preferred strategic option identified the Sizewell area as the area on the network the Proposed Project was required to connect, in order to meet the Needs Case as described in Section 2. Three potential points of connection were identified within the Sizewell area, and these were appraised as part of the routeing and siting appraisal.

4.3.2 These connection points are illustrated on **Figure 4.1: Suffolk Network Connection Points in Appendix A** and were:

- the existing Sizewell B substation or the consented Sizewell C substation (which forms part of the proposed Sizewell C Nuclear Power Station Project);
- the proposed Friston substation (which forms part of the consented Scottish Power Renewables East Anglia One North and East Anglia Two Offshore Wind Farm Projects); or
- a new connection point directly onto the existing 400 kV overhead lines within proximity to the Sizewell area.

4.3.3 These were used as the basis for defining the routeing and siting study area in Suffolk.

Study area

4.3.4 The routeing and siting study area in Suffolk extended from Hollesley in the south to Dunwich in the north along the Suffolk coast, and inland to Wickham Market.

Landfall Areas Of Search Considered

4.3.5 Five landfall areas of search were initially identified in Suffolk. These are illustrated on **Figure 4.2: Suffolk Landfall Areas of Search - Sheets 1- 4 of Appendix A**. The southernmost area of search(S1) was identified to the south of Aldeburgh, north of the Alde and Ore River. A second Area of search was identified between Aldeburgh and Thorpeness (S2). A third area of search was identified between Thorpeness and Sizewell (S3). This area was further split down into two sub areas, south (S3) and north (S3N). A fourth area (S4) at Sizewell and the northern most area of search was identified to the north of Sizewell south of Minsmere (S5).

Summary of appraisal outcomes

Terrestrial constraints

4.3.6 All five landfall areas of search are within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) which was unavoidable within the study area.

Landfall area of search S1

4.3.7 Landfall area of search S1 is located to the south of Aldeburgh and the north of the Alde and Ore River. The Alde and Ore River is located adjacent to the south of this landfall area of search and is designated as the Alde-Ore Estuary Ramsar, Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) and the Alde-Ore & Butley Estuaries Special Area of Conservation (SAC). These designations were avoidable within this landfall area of search, however they would need to be crossed by any onward terrestrial routeing from this landfall. The whole of this landfall area of search is within Flood Zones 2 and 3 and construction within the flood zone could not be avoided. Access to this landfall area of search was also limited and would likely need to be taken through Aldeburgh.

Landfall area of search S2

4.3.8 Landfall area of search S2 is located to the north of Aldeburgh and south of Thorpeness. The whole of the landfall area of search is designated as Leiston – Aldeburgh SSSI and North Warren Royal Society for the Protection of Birds (RSPB) Reserve. These designations were unavoidable within this area of search, but the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations) could be used to reduce potential significant effects. The majority of the landfall area of search is within Flood Zone 2 and 3, depending on the installation technique, these zones were considered potentially avoidable as trenchless techniques could be used to avoid working directly within Flood Zone 2 and 3.

Landfall area of search S3

4.3.9 Landfall area of search S3 stretches from Thorpeness in the south to Sizewell in the north and was broadly split into two, S3 in the south from Thorpeness to Beach View Holiday Park and S3N to the north of Beach View Holiday Park to Sizewell Gap Road. The whole of the intertidal area within S3 is designated as Leiston – Aldeburgh SSSI, however within this landfall area of search this designation is very narrow and likely to be avoidable with the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations). A section of North Warren RSPB Reserve is located in the south of this landfall area of search but was likely to be avoidable. S3N is wholly outside of the Leiston – Aldeburgh SSSI. There are small areas of Flood Zone 2 and 3 across both S3 and S3N but these areas are localised and were considered likely to be avoidable.

Landfall area of search S4

4.3.10 Landfall area of search S4 is located to the north of Sizewell Gap Road at Sizewell. There are no terrestrial designations for ecological conservation within the intertidal area however the landfall area of search was significantly constrained by the existing Sizewell B Nuclear Power Station.

Landfall area of search S5

4.3.11 Landfall area of search S5 is located to the north of existing Sizewell Nuclear Power Station and south of Minsmere New Cut drainage channel. The whole of the intertidal area and immediate terrestrial area is designated as Minsmere-Walberswick Ramsar and SPA, Minsmere to Walberswick Heaths & Marshes SAC and SSSI and Minsmere RSPB Reserve. These designated sites were unavoidable within this area of search, but the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations) could be used to reduce potential significant effects. A second crossing of the Minsmere to Walberswick Heaths & Marshes SSSI and Minsmere RSPB Reserve would also be required for any onward terrestrial routeing. The majority of this landfall area of search is within Flood Zones 2 and 3 and construction within the flood zone could not be avoided. Access to this landfall area of search was also very limited and likely to require a long temporary access road.

Summary of relevant marine alignments

4.3.12 Whilst the immediate offshore landfall area of search at S1 and S2 is outside of the Southern North Sea SAC, all marine alignments to the landfall areas of search in Suffolk would need to cross both the Southern North Sea SAC and the Outer Thames Estuary SPA.

4.3.13 The marine approaches to both landfall area of search S1 and S2 were relatively unconstrainted.

4.3.14 The marine alignment to landfall area of search S3 was significantly constrained due to the presence of rocky reefs comprised of cemented limestone rich shells in the immediate offshore environment. This constraint is reduced at landfall S3N.

4.3.15 The marine alignments to landfall areas of search S4 and S5 were more constrained than the other options due to the additional number of offshore crossings that would be required and the potential for interaction with the proposed Sizewell C development.

Summary of appraisal outcomes

4.3.16 Landfall area of search S1 was relatively unconstrainted from a marine approach perspective but terrestrially had access and flood risk constraints and constraints associated with the onward terrestrial routeing.

4.3.17 Landfall area of search S2 was relatively unconstrainted from a marine approach perspective but terrestrially crosses a wide area designated as SSSI and RSPB reserve.

4.3.18 Landfall area of search S3 was significantly constrained from a marine approach perspective due to the presence of rocky reefs and, in the immediate offshore by the proposed export cable route from the proposed East Anglia One North and Two Offshore Wind Farm Projects. Onshore it was considered likely that the effects on the SSSI and RSPB reserve could be reduced through the use of trenchless installation techniques (subject to confirmation through further studies and ground investigations). Offshore, the approach to landfall S3N was less constrained by the rocky reef but other existing and proposed offshore infrastructure on the approach still posed a constraint. Terrestrially, S3N was relatively unconstrained environmentally.

4.3.19 Landfall area of search S4 was significantly constrained both on the offshore approach and terrestrially by the presence of the existing Sizewell B Nuclear Power Station and the proposed Sizewell C Nuclear Power Station development.

4.3.20 Landfall area of search S5 was constrained on the marine approach by the large number of offshore cable crossings and the potential interaction with the proposed Sizewell C Nuclear Power Station development, and onshore by both European and national designated sites for nature conservation.

4.3.21 These factors were considered when selecting the preferred option to take forward, as set out later in this section.

Converter Site Areas Considered

4.3.22 The main search parameter for the converter site Areas was that they should be within approximately 5 km of the network connection point, as a distance greater than this would trigger the need for reactive compensation equipment on the network resulting in additional land take and cost. This search parameter was however used as a guide, so as not to discount potentially suitable sites at a slightly greater distance where the benefits might outweigh the additional land take and cost.

4.3.23 Nine converter site Areas (A – I) were initially identified.

4.3.24 Due to there being a number of potential network connection points in the Sizewell area, converter site Areas were identified for each connection point, but some Areas provided a connection into more than one of the connection points. **Table 4.2** lists the converter station Areas appraised for each connection point. A description of the Areas is provided below. The Areas are illustrated on **Figure 4.3: Suffolk Converter Site Areas - Sheets 1- 4 of Appendix A.**

Table 4.2: Suffolk converter site Areas – connection points

Connection point	Converter site Areas
Existing and proposed Sizewell substations	A B C D
Proposed Friston substation	B C D E F G H
New substation along the existing 4Z overhead lines	B E F H I

Converter site Area A

4.3.25 Area A is located to the north of Kenton and Goose Hill, to the southeast of Eastbridge. The Area is wholly within the Suffolk Coast and Heaths AONB, but it was identified as a potential Area as it is close to the existing Sizewell B Nuclear Power Station and adjacent to the proposed Sizewell C Nuclear Power Station, therefore, providing an opportunity to keep energy infrastructure close together. The Area is adjacent to the Minsmere-Walberswick Ramsar and SPA, Minsmere to Walberswick Heaths & Marshes SAC and SSSI and Minsmere RSPB Reserve.

Converter site Area B

4.3.26 Area B is located to the east of Leiston and west of the existing Sizewell B Nuclear Power Station. The Area is wholly within the Suffolk Coast and Heaths AONB, but, was identified as a potential Area as is adjacent to the existing Sizewell B Nuclear Power Station and existing overhead lines, therefore, providing an opportunity to keep energy infrastructure close together. Sandlings SPA, Leiston – Aldeburgh SSSI and North Warren RSPB Reserve border this Area to the south.

Converter site Area C

4.3.27 Area C is located on the site of the former Leiston Airfield and is bordered to the south by Harrow Lane to the northwest by Theberton Woods. Moat Road runs west to east through the northern half of the Area.

Converter site Area D

4.3.28 Area D is located to the west of Leiston and is bordered to the northwest by the B1119 and Abbey Road and to the west by the Hundred River. There is a small parcel of Ancient Woodland (Buckles Wood) located within the north of this Area adjacent to Buckleswood Road. There is an area of Flood Zone 2 and 3 on the far western boundary of the Area associated with the Hundred River.

Converter site Area E

4.3.29 Area E is located to the south of Knodishall and is bounded to the east by the Suffolk Coast and Heaths AONB, the south by the A1094 Aldeburgh Road and the B1069 (Snape Road) runs southwest to northeast through the centre of the Area. There is a small area of Ancient Woodland at Great Wood located on the eastern edge of the Area and Grove Wood Ancient Woodland is located adjacent to the northwest corner of the Area.

Converter site Area F

4.3.30 Area F is located to the southeast of Sternfield and west of Friston. An unnamed road linking Church Hill in the north to the A1094 in the south borders the west of the Area and the B1121 borders the Area to the north and northeast. Red Lane and Kiln Lane run west to east through the northern half of this Area. The existing 400 kV overhead lines run southwest to northeast through the centre of this Area. The Suffolk Coast and Heaths AONB is located to the south of the Area, south of the A1094.

Converter site Area G

4.3.31 Area G is located the southwest of Saxmundham and is bordered to the east by the A12 and the west by Deadmans Lane.

Converter site Area H

4.3.32 Area H is located to the west of Gromford and is bounded to the south and east by a railway line the west by Langham Road, Racewalk Covert is located to the north of the site. Snape RSPB Reserve is located to the south of the Area, south of the railway line.

Converter site Area I

4.3.33 Area I is located to the east of Lower Hacheston and is bounded to the north by the A12. The existing 400 kV overhead lines and railway line cross the far southeastern boundary of the Area. A small area of Flood Zone 2 and 3 is located in the northeastern corner the Area, associated with the River Ore.

Summary of appraisal outcomes

4.3.34 Of the possible connection points in the Sizewell area, only the Sizewell B substation is currently in existence; all the other proposed connection points would require the installation of a new substation, either proposed through another project in the area, or installed as part of this Proposed Project. Connecting into the existing Sizewell B[1] or consented Sizewell C substation would require taking over two of the super grid transformer (SGT) circuits feeding the existing Leiston 132 kV substation by connecting into the 400 kV circuits feeding the SGTs. This would require the installation of two new 400/132 kV SGTs in the converter station site with new 400 kV cables connecting into the existing Sizewell B or consented Sizewell C substation, and new 132 kV cables connecting the SGTs in the converter station with the Leiston 132 kV substation. The 400 kV cable route to the substation would require either using the corridor allocated to the existing 132 kV connection or routeing through Sizewell Marshes SSSI. A connection into either the existing or proposed Sizewell substation would also need to consider the works to construct the proposed Sizewell C Nuclear Power Station as the program of works would overlap. This could have programme implications for the delivery of this Proposed Project in line with the needs case and to meet the required connection date.

4.3.35 At the time of the routeing and siting appraisal the Development Consent Order (DCO) that would deliver Friston substation (which forms part of the Proposed SPR East Anglia One North and East Anglia Two Offshore Wind Farm Projects) was advanced in the consenting process and it has subsequently received development consent.

4.3.36 A connection into the existing 400 kV overhead lines would require a new substation to be built. This was assessed on the basis that it would be combined within the converter site Areas and would also require either the existing overhead lines to be diverted into and out of the new substation or a cable route (where economic and efficient) from a new substation to the existing overhead lines with a cable sealing end compound located adjacent to the overhead lines.

4.3.37 Converter site Areas A and B are both within the Suffolk Coast and Heaths AONB but offered opportunities to keep existing and proposed energy infrastructure together. Both areas are also within land which is being used as part of ecological mitigation areas for the proposed Sizewell C Nuclear Power Station. As set out above a connection from either of these sites into either the existing or proposed Sizewell substation was significantly constrained, and a connection into either the proposed Friston substation or a new connection into the existing 400 kV overhead lines would likely be required. Site Area A was not identified as a site suitable for either a connection into the proposed Friston substation or the existing 400 kV overhead lines due to the distance from this Area to these connection points.

4.3.38 Converter site Area C was constrained by the existing access, however the development of the proposed Theberton bypass as part of the proposed Sizewell C development, would alleviate some of these constraints if developed in time.

4.3.39 Converter site Area D was considered constrained by planned future development plans to the north including the proposed Sizewell C rail head and poor site access along the existing road network that would require routeing of traffic through the settlement of Leiston.

[1] Sizewell B substation is nearing the end of its design life; therefore, replacement or refurbishment works may be required as either part of the Proposed Project or as a separate project (if a connection to Sizewell B substation were to be taken forward).

4.3.40 Converter site Areas E and F both had good access from the A1094 but were considered constrained by the proximity to the Suffolk Coast and Heaths AONB in terms of the potential for setting impacts.

4.3.41 Converter site Areas G and H were considered highly constrained by future development plans on the eastern side of the A12 constraining the ability to connect into either the proposed Friston substation and, in the case of Area H, a new connection point on the existing 400 kV overhead lines.

4.3.42 Converter site Area I was not identified for a Sizewell or a Friston connection due to the distance from these proposed connection points so this site would require a new connection point to be established. This Area was also constrained by the length of onshore cable that would be required to connect to any of the landfall areas of search, increasing the spread of potential temporary disturbance during construction.

4.3.43 Due to the existing and proposed energy development within the study area coupled with the proximity of the Suffolk Coast and Heaths AONB in this locality the environmental and socio-economic appraisal concluded that an underground HVAC connection would be preferred to an overhead line HVAC connection between the converter site options areas and any of the connection points.

4.3.44 These factors were considered when selecting the preferred option to take forward, as set out later in this section.

Route Corridors Considered

4.3.45 Corridors were developed that could connect each of the landfall areas of search to each of the converter site Areas.

4.3.46 Within Suffolk this process resulted in 15 corridors being identified:

- five corridors from each of the five landfall areas of search to the four converter site Areas that could connect into the existing and proposed Sizewell substations **Figure 4.4: Suffolk Terrestrial Route Corridors Sizewell Connection - Sheets 1 to 4 of Appendix A**;
- five corridors from each of the five landfall areas of search to the seven converter site Areas that could connect into the proposed Friston substation **Figure 4.5: Suffolk Terrestrial Route Corridors Proposed Friston Connection – Sheets 1 – 4 of Appendix A;** and
- five corridors from each of the five landfall areas of search to the five converter site Areas that could connect into the existing 400kV overhead line **Figure 4.6: Suffolk Terrestrial Route Corridors New Connection – Sheets 1 - 4 of Appendix A.**

Summary of appraisal outcomes

4.3.47 Within Suffolk none of the corridors avoided designated sites. The Suffolk Coast and Heaths AONB extends across the full extent of the routeing and siting study area and was therefore unavoidable for any of the 15 corridors that were identified and appraised. Whilst the routeing and siting study area was drawn to provide opportunities to avoid designated sites and constraints, the Suffolk Coast and Heaths AONB extends unbroken from Felixstowe and Harwich in the south to Kessingland in the north. It was not therefore possible to avoid this designation and meet the need case without a significantly longer and indirect route that would not be in accordance with National Grid's statutory duties.

4.3.48 All three green corridors as illustrated on **Figure 4.4 to Figure 4.6 of Appendix A** that connected with the southernmost of the five landfall areas of search S1, south of Aldeburgh, would require an extensive crossing of the Alde-Ore Estuary, which is designated as the Alde-Ore Estuary Ramsar, SPA and SSSI and the Alde-Ore & Butley Estuaries SAC. These corridors would also interact with the same designated sites around the settlements of Iken and Snape. A large proportion of the green corridors are also within Flood Zone 2 and 3 and would require the longest cable route within the Suffolk Coast and Heaths AONB of all the corridors.

4.3.49 The three blue corridors as illustrated on **Figure 4.4 to Figure 4.6 of Appendix A** that connected into the southern part of the landfall area of search S3 between Thorpeness and Sizewell would need to cross a section of Sandlings SPA and the Leiston – Aldeburgh SSSI and would likely require interaction with the proposed cable routes for the East Anglia One North and East Anglia Two Offshore Wind Farms Projects.

4.3.50 The three purple corridors as illustrated on **Figure 4.4 to Figure 4.6 of Appendix A** that connected into the northern part of this landfall area of search S3N, when considered in isolation, provided an opportunity to avoid sites designated for nature conservation but would entail interaction with the proposed Sizewell C Nuclear Power Station project.

4.3.51 The three orange corridors as illustrated on **Figure 4.4 to Figure 4.6 of Appendix A** that connected to the most northern landfall area of search S5, to the north of Sizewell would need to cross Minsmere-Walberswick Ramsar and SPA, Minsmere to Walberswick Heaths & Marshes SAC and SSSI and Minsmere RSPB Reserve and would entail significant interaction with the proposed Sizewell C Nuclear Power Station project. Four pinch points were identified within the route corridors:

- The first was at a crossing of Leiston Road close to Aldeburgh Golf Course, which would be crossed by all three red corridors connecting to the landfall area of search S2.
- The second of these was located between the B1353 and Leiston Road and would require cable routes to cross the Sandlings SPA, the Leiston – Aldeburgh SSSI, and a section of the golf course, as well as having a pinch point at the crossing of Leiston Road. This pinch point would affect the three blue corridors connecting to landfall area of search S3.
- The third pinch point was to the south of Aldringham at the crossing of the Hundred River. This area is constrained by the Hundred River itself, the crossing of the B1353 and the B1122, and an area of woodland and properties. In addition, the cables for the East Anglia One North and Two Offshore Wind Farms are proposed to be routed through this same pinch point. This area would need to be routed through (depending on which converter site Area is selected) by the three purple corridors connecting to landfall area of search S3N or by all three blue corridors connecting to landfall area of search S3 to avoid the second pinch point.
- The fourth pinch point was to the northwest of Leiston and is associated with the offsite works for the proposed Sizewell C Nuclear Power Station including an area that has recently been established for ecological mitigation measures related to that project. Depending on which converter site Area is selected, this area would need to be routed through by the three purple corridors connecting to landfall area of search S3N.

4.3.52 Significant engineering and environmental constraints associated with a connection into either the existing or proposed Sizewell substations meant that these options were not preferred. Connecting to a new connection point in the area, with an associated additional substation, was also not preferred as there would be no environmental or socio-economic, technical, or economic benefit over connecting into an existing (where possible) or proposed substation. The proposed Friston substation (which is now consented) was therefore identified as the preferred connection point. As a consequence, those converter site Areas (Area A and Area I) which were not identified for a Friston connection were discounted alongside the associated terrestrial corridors.

4.3.53 Landfall area of search S4 was identified as being significantly constrained from a terrestrial perspective as no onward terrestrial route corridor was identified from this landfall area of search due to the existing and proposed Sizewell Nuclear Power Stations. The marine approach was also constrained by the number of cable crossings, therefore this option was not taken forward.

4.3.54 Whilst the marine alignment to landfall area S1 was relatively unconstrained, the terrestrial green corridor was constrained technically by two large river crossings of the Alde and Ore River which would also require a crossing of the Alde-Ore and Butley SAC in two places and the Alde-Ore Estuary SPA and SSSI in three places. A large proportion of this corridor was also within the Flood Zone and this corridor would require the longest route within the Suffolk Coast and Heaths AONB. Access to this corridor was also very limited, in particular in the area between the two large river crossings due to the nature and scale of the existing road network. As such area S1 was discounted

4.3.55 The marine approach to landfall area S3 was significantly constrained by the presence of rocky reefs. Onward terrestrial routeing within the blue corridor would also likely require a crossing of Sandlings SPA and Leighton-Aldeburgh SSSI although the potential for significant effects were considered likely to be reduced through the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations).

4.3.56 The marine approach to landfall S5 was constrained by the number of crossings offshore. Terrestrially the onshore orange corridor is constrained at the landfall by the presence of both European and national designated sites for nature consideration, albeit it was considered likely that significant effects could be reduced through the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations). The orange corridor also crossed a large area of the proposed Sizewell C Nuclear Power Station development area which could significantly constrain the ability to route through this area and also have programme implications associated with construction sequencing of the two developments.

4.3.57 The marine approach to the landfall area S2 had fewer constraints, however the Leiston – Aldeburgh SSSI and North Warren RSPB reserve could not be avoided. The use of trenchless construction techniques (subject to confirmation through further studies and ground investigations) would reduce the impacts at this landfall. The red terrestrial route corridor from this landfall area of search also included the pinch point along Leiston Road.

4.3.58 The northern part of the landfall area of search S3 (S3N) could avoid the area of rocky reef which significantly constrained the marine approach to S3; however, the presence of existing and proposed cables at this landfall area and in the nearshore environment constrained potential marine alignments. The purple terrestrial route corridor connecting to this landfall area of search could not avoid either of the two following pinch points. The first of these pinch points is on the route to the south of Aldringham; This route would have to cross the Leiston Aldborough SSSI and then the Hundred River. This area is constrained by the Hundred River itself, the crossing of the B1353 and the B1122, and an area of woodland and properties. In addition, the cables for the East Anglia One North and Two Offshore Windfarms are proposed to be routed through this same pinch point. The second pinch point is to the north and northwest of Leiston, associated with the offsite works for the proposed Sizewell C Nuclear Power Station including an area that has been establishing for several years in readiness for it to be a suitable reptile receptor site essential to mitigate effects related to that project. It would not be possible to replace this receptor habitat as it would not mature in time to provide a suitable receptor site.

4.3.59 Converter site Area B was constrained as this site is within the Suffolk Coast and Heaths AONB and overlaps with an area that has been established for the proposed Sizewell C Nuclear Power Station ecological mitigation, which has been maturing for a number of years and would be very difficult, if not impossible, to replace. Area C would also result in a significantly longer onshore cable route if landfall area of search S2 and the red corridor were selected. Area C was also constrained by the existing access. Area D is considered constrained by planned future development plans to the north included the proposed Sizewell C rail head and poor site access along the existing road network that would require routing of traffic through Leiston. Area G was significantly constrained by future development plans on the eastern side of the A12 and Area H was constrained by a new connection point on the existing 400kV OHL. Areas E and F were both in close proximity to the Suffolk Coast and Heaths AONB and therefore setting impacts were a consideration for both. The landscape character of Area F is more open than Area E, and Area E provided a greater opportunity to mitigate both through the use of existing and additional screening. Both Areas had good access to the strategic highway network. Area E would result in a shorter onshore cable route from either landfall area of search S2 and the red corridor, or else landfall area of search S3N and the purple corridor.

4.3.60 On balance the preferred solution identified was landfall area of search S2 connecting to a converter site Area E via the red corridor with a connection back to the network through the proposed Friston substation.

4.3.61 Whilst Area E was constrained at the landfall due to presence of terrestrial nature conservation sites, it was identified that trenchless installation methods could be used to reduce or avoid potential impacts. However, as further survey work was required to confirm the feasibility of using trenchless techniques at this landfall it was considered prudent to also progress an alternative. This alternative was landfall area of search S3N and a connection to converter site Area E via the purple corridor with a connection back to the network through the proposed Friston substation.

4.3.62 Area E was the preferred converter station area prior to the investigation of coordination, which is discussed below.

Stakeholder Feedback And Option Refinement

4.3.63 Through engagement prior to non-statutory consultation, Suffolk County Council and East Suffolk District Council encouraged National Grid to explore opportunities to coordinate with the interconnector projects being proposed by National Grid Ventures (NGV) in the area, namely Nautilus Interconnector and LionLink (formally known as EuroLink) Interconnector, which would require similar onshore infrastructure.

4.3.64 Coordination may mean a variety of different things, from sharing of data and site survey information, sharing construction materials such as stone for temporary access tracks (if projects are constructed in sequence) through to physical co-location or even sharing infrastructure.

4.3.65 Whilst it is possible to share certain types of infrastructure, for example car parks, accesses, and landscaping, the sharing of large-scale infrastructure would not necessarily realise benefits as there would be no reduction in the size of development or its footprint.

4.3.66 National Grid has explored the concept of co-locating converter stations, sharing cable corridors and consolidating landfalls as part of the exploration of coordination. These elements of coordination are considered to reduce the potential spread of infrastructure through a rural environment, concentrating development in a single area. It could also allow for sharing some elements of infrastructure, such as temporary and permanent access, and allows for shared mitigation. This is explained in the following sections.

4.3.67 National Grid has backchecked and reviewed all potential converter sites/Areas that were identified independently through both NGV's non-statutory consultation for the Nautilus Project[2] and the routeing and siting option appraisal for the Proposed Project described above. This backcheck and review considered whether it was feasible for any of the converter site Areas to accommodate up to three co-located converter stations and whether there were any additional sites that should be investigated/appraised further for co-location opportunities (this is described further in the next section).

4.3.68 The landfall areas of search S2, between Aldeburgh and Thorpeness and S3 and S3N, between Thorpeness and Sizewell were revisited, along with the red, blue and purple cable corridors, to understand the feasibility of co-located landfalls and corridors.

4.3.69 Seven sites were identified as potentially offering opportunities for coordination, some of which aligned with the original converter station Areas identified for Sea Link, and some that had not been previously considered. These are illustrated on **Figure 4.7: Potential Coordinated Converter Station Sites – Sheets 1 to 4 of Appendix A**.

Potential coordinated (co-located) converter station sites considered

4.3.70 A summary of key considerations for each of the seven sites is illustrated **Figure 4.7: Potential Coordinated Converter Station Sites – Sheets 1 to 4 of Appendix A** and is described in the following sections.

[2] At the time of routeing and siting, potential converter station sites for LionLink were not known, only those for the proposed Nautilus Project. The outputs of the exploration of coordination and co-location with NGV fed into the routeing and siting that was subsequently undertaken for LionLink which they consulted on in October 2022.

Site 1

4.3.71 Site 1 was contiguous with part of converter site Area E and offered good existing screening to the north of the site and good construction access to the strategic road network. It is close to the Suffolk Coast and Heaths AONB so setting was a consideration for this site. However, the site offered good opportunities for mitigation in keeping with the existing landscape character. This site also offered the shortest overall onshore cable route.

Site 2

4.3.72 Site 2 was contiguous with part of converter site Area F and whilst being located close to the strategic road network in terms of access, in terms of landscape character it is a very open landscape and development of a coordinated solution on this site would likely require substantial mitigation. Suffolk Coast and Heaths AONB is adjacent to the southern boundary of this site. The settlement of Sternfield is located to the northwest of the site, Church Common to the southwest of the site and Friston to the east of the site.

Site 3

4.3.73 Site 3 was located further from the Suffolk Coast and Heaths AONB but in close proximity to the settlement of Saxmundham. There was good existing screening along the western and southern edges of the site, this along with the topography of the local area would limit the intervisibility between the settlement and the site. Access to this site is constrained and would need to be routed through the settlement of Saxmundham if taken off the B1119. An alternative opportunity does exist to take permanent construction access from the B1121. This would require construction of a permanent access route and a potential crossing of the River Fromus or the railway line.

Site 4

4.3.74 Site 4 was contiguous with part of converter site Area C and was located further away from the Suffolk Coast and Heaths AONB and offers good existing screening and additional screen planting could be developed in keeping with the existing landscape character. Access to this site was challenging as it is accessed via small country roads; however, Site 4 did have the benefit of the proposed new link road being developed as part of the proposed Sizewell C Nuclear Power Station albeit the cumulative impact with this development would be a consideration. The site contains the former RAF Leiston Airfield, therefore this non-designated asset would need to be considered further if taken forward for development.

Site 5

4.3.75 Site 5 was located approximately 2.5 km from the Suffolk Coast and Heaths AONB at its closest point. There are smaller settlements that surround the site on the west, south and east, although intervening vegetation, particularly in the southern part of the site, would provide a degree of existing screening. The existing overhead lines are routed to the south of the site, and this was the closest of the proposed sites to the proposed Friston substation development. There are a number of non-designated assets within the site which include potential extensive remains of a roman settlement and villa within the north of the site. Physical impacts to these assets could potentially be avoided if development were to take place in the southern part of the site. A small section of Flood Zones 2 and 3 are located along the eastern boundary of the site associated with the Hundred River although it was considered likely that these areas could be avoided. This site is located further from the strategic road network and routeing construction traffic through settlements was considered unlikely to be avoidable.

Site 6

4.3.76 Site 6 was contiguous with converter site Area D and located approximately 1.5 km from the Suffolk Coast and Heaths AONB at its closet point. The site is located to the west of the settlement of Leiston and north of the settlement of Knodishall. There are a number of woodland blocks and shelterbelts which did offer some opportunity for existing screening and integration of mitigation planting. There are a number of historical designated assets within the settlements of Leiston and Knodishall but these are well screened by existing vegetation surrounding the assets. Similar to Site 5, this site is located further from the strategic road network and routeing construction traffic through settlements was considered unlikely to be avoidable.

Site 7

4.3.77 Site 7 was contiguous with part of converter site Area D and located within the Suffolk Coast and Heaths AONB adjacent to the existing nuclear power stations and the Galloper and Gabbard Offshore Windfarm substations as well as the proposed Sizewell C Nuclear Power Station. Whilst within the designated site, this site did offer the opportunity to keep energy development close together. The settlement of Leiston is located to the west of this site although it is the industrial edge of this settlement closest to the site. Existing planting along the southern boundary of the site also provided good existing screening. Sandlings SPA is adjacent to the southern boundary of this site and Sizewell Marshes SSSI to the northern and western boundaries. The site is currently being used as a reptile mitigation area for the proposed Sizewell C Nuclear Power Station, therefore should this site be developed, this would need to be considered. This is the furthest of the sites from the strategic road network and like Site 4 access was constrained based on the existing road network. The proposed bypass as part of the proposed Sizewell C Nuclear Power Station would reduce potential impacts if in place for the start of construction but the cumulative impacts with the Sizewell C development would need to be considered. A connection back into Friston from Site 7 was also technically challenging (due to being constrained by a pinch point at Aldringham and at the crossing of the Hundred River) and an alternative solution would likely be required in terms of connecting into the existing network on the site.

Potential for coordinated (co-located) landfalls

4.3.78 As set out above landfall area S2 interacts with the Leiston - Aldeburgh SSSI and North Warren RSPB reserve but had fewer constraints on the marine approach and was not constrained by the presence of any other existing or proposed infrastructure.

4.3.79 As set out above the majority of landfall S3 was considered significantly constrained in the immediate offshore environment due to the presence of the bedrock reef of the Coralline Crag formation which is an important feature when considering coastal processes. Opportunities to reduce interaction with this feature were identified to the northern and southern ends of the landfall area of search however the southern extent of the landfall is spatially constrained by the proposed East Anglia One North and East Anglia Two Offshore Windfarm developments.

4.3.80 Whilst reducing interaction with the bedrock reef of the Coralline Crag compared to S3, the routeing and siting process identified that landfall S3N had constraints associated with existing and proposed onshore and offshore infrastructure. When appraised as a landfall for the Proposed Project and as described in the sections above this landfall was identified as alternative to take forward. When considered as co-located landfall it was identified that whilst landfall maybe achieved with two sets of cables but with significant technical complexity it was deemed unlikely that landfall could be made with three sets of cables due to the space available.

4.3.81 The appraisal identified that only landfall area of search S2 could potentially deliver a co-located landfall solution for three sets of cables.

Potential for coordinated (co-located) terrestrial route corridors

4.3.82 The assessment of the co-located terrestrial route corridors identified the same constraints as those identified for the red, blue and purple corridors appraised for the Proposed Project.

4.3.83 With regards to the four pinch points that were identified and are unavoidable on either the red, blue or purple corridors, the third pinch point was identified as not being able to accommodate a co-located solution. This would affect routes within the blue or purple corridors from landfall S3N depending on the location of the converter station.

4.3.84 Landfall S2 and the associated red corridor was the only landfall area of search/terrestrial corridor combination that could provide co-located solution for three projects. It was however identified that the pinch point crossing within this corridor at Leiston Road may require the separation of the circuits over a short length including routeing some of the cables through the Aldeburgh Golf Course.

Suffolk Onshore Scheme preferred option

4.3.85 Following a backcheck of the initial preferred option for the Proposed Project and taking account of the appraisal findings of potential co-located options, Converter Site 1 and Site 3 were identified as emerging preferences for the Proposed Project and sites which could also accommodate co-location with other projects. Site 1 was in the originally preferred converter Area E, whereas Site 3 was a new site for the Sea Link project, having originally been identified by National Grid Ventures as part of the Nautilus site selection process.

4.3.86 Landfall S2 and the red corridor remained the emerging preference and this option was also identified as potentially providing for a co-located landfall and cable route with other projects.

4.3.87 Landfall S3N and the purple corridor remained an alternative option until further studies and survey work had been undertaken to determine the installation technique. However, this option could not facilitate a co-located landfall or terrestrial cable route to either Converter Site 1 or Site 3.

Suffolk Onshore Scheme At Non-Statutory Consultation

4.3.88 The Suffolk Onshore Scheme consulted on at non-statutory consultation comprised of:

- HVAC connection, by underground cable, from the proposed Friston Substation to a converter station site;
- a new converter station site; and
- a HVDC underground cable from a new converter station site to a landfall on the Suffolk coast.

4.3.89 As described above there were options for the location of the infrastructure which makes up the Suffolk Onshore Scheme. These options were consulted on as part of non-statutory consultation.

4.3.90 There were five options in total which are listed below:

- Suffolk Site 1 Emerging Preference – this is illustrated on **Figure 4.8: Suffolk Site 1 Emerging Preference of Appendix A**;
- Suffolk Site 3 Emerging Preference – this is illustrated on **Figure 4.9: Suffolk Site 3 Emerging Preference of Appendix A**;
- Suffolk Site 1 Alternative – this is illustrated on **Figure 4.10: Suffolk Site 1 Alternative of Appendix A**;
- Suffolk Site 3 Alternative (Option 1) – this is illustrated on **Figure 4.11: Suffolk Site 3 Alternative (Option 1) of Appendix A**; and
- Suffolk Site 3 Alternative (Option 2) – this is illustrated on **Figure 4.12: Suffolk Site 3 Alternative (Option 2) of Appendix A.**

4.3.91 The graduated swathes shown on **Figure 4.8 to Figure 4.12** illustrated the area within the preferred corridors, where, based on the understanding of baseline conditions at the time, the HVAC connection, converter station site and underground HVDC cables were likely to be routed/sited.

4.4 Kent Onshore Scheme

Network Connection Point

4.4.1 The preferred strategic option identified Richborough substation as the network connection point in Kent as described in section 2. This was used as the basis for defining the routeing and siting study area and the identification of landfall areas of search, converter site Areas and terrestrial route corridors in Kent.

Routeing And Siting Study Area

4.4.2 The routeing and siting study area in Kent extended from Herne Bay on the north Kent coast to Kingsdown on the east Kent coast and, inland, to the settlement of Wingham.

Landfall Areas Of Search Considered

Areas of search

4.4.3 Six landfall areas of search were identified in Kent, which were split geographically across Pegwell Bay, Broadstairs and the north Kent coast. These are illustrated on **Figure 4.13: Kent Landfall Areas of Search - Sheets 1 to 4 of Appendix A**. One area of search (K1) was identified within Pegwell Bay, which stretched from the settlement of Ramsgate to the settlement of Deal. One area (K1a) was identified at Broadstairs at North Foreland between the settlements of Margate and Broadstairs. Four areas of search (K2, K3, K4 and K5) were identified along the north Kent coast between the settlements of Herne Bay and Birchington.

Summary of appraisal outcomes

Terrestrial constraints

Landfall area of search K1 (Pegwell Bay)

4.4.4 Landfall area of search K1 in Pegwell Bay was broadly split into two. The area to the north of the mouth of the River Stour, where the intertidal area is wide (approximately 2 km) and the area to the south of the mouth of the River Stour where the intertidal area gradually narrows towards the south.

4.4.5 The whole of the landfall area of search is designated as the Thanet Coast and Sandwich Bay Ramsar and SPA, Sandwich Bay SAC and Sandwich Bay to Hacklinge Marshes SSSI. These designations were unavoidable within this landfall area, albeit the width of the designations narrows towards the south due to the narrowing of the intertidal area. There would therefore potentially be more opportunity to avoid direct impacts on the designated sites through the use of trenchless installation methods (subject to confirmation through further studies and ground investigations) towards the south of the area of search. Sandwich Bay and Pegwell Bay National Nature Reserve (NNR) is located within this landfall area but could be avoided by landing the cable to the south of the River Stour.

4.4.6 Five Golf courses are present within this landfall area. From north to south these are: St Augustine's, Stonelees, Princes, Royal St George's and Royal Cinque Ports.

4.4.7 To the south of the River Stour there are extensive areas of terrestrial flood zone which were not avoidable. Access to this same area was also limited due to the existing road network.

Landfall area of search K1a (Broadstairs)

4.4.8 Landfall area of search K1a is located at North Foreland to the north of Broadstairs. The whole of the landfall area falls within the following designated sites, Thanet Coast and Sandwich Bay Ramsar and SPA and Thanet Coast SAC, SSSI and Marine Conservation Zone (MCZ). Whilst all these designated sites would be unavoidable, trenchless installation methods could be used to avoid direct effects (subject to confirmation through further studies and ground investigations). Due to the width of both the SAC and MCZ designations, potential direct effects on these sites were considered unlikely to be avoidable with the use of trenchless installation methods.

4.4.9 North Foreland Golf Course is located within this landfall area of search and was unavoidable.

4.4.10 Joss Bay, a recreational beach, is located within this landfall area of search but could be avoided.

Landfall areas of search K2, K3, K4 & K5 (North Kent Coast)

4.4.11 Landfall areas of search K2 and K3 are located on the north Kent coast between the settlements of Birchington and Reculver. Thanet Coast and Sandwich Bay Ramsar and SPA and Thanet Coast SSSI and MCZ are unavoidable across both landfall areas of search, but Thanet Coast SAC is avoidable within K3.

4.4.12 Both areas are within extensive areas of Flood Zone 2 and 3 and access to both landfall areas of search was limited and constrained by the presence of the railway line with suitable access for construction traffic across the railway.

4.4.13 Landfall areas of search K4 and K5 are located between the settlements of Reculver and Herne Bay. Thanet Coast and Sandwich Bay Ramsar and SPA and Thanet Coast SSSI were unavoidable across both areas of search. Thanet Coast MCZ was unavoidable within K4 but could be avoided within K5. Other than at the Thanet Coast MCZ, trenchless installation methods (subject to confirmation through further studies and ground investigations) could potentially be used to avoid directly impacting on these designated sites.

4.4.14 Reculver Country Park was unavoidable within K4, and K5 was significantly constrained by the settlement of Herne Bay.

Summary of relevant marine alignments

4.4.15 It was considered likely that marine alignments to landfall area of search K1 would potentially need to be routed within Goodwin Sands SAC due to the requirement to cross other marine cables within sufficient water depth for navigational safety. A landfall to the north of the River Stour would result in direct impacts on the Pegwell Bay designated sites, however it was considered likely that this would be limited to a short-term temporary impact and that the more sensitive saltmarsh habitats could be avoided by using trenchless installation methods (subject to confirmation through further studies and ground investigations).

4.4.16 The marine approach to landfall area of search K1a was relatively unconstrainted, although the landfall area of search overlapped with Joss Bay, meaning there could be a greater temporary recreational impact during construction at this landfall location.

4.4.17 All marine approaches to landfall areas of search K2 to K5 would need to be routed through the Outer Thames Estuary SPA. Due to shipping and navigation constraints, in conjunction with the bathymetry of the area, it was not possible to identify feasible marine corridors and subsequent alignments to the west of Margate and Long Sands SAC. All marine alignments that approached the landfall areas of search K2 to K5 would need to cross Margate and Long Sands SAC. Due to the benthic interest features that support the designation of this site there was the potential for marine alignments to landfall areas of search K2 to K5 to result in permanent habitat loss within this site.

4.4.18 Significant constraints were also identified on the marine route alignments approaching landfalls on the north Kent coast from a physical environment perspective, as it was considered unlikely that an area of mobile sandbanks could be avoided. This would present a cable exposure and engineering risk. It was also likely that routes through this area would interact with key anchorage areas offshore at Margate.

Overall summary of appraisal outcomes

4.4.19 Landfall area of search K1 was constrained by the marine approach associated with the potential interaction with Goodwin Sands MCZ, however it was considered likely that potential effects at the landfall on the designated sites for nature conservation would be limited to short-term temporary impacts. Landfall areas to both the north and the south of the mouth of the River Stour would be constrained by the golf courses. Construction access would be constrained for landfalls to the south of the river and there would also be more interaction with the Flood Zone.

4.4.20 The marine approach to landfall area of search K1a was relatively unconstrained, and it was also considered likely that any impacts on the designated sites for nature conservation would be temporary and short term. The North Foreland golf course would be unavoidable. Joss Bay was considered avoidable within this search area.

4.4.21 The marine approaches to the landfalls on the north Kent coast (K2 to K5) were significantly constrained by the potential for permanent habitat loss within Margate and Long Sands SAC and the technical and engineering risks associated with potential cable exposure. Terrestrially K5 was significantly constrained by the settlement with Herne Bay and areas of search K2, K3 and K4 by access.

Converter Site Areas Considered

Areas

4.4.22 Two converter site Areas were identified within the routeing and siting study area. Area A is located adjacent to Richborough Energy Park and Area B is located to the north and south of the A299 and adjacent to Manston Business Park. These are illustrated on **Figure 4.14: Kent Station Site Areas – Sheets 1 to 4 of Appendix A**.

Summary of appraisal outcomes

Converter site Area A

4.4.23 Richborough Energy Park and Richborough Port are located within Area A which provided an opportunity to site the converter station within an area adjacent to similar infrastructure or industrial land uses. Part of the Sandwich Bay to Hacklinge Marshes SSSI extends into this area, but converter station siting could avoid this designation. Part of this area is within the Flood Zones 2 and 3 but there were opportunities to site a converter station outside of these zones. The network connection point (Richborough substation) was located within this area therefore reducing the length of HVAC connection back to the network.

Converter site Area B

4.4.24 There is one designated site within Area B, an Anglo-Saxon cemetery and associated remains at Monkton Scheduled Monument; this is located immediately adjacent to the south of the A299, to the north of Monkton. The area contains Manston Business Park, Columbus Avenue Industrial Estate, and an area with larger scale agricultural buildings. Manston Airport is located to the southeast. Whilst the existing development in this area is not related to energy there were opportunities to site a converter station adjacent to these other industries. Area B is located further from the network connection point at Richborough substation and development of a converter site in this area would require approximately 5 km of HVAC connection.

Route Corridors Considered

Route corridors

4.4.25 Seven route corridors were identified, three corridors (green, red, and blue) from landfall area of search K1, one corridor (green) from landfall area of search K1a and three corridors from the landfall areas of search on the north Kent coast (blue corridor from K2, red corridor from K3 and a green corridor from K4). No corridor was identified from landfall area of search K5 due to the terrestrial constraints. These corridors are illustrated on **Figure 4.15: Kent Route Corridors - Sheets 1 - 4 of Appendix A**.

Summary of appraisal outcomes

4.4.26 Of the three corridors that connected with the Pegwell Bay K1 landfall area of search, the red and blue corridors were significantly constrained from a traffic and access perspective, with key issues including access to the east of the River Stour and weight restrictions on local roads around the Sandwich Bay Estate and Royal St George and Royal Cinque Ports golf courses.

4.4.27 All three of these corridors interacted with several coastal nature conservation designations at the landfall as described in Section 3.1.2 with the blue corridor having the potential for the smallest direct interaction.

4.4.28 Both the red and the blue corridors extended across a large area of Flood Zone 2 and 3 and would require several watercourses associated with the River Stour to be crossed. The blue corridor would require crossing the River Stour at a point where it is designated as a Ramsar, SAC, SPA and SSSI; although, if feasible, the river could potentially be crossed using trenchless techniques (subject to confirmation through further studies and ground investigations).

4.4.29 Both the green and red corridors intersected with golf courses; however, it was proposed that a trenchless technique, if feasible (subject to confirmation through further studies and ground investigations) would be used at these locations to reduce disturbance.

4.4.30 The green corridor which connects to the landfall area of search K1a at Broadstairs crossed a linear belt of development between the settlements of Margate and Ramsgate. This would require routeing the cable along either Star Lane or Farley Road, both of which are heavily constrained by several connected planning allocations for housing as well as a proposed extension to the cemetery. These constraints span the entire corridor west of the Westwood Industrial Estate and these factors significantly constrained this corridor.

4.4.31 The three corridors connecting the landfall areas of search located on the north Kent coast (K2, K3 and K4) were all significantly constrained from a traffic and access perspective, due to a weight restricted bridge, sensitive receptors and carriageway widths that were inadequate to allow two-way Heavy Goods Vehicle (HGV) movements. It was likely that extensive mitigation would be required, even during temporary construction work, to facilitate safe access and to reduce other environmental effects (congestion, delays) that could arise because of additional HGV construction traffic on poorly suited roads. Careful routeing of the cables could have avoided access issues around the Minster Marshes.

4.4.32 The green and red corridors interacted extensively with areas of Flood Zones 2 and 3 and both had a high number of watercourse crossings in comparison to the blue corridor.

4.4.33 There are several scheduled monuments located within each of these three corridors, however the blue corridor was considered the most constrained, with a combination of scheduled monuments and a proposed planning allocation in the south of Birchington, creating a pinch point that reduced the ability to route away from and around these sites.

Identification of the initial preferred option

4.4.34 The marine alignments to the north Kent coast were significantly constrained due to exposure risks to the cable and the potential for permanent habitat loss within Margate and Long Sands SAC.

4.4.35 The terrestrial green corridor from landfall K1a was significantly constrained due to the linear belt of settlement which would require the cables to be installed within the public highway for a section and the planning allocations within this corridor. All three corridors from the landfalls along the north Kent coast (green, red and blue) were significantly constrained due to traffic and access and needing to cross the railway to obtain access to the landfall.

4.4.36 All three corridors that connected with the Pegwell Bay landfall area of search K1 interact with sites designated for their nature conservation value; whilst the blue corridor would reduce that interaction, it was the longest corridor of the three and would require a crossing of the River Stour at a point where is it designated as a Ramsar, SAC, SPA and SSSI. Access to the red corridor was limited and this corridor would also require a crossing of the River Stour. Both the red and green corridors would require a crossing of a golf course. Whilst the green corridor interacted with a larger area of the designated sites for nature conservation this would be temporary and short term and this corridor represented the most direct connection to either of the converter site Areas and had fewer river and road crossings. Converter site Area A facilitated the siting of a converter station close to existing similar infrastructure and reduced the lengths of both HVDC cable from a landfall in Pegwell Bay and the HVAC connection back to the network at Richborough Substation, when compared to Area B.

4.4.37 Landfall K1, Pegwell Bay green corridor to converter site Area A was identified as the initial preferred solution for the Kent Onshore Scheme.

Stakeholder Feedback And Option Refinement

4.4.38 Following engagement with other developers who subsequently submitted planning applications (and obtained consent) for other energy developments within Richborough Energy Park, a backcheck and review was undertaken, as these proposed developments significantly constrained the Proposed Project being able to connect into the existing network at Richborough substation. As a result, a new substation and an alternative HVAC connection (either by overhead line or underground cables) was identified. This directly connected onto the existing Richborough to Canterbury 400 kV overhead line. A review was undertaken of the routeing and siting options in Kent based on this revised connection point and, following this review, the conclusions on the landfall Area, cable corridors and converter site Area all remained unchanged.

Kent Onshore Scheme Description at Non-statutory Consultation

4.4.39 The Kent Onshore Scheme consulted on at non-statutory consultation is illustrated on **Figure 4.16: Kent Emerging Preference of Appendix A** and comprised of:

- HVAC connection, either by overhead line or underground cable, from the existing Richborough to Canterbury 400kV overhead line to a converter station site;
- A new converter station and substation; and
- A HVDC underground cable from the new converter station to a landfall in Pegwell Bay.

4.4.40 The graduated swathes shown on **Figure 4.16: Kent Emerging Preference of Appendix A** illustrated the area within the preferred corridors, where, based on the understanding of baseline conditions at the time the HVAC connection, converter station site and underground HVDC cables were likely to be routed/sited.

4.5 Offshore Scheme

Network Connection Points

4.5.1 The preferred strategic option identified Richborough substation as the network connection point in Kent and the Sizewell Area as the preferred connection point in Suffolk. This was used as the basis for defining the routeing and siting study area.

Study Area

4.5.2 The routeing and siting study area for the Offshore Scheme extended from Mean High-Water Spring (MHWS) on the Kent coast (from Herne Bay on the north Kent coast to Kingsdown on the east Kent coast) to MHWS on the Suffolk Coast (from Hellesley in the south to Dunwich in the north).

Landfall Areas Of Search Considered

Areas of search - Suffolk

4.5.3 Five landfall areas of search were initially identified in Suffolk. These are illustrated on **Figure 4.2: Suffolk Landfall Areas of Search - Sheets 1- 4 of Appendix A**. The southernmost area of search (S1) was identified to the south of Aldeburgh, north of the Alde and Ore River. A second area of search was identified between Aldeburgh and Thorpeness (S2). A third area of search was identified between Thorpeness and Sizewell (S3). This area was further split down into two sub areas, south (S3) and north (S3N). A fourth area (S4) at Sizewell and the northern most area of search was identified to the north of Sizewell, south of Minsmere (S5).

Areas of search - Kent

4.5.4 Six landfall areas of search were identified in Kent, which were split geographically across Pegwell Bay, Broadstairs, and the north Kent coast. These are illustrated on **Figure 4.13: Kent Landfall Areas of Search - Sheets 1 to 4 of Appendix A**. One area of search (K1) was identified within Pegwell Bay, which stretched from the settlement of Ramsgate to the settlement of Deal. One area (K1a) was identified at North Foreland between the settlements of Margate and Broadstairs. Four areas of search (K2, K3, K4 and K5) were identified along the north Kent coast between the settlements of Herne Bay and Birchington.

Indicative Marine Alignments Considered

4.5.5 Due to the extensive geographical study area in the marine environment and large-scale nature of many of the constraint features, in order to perform a meaningful routeing appraisal in the marine environment it was necessary to identify indicative marine alignments (500m wide, representing a typical offshore working corridor) connecting the identified landfall areas of search in Suffolk to those in Kent. These were developed based on the following criteria:

- shortest route possible to reduce the cable length, which in turn reduces the manufacturing and installation cost as well as the environmental and security footprint;
- avoidance of environmentally sensitive areas where possible;
- avoidance of areas that have restricted movement i.e., anchorages;
- avoidance of known wrecks and areas of archaeological importance;
- avoidance of offshore existing and proposed installations (renewable, oil/gas, wells/platforms, etc.);
- limiting the need to cross in-service cables and pipelines and, where crossings would be necessary, corridors and alignments were routed to ensure the crossing angle would be optimal and water depth would be sufficient for navigational safety;
- routed to consider shipping density, i.e., anchorage areas, high density shipping lanes;
- avoidance of hazardous seabed terrain (e.g., bedrock outcrop and mobile sediments) where possible, ensuring the cable would be protected by achieving an acceptable depth of burial; and
- limiting the impact on third-party considerations including seasonal fishing activities, local tourist trade, and military practice zones.

Summary of appraisal outcomes

4.5.6 The Offshore Scheme and associated indicative marine alignments were divided into three main sections, the approach to landfalls in Suffolk (landfalls and alignments with prefix S), the central section (alignments with prefix C) and the approach to the Kent landfalls (landfalls and alignments with prefix K). These are shown on **Figure 4.17: Marine Alignments - Sheets 1- 4 of Appendix A.**

Marine alignments and landfalls (up to MHWS) – Suffolk

4.5.7 The section of the Suffolk coast within the routeing and siting study area has a number of nature conservation designations, with all potential marine alignment options interacting with these designations to varying degrees on the approach to the landfall.

4.5.8 All marine alignment options approaching the Suffolk coast intersect with the Outer Thames Estuary SPA and the Southern North Sea SAC.

4.5.9 Marine alignment options S1 and S2 are not constrained in the offshore environment.

4.5.10 Marine alignment option S2 intersects with the Leiston-Aldeburgh SSSI and The Haven, Aldeburgh Local Nature Reserve (LNR) both of which extend onto the foreshore, however the use of a trenchless technique, if feasible, at the landfall could mitigate impacts.

4.5.11 Marine alignment option S3 is considered significantly constrained in the immediate offshore environment due to the rocky reefs comprised of cemented limestone-rich shells known as the Coralline Crag, which is an important feature for coastal processes. This alignment also intersects with the Leiston-Aldeburgh SSSI at landfall; however, the use of a trenchless technique, if feasible, at the landfall could mitigate impacts.

4.5.12 Marine alignment option S3 is also constrained in the immediate offshore by the proposed export cable route of the East Anglia One North and East Anglia Two developments.

4.5.13 Landfall area of search S3 and associated marine alignment option S3N is less constrained by the Coralline Crag in the immediate offshore environment however this location is constrained by the presence of existing infrastructure, namely the Concerto submarine telecommunications cable and the export cables of Greater Gabbard and Galloper offshore windfarms as well as the proposed (and consented) Sizewell C Nuclear Power Station development.

4.5.14 Landfall area of search S4 and associated marine alignment option S4 is constrained by the existing Sizewell B Nuclear Power Station site including the intake/outtake pipes located in the immediate offshore area in front of Sizewell B.

4.5.15 Landfall area of search S5 intersects with the Minsmere-Walberswick Heaths and Marshes SSSI/SAC and the Minsmere-Walberswick SPA/Ramsar at the landfall including in the intertidal area, however the use of a trenchless technique, if feasible, at the landfall could mitigate impacts.

4.5.16 Landfall areas of search S4 and S5 and associated marine alignment options S4 and S5 are more constrained than the other options due to the additional number of offshore crossings that would be required and also the proposed Sizewell C development.

Summary of relevant terrestrial constraints – Suffolk

4.5.17 All landfall areas of search in Suffolk are within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB).

4.5.18 Whilst the marine alignment to landfall area S1 was relatively unconstrained, the terrestrial green corridor was constrained technically by two large river crossings of the Alde and Ore River, which would also require a crossing of the Alde, Ore and Butley Estuaries SAC in two places and the Alde-Ore Estuary SPA and SSSI in three places. A large proportion of this corridor is within the Flood Zone and this corridor would require the longest route within the Suffolk Coast and Heaths AONB. Access to this corridor was also very limited, in particular in the area between the two large river crossings.

4.5.19 The marine approach to the landfall area S2 has fewer constraints, however the Leiston-Aldeburgh SSSI and North Warren RSPB reserve could not be avoided. The use of trenchless construction techniques would reduce impacts at this landfall. The red terrestrial route corridor from this landfall area of search also includes the pinch point along Leiston Road. The majority of the landfall area of search is within Flood Zone 2 and 3, depending on the installation technique, construction works within these zones are potentially avoidable.

4.5.20 Landfall area of search S3 was significantly constrained from a marine approach perspective. Onward terrestrial routeing from landfall S3 within the blue corridor would likely require a crossing of the Sandlings SPA and Leiston-Aldeburgh SSSI although the potential for significant effects would likely be reduced through the use of trenchless construction techniques.

4.5.21 The purple terrestrial route corridor connecting to S3 landfall area of search and marine alignment option S3N could avoid the designated sites for ecological conservation but could not avoid either of the two following pinch points. The first being a pinch point to the south of Aldringham at the crossing of the Hundred River. This area is constrained by the Hundred River itself, the crossing of the B1353 and the B1122, and an area of woodland and properties. In addition, the proposed cables for the East Anglia One North and Two Offshore Windfarms are proposed to be routed through this same pinch point. The second being a pinch point to the northwest of Leiston associated with the offsite works for the proposed Sizewell C Nuclear Power Station including an area which has recently been established for ecological mitigation measures related to that project.

4.5.22 Landfall area of search S4 was identified as being significantly constrained from a terrestrial perspective as no onward terrestrial route corridor was identified from this landfall area of search, as it is significantly constrained by the existing Sizewell B Nuclear Power Station and the proposed Sizewell C Nuclear Power Station development.

4.5.23 Landfall area of search S5 is located to the north of the existing Sizewell Nuclear Power Station and south of Minsmere New Cut drainage channel. The whole of the intertidal area and immediate terrestrial area is designated as Minsmere-Walberswick Ramsar and SPA, Minsmere to Walberswick Heaths & Marshes SAC and SSSI and Minsmere RSPB Reserve. These designated sites are unavoidable within this area of search, but the use of trenchless construction techniques (subject to confirmation through further studies and ground investigations) could be used to reduce potential significant effects. A second crossing of the Minsmere to Walberswick Heaths & Marshes SSSI and Minsmere RSPB Reserve would also be required for any onward terrestrial routeing. The majority of this landfall area of search is within Flood Zones 2 and 3 and construction within the flood zone could not be avoided. Access to this landfall area of search is also very limited and likely to require a long temporary access road.

4.5.24 The onward terrestrial corridor for landfall area of search S5 also crosses a large area of the proposed Sizewell C Nuclear Power Station development area which could significantly constrain the ability to route through this area and also have programme implications associated with construction sequencing of the two developments.

Overall summary – Suffolk

4.5.25 When considering marine constraints alone there was a preference for Landfalls S1, S2 and S3 with associated marine alignment options S1, S2 and S3N respectively.

4.5.26 When considering the constraints from both a terrestrial and marine perspective, on balance, landfall area of search S2 was preferred with associated marine alignment option S2 connecting to the red corridor. An alternative marine alignment option of S3N connecting to the northern part of landfall area of search S3 connecting to the terrestrial purple corridor was proposed at that stage. This alternative was included as further ground investigations were required to inform final decision making.

Marine alignments and landfalls (up to MHWS) - Kent

4.5.27 The section of the Kent coast within the routeing and siting study area has a number of national and international nature conservation designations, with all potential marine alignment options interacting with several of these designations, to varying degrees, on approach to the landfall areas of search.

4.5.28 Detailed consideration has therefore been given to the potential activities associated with cable installation and operation on the type of features for which the sites are designated, the distribution of the features within the sites and the sensitivity and recoverability of the features. The extent of interaction and potential for mitigation were also considered.

4.5.29 Marine alignment sections connecting into landfalls K2, K3 and K4 were determined to be the least preferred options from a nature conservation perspective due to the length of interaction with the Margate and Long Sands SAC and the interaction with the Thanet Coast SSSI/ MCZ and the Thanet Coast & Sandwich Bay SPA/Ramsar. Sections K2 and K3 also intersect with the Thanet Coast SAC.

4.5.30 Several significant constraints were also identified around the marine alignment sections K2, K3 and K4 approaching landfalls on the North Kent coast from a physical environment perspective. It is unlikely that mobile sandbanks could be avoided, some of which may be exposed at low tide, which presents a considerable exposure and engineering risk. It is also likely that there would be some interaction with key anchorage areas offshore of Margate.

4.5.31 All routes making landfall at K1 in Pegwell Bay intersect with the Sandwich Bay to Hacklinge Marshes SSSI, Sandwich and Pegwell Bay NNR, Sandwich Bay SAC, Thanet Coast & Sandwich Bay SPA/Ramsar and the Goodwin Sands MCZ.

4.5.32 K1a at Broadstairs also intersects with areas designated for their nature conservation value - Thanet Coast SAC/SSSI/MCZ and Thanet Coast & Sandwich Bay SPA/Ramsar.

4.5.33 Although the K1a marine alignment to landfall area of search K1a and all marine alignments to landfall area of search K1 are all constrained from a biological environment perspective, there was a slight preference for K1a at Broadstairs. This is because the extent of interaction is smaller, and it would also be possible to avoid potential interaction with the Goodwin Sands MCZ in the offshore environment. There was a preference for marine alignments making landfall to the south in Pegwell bay as the extent of interaction with the designations is reduced towards the south of this landfall area.

4.5.34 Based on the available desktop information it was initially considered that the Goodwin Sands MCZ could not be avoided by the identified marine alignments connecting to landfalls in Pegwell Bay. This interaction is due to the routeing in this area being constrained, to the east, by the Goodwin Sandbank – routeing over the Goodwin Sandbank could increase the risk of cable exposure during the lifetime of the cable. This could subsequently result in the requirement for additional rock protection associated with any remedial works, potentially resulting in permanent habitat loss. To the west routeing is constrained by the Ramsgate dredged channel and an area of sandwave fields.

4.5.35 Additionally, when routeing east out from Pegwell Bay, in order to head north the route must cross the Nemo Link cable and the Thanet Offshore Windfarm export cables, requiring the placement of rock protection on the seabed at these locations, potentially resulting in permanent habitat loss, including within the Goodwin Sands MCZ. The water depths in this area are very shallow, slowly gaining depth moving to the east. In order to ensure alignment with guidance regarding reductions in water depths that could pose a hazard to marine vessels (reduction of no more than 5% of water depth – advice from Maritime Coastal Agency), proposed crossing locations should be located in areas with a suitable water depth.

4.5.36 Considering the factors described above (dredged areas, acceptable navigational depths and seabed features) routeing within the northwest corner of the Goodwin Sands MCZ was considered likely to be unavoidable.

4.5.37 Marine routeing into Broadstairs (landfall area of search K1a) would require fewer marine cable crossings than the routes connecting into Pegwell Bay (landfall area of search K1) as there would be no requirement to cross with Thanet Offshore Windfarm export cables and the Nemo Link interconnector. However, landfall areas of search K1a is located at a popular recreational beach location, meaning there could be a greater temporary recreational impact during construction at this landfall location.

4.5.38 Although landfalls in Pegwell Bay (landfall area of search K1) would interact with designated sites, these could be largely mitigated by using trenchless techniques). This would avoid/reduce the need to trench across areas of saltmarsh and intertidal habitat, which could potentially result in greater habitat loss and water quality effects.

4.5.39 It has been assumed that access to the seaward end of the trenchless solution in the intertidal area will be from the sea by a marine vessel or limited terrestrially to the site of the disused hoverport, to avoid impacts to the sensitive saltmarsh habitat in the northern part of the bay.

Summary of relevant terrestrial constraints – Kent

4.5.40 Of the three corridors that connect with the Pegwell Bay K1 landfall area of search, the red and blue corridors are significantly constrained from a traffic and access perspective, with key issues including access to the east of the River Stour and weight restrictions on local roads around the Sandwich Bay Estate and Royal St George and Royal Cinque Ports golf courses.

4.5.41 All three corridors that connect with the Pegwell Bay landfall area of search K1 interact with sites designated for their coastal nature conservation value; whilst the blue corridor reduces that interaction, it is the longest corridor of the three and would require a crossing of the River Stour at a point where is it designated as a Ramsar, SAC, SPA and SSSI, although, if feasible, the river could potentially be crossed using trenchless techniques (subject to confirmation through further studies and ground investigations).

4.5.42 Access to the red corridor is limited and this corridor would require several watercourses associated with the River Stour to be crossed. Both the red and green corridors would require a crossing of a golf course. Whilst the green corridor interacts with a larger area of the designated sites for nature conservation, this would be temporary and short term and this corridor represents the most direct connection to either of the converter site Areas and has fewer river and road crossings.

4.5.43 Both the red and the blue corridors extend across a large area of Flood Zone and would require several watercourses associated with the River Stour to be crossed. The blue corridor would require crossing the River Stour at a point where is it designated as a Ramsar, SAC, SPA and SSSI; although, if feasible, the river could be crossed using trenchless techniques. The green and red corridors interacted extensively with areas of Flood Zones 2 and 3, with a higher number of watercourse crossings when compared to the blue corridor.

4.5.44 Both the green and red corridors intersect with golf courses; however, it is proposed that a trenchless technique, if feasible (subject to confirmation through further studies and ground investigations), would be used at these locations to reduce disturbance.

4.5.45 The green corridor which connects to the landfall area of search K1a at Broadstairs crosses a linear belt of development between the settlements of Margate and Ramsgate. This would require routeing the cable along either Star Lane or Farley Road, both of which are heavily constrained by several connected planning allocations for housing as well as a proposed extension to the cemetery. These constraints span the entire corridor west of the Westwood Industrial Estate and these factors significantly constrain this corridor.

4.5.46 The three corridors connecting the landfall areas of search located on the north Kent coast (K2, K3 and K4) were all significantly constrained from a traffic and access perspective, due to weight restricted bridge, sensitive receptors, and carriageway widths that are inadequate to allow two-way HGV movements. It is likely that extensive mitigation would be required, even during temporary construction work, to facilitate safe access and reduce other environmental effects that could arise because of additional HGV construction traffic on poorly suited roads. Careful routeing of the cables could avoid access issues around the Minster Marshes.

4.5.47 In relation to scheduled monuments located within each of the three corridors, the blue corridor was considered the most constrained with a combination of scheduled monuments and a proposed planning allocation in the south of Birchington, creating a pinch point that reduced the ability to route away from and around these sites.

Overall summary – Kent

4.5.48 When considering marine constraints alone there is a preference for landfall area of search K1a with associated marine alignment K1a.

4.5.49 When considering the constraints from both a terrestrial and marine perspective, on balance, landfall area of search K1 with associated marine alignment section K1c is preferred.

Marine alignments – central section

4.5.50 The central section of the offshore route is common to both the Suffolk and Kent alignment options. All central indicative marine alignments intersect with the Outer Thames Estuary SPA and Southern North Sea SAC.

4.5.51 There is a particularly constrained area within the central section where the northeastern extent of the Margate and Long Sands SAC abuts the Sunk TSS. Also present are several aggregate extraction areas and deep-water shipping channels.

4.5.52 In addition, there are three proposed projects in this area, namely the NeuConnect Interconnector and the proposed Five Estuaries and North Falls Offshore Windfarms and associated export cables, as well as the existing Greater Gabbard and Galloper Offshore Windfarms.

4.5.53 Considering the potentially conflicting constraints relating to the biological environment, shipping and navigation and existing and proposed new infrastructure in this central section the emerging marine routeing preferences were discussed with marine stakeholders, including nature conservation bodies, port authorities and other developers to obtain their feedback to help inform decision making.

4.5.54 The draft outputs of the marine options appraisal were presented to stakeholders to help inform the decision making and reduce potential for consenting risk. This was undertaken in advance of the planned project-specific marine survey (summer 2021), to ensure the most likely route was surveyed.

4.5.55 The most significant marine survey route refinements based on stakeholder feedback were in the following areas:

- northeast of the Margate and Long Sands SAC; and
- southwest of Thanet Offshore Windfarm.

4.5.56 These are discussed further below.

Northeast of the Margate and Long Sands SAC

4.5.57 The original proposed marine alignments in this area are the black routes shown on **Figure 4.17: Marine Alignments - Sheets 1- 4 of Appendix A.** These routes provided suitable seabed conditions for cable installation (geology and topography), whilst also being the most direct route to the Suffolk landfalls.

4.5.58 The route alignments were refined as a result of feedback from:

- Natural England;
- Maritime and Coastguard Agency;
- Trinity House;
- Port of London Authority;
- Harwich Haven Authority;
- Port of Felixstowe;
- North Falls Offshore Windfarm (OWF);
- Five Estuaries Offshore Windfarm; and
- the aggregate extraction operators of Areas 508, 509/3, 510/1 and 510/2 (**Figure 4.17: Marine Alignments - Sheets 1- 4 of Appendix A.**

4.5.59 Natural England expressed concerns regarding the potential impacts of crossing the proposed NeuConnect cable within the Margate and Long Sands SAC as the material required for the crossing would introduce hard substrate into a naturally sandy environment, which could permanently change the protected features in this site. Natural England also advised that their preference was for the project to avoid any cable installation in the protected site.

4.5.60 The navigational bodies also expressed concerns regarding the cable routeing in this area, specifically in relation to the potential for a reduction of navigable depths because of rock protection at the potential crossing with NeuConnect. Concerns were also raised relating to cable installation in this area, due to the high shipping density caused by the Long Sands Head Deep shipping channel; however, it was agreed that the implementation of a robust vessel management plan during installation could mitigate this issue.

4.5.61 The aggregate operators advised that their preference was for the route to be located to the east of Area 510/2 to reduce interaction with their operations (**Figure 4.17: Marine Alignments - Sheets 1- 4 of Appendix A (Sheet 2))**.

4.5.62 Based on the above stakeholder feedback the black marine alignment furthest to the east (C8) was identified as this alternative (**Figure 4.17: Marine Alignments - Sheets 1- 4 of Appendix A**) which:

- routes to the east of aggregate extraction Area 510/2; and
- crosses NeuConnect in deep waters outside Margate and Long Sands SAC and Long Sands Two Way Shipping Channel.

4.5.63 However, following consultation with the developers of North Falls Offshore Windfarm, it was established that they had identified the same area for their proposed export cable route, and they were undertaking their offshore survey imminently **(Figure 4.17: Marine Alignments - Sheets 1- 4 of Appendix A (Sheet 2)).** As such, the route was reviewed again to try to avoid potential complications regarding crowding and installation and an alternative C8A was identified.

4.5.64 Discussions with Five Estuaries Offshore Windfarm highlighted potential constraints of the C8A alternative with their proposed export cable route **(Figure 4.17: Marine Alignments - Sheets 1- 4 of Appendix A (Sheet 2)).**

4.5.65 Due to the proximity to the Sunk TSS, and the associated high shipping density to the north and east of these proposed export cable corridors, and the shallower waters and sensitive benthic habitats of the Margate and Long Sands SAC to the west, it was determined that a further deviation needed to be identified.

4.5.66 Factoring in the parameters (shipping density and water depth) provided by the navigational bodies, an additional marine alignment section, referred to as C8B was identified. This refined route alignment:

- avoided the higher density shipping areas in the Sunk TSS; and
- kept the crossings of the proposed NeuConnect cable and North Falls and Five Estuaries offshore windfarms export cables in deeper water and out of the busy shipping lanes.

4.5.67 This results in a route deviating east to the centre of the Sunk TSS approach channels, where the shipping density is lower and the crossings could be in deeper water, routeing north through the centre of the Sunk TSS, where the shipping density is again lower, before routing west, north of the Harwich and Port of Felixstowe approach channel to avoid the higher shipping density in this area. The revised route received the support of the navigational bodies.

Southwest of Thanet OWF

4.5.68 The original preferred marine routeing in this area was the black route shown on **Figure 4.17: Marine Alignments - Sheets 1- 4 of Appendix A** (marine alignment section C4). This route provided suitable seabed conditions for cable installation (geology and topography). However, following stakeholder engagement the route needed to be refined because of feedback from the Port of London Authority, who expressed significant concerns regarding the potential decrease in water depths that would occur where the route would cross the proposed GridLink interconnector.

4.5.69 The Port of London Authority advised that because this area is an important area for shipping, and water depths are too shallow, they would not be able to support the routeing as originally proposed. They also advised that the Thanet Extension Offshore Windfarm DCO application, the export cable from which was also proposed to be in this area, was refused by the Secretary of State due to potential impacts on shipping and navigation.

4.5.70 An alteration to the route was made, which required a slight deviation to the original marine alignment section C4, referred to as C4A **(Figure 4.17: Marine Alignments - Sheets 1- 4 of Appendix A)** to increase the water depth of the crossing by an additional 3.5m. The Port of London Authority and other navigational bodies were consulted on the refined route and have advised that they are satisfied with the modification made to the route.

Summary

4.5.71 Considering the above factors, the emerging preference option from marine appraisal perspective was marine alignment central section's C8B and C4A.

Offshore Scheme Description At Non-Statutory Consultation

4.5.72 The Offshore Scheme comprised of a marine HVDC cable from preferred landfall area of search S2 or alternative landfall area of search S3 in Suffolk, to landfall area of search K1 in Kent. Marine alignment sections S2 or S3N, C8B, C4A and K1c were preferred.

4.5.73 As described above in section 3, landfall area of search S2 was identified as the emerging preference landfall and S3N was identified as an alternative option. Therefore, in addition to the Offshore Scheme Emerging Preference an alternative marine route to landfall area of search S3N was consulted on as part of non-statutory consultation.

4.5.74 The Offshore Scheme as consulted on at non-statutory consultation is shown on **Figure 4.18: Offshore Scheme Emerging preference and Alternative of Appendix A.**

5. Summary Of Non-Statutory Consultation Feedback

5.1 Introduction

5.1.1 This section summarises the non-statutory consultation feedback relevant to the option selection and design evolution of the Proposed Project. A full summary of the non-statutory consultation feedback is presented within the Non-Statutory Consultation Report (Ref 13).

5.2 Non-statutory Consultation Feedback

5.2.1 The following sections summarise the feedback received relevant to the section of options. There had been a substantial amount of engagement with marine stakeholders prior to the launch of the non-statutory consultation, which is why there appears to be little feedback on marine matters below.

5.2.2 Feedback received from the general public is summarised under the subheadings of "Suffolk" and "Kent". Feedback from organisations and groups is summarised under the subheadings of "Prescribed bodies" and "Non-prescribed bodies".

Coordination Of Projects

Suffolk

5.2.3 Many respondents expressed the view that all major energy projects currently proposed in East Suffolk should be coordinated, thus reducing the scale of industrialisation and minimising impacts on the area. Suggestions included using multipurpose interconnectors and a single location for all landfall, grid entry and converter stations.

Kent

5.2.4 This was not a key theme for the public.

Prescribed bodies

5.2.5 Many respondents expressed the view that all major energy projects underway in the Suffolk area should be coordinated in order to reduce cumulative impacts. Concerns about coordination were regarding the potential need for a significant amount of land to host coordinated infrastructure, and the national security risk posed from the concentration of energy supply in one area.

Non-prescribed bodies

5.2.6 Many respondents expressed the view that all energy projects underway in East Anglia should be coordinated, in an effort to reduce cost, construction, environmental and societal impacts. Some respondents referenced the new Offshore Coordination Support Scheme, which was launched at the end of 2022, as an opportunity for National Grid, along with other energy companies, to integrate project proposals.

Need

Suffolk

5.2.7 Some respondents appreciated the need to expand renewable energy infrastructure but questioned the need to develop in the Suffolk area. Most respondents cited intrusion and impacts on Suffolk's Coast and Heaths AONBs and designated wildlife sites as factors for why they believe this Project should not be constructed in Suffolk. The need for grid reinforcement was questioned, with future North Sea windfarms and a Modular Offshore Grid being referenced as sufficient schemes.

Kent

5.2.8 Some respondents showed support for plans to improve the UK's power network distribution and increase its security and flexibility. Others questioned the need to develop in the Kent area, referencing impacts on residents and local wildlife as concerns.

Prescribed bodies

5.2.9 Whilst some respondents supported principles of the Proposed Project, namely de-carbonisation of energy supply, others felt the needs case of such a major project in the proposed location was unclear.

Non-prescribed bodies

5.2.10 While some respondents supported the principle of renewable energy generation, the need for the Proposed Project was questioned. Reasons given included that the perceived negative impacts on all proposed areas would be too high, there are multiple other nationally significant energy projects in development in East Suffolk which is an area that has relatively low demand for electricity power, and that such projects do not contribute to renewable energy generation or energy security.

Alternatives

Suffolk

5.2.11 Proposed Project locations prompted concerns from respondents who felt the development would be too imposing. The use of brownfield sites, such as the Isle of Grain or Bradwell, areas without environmental protection and offshore grids or facilities with onshore connections were suggested by respondents as suitable alternatives.

Kent

5.2.12 Many respondents expressed the view that the proposed converter station should be located on a brownfield site, such as Richborough or River Stour Old Docks.

Prescribed bodies

5.2.13 Some respondents suggested locating infrastructure closer to areas requiring more power would be a better solution, namely London and the southeast. The use of brownfield sites was also suggested, as was the exploration of offshore facilities to situate infrastructure.

Non-prescribed bodies

5.2.14 Respondents expressed the view that as much infrastructure as possible should be located offshore. Many respondents called for the exploration of alternative site and route options for onshore infrastructure, if offshore would not be possible, namely existing brownfield locations such as Bradwell and Great Yarmouth (Suffolk), and the Isle of Grain and Tilbury (Kent).

Design

Suffolk

5.2.15 Of those in support of the Proposed Project, some stated their location and routing preference would be whichever had the least impact. Many respondents expressed the view that the current Proposed Project designs should be re-evaluated, suggesting that new designs implementing shorter cable routes, using existing infrastructure and offshore networks would have less impact. Additional information was requested regarding the width of a combined cable corridor (a Sea Link cable corridor combined with up to two other project cable corridors), as they felt they could not comparatively evaluate the impacts of a single and combined cable corridor option without this information. Questions were raised regarding the proposed width of the trenches for cable routes.

Kent

5.2.16 Many respondents expressed the view that cables should be underground so as not to impact bird safety or the visual landscape. Respondents suggested cables should be routed within, or as close to as possible, existing cable corridors, and have minimal impacts on ecology, using techniques such as moling. Design suggestions regarding the converter station included reducing its scale, a cylindrical design to mirror Oast houses (a form of architecture historical to Kent) and painting it green to blend in with the rural landscape).

Prescribed bodies

5.2.17 Some respondents requested more detail concerning the design of the Proposed Project in the event of coordination with other energy projects. Respondents suggested that National Grid consider independent professional advice on all design aspects and design the Proposed Project with as little residual impacts as possible, such as using the smallest possible cable routes and the least damaging drilling techniques.

Non-prescribed bodies

5.2.18 A key theme was the design of the Proposed Project in relation to the routeing of the cables and the siting of the converter station. Impacts were cited on biodiversity, local roads, landscape and the livelihoods of local residents.

Landfall Location

Suffolk

5.2.19 This was not a key theme for the public.

Kent

5.2.20 This was not a key theme for the public.

Prescribed bodies

5.2.21 Concerns were raised about the proposed landfall locations, with respondents citing ecological, archaeological and transportation constraints as grounds for the conduction of further assessments to inform design change. Some respondents requested that National Grid have consideration for the possibility of coordinating landfall locations for multiple energy projects; the principle of coordination was supported, but concern was had for the capability of the proposed landfall locations to accommodate more than one project.

Non-prescribed bodies

5.2.22 Some respondents commented that the proposed landfall locations would have detrimental impacts on biodiversity and suggested that National Grid look at alternative locations and means of construction such as all underground.

Onshore Route Location

Suffolk

5.2.23 This was not a key theme for the public.

Kent

5.2.24 This was not a key theme for the public.

Prescribed bodies

5.2.25 This was not a key theme for prescribed bodies.

Non-prescribed bodies

5.2.26 Some respondents felt that the proposed onshore route locations should be revised, citing that, in the Suffolk area, they disrupt a Sizewell evacuation route and sensitive ecology and terrain, and in the Kent area, they disrupt biodiverse wildlife sites, namely Pegwell Bay.

Cumulative Impacts

Suffolk

5.2.27 Many respondents raised concerns about the impacts of multiple projects in East Suffolk. These concerns related to lasting impacts on the natural landscape, local wildlife and biodiversity, tourism and quality of life. Some respondents queried whether, following the development of this Proposed Project, more projects would be developed in the same location in future.

Kent

5.2.28 Some respondents suggested that long-term surveys examining any impacts of Proposed Project development should be conducted, as well as consideration for residents' mental health and quality of life. Ecological damage from existing infrastructure in the Kent area was mentioned, with respondents questioning the effects of additional industrialisation.

Prescribed bodies

5.2.29 Several respondents stated that the full cumulative impacts of the Proposed Project should be assessed in combination with other consented and planned developments in the area, together with a comprehensive package of mitigation measures where avoidance of impacts is not possible.

Non-prescribed bodies

5.2.30 Some respondents questioned whether the cumulative impacts of the development of multiple major energy projects in East Suffolk have been considered by National Grid and other energy companies, including the displacement of the resident population and large-scale industrialisation on a natural landscape largely responsible for the local visitor economy.

Landscape and Visual

Suffolk

5.2.31 Many respondents expressed their interest in maintaining East Suffolk's Heritage Coastline, AONB and protected landscapes including heathland, forest and acid grassland. Some respondents were concerned about whether the appearance and height of the proposed infrastructure would visually impact the natural landscape.

Kent

5.2.32 Respondents were concerned about the visual impact of the Proposed Project on Kent's natural landscape, especially regarding the implementation of overhead cables on the Minster Marshes.

Prescribed bodies

5.2.33 Concerns were had for the protection of sensitive landscapes such as heathland, woodland and marshes. If avoidance is not possible, respondents requested there be minimal impacts on the region's natural landscape. Further landscape assessments were requested by respondents, to ensure all potential impacts have been accounted for. The appearance of any infrastructure associated with the Proposed Project was requested to be designed in accordance with its location's landscape.

Non-prescribed bodies

5.2.34 Comments were received with regard to the development of the Proposed Project within the AONBs in Suffolk. Respondents considered the Proposed Project to be unacceptable in nationally designated landscapes and that it would have an adverse effect on the landscape and the setting of listed buildings.

Ecology And Biodiversity

Suffolk

5.2.35 Many respondents raised concerns about the impact of construction on Suffolk's wildlife and biodiversity, referencing AONBs, the North Warren Nature Reserve, the Minsmere RSPB Reserve, the Suffolk Sandlings, Leiston, Aldeburgh SSSIs, the Suffolk Wildlife Trust Reserves including the Dingle Marshes, Walberswick National Nature Reserve and National Trust Dunwich Heath, as particularly ecologically sensitive.

Kent

5.2.36 Many respondents raised concerns about the impacts of the Proposed Project on local wildlife, particularly in ecologically sensitive areas such as Pegwell Bay and the Minster Marshes. The protection of badgers, grass snakes, and most notably, birds, including swans, geese, owls, raptors, cranes, falcons and turtle doves, were a priority for many. Respondents expressed the view that overhead cables would disrupt bird migration and cause bird fatalities, should they fly into the overhead lines.

Prescribed bodies

5.2.37 Concerns were raised about the impacts of Proposed Project development on local wildlife and ecology. Wetlands, woodland and the general Aldeburgh area were deemed particularly ecologically sensitive by respondents, home to a range of birdlife, amphibians and other wildlife that must be protected.

Non-prescribed Bodies

5.2.38 The safety and protection of local wildlife and ecology was a concern. Specific areas within the Suffolk area were deemed ecologically sensitive including Leiston, Aldeburgh, Minsmere and North Warren. Reasons given included that these areas are diverse habitats such as coastal wetlands, marshes, heathland and woodland, home to rare bird species, deer, amphibians and other valuable wildlife. Areas in the Kent area deemed ecologically sensitive by respondents included the Minster Marshes and Pegwell Bay, citing concerns for special terrain, seals and rare bird species that could be disturbed by infrastructure development.

Cultural Heritage And Archaeology

Suffolk

5.2.39 This was not a key theme for the public.

Kent

5.2.40 This was not a key theme for the public.

Prescribed bodies

5.2.41 Some respondents raised concerns about the impacts of Proposed Project development on areas of cultural heritage and archaeology, particularly the Heritage Coast, World War Two related historical sites, listed buildings and farms, and Roman and medieval sites. A full suite of archaeological assessments, including desktop and field evaluations, was requested by respondents to be conducted on all elements of the Proposed Project as soon as possible, to inform its continued planning and design.

Non-prescribed bodies

5.2.42 This was not a key theme for non-prescribed bodies.

Socio-Economics Recreation And Tourism

Suffolk

5.2.43 Many respondents raised concerns about construction and development affecting Suffolk's tourism, a main driver behind its local economy. Construction disruption and noise concerns impacting recreational use, including bird watching, hiking and concerts, subsequently affecting quality of life and mental health, were mentioned by local residents, as were impacts on the local housing market. Some respondents felt farming would be affected, citing loss of income and food production as potential outcomes. Protecting Aldeburgh Golf club was of particular interest amongst respondents, owing to its historical significance and members who bring income to the town.

Kent

5.2.44 Concerns were raised regarding the impacts of new infrastructure on Kent's local tourism, citing its natural landscape as a significant attraction. Many respondents questioned whether recreational activities such as walking, fishing and bird watching would be affected by the Proposed Project, particularly around the Pegwell Bay area. The protection of St. Augustine's Golf Club was also a priority for some respondents.

Prescribed bodies

5.2.45 Respondents questioned the impacts of an increased number of construction workers in the local area. Respondents wanted to highlight to National Grid that there may be potential pressures on workforce acquirement given that the proposed construction period of the Proposed Project could coincide with other projects in the local area. The potential opportunity for temporary employment and training presented by the Proposed Project was welcomed. Respondents were concerned about the impacts of construction on East Suffolk's tourism economy, citing its natural landscapes and AONB's as popular tourist destinations. Concerns about the impacts of construction on the recreation and leisure of local residents, such as walking and wildlife observing, namely around Pegwell Bay in the Kent area, were raised.

Non-prescribed bodies

5.2.46 Concerns regarding the impacts of construction and development on tourism in East Suffolk were raised, citing the area's natural landscape and coastline as a significant attraction for visitors, as well as The Aldeburgh Festival. There were concerns for the mental well-being of residents as a consequence of disruptions associated with the Proposed Project to recreation, such as birdwatching, walking and cycling.

Traffic And Transport

Suffolk

5.2.47 Some respondents expressed concerns about construction traffic and obstructed road access, with one suggestion for construction staff to operate feeder transport as opposed to individual vehicles. Some respondents questioned the ability to accommodate increased traffic and construction trucks citing concerns over existing roads being narrow and susceptible to flooding and damage. Increased demand on alternative routes through small villages was also a concern.

Kent

5.2.48 This was not a key theme for the public.

Prescribed bodies

5.2.49 Concerns were raised about the accumulation of construction traffic from coinciding energy projects proposed in the Suffolk area. Existing road structure including hazardous junctions, narrow roads, and aged structures were raised by respondents as reasons why it is unsuitable for construction traffic and transport. Detailed traffic and transport assessments were requested. Also requested was a commitment from National Grid to fund any damage repair caused by vehicles associated with the development of the Proposed Project.

Non-prescribed bodies and the public

5.2.50 Some respondents raised concerns about construction traffic on fragile road networks in East Suffolk, asking for further traffic assessments to be conducted. Concern was had for road accessibility regarding emergency services, especially around the Sizewell nuclear power stations in event of an emergency.

5.3 EIA Scoping

5.3.1 The project submitted a request for a scoping opinion at the same time as the non-statutory consultation was launched. Whilst the purpose of scoping and the scoping opinion is to set out and provide comment on the proposed scope of the EIA rather than feedback on the options, a small number of comments were received as part of the scoping opinion (Ref 14) that related to options and design decisions and these have been taken into account in the selection of the preferred option.

Coordination Of Projects (Suffolk Only)

5.3.2 The coordination of Projects within Suffolk was a key theme which was adopted within the Planning Inspectorate's scoping opinion (Ref 14) at section 2.1.

"*The Inspectorate encourages the Applicant to make effort to coordinate the delivery of the Proposed Development with other relevant developments in the area. This may include sharing infrastructure requirements eg converter stations and/or cabling, where possible in effort to reduce the cumulative impacts and significant effects*".

5.3.3 Although options to share infrastructure are limited, as summarised in paragraph 4.3.65 above, coordination has been progressed in the form of co-location.

Options

5.3.4 Limited comments were received in relation to preferences for the selection of one option over another, however Natural England did express a preference for the Suffolk converter station to be on Site 3 over Site 1, due to Site 3 being located further from the Suffolk Coast and Heaths AONB.

6. Option selection

6.1 Introduction

6.1.1 This section outlines the reasons why certain options were selected whilst others were discounted, with reference to the outcomes of non-statutory consultation and those issues which have influenced the selection of the preferred option.

6.1.2 Backchecks on the selection of the preferred option will be undertaken, as appropriate, as the Proposed Project develops.

6.2 Suffolk onshore scheme

Emerging preferences vs alternative options

6.2.1 Five options were consulted on as part of the non-statutory consultation, two emerging preference options from landfall area of search S2 through to converter station Sites 1 or 3 and three alternative options from landfall area of search S3N as illustrated on **Figure 4.8 to Figure 4.12** of **Appendix A**.

6.2.2 Landfall area of search S2 was identified as the emerging preference as it avoided both nearshore constraints and a number of terrestrial pinch points as explained in section 2, as well as being able to facilitate co-location with other projects. It was however acknowledged that landfall area of search S2 was constrained by the Leiston – Aldeburgh SSSI and the North Warren RSPB Reserve which are designated for their nature conservation value. Whilst feedback was received as part of non-statutory consultation with regards to the presence and the sensitivities of the designated sites at the landfall area of search S2, no different or additional information was received.

6.2.3 The emerging preference options (Site 1 emerging preference and Site 3 emerging preference) could provide opportunity for the co-location of up to three projects within the same corridor. Further technical studies have also been undertaken since non-statutory consultation which, subject to the results of ground investigations, confirmed that a trenchless crossing beneath the designated sites, in order to avoid direct effects is achievable. This, coupled with feedback relating to the opportunity to coordinate with other proposed projects, means that landfall area of search S2 remains the emerging preference.

6.2.4 Having regard to feedback received through non-statutory consultation and National Grid's ongoing work, no different or additional information has altered the preliminary conclusions in respect of the two emerging preference options being preferred to the three alternative options.

Site 1 Emerging Preference vs Site 3 Emerging Preference

Converter station sites

Landscape and visual

6.2.5 Whilst both sites are located outside of the Suffolk Coast and Heaths AONB, Site 1 is closer to this designation and therefore there is more potential for impacts on the setting of this designation.

6.2.6 Whilst Site 1 is in closer proximity to the Suffolk Coast and Heaths AONB the site is surrounded by a number of areas of mature planting including Great Wood, Foxburrow Covert and Ten Acre Covert, all of which provide opportunity to utilise this existing screening and to integrate additional screen planting into the existing landscape character. It is noted that Great Wood is designated as Ancient Woodland and therefore a standoff from this designation would be required.

6.2.7 There is limited intervisibility between Site 1 and nearby settlements and the local road network because of intervening mature vegetation, however there are some properties and farmsteads interspersed in the local landscape that would be likely to experience close proximity views.

6.2.8 Site 1 is located close to the Sandlings Walk recreational route; however, there is limited intervisibility due to the existing intervening mature coverts. Views would also likely be experienced from road users travelling along the A1094 although mature roadside hedgerow planting would provide a degree of screening to views.

6.2.9 The local Public Right of Way (PRoW) network crosses Site 1 therefore there is likely to be a need to temporarily and/or permanently divert the PRoW network. The site would also result in close proximity views from visual receptors on such routes.

6.2.10 Site 3 is further from the Suffolk Coast and Heaths AONB and the potential for an impact on the setting of this designation is therefore considered unlikely.

6.2.11 The site is in close proximity to Bloomfields's Covert and other mature tree belts and copses providing opportunity to integrate additional screening into the wider green infrastructure network and potentially providing opportunity to reinstate historical pockets of woodland.

6.2.12 Site 3 has landscape value in terms of function and distinctiveness as it forms part of the open gateway into the settlement of Saxmundham, therefore development of this site would increase the likelihood of adverse landscape effects and impacts on the setting of the settlement.

6.2.13 There is potential intervisibility with residential receptors on the edge of Saxmundham and residential properties in immediate proximity and farmsteads interspersed in the local landscape.

6.2.14 The local PRoW network crosses Site 3 therefore there is likely to be a need to temporarily and/or permanently divert the PRoW network. The site would also result in close proximity views from visual receptors on such routes. There are likely to be open views from the B1119, which represents a key vehicular route on the approach to Saxmundham, noting opportunities for landscape mitigation.

Historic environment

6.2.15 The closest designated asset to Site 1 is Grade II Listed Billeaford Hall which is located adjacent to the northern boundary of the site. The closest designated asset to Site 3 is the Grade II Listed Wood Farmhouse which is located adjacent to the western boundary of the site. There are a number of other designated assets to the west and south of Site 3 although existing woodland blocks and topography provide limited intervisibility with the site. Whilst there are designated assets adjacent to both sites, it is likely that screening could be incorporated more easily into the existing landscape character at Site 1 due to the existing woodland network and the existing screening around the asset itself.

Biological environment

6.2.16 Site 1 is located adjacent to Great Wood which listed on the Ancient Woodland Inventory and designated as a County Wildlife Site.

6.2.17 Whilst Site 1 is adjacent to Ancient Woodland it is likely an appropriate 15 m buffer (standoff) could be maintained between the development and the designation thereby avoiding loss or deterioration of the woodland. Opportunities may also exist to strengthen the green infrastructure network around the site.

6.2.18 Site 3 is not adjacent to any designated sites although an area of woodland (Bloomfield's Covert) and other mature tree belts and copses are located adjacent to the site. It is likely that appropriate buffers could be maintained between development on this site and the mature woodland blocks. Opportunities may also exist to strengthen the green infrastructure network around the site.

6.2.19 Protected species surveys have not yet been undertaken to confirm presence or absence, but due to the habitats present within and surrounding each site it is likely there is a greater potential for protected species to be present within Site 1. This will continue to be backchecked as more survey data is gathered.

Physical environment

6.2.20 Both sites are located within Flood Zone 1 and Source Protection Zone 3 and both sites are located on agricultural land which is anticipated to have a very low potential for significant contamination to be present. Both sites are relatively flat with Site 1 gently sloping from northeast to southwest and Site 3 gently sloping from west to east.

6.2.21 Site 1 is located on freely draining slightly acid but base rich sandy soils, there is a lower risk of soil compaction or plastic deformation of these soil types during stripping and handling. Site 3 is located on slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. These soils can be difficult to handle or traffic without the risk of compaction and negative impacts to their structure.

Socio-economics

6.2.22 Site 1 is located in close proximity to the Sandlings Walk recreational route, however there is limited intervisibility with users of this walk due to the existing intervening mature coverts.

6.2.23 The local PRoW network crosses both Sites 1 and 3 therefore there is likely to be a need to temporarily and/or permanently divert the PRoW network should either site be developed. The sites would also result in close proximity views from receptors on such routes.

6.2.24 There are some properties and farmsteads interspersed in the local landscape around both Site 1 and Site 3, some of which would be likely to experience close proximity views.

6.2.25 There are a number of visitor accommodation units close to the southwest and south of Site 1 which may experience views of the site and to the northeast of Site 3.

6.2.26 Site 3 is adjacent to the settlement of Saxmundham, however it is unlikely development at this site would lead to the severance of community facilities.

6.2.27 Site 1 is located adjacent to the A1094 and B1069 both of which would facilitate good access into the site. However, it has been noted through consultation that Blackheath Corner, which is the T junction between B1069 Snape Road and A1094 Aldeburgh Road, is an accident blackspot that would need to be considered in any access strategy for this site.

6.2.28 Feedback from non-statutory consultation also indicated that the rail bridge on the A1094 to the east of the junction with the A12 is potentially unsuitable to Abnormal Indivisible Loads (AIL), therefore an alternative route for AIL deliveries to Site 1 may need to be identified.

6.2.29 Site 3 is located adjacent to the B1119 however taking construction access off this road would require construction traffic to be routed through the centre of the settlement of Saxmundham. To avoid this, it is likely that a new access would need to be created off the B1121 either to the south of Saxmundham crossing the River Fromus or off the B1121 to the north of Saxmundham crossing the railway.

6.2.30 All the land within Site 1 is currently provisionally graded as a mixture of Agriculture Land Classification (ALC) Grade 3 and 4, therefore it is unlikely there will be large areas of Best and Most Versatile (BMV) land present. The whole of Site 1 is within the Countryside Stewardship (middle tier) agreement. The land within Site 3 is provisionally mapped at ALC grades 3 and 2, therefore there is a greater potential for the presence of BMV land within this site. A section of Site 3 is currently under entry level plus Higher Level Stewardship (environmental stewardship agreement).

6.2.31 Site 1 is located entirely within a minerals consultation area, whereas Site 3 is partly located within a minerals consultation area.

Technical considerations

6.2.32 Site 1 has a slightly steeper gradient than Site 3 therefore there is the potential that more earthworks would be required in order to construct the converter station. Site 3 is less spatially constrained than Site 1 therefore potentially providing more ability to microsite both permanent and temporary infrastructure within the site to avoid other constraints.

6.2.33 As set out above there is good access to Site 1 off the A1094 and B1069 noting the constraints associated with Blackheath Corner and the rail bridge. Site 3 would require an off-network access to be able to facilitate construction traffic accessing the site without passing through the centre of the settlement of Saxmundham.

Cable corridors

6.2.34 The cable corridors for both options are contiguous from the landfall through to Site 1. Both options would require a trenchless crossing beneath the Leiston – Aldeburgh SSSI and North Warren RSPB Reserve to reduce direct impacts and whilst avoidable both options would require temporary construction in proximity to the Sandlings SPA.

6.2.35 Both options would either need to cross the pinch point at the B1122 Leiston Road and to the north of Aldeburgh Golf Course for which there is a planning application to extend north or cross Leiston Road further south and route through the golf course.

6.2.36 Whilst Site 1 emerging preference has an overall shorter cable route than Site 3 emerging preference (6.5 km compared to 11 km), the HVAC cable is longer for Site 1 than it is for Site 3, 3.5 km and 1.5 km respectively. Due to the greater number of cables required for underground HVAC, this section has a greater working width typically 60 m compared with 40 m for a HVDC cable. Therefore, whilst the overall cable route is longer for Site 3 the additional temporary land take is not proportionate to the additional length. Overall, however there is more potential for temporary effects on more receptors for Site 3 than Site 1 and more potential for physical impacts on unknown or unrecorded archaeology due to the additional length.

Cost

6.2.37 There was little difference in the cost between the two options, Site 1 emerging preference had a capital cost of approximately £1,461 million to £1,513 million (depending on the HVAC technology choice in Kent) and Site 3 emerging preference had a capital cost of approximately £1,455 million to £1,507 million (depending on the HVAC technology choice in Kent).

6.3 Selection Of The Proposed Project: Suffolk Onshore Scheme

6.3.1 As set out above, landfall area of search S2 was consulted on as the emerging preference. Whilst feedback was received regarding the designated nature consideration sites within landfall area of search S2, and having regard to non-statutory consultation feedback and National Grid's ongoing work, no different or additional information emerged that altered the preliminary conclusion of the two emerging preference options being preferred to the three alternative options. The emerging preference options (Site 1 emerging preference and Site 3 emerging preference) which utilise landfall area of search S2 could provide opportunity for co-location of up to three projects within the same corridor. In addition, further technical studies have been undertaken since non-statutory consultation which have confirmed that, subject to the results of ground investigations, a trenchless crossing beneath the designated sites to avoid direct effects is achievable. Therefore, landfall area of search S2 remains the emerging preference. This landfall could also accommodate co-location with the NGV projects.

6.3.2 With regards to Site 1 emerging preference and Site 3 emerging preference, the Site 1 converter station is closer to the Suffolk Coast and Heaths AONB which could potentially result in an impact on the setting of this designation which is unlikely on Site 3. There is direct access to Site 1 from the existing road network whereas Site 3 would require an off highway network access to be created to avoid routeing construction traffic through the settlement of Saxmundham. Site 1 is more spatially constrained due to the location of existing woodland blocks within the site therefore Site 3 would provide more potential to microsite the converter station if co-located with other projects. Site 1 would also likely require more earthworks due to the slightly steeper gradient on the site.

6.3.3 Overall Site 3 would require a longer cable route and temporary land take. There would be more potential for temporary effects on more receptors for Site 3 than Site 1 and more potential for physical impacts on unknown or unrecorded archaeology due to the additional length. Site 1 however would require a longer length of HVAC cable than Site 3 which has a wider construction swathe.

6.3.4 On balance, overall Site 3 emerging preference has been identified as the preferred option for the Suffolk Onshore Scheme. This is illustrated on **Figure 6.1: Suffolk Onshore Scheme Preferred Option of Appendix A**. Site 3 converter station will be referred to as the proposed Saxmundham Converter Station in the subsequent sections.

Consideration of coordination and co-location with other projects

6.3.5 Many respondents to the non-statutory consultation expressed the view that all major energy projects currently proposed in East Suffolk should be coordinated, thus reducing the perceived spread of industrialisation and reducing impacts on the area.

6.3.6 Both emerging preference options were identified at non-statutory consultation as being able to facilitate co-location of up to three HVDC projects. The potential impacts of each of the options would be the same as described above although temporary land take for the cable routes and permanent land take at the converter station sites would be greater under a co-located scenario. However, the overall land take would be less than if all three projects developed independent cable routes and converter station sites.

6.3.7 Whilst Site 1 and Site 3 are similar in area, there are more areas of vegetation within Site 1 that spatially constrain the site, this may limit opportunities to microsite up to three converter stations and the implementation of a landscape mitigation strategy. Site 3 is more open in landscape character, therefore the placement of up to three converter stations within this site is likely to be more prominent in the landscape, however the site is less spatially constrained and therefore would allow for a comprehensive mitigation strategy.

6.3.8 As set out above the cable corridors are contiguous from the landfall through to Site 1. The area to the east of Friston and Grove Wood is spatially constrained due to the presence of Grove Wood, residential properties and farmsteads and the location of the proposed Scottish Power Renewables (SPR) East Anglia One North and East Anglia Two projects. Whilst both options could accommodate co-location through this section, Site 3 emerging preference would require HVDC cables through this section whereas Site 1 emerging preference would require HVAC cables through this section. Therefore, there may be more limited opportunity to microsite cables for Site 1 emerging preference due to the wider swathe required for HVAC.

6.3.9 On balance, Site 3 emerging preference has been identified as the preferred option for co-location, as well as being the preferred option for the Proposed Project alone (for the reasons described in paragraph 1.1.1 above).

6.4 Kent Onshore Scheme

6.4.1 As part of the Kent Onshore Scheme the technology choice of making the HVAC connection via either an overhead HVAC line or an underground HVAC cable was left open for feedback through non-statutory consultation process.

6.4.2 Many respondents to non-statutory consultation expressed the view that cables should be underground so as not to impact bird safety or landscape and visual receptors. Respondents also suggested that cables should be routed within, or as close as possible, to existing cable corridors, and have minimal impacts on ecology, using techniques such as “moling”.

Landscape And Visual

6.4.3 The Kent Onshore Scheme is not within any nationally designated landscapes. Both, overhead and underground options would require the installation of above ground infrastructure, pylons for the overhead line option and a cable sealing end compound for the underground option in order to make the connection to the existing Richborough to Canterbury 400 kV overhead line. The overhead line option would result in greater operational landscape and visual impacts; however, these could be reduced through routeing. The soil conditions of the low-lying marshland within the fluvial floodplain of the River Stour may also make reinstatement of any underground cable route more challenging, therefore temporary construction effects of the underground option may endure longer than in other soil types.

Historic Environment

6.4.4 There are a number of designed assets within the settlement of Minster to the north as well as Richborough Fort scheduled monument to the south. The overhead line option would therefore have more potential for setting impacts than the underground option however these could be reduced through routeing. The underground option would have more potential for direct physical impacts on non-designated recorded and unrecorded archaeology.

Biological Environment

6.4.5 Sandwich Bay to Hacklinge Marshes SSSI is partly located within the HVAC connection Area. The railway and adjacent habitats are designated as a local wildlife site “TH12 Woods and Grassland, Minster Marshes”. Immediately north and land to the south of the River Stour is also designed as “DO21 Ash Level and South Richborough Pasture” local wildlife site. Depending on the location of the converter station and the connection point to the existing overhead line the section of SSSI could either be avoided by routeing of both options, or if it cannot be avoided by routeing, either oversailed with an overhead line or crossed using a trenchless technique with an underground cable, thereby avoiding the potential for direct effects. It is unlikely that the local wildlife sites could be avoided by either option. The underground option would result in greater temporary land take and habitat loss. Permanent habitat loss for the overhead line option would be limited to the pylon foundations and, for the underground cable, the area of the cable sealing end compound, which is typically 116 m x 63 m. Water vole are known to be present in the Minster Marshes. Due to the construction footprint for the underground option, there is more potential for temporary impacts on water vole habitat compared with the overhead line option. The overhead line introduces the potential for collision risk with certain bird species, therefore mitigation in the form of bird diverters may be required if this option is progressed.

Physical Environment

6.4.6 The existing Richborough to Canterbury 400 kV overhead line within the HVAC Area is wholly located within Flood Zones 2 and 3; therefore, the underground cable option would require a cable sealing end compound to be located within these flood zones. Whilst the overhead line option would also be located within Flood Zone 2 and 3, flood water could ingress around the pylon feet.

6.4.7 The geology comprises tidal flat deposits (superficial) overlying the Thanet Formation (bedrock), with the Thanet classified as a Secondary A aquifer. Below the Thanet is the Chalk, classified as a Principal aquifer. The tidal flat deposits may include layers of peat which is characterised by very high moisture contents, high compressibility and low shear strength and can present a significant constraint to development. The ground conditions are anticipated to be characterised by soft and compressible materials with shallow groundwater, and therefore are unlikely to stay open unsupported during excavations. Therefore, underground cable open trenches may require trench support and also dewatering.

6.4.8 The soil types present are loamy and clayey soils (fine textured) of the coastal flats, with naturally high groundwater. These soils will be difficult to handle or traffic without the risk of compaction and potentially negative impacts to their structure and could be wet and plastic for long periods. The overhead line option would require a smaller construction area and less handling of soils compared with the underground cable option.

Socio-Economics

6.4.9 There are limited socio-economic receptors within or adjacent to the HVAC connection Area to differentiate between the options. The Saxon Shore Way is located along the south bank of the River Stour. There is the potential for temporary and permanent impacts on the users of this trail during the construction and operation of both options.

6.4.10 It is likely the construction traffic would use the same accesses regardless of the option although there is a potential for construction traffic figures to differ between options.

Technical Considerations

6.4.11 The underground cable option would require a trenchless crossing beneath the railway and depending on where the connection is made to the existing Richborough to Canterbury 400 kV overhead line, a trenchless crossing of the River Stour. Access to the south of the River Stour within the HVAC Area is limited therefore should the connection be made to the south of the River Stour either by overhead line or underground cable, construction traffic would require a temporary bridge crossing of the River Stour.

6.4.12 As set out above the ground conditions and soil types present could make soil handing for the underground cable option and the associated trenchless crossings technically challenging.

Cost

6.4.13 The capital cost difference between the overhead line option and the underground cable option was approximately £52 million irrespective of the option chosen for the Suffolk Onshore Scheme.

6.4.14 Suffolk Onshore Scheme Site 1 emerging preference had a capital cost of approximately £1,461 million (overhead line in Kent) to £1,513 million (underground cable in Kent) and Suffolk Onshore Scheme site 3 emerging preference had a capital cost of approximately £1,455 million (overhead line in Kent) to £1,507 million (underground cable in Kent).

6.5 Selection Of The Proposed Project: Kent Onshore Scheme

6.5.1 There are environmental and technical constraints and opportunities associated with both options. Due to the ground conditions and requirement for trenchless crossings it is likely that the underground cable option would have greater temporary impacts during construction than the overhead line option.

6.5.2 Both options would require permanent above ground infrastructure, the overhead line option has a greater potential for permanent impacts on landscape character, setting of historical assets and bird collision risk. The underground option would require a permanent compound within Flood Zones 2 and 3 and more potential for physical impacts on non-designed heritage assets and a greater amount of permanent habitat loss.

6.5.3 On balance the overhead line option has been identified as the preferred option for the Kent Onshore Scheme as it avoids the need to site a permanent compound within Flood Zones 2 and 3, technical constraints associated with construction and reducing impacts in relation to the potential for physical impacts on non-designated heritage assets and a greater amount of permanent habitat loss. The potential for greater landscape and visual, setting and bird collision risk from the overhead line option are recognised and have been, and will continue to be, considered and reduced as much as possible through the development of the design of the Proposed Project and the inclusion of mitigation such as bird diverters where required.

6.5.4 The Kent Onshore Scheme preferred option is illustrated on **Figure 6.2: Kent Onshore Scheme Preferred Option of Appendix A**. The Kent converter and substation station will be referred to as the proposed Minster 400 kV Substation and Converter Station in subsequent sections.

6.6 Offshore Scheme

6.6.1 As described above in section 3 landfall area of search S2 was identified as the emerging preference landfall and S3N was identified as an alternative option. Therefore, in addition to the Offshore Scheme Emerging Preference and alternative marine route to landfall area of search S3N was consulted on as part of non-statutory consultation.

6.6.2 Landfall area of search S2 was identified as the emerging preference as it avoided both nearshore constraints and a number of terrestrial pinch points as explained in sections 3 and 5, as well as being able to facilitate coordination and co-location with other projects. The alternative landfall area of search S3N was included until further work had been undertaken to confirm the feasibility of a trenchless crossing technique beneath these designated sites to avoid any direct effects on these sites at landfall area of search S2 and to review feedback received as part of the non-statutory consultation. Having regard to feedback received prior to and during non-statutory consultation and National Grid's ongoing work no different or additional information has altered the preliminary conclusions in respect of the emerging preference option being preferred to the alternative option.

6.6.3 Further technical studies have been undertaken since non-statutory consultation which subject to the results of ground investigations have confirmed a trenchless crossing beneath the designated sites in order to avoid direct effects is achievable. This coupled with feedback relating to the need to coordinate with other proposed projects means that landfall area of search S2 remains the emerging preference.

6.7 Selection Of The Proposed Project: Offshore Scheme

6.7.1 For the reasons set out above and an overall marine preference for landfall area of search S2 as set out in section 4 the marine corridor emerging preference remains the preferred option for the offshore scheme. This is illustrated on **Figure 6.3: Offshore Scheme Preferred Option of Appendix A.**

7. Design Development Of The Proposed Project

7.1 Introduction

7.1.1 This section provides a summary of how the design of the Proposed Project has evolved from the preferred option described in section 6 to the Proposed Project (including the draft Order Limits) as presented at Statutory Consultation, as a result of design development. Where relevant, this includes information about consultation feedback and how this has influenced the evolution of the Proposed Project; however, most of the feedback was relatively high level, relating to protecting the local environment, consideration of offshore solutions, and relocating the project out of Suffolk.

7.2 Suffolk Onshore Scheme

7.2.1 The proposed Suffolk Onshore Scheme comprises of:

- A connection from the existing transmission network via Friston Substation, including the substation itself. Friston Substation already has development consent as part of other third-party projects. If Friston Substation has already been constructed under another consent, only a connection into the substation would be constructed by the Sea Link project.
- A high voltage alternating current (HVAC) underground cable of approximately 1.7 km in length between the proposed Friston Substation and a proposed converter station (below).
- A 2 GW high voltage direct current (HVDC) converter station up to 26 m high plus external equipment (such as lightning protection & railings for walkways) near Saxmundham.
- A HVDC underground cable connection of approximately 10 km in length between the proposed converter station near Saxmundham, and a transition joint bay (TJB) approximately 900m inshore from a landfall point (below) where the cable transitions from onshore to offshore technology.
- A landfall on the Suffolk coast (between Aldeburgh and Thorpeness).

7.2.2 The proposals in Suffolk have been developed for Sea Link as a standalone project, but also include opportunities to co-locate infrastructure for up to two further projects at the converter station site, cable corridors and the landfall location.

Proposed Friston Substation

7.2.3 Friston Substation already benefits from development consent granted to Scottish Power Renewables (SPR), pursuant to ‘The East Anglia ONE North Offshore Wind Farm Order 2022’ and ‘The East Anglia TWO Offshore Wind Farm Order 2022’.

7.2.4 The proposed Friston Substation is included in the Proposed Project to achieve a comprehensive consenting position in time for the Proposed Project. The proposed Friston substation included within the Proposed Project would comprise a 400 kV substation, containing primarily gas insulated switchgear (GIS) within a GIS building, but also include air insulated elements.

7.2.5 The Friston substation is likely to comprise one or more buildings which could house services, storage workshop, and relay room along with a backup diesel generator. The substation compound would include hard and soft landscaping, the substation will be enclosed by a fence and would contain a parking area and access road.

7.2.6 Delivery of the Friston Substation would also require the removal of one existing 4ZW 400 kV overhead line pylons, and installation of two new pylons on the 4ZW 400 kV overhead line. It could also include the re-conductoring of a short length of the 4ZW 400 kV overhead line.

7.2.7 The location of the proposed Friston substation is illustrated on **Figure 7.4: Suffolk Onshore Scheme – Proposed Project of Appendix A** and the proposed infrastructure required for the Proposed Project is shown indicatively in red on **Design Drawing S42_S/TDD/SS/0003**.

7.2.8 National Grid is proposing to construct Friston substation as part of the Proposed Project. The infrastructure required for the Proposed Project is shown indicatively in red on **Design Drawing S42_S/TDD/SS/0003**. A short section of re-conducting on the existing 4ZW overhead line may be required, in the event that the proposed Friston substation is constructed by National Grid as part of the Proposed Project. This is illustrated on **Figure 7.1: Suffolk Onshore Scheme Design Evolution – HVAC Connection of Appendix A**.

7.2.9 Should the proposed Friston substation be installed under the current consent secured by SPR, the works required for the Proposed Project would be limited to the installation of new GIS bays and additional switch gear and bus bars, all within the boundary of the substation. This is illustrated indicatively in red on **Design Drawing S42_S/TDD/SS/0001**.

Proposed HVAC Connection

7.2.10 The proposed HVAC connection would be located between the proposed Friston substation and the proposed Saxmundham Converter Station. It would be routed northwest from the proposed Friston substation for approximately 1.6 km to the south of the B1119 and north of the B1121. The length of the connection could increase depending upon the micro siting of the Saxmundham Converter Station.

7.2.11 The feedback received did not suggest any specific reroutes but did reinforce a more general need to minimise the impact of the route on the local landscape, habitats, roads and tourism and recreation.

7.2.12 The graduated swathe for the underground HVAC cables at non-statutory consultation was shown through the centre of the Site 3 Emerging Preference corridor. The draft Order Limits broadly follow the graduated swathe as shown on **Figure 7.1: Suffolk Onshore Scheme Design Evolution – HVAC Connection of Appendix A**.

7.2.13 The draft Order Limits narrow to the northwest of the proposed Friston substation to take the most direct route to the proposed Saxmundham Converter Station site but remain wide to the west of Fristonmoor Lane to allow for further micro siting of the Saxmundham Converter Station within the site, and, as a consequence flexibility in the route of the HVAC cables to the converter station.

7.2.14 The proposed HVAC connection would be sited within the Limits of Deviation (LoD) as illustrated on **Figure 7.4: Suffolk Onshore Scheme – Proposed Project of Appendix A**.

Proposed Saxmundham Converter Station

7.2.15 The indicative location of the Saxmundham Converter Station within the proposed site is illustrated on **Figure 7.4: Suffolk Onshore Scheme – Proposed Project of Appendix A**. A typical arrangement for the Saxmundham Converter Station is illustrated on **Design Drawing S42_S/TDD/SS/0015**.

7.2.16 The feedback received did not suggest any specific design related matters other than to look for opportunities to reduce the height of the converter station, which will be considered. Feedback did reinforce a more general need to minimise the impact of the route on the local landscape, habitats, roads and tourism and recreation.

7.2.17 The graduated swathe for the converter station at non-statutory consultation was shown in the south of the site Area. Taking account of feedback received and further environmental and technical studies, the indicative location of Saxmundham Converter Station within the draft Order Limits is in the far south of the site Area adjacent to Bloomfield's Covert as shown on **Figure 7.2: Suffolk Onshore Scheme Design Evolution – Saxmundham Converter Station of Appendix A**. The indicative location of Saxmundham Converter Station has been identified to utilise the existing screening of Bloomfield's Covert and the tree belt to the south of the site, reducing the potential for landscape and visual effects from the settlement of Saxmundham, B1119 and individual properties to the south, west and north of the site. Siting the proposed Saxmundham Converter Station in this location also utilises the existing screening to reduce the potential for setting effects on a number of Grade II Listed properties to the west and south of the site.

7.2.18 The draft Order Limits remain wide in this location around the whole site that was consulted on as part of non-statutory consultation to allow for the potential for co-location with the NGV proposed projects in the area, to allow for possible mitigation planting and to allow enough flexibility for co-location with NGV's converter stations.

7.2.19 The draft Order Limits extend beyond the previous Site 3 Emerging Preference corridor in the following locations:

- Approximately 200 m to the southwest through Bloomfield's Covert to allow for a potential temporary drainage outfall during construction.
- To the west by approximately 850 m, crossing the River Fromus to the B1121, and to the northwest by approximately 850 m crossing the B1119 and the railway line to the B1121 Main Road. These are to facilitate temporary construction access to Saxmundham Converter Station to avoid the need to route construction traffic through the centre of the settlement of Saxmundham.
- Lastly to the north of the B1119 to the west of Workhouse Lane by approximately 40 m, this is to facilitate landscape planting should the site be developed as a co-located site with the NGV proposed projects in the area.

7.2.20 The proposed Saxmundham Converter Station would include a DC hall, converter transformers, valve hall, reactor hall, AC switchyard, control building, strategic spare parts building, Low Voltage (LV) electricity supply, fire deluge pump house, car parking, a permanent access road and landscaping.

7.2.21 The proposed Saxmundham Converter Station would be up to 6.5 ha in area (excluding landscaping) and the valve halls could be up to 26 m in height excluding lightning protection, aerials, walkways, fall arrest equipment and potential architectural treatments (such as soft landscaping).

7.2.22 The design of this structure, in terms of the building form and the cladding materials, will be developed alongside consultation and stakeholder feedback and design principles will be provided with the application for development consent.

Proposed Underground HVDC Cables And Suffolk Landfall

7.2.23 Protecting Aldeburgh Golf club was a key theme in responses. The feedback received did not suggest any specific reroutes but did reinforce a more general need to minimise the impact of the route on the local landscape, habitats, roads and tourism and recreation.

7.2.24 The draft Order Limits broadly follow the previous graduated swathe from the landfall, across Leiston and Snape Road, through to the crossing of Sandlings Walk as illustrated on **Figure 7.3: Suffolk Onshore Scheme Design Evolution – Underground HVDC Cables and Landfall of Appendix A.** From the crossing of Sandlings Walk (to the south of School Road) the draft Order Limits cross Grove Road to the north of Laurel Covert, this is within the corridor but to the south of the graduated swathe. This avoids the need for temporary construction activities on both sides of several properties with temporary construction activity from both the HVAC connection and the underground HVDC cables. The draft Order Limits re-join the graduated swathe at Fristonmoor Lane but remains wide from Fristonmoor Lane to the proposed Saxmundham Converter Station. This is to allow for further micro siting of the Saxmundham Converter Station within the site, and, as a consequence flexibility in the route of the underground HVDC cables to the converter station.

7.2.25 The proposed HVDC underground cables would be routed from the proposed Saxmundham Converter Station to the proposed Suffolk Landfall. They would be routed southeast from Saxmundham Converter Station passing to the north of the proposed Friston substation, south of Great Wood and north of the A1094. They would then be routed to the north of Old Broom Covert and Eight Acre Covert crossing the B1122 Leiston Road to the TJB located to the north of Warren Hill Lane and south of Sandlings SPA. The total length of the HVDC cable will depend upon the final micro siting of the Saxmundham Converter Station.

7.2.26 The Offshore Scheme has been refined on the approach to the Suffolk landfall. This refinement follows a combination of analysis of the marine survey data collected in summer 2021, and further advances in the Proposed Project design to identify a proposed location of the transition joint bay (TJB) to facilitate a trenchless crossing of the designated sites.

7.2.27 The landfall will be a committed trenchless crossing under Leiston – Aldeburgh SSSI and North Warren RSPB Reserve.

7.2.28 The draft Order Limits extend by approximately 350 m beyond the Site 3 Emerging Preference corridor along Sandlings Walk to the B1122 Leiston Road, this is to facilitate mobilisation and maintenance accesses by small vehicles or on foot.

7.2.29 The proposed underground HVDC cables and landfall would be sited within the LoD as illustrated on **Figure 7.4: Suffolk Onshore Scheme – Proposed Project of Appendix A**.

7.3 Kent Onshore Scheme

7.3.1 The proposed Kent Onshore Scheme would comprise:

- A landfall point on the Kent coast at Pegwell Bay.
- A TJB approximately 800m inshore to transition from offshore HVDC cable to onshore HVDC cable, before continuing underground for approximately 2 km to a new converter station (below).
- A 2 GW HVDC converter station, up to 26 m high plus external equipment (such as lightning protection & railings for walkways), near Minster. A new substation would be located immediately adjacent.
- Removal of approximately 1 km of existing HVAC overhead line, and installation of approximately 2.25 km of new HVAC overhead line from the substation near Minster and the existing Richborough to Canterbury overhead line.

Proposed HVAC Connection

7.3.2 The HVAC connection from the existing Richborough to Canterbury 400 kV overheard line to the proposed Minster 400 kV substation would be made via a new approximately 1 km section of double overhead line. The proposed new section of overhead line would be routed to the northeast from the existing Richborough to Canterbury overhead line, crossing the River Stour and a section of railway, and connecting into the proposed Minster 400kV substation.

7.3.3 Feedback indicated a preference to limit the length of the section of overhead line. Respondents expressed the view that overhead cables would disrupt bird migration and cause bird fatalities, should they fly into the cables. Other than this, the feedback received did not suggest any specific reroutes but did reinforce a more general need to minimise the impact of the route on the local landscape, habitats, roads, and tourism and recreation.

7.3.4 The graduated swathe within the Kent Onshore Scheme Emerging Preference corridor at non-statutory consultation was shown to the north of the River Stour. However, taking account of feedback and further environmental and technical studies the HVAC connection in combination with the proposed Minster 400 kV substation and Minster Converter Station (proposed to be located within the same compound) has been routed within the south of the non-statutory consultation corridor to reduce the length of overhead line as far as possible. The proposed overhead line is therefore routed from the proposed Minster 400 kV substation to the existing Richborough to Canterbury 400 kV overhead line to the south of the River Stour. This has taken into account the potential for views from the settlement of Minster to the north and potential setting effects on the historic statutory designated sites within the settlement of Minster as well and from Richborough Fort scheduled monument to the south. Reducing the length of the HVAC connection also reduces both temporary habitat loss during construction and any permanent habitat loss associated with the pylon footprints. The location of the draft Order Limits within the Kent Onshore Scheme Emerging Preference corridor is shown on **Figure 7.5: Kent Onshore Scheme Design Evolution – HVAC Connection of Appendix A**. Consideration will be given to the need for bird diverters to reduce the risk of bird strike.

7.3.5 The draft Order Limits extend approximately 600 m beyond the Kent Onshore Scheme Emerging Preference corridor in the southeast in order to facilitate the replacement of an existing pylon on the existing Richborough to Canterbury 400 kV overhead line and along Whitehouse Drove to facilitate a mobilisation access in order to install a temporary bridge crossing of the River Stour. The proposed pylon type has not been selected; this will be determined through further environmental considerations, including ornithological surveys and landscape and heritage surveys, as well as stakeholder engagement and consultation feedback. The potential pylon types under consideration are a steel lattice low height pylon and a steel lattice standard height pylon. Indicative illustrations of these pylon types are shown on **Design Drawing S42_T/TDD/SS/3006**. Indicative illustrations of these pylon types are shown on **Design Drawing S42_T/TDD/SS/3006** .

7.3.6 The proposed HVAC connection would be sited within the LoD as illustrated on **Figure 7.8: Kent Onshore Scheme – Proposed Project of Appendix A**.

Proposed Minster 400 Kv Substation and Minster Converter Station

7.3.7 Non-statutory consultation feedback relating to the siting and the design of Minster 400 kV substation and Minster Converter Station included:

- Design suggestions regarding the converter station included reducing the scale, being built in cylindrical form to appear as Oast Houses (a form of architecture historical to Kent) and painting it green to blend in with the rural landscape.
- The appearance of any infrastructure associated with the Proposed Project was requested to be designed in accordance with the location's landscape.
- Concerns were raised regarding the impacts of new infrastructure on Kent's local tourism, citing its natural landscape as a significant attraction.

7.3.8 At non-statutory consultation the graduated swathe for the converter station was shown in the south of the site Area within the Kent Onshore Scheme Emerging Preference corridor.

7.3.9 Taking account of feedback received and further environmental and technical studies the proposed location of Minster 400 kV substation and Minster Converter Station within the draft Order Limits is in the far south of the of the site Area, to the south of Minster Stream and as illustrated on **Figure 7.6: Kent Onshore Scheme Design Evolution – Minter 400 kV Substation and Minster Converter Station of Appendix A.**

7.3.10 As the HVAC connection in Kent is being made directly onto the existing Richborough to Canterbury overhead line there is a requirement for a new substation to be sited adjacent to Minister Converter Station. The proposed Minster 400 kV substation and Minster Converter Station are indicatively located to the north of Richborough Energy Park and a section of Sandwich Bay to Hacklinge Marshes SSSI, and to the west of the A256 as illustrated on **Figure 7.8: Kent Onshore Scheme – Proposed Project of Appendix A.** An indicative combined layout of Minster 400 kV substation and Minster Converter Station is illustrated on General Arrangement **Drawing S42_K/IGA/PS/2002**.

7.3.11 The proposed location of Minster 400 kV substation and Minster Converter Station has been identified to keep the infrastructure as close as possible to existing energy infrastructure within Richborough Energy Park and the sewage works to the south. This means that they would be visible but set within the context of other energy infrastructure in available views from the settlement of Minster to the north, rather than being visible within the more open marsh landscape and in proximity to the settlement of Minster. This has also taken account of potential setting effects on the historic statutory designated sites within the settlement of Minster as well and from Richborough Fort scheduled monument to the south. Siting within the south of the Kent Onshore Scheme Emerging Preference corridor and Area does bring the proposed infrastructure closer to a section of Sandwich Bay to Hacklinge Marshes SSSI, however a buffer would be maintained between the Proposed Project and this designated site.

7.3.12 An indicative arrangement for the proposed Minster 400 kV substation is illustrated on **Design Drawing S42_K/TDD/SS/2001** and would comprise a 400 kV substation, anticipated to contain primarily gas insulated switchgear (GIS) within a GIS building, but also including air insulated elements.

7.3.13 A typical arrangement for the proposed Minster converter station is illustrated on **Design Drawing S42_K/TDD/SS/2002**.The proposed Minster Converter Station would comprise of a DC hall within which the converter transformers would be housed, valve hall, reactor hall, AC switchyard, control building, strategic spare parts building, Low Voltage (LV) electricity supply, fire deluge pump house, car parking, a permanent access road and landscaping.

7.3.14 The proposed Minster 400 kV Substation and Minster Converter Station site would be up to 9 ha in area (excluding landscaping) and the valve halls of the Converter Station could be up to 26 m in height (excluding lightning protection, aerials, walkways, fall arrest equipment and potential architectural treatments (such as soft landscaping)).

7.3.15 The design of this structure, in terms of the building form and the external materials, will be developed alongside consultation and stakeholder feedback and design principles will be provided with the application for development consent.

Proposed Underground Hvdc Cables And Kent Landfall

7.3.16 Respondents suggested cables should be routed within, or as close to as possible, existing cable corridors, and have minimal impacts on ecology, using techniques such as ‘moling’. The protection of St. Augustine’s Golf Club was also a priority for some respondents, as was the need to minimise impacts in the Pegwell Bay area. The feedback received did not suggest any specific reroutes but did reinforce a more general need to minimise the impact of the route on the local landscape, habitats, roads, and tourism and recreation.

7.3.17 The graduated swathe for the underground HVDC cables at non-statutory consultation was shown through the centre of the Kent Onshore Scheme Emerging Preference corridor. The draft Order Limits broadly follows the graduated swathe as shown on **Figure 7.7: Kent Onshore Scheme Design Evolution – Underground HVDC Cables and Landfall in Appendix A**.

7.3.18 The draft Order Limits remain wide to the west of the A256 Richborough Way due to the potential for unrecorded archaeology within this area. Further surveys including a geophysical survey will be undertaken as the Proposed Project develops to enable micro-routeing through this area to reduce the potential for effects on any unrecorded archaeology.

7.3.19 The draft Order Limits also remain wide to the east of the A256 Richborough Way in order to facilitate access off Ebbsfleet Lane into the field to the west of St Augustine's Golf Course to install the underground HVDC cable and provide access the TJB which is proposed within this same field.

7.3.20 The approach to the landfall has been refined following the analysis of the marine survey data collected in summer 2021, avoidance of Cliffsend historical landfill site, and an offset required from the existing Nemo Link cables within Pegwell Bay.

7.3.21 The landfall would be a committed trenchless crossing under the sensitive saltmarsh habitat within the Pegwell Bay designated sites and this trenchless crossing will also include St Augustine's and Stonelees Golf Course.

7.3.22 The draft Order Limits extend beyond the Kent Onshore Scheme Emerging Preference corridor to the south by approximately 300 m and the north by approximately 60 m in a number of locations; these are to facilitate mobilisation and maintenance accesses by small vehicles or on foot.

7.3.23 The proposed underground HVDC cables would be routed from the proposed Minster Converter Station to the Kent landfall. From the proposed Minster Converter Station would be routed east to the north of Richborough Energy Park and the sewage works crossing the A256 to a TJB located to the west of St Augustine's Golf Club.

7.3.24 The proposed underground HVDC cables and landfall would be sited within the LoD as illustrated on **Figure 7.8: Kent Onshore Scheme – Proposed Project of Appendix A**.

7.4 Offshore Scheme

7.4.1 Following feedback from non-statutory consultation, stakeholder engagement and further environmental, socio-economic and technical studies, the Offshore Scheme has been refined from the Marine Corridor Emerging Preference to the draft Order Limits as shown on **Figure 7.9: Offshore Scheme Design Evolution – Marine Cable of Appendix A**.

7.4.2 There are three areas where the Offshore Scheme Boundary has either been widened or refined from the Marine Corridor Emerging Preference to the current draft Order Limits. The reasons for these refinements are explained in the sections below.

Area 1 – Approaches to Suffolk landfall

7.4.3 The Offshore Scheme has been refined on the approach to the Suffolk landfall (S2 Landfall Area of Search).

7.4.4 This refinement follows a combination of analysis of the marine survey data collected in summer 2021 and further advances in the Proposed Project design to identify a proposed landfall location within the wider S2 landfall area of search. Refinements of the Offshore Scheme boundary at the Suffolk landfall have also been made in consideration of the location of the onshore TJB and also the location of the proposed trenchless crossing beneath the Leiston – Aldeburgh SSSI and North Warren RSPB Reserve. This is illustrated on **Figure 7.9: Offshore Scheme Design Evolution – Marine Cable of Appendix A**.

Area 3 – North of the sunk TSS

7.4.5 Area 3 located North of the Sunk TSS has now been extended from the Marine Corridor Emerging Preference to the draft Order Limits as illustrated on **Figure 7.9: Offshore Scheme Design Evolution – Marine Cable of Appendix A.**

7.4.6 This extension at Area 3 follows stakeholder engagement feedback from the Harwich Haven Authority regarding concerns to shipping and navigation and a subsequent request to move the cable route north of the W1 buoy and out of the existing pilotage area. This extension of the boundary allows for flexibility in route optimisation at this location and also to reduce the risk to shipping and navigation.

Area 5 – Approaches to kent landfall

7.4.7 Area 5 located at approaches the Kent landfall (K1) has now been refined from the Marine Corridor Emerging Preference to the Offshore Scheme boundary **Figure 7.9: Offshore Scheme Design Evolution – Marine Cable of Appendix A.**

7.4.8 This refinement follows a combination of analysis of the marine survey data collected in summer 2021 and further advances in the Proposed Project design which consider engineering and construction activities. This has considered the location of the Cliffsend historical landfill site and the standoff required from the existing Nemo Link cables within Pegwell Bay.

The Offshore Scheme

7.4.9 The Offshore Scheme comprises of proposed marine HVDC cables which would be routed from the TJB at the Suffolk landfall located between the settlements of Aldeburgh and Thorpeness to the TJB at the Kent landfall located within Pegwell Bay to the south of the settlement of Cliffsend. The marine HVDC cables would be routed south from the Suffolk landfall through a section of the Outer Thames Estuary SPA and to the west of the existing Greater Gabbard and Galloper offshore wind farms. They would then head east through the Sunk TSS turning south to route around Margate and Long Sands SAC and between a number of mineral aggregate sites. The marine HVDC cables would then continue south to the east of London Array offshore wind farm and west of Thanet offshore windfarm, before turning west to make landfall in Pegwell Bay.

7.4.10 The proposed marine HVDC cables and landfall would be sited within the LoD as illustrated on **Figure 7.10: Offshore Scheme - Proposed Project of Appendix A**.

8. Description of the Proposed Project

8.1.1 The Proposed Project involves the reinforcement of the electricity transmission network between Suffolk and Kent, predominantly via offshore High Voltage Direct Current (HVDC) link, but with onshore elements to connect into the transmission network. The proposed Project is split into three elements, as follows.

8.2 The Suffolk Onshore Scheme

- A connection from the existing transmission network via Friston Substation, including the substation itself. Friston Substation already has development consent as part of other third-party projects. If Friston Substation has already been constructed under another consent, only a connection into the substation would be constructed by the Sea Link project.
- A high voltage alternating current (HVAC) underground cable of approximately 1.7 km in length between the proposed Friston Substation and a proposed converter station (below).
- A 2 GW high voltage direct current (HVDC) converter station up to 26 m high plus external equipment (such as lightning protection & railings for walkways) near Saxmundham.
- A HVDC underground cable connection of approximately 10 km in length between the proposed converter station near Saxmundham, and a transition joint bay (TJB) approximately 900m inshore from a landfall point (below) where the cable transitions from onshore to offshore technology.
- A landfall on the Suffolk coast (between Aldeburgh and Thorpeness).

8.2.1 The proposals in Suffolk have been developed for Sea Link as a standalone project, but also include opportunities to co-locate infrastructure for up to two further projects at the converter station site, cable corridors and the landfall location.

8.3 The Offshore Scheme

- Approximately 130 km of subsea HVDC cable, running between the Suffolk landfall location (between Aldeburgh and Thorpeness), and the Kent landfall location at Pegwell Bay.

8.4 The Kent Onshore Scheme

- A landfall point on the Kent coast at Pegwell Bay.
- A TJB approximately 800m inshore to transition from offshore HVDC cable to onshore HVDC cable, before continuing underground for approximately 2 km to a new converter station (below).
- A 2 GW HVDC converter station, up to 26 m high plus external equipment (such as lightning protection & railings for walkways), near Minster. A new substation would be located immediately adjacent.
- Removal of approximately 1 km of existing HVAC overhead line, and installation of approximately 2.25 km of new HVAC overhead line from the substation near Minster and the existing Richborough to Canterbury overhead line.

8.4.1 The project also includes modifications to sections of existing overhead lines in Suffolk and Kent, diversions of third-party assets, and land drainage from the construction and operational footprint. It also includes opportunities for environmental mitigation, compensation and enhancement (which could include hedgerow creation, native tree planting or funding local wildlife groups). The construction phase will involve various temporary construction activities including overhead line diversions, working areas for construction equipment and machinery, site offices, storage, accesses, bellmouths, and haul roads, as well as watercourse crossings and the diversion of public rights of way (PROWs).

9. Next Steps

9.1 Introduction

9.1.1 The feedback from the 2022 non-statutory consultation and scoping together with further technical and environmental work has led to the development of the Proposed Project which is set out in this document.

9.1.2 National Grid considers that the current project proposals strike the right balance between all of its statutory duties.

9.2 Next steps

9.2.1 National Grid is undertaking statutory consultation on its current proposals between 24 October and 18 December 2023.

9.2.2 During the coming months further environmental and site-based surveys studies will be undertaken which, alongside the feedback and outcomes of the 2023 statutory consultation, will further refine the proposed location of the substations, HVAC connections, converter stations, underground HVDC cable and marine HVDC cable and the location of areas required temporarily for the construction of the Proposed Project within the draft Order Limits.

9.2.3 The Proposed Project will be the subject of environmental impact assessments and there will be on-going consultation with stakeholders, interested parties and members of the public. A Preliminary Environmental Information Report (PEIR) has been provided as part of statutory consultation.

9.2.4 As with previous stages National Grid's initial decisions will be backchecked in the light of the findings of these further studies and assessments and new material information.

9.2.5 National Grid expects to submit an application for the Proposed Project in autumn 2024.

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Ref 14: Sea Link Scoping Opinion Adopted by the Planning Inspectorate (on behalf of the Secretary of State) pursuant to Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, December 2022 [online] available at https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN020026/EN020026-000027-EN020026-Scoping-Opinion.pdf

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Appendix A Figures

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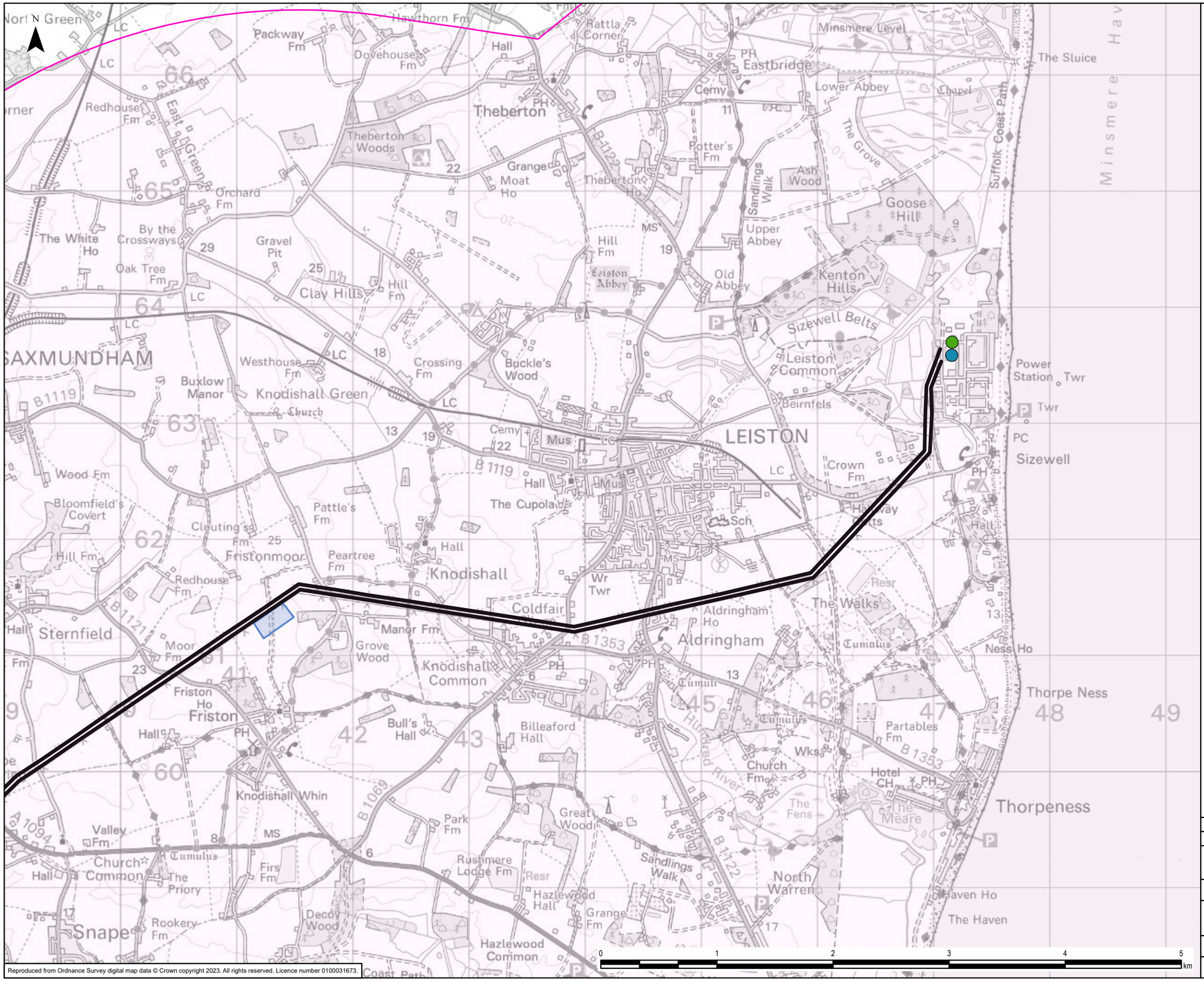

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Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK NETWORK CONNECTION POINTS

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-1	1:30,000	A3	1	0

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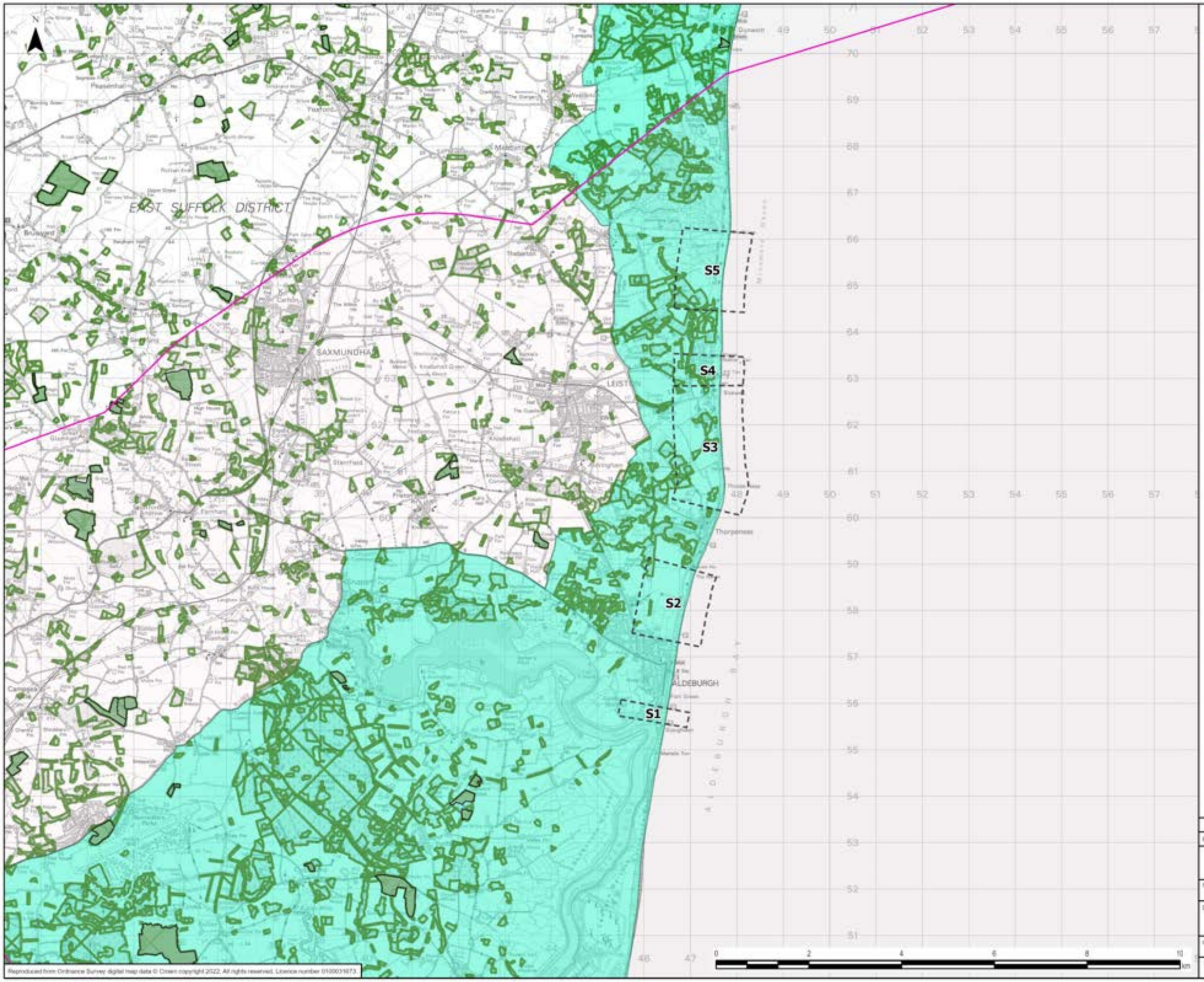

Legend

- Routeing and Siting Study Area
- Landfall Area of Search
- Area of Outstanding Natural Beauty
- National Woodland Inventory
- Ancient Woodland

Rev	Date	Description	Drawn	Chk	Appr
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK LANDFALL AREA OF SEARCH SHEET 1

Creator	Date	Checker	Date	Approver	Date
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

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N

DINGLE MARSHES RSPB RESERVE

MINSMERE RSPB RESERVE

EAST SUFFOLK DISTRICT

S5

Sizewell Marshes SSSI

S4

S3

Sandlings SPA

Leiston - Aldeburgh SSSI

Outer Thames Estuary SPA

NORTH WARREN RSPB RESERVE

S2

Alde-Ore Estuary Ramsar

Gromford Meadow SSSI

SNAPE RSPB RESERVE

Snape Warren SSSI

Alde-Ore Estuary SPA

Round Hill Pit, Aldeburgh SSSI

Iken Wood SSSI

Alde-Ore & Butley Estuaries SAC

S1

Sandlings SPA

HAVERGATE ISLAND & BOYTON MARSHES RSPB RESERVE

Alde-Ore Estuary SSSI

Sandlings SPA

0 2 4 6 8 10 km

Legend

- Routeing and Siting Study Area
- Landfall Area of Search
- Ancient Woodland
- Site of Special Scientific Interest
- RSPB Reserve
- Special Area of Conservation
- Ramsar
- Special Protection Area

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

nationalgrid

Scheme: SEA LINK

Document Title: SUFFOLK LANDFALL AREA OF SEARCH SHEET 2

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-2	1:75,000	A3	1	0

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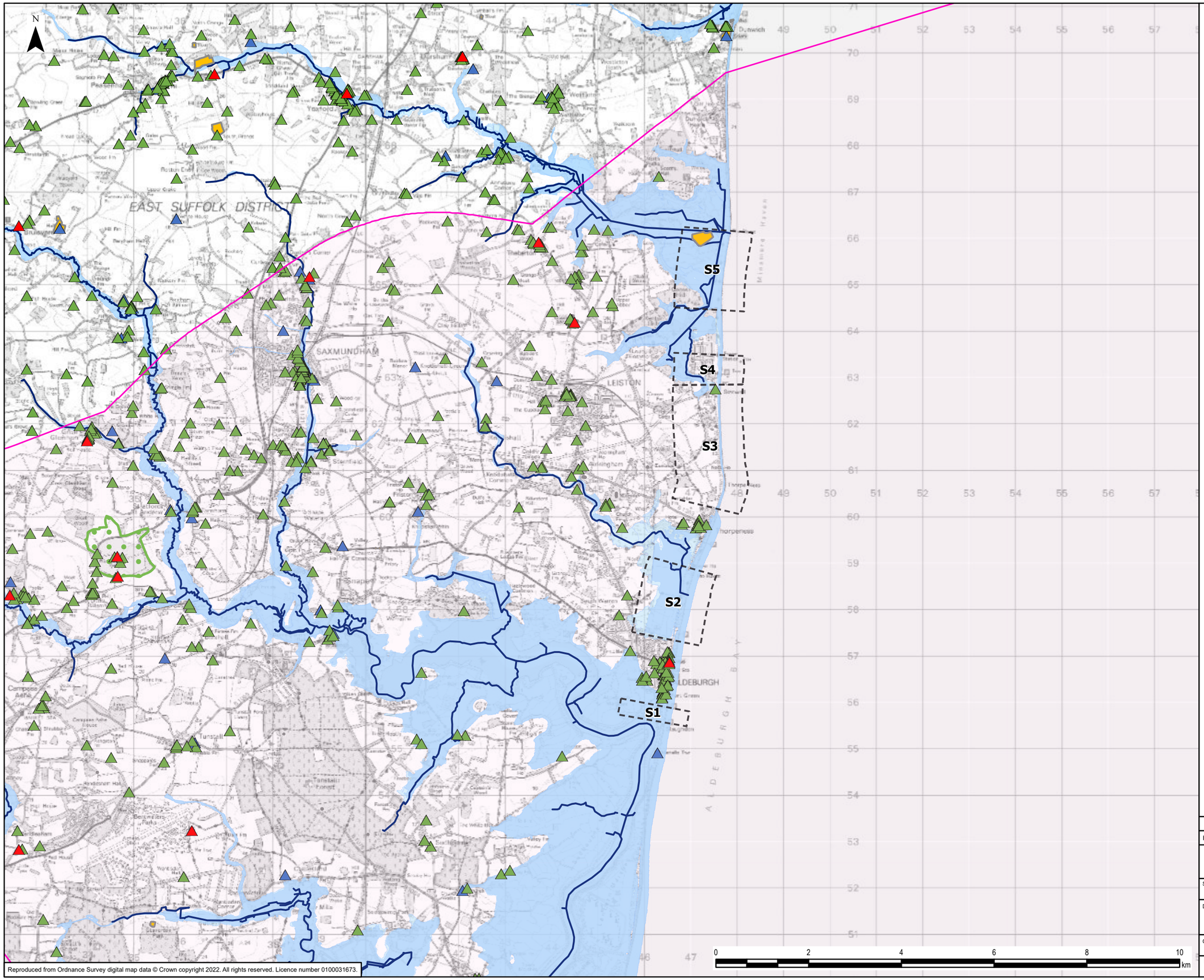

Legend

- Routeing and Siting Study Area
- Landfall Area of Search
- Listed Buildings - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Parks and Gardens - Grade II
- Scheduled Monuments
- Main Rivers
- Flood Zone 2
- Flood Zone 3

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

nationalgrid

Scheme: SEA LINK

Document Title: SUFFOLK LANDFALL AREA OF SEARCH SHEET 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-2	1:75,000	A3	1	0

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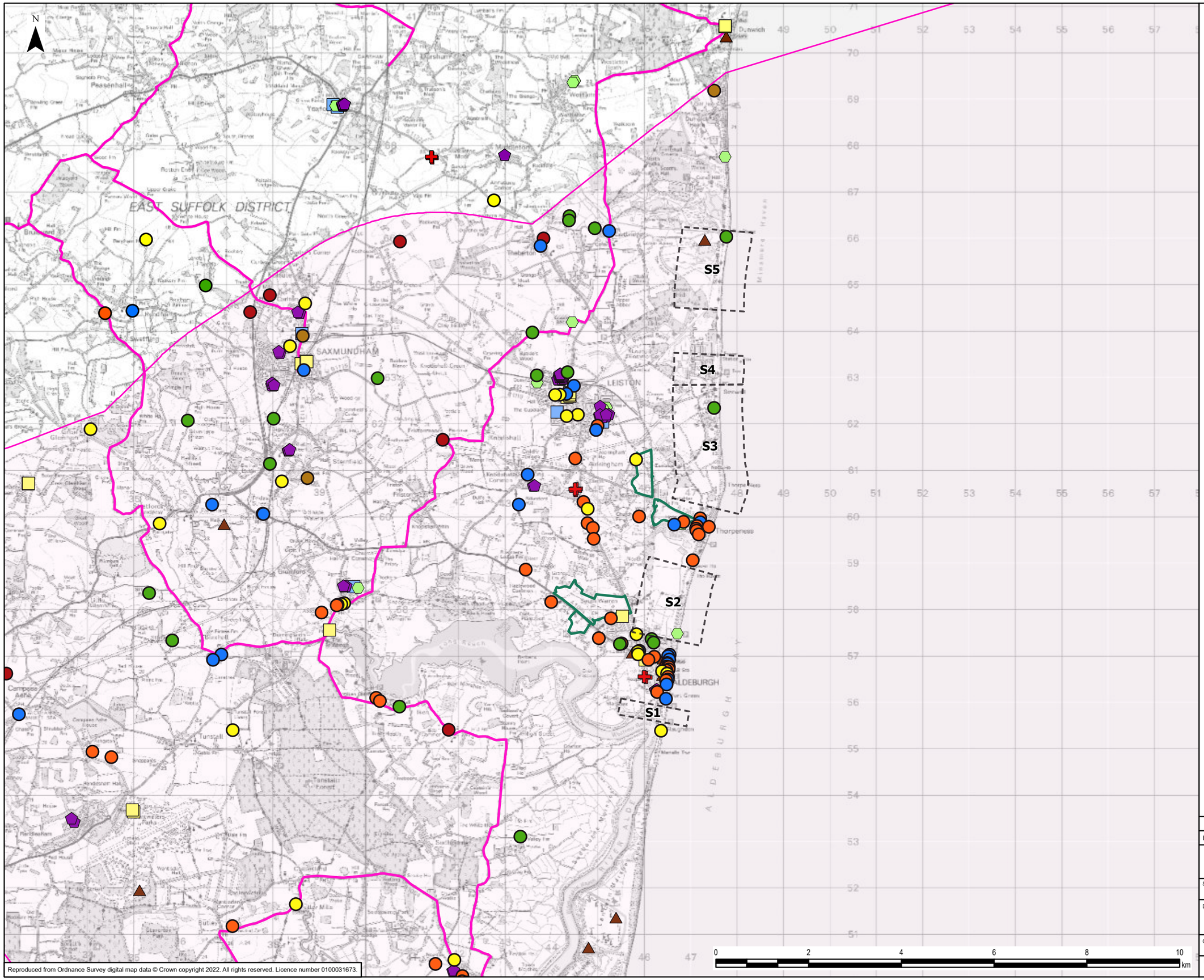

Legend

- Routeing and Siting Study Area
- Landfall Area of Search
- Bed and Breakfast
- Campsite
- Caravan Park
- Guest House
- Holiday Park
- Hotel
- Touring Park
- Cultural Facility
- Education
- Heritage
- Leisure Facility
- Medical
- Sports And Leisure Centre & Sports Club
- National Cycle Network
- Golf Course

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK LANDFALL AREA OF SEARCH SHEET 4

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
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EAST SUFFOLK DISTRICT

SAXMUNDHAM

ALDEBURGH

A

B

C

D

E

F

G

H

I

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Proposed Sizewell Substation
- Existing Sizewell Substation
- Proposed Friston Substation
- Converter Site Option Areas
- Area of Outstanding Natural Beauty
- National Woodland Inventory
- Ancient Woodland

0 1 2 3 4 5 km

Rev	Date	Description	GIS	Chk	App
0	19/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

nationalgrid

Scheme: SEA LINK

Document Title: SUFFOLK CONVERTER SITE OPTION AREAS SHEET 1

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	19/07/2023	DF	19/07/2023	NP	19/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
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EAST SUFFOLK DISTRICT

SAXMUNDHAM

MINSMERE RSPB RESERVE

Sizewell Marshes SSSI

Leiston - Aldeburgh SSSI

Sandlings SPA

NORTH WARREN RSPB RESERVE

Alde-Ore & Butley Estuaries SAC

Outer Thames Estuary SPA

Gromford Meadow SSSI

SNAPE RSPB RESERVE

Snape Warren SSSI

Sandlings SPA

Alde-Ore Estuary SPA

Round Hill Pit, Aldeburgh SSSI

Alde-Ore Estuary SSSI

Iken Wood SSSI

Alde-Ore Estuary Ramsar

Sandlings SPA

A

B

C

D

E

F

G

H

I

0 1 2 3 4 5 km

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Proposed Sizewell Substation
- Existing Sizewell Substation
- Proposed Friston Substation
- Converter Site Option Areas
- Ancient Woodland
- Site of Special Scientific Interest
- RSPB Reserve
- Special Area of Conservation
- Ramsar
- Special Protection Area

Rev	Date	Description			
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK CONVERTER SITE OPTION AREAS SHEET 2

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EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
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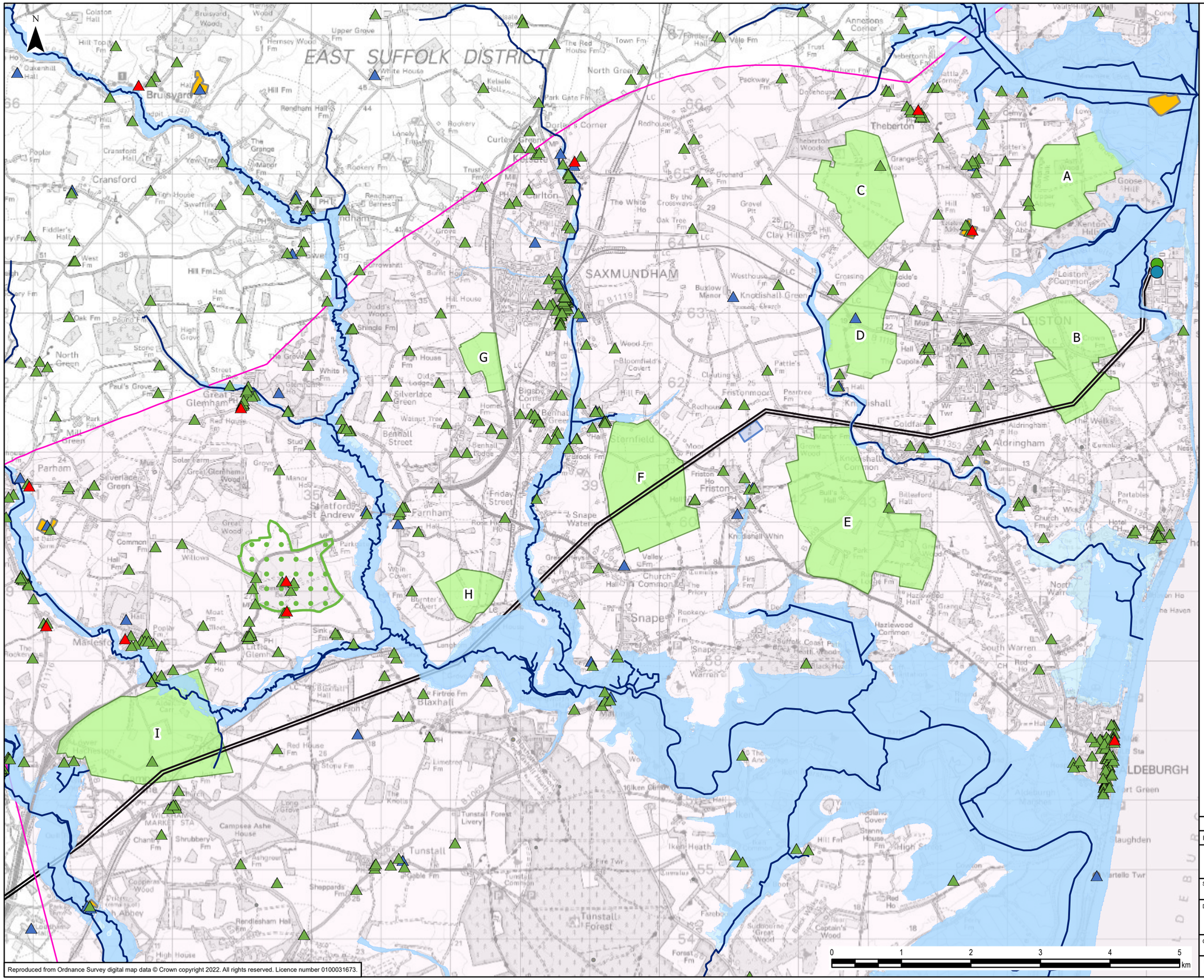

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Proposed Sizewell Substation
- Existing Sizewell Substation
- Proposed Friston Substation
- Converter Site Option Areas
- Listed Buildings - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Parks and Gardens - Grade II
- Scheduled Monuments
- Main Rivers
- Flood Zone 2
- Flood Zone 3

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

nationalgrid

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Document Title: SUFFOLK CONVERTER SITE OPTION AREAS SHEET 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-3	1:50,000	A3	1	0

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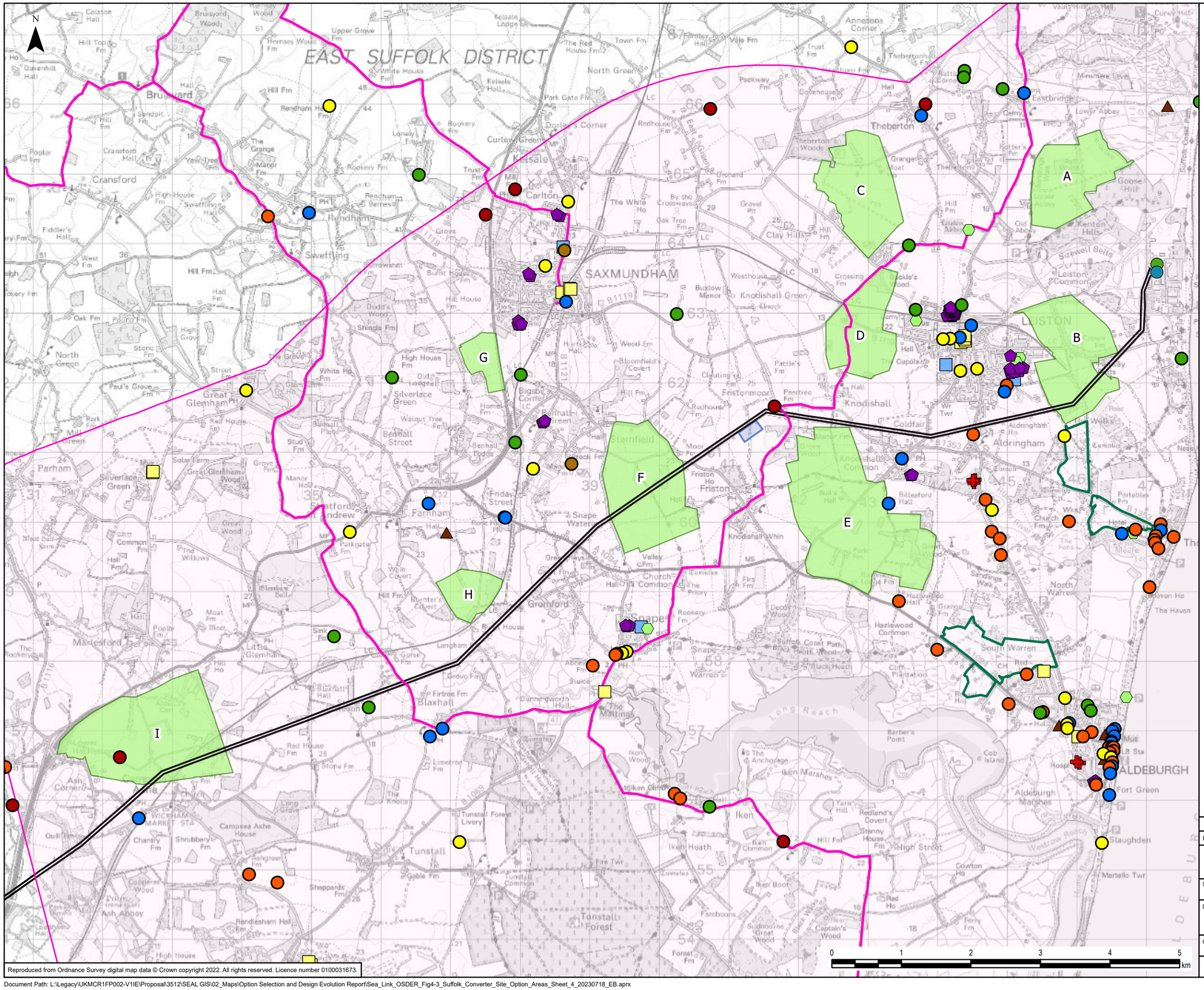

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Proposed Sizewell Substation
- Existing Sizewell Substation
- Proposed Friston Substation
- Converter Site Option Areas
- Bed and Breakfast
- Campsite
- Caravan Park
- Guest House
- Holiday Park
- Hotel
- Touring Park
- Cultural Facility
- Education
- Heritage
- Leisure Facility
- Medical
- Sports And Leisure Centre & Sports Club
- National Cycle Network
- Golf Course

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK CONVERTER SITE OPTION AREAS SHEET 4

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-3	1:50,000	A3	1	0

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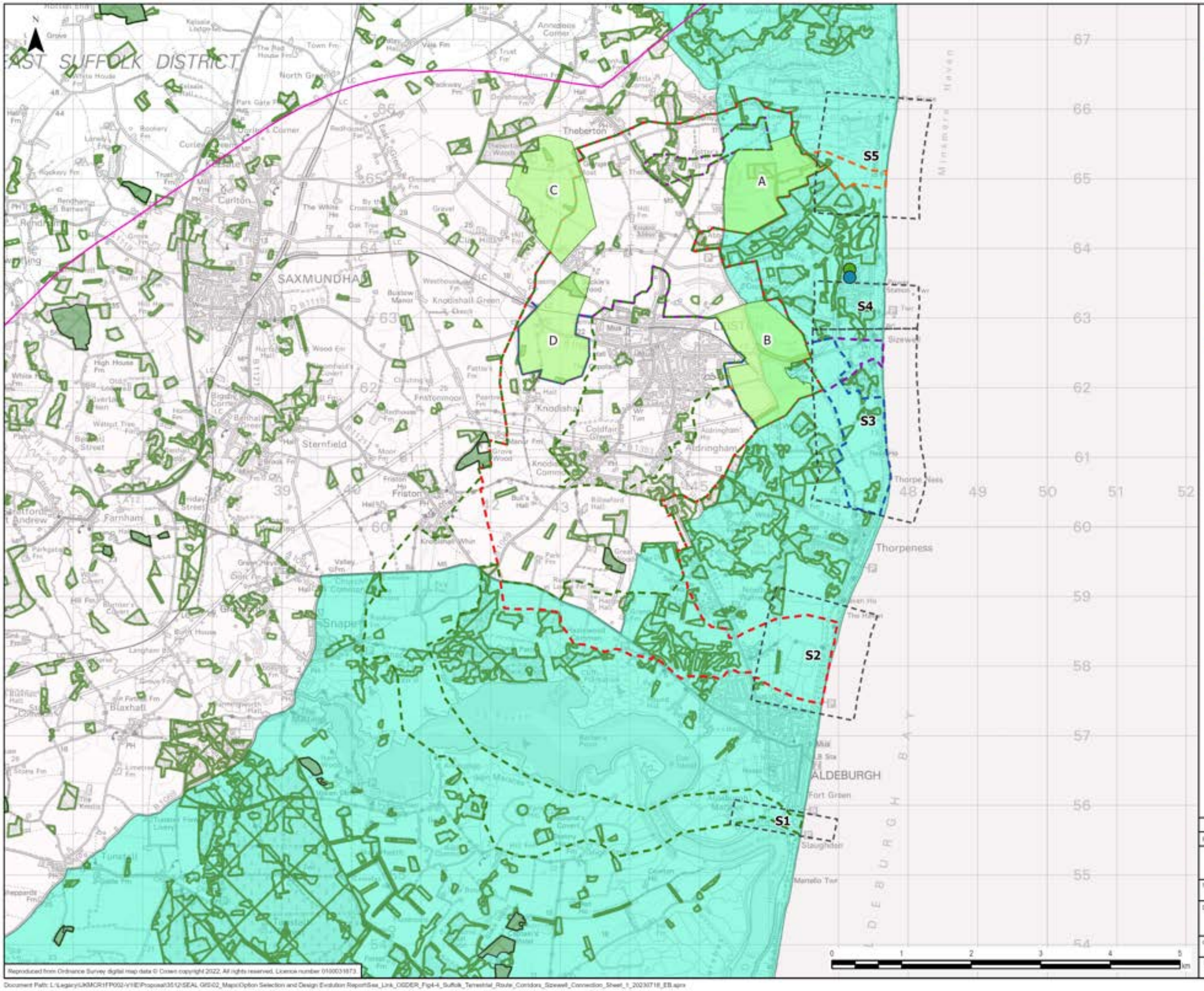

Legend

- Routeing and Siting Study Area
- Proposed Sizewell Substation
- Existing Sizewell Substation
- Converter Site Option Areas

Sizewell Connection Points Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Landfall Area of Search
- Area of Outstanding Natural Beauty
- National Woodland Inventory
- Ancient Woodland

Rev	Date	Description	Drn	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS SIZEWELL CONNECTION - SHEET 1

Creator	Date	Checker	Date	Approver	Date
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref	Scale	Format	Sheets	Rev
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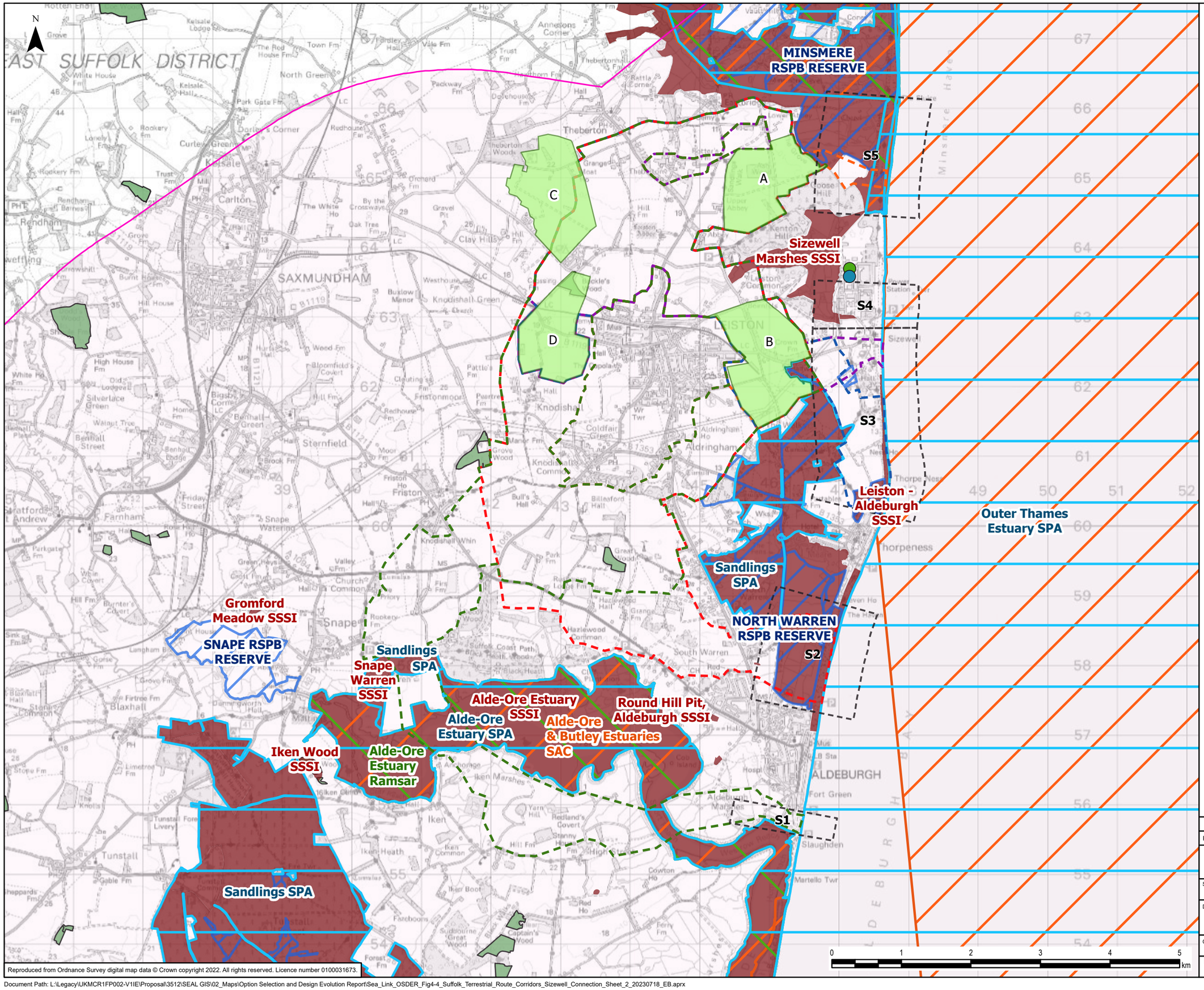

Legend

- Routeing and Siting Study Area
- Proposed Sizewell Substation
- Existing Sizewell Substation
- Converter Site Option Areas

Sizewell Connection Points Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Landfall Area of Search
- Ancient Woodland
- Site of Special Scientific Interest
- RSPB Reserve
- Special Area of Conservation
- Ramsar
- Special Protection Area

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS SIZEWELL CONNECTION - SHEET 2

Creator:	Date:	Checker:	Date:	Approver:	Date:
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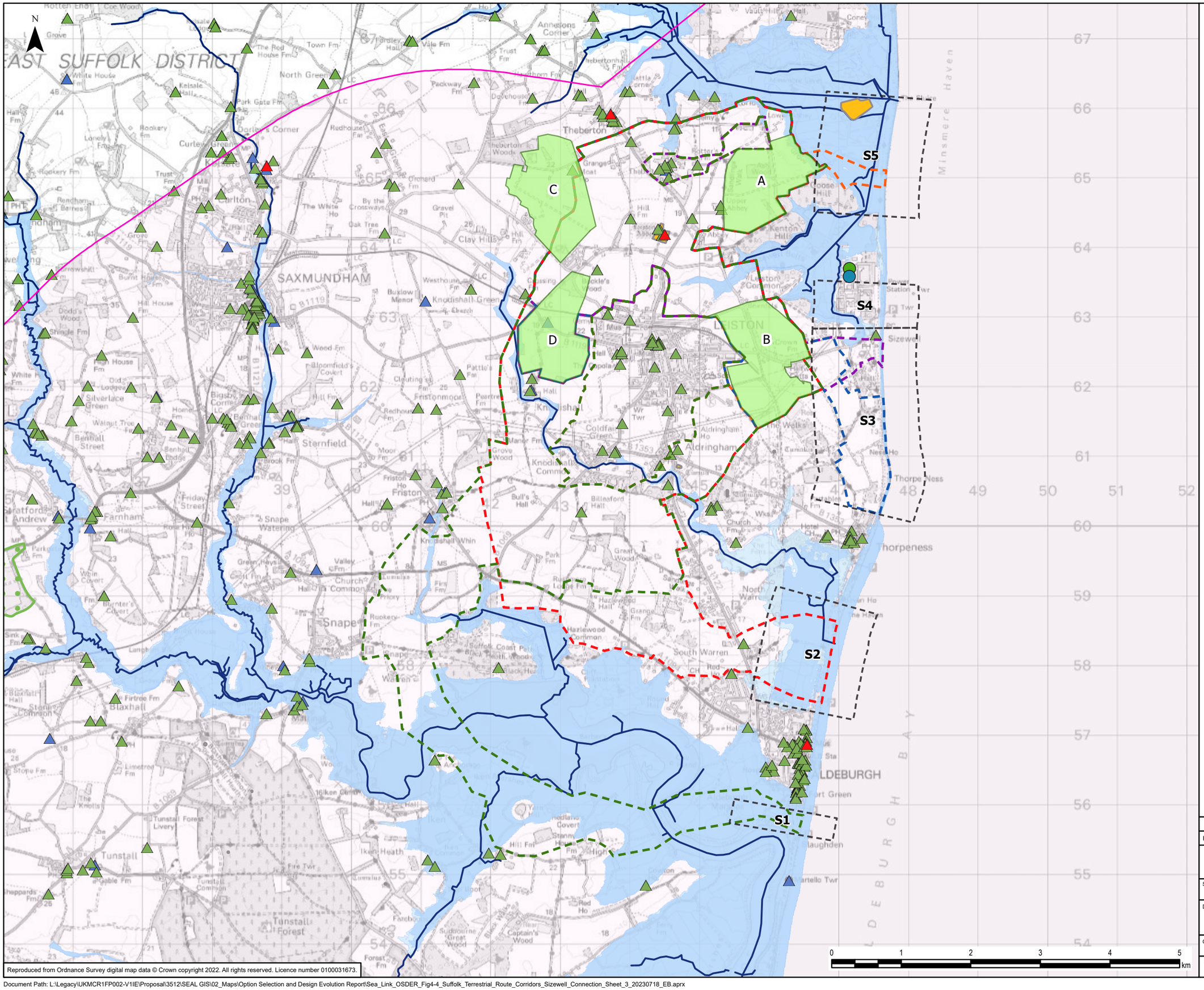

Legend

- Routeing and Siting Study Area
- Proposed Sizewell Substation
- Existing Sizewell Substation
- Converter Site Option Areas

Sizewell Connection Points Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Landfall Area of Search
- Listed Buildings - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Parks and Gardens - Grade II
- Scheduled Monuments
- Main Rivers
- Flood Zone 2
- Flood Zone 3

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS SIZEWELL CONNECTION - SHEET 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
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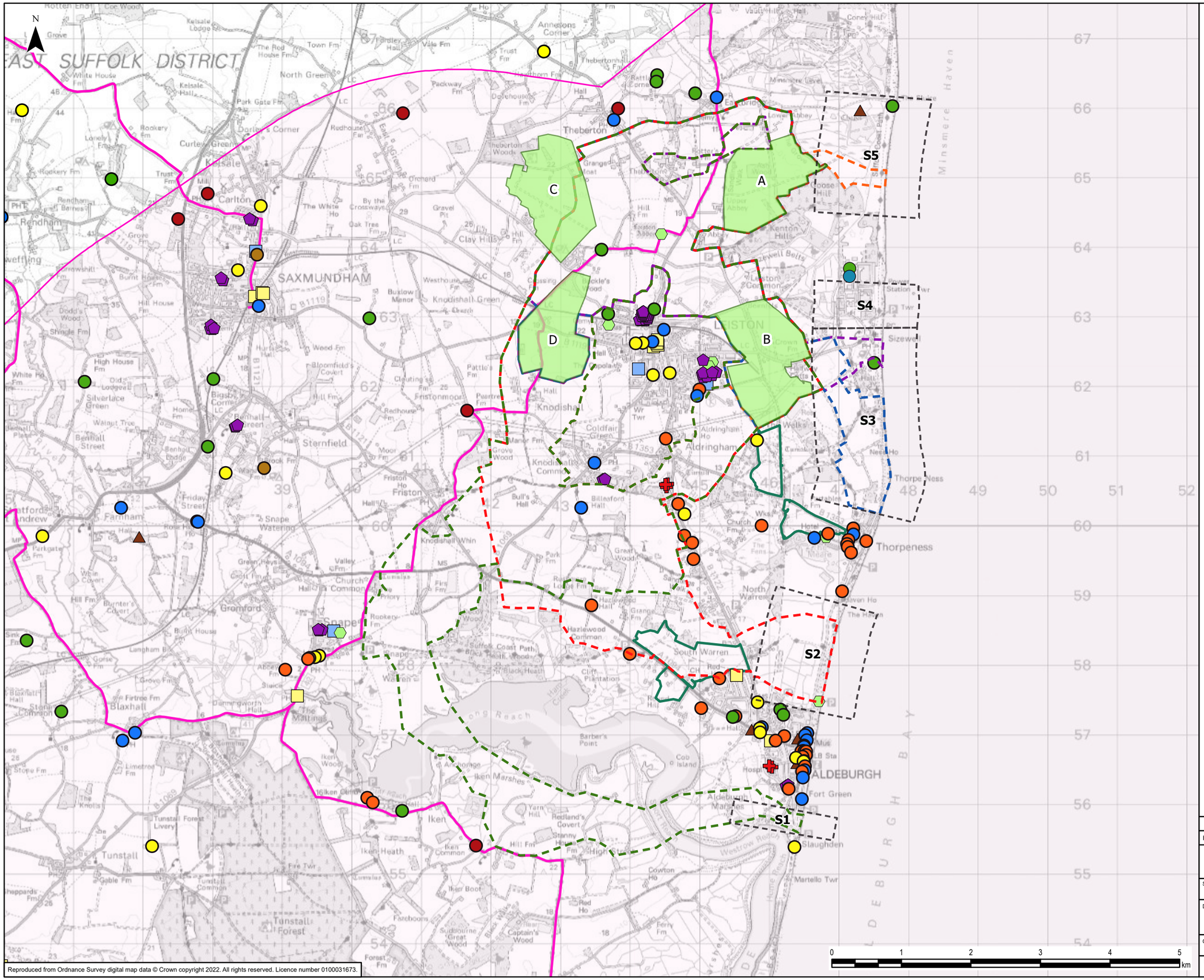

Legend

- Routeing and Siting Study Area
- Proposed Sizewell Substation
- Existing Sizewell Substation
- Converter Site Option Areas

Sizewell Connection Points Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Landfall Area of Search
- Bed and Breakfast
- Campsite
- Caravan Park
- Guest House
- Holiday Park
- Hotel
- Touring Park
- Cultural Facility
- Education
- Heritage
- Leisure Facility
- Medical
- Sports And Leisure Centre & Sports Club
- National Cycle Network
- Golf Course

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS SIZEWELL CONNECTION - SHEET 4

Creator:	Date:	Checker:	Date:	Approver:	Date:
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Document Ref:	Scale:	Format:	Sheets:	Rev:
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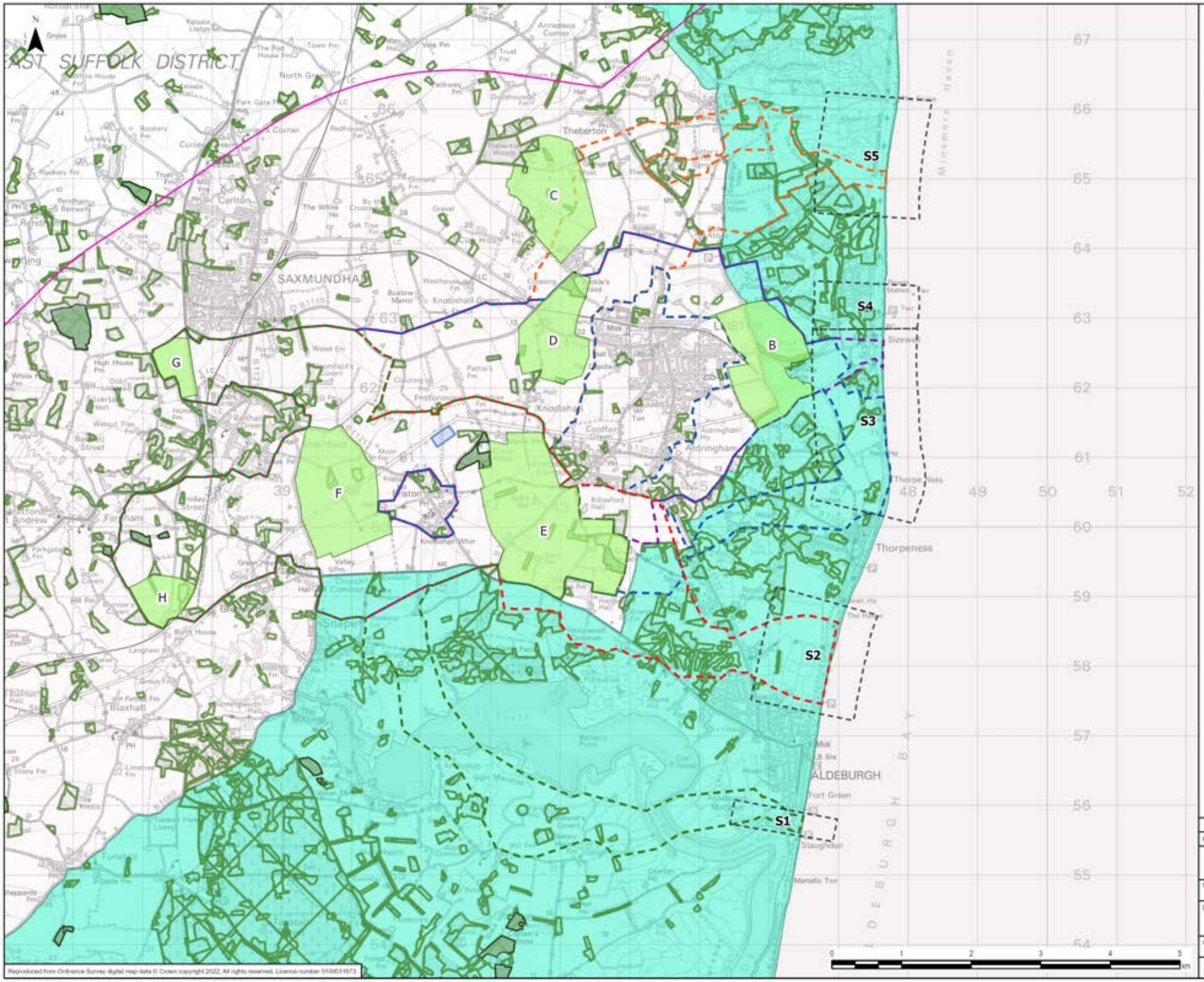

Legend

- Routeing and Siting Study Area
- Proposed Friston Substation
- Landfall Area of Search
- Converter Site Option Areas

Proposed Friston Substation Connection Point Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Area of Outstanding Natural Beauty
- National Woodland Inventory
- Ancient Woodland

Rev	Date	Description	Drawn	Chk	Appr
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS PROPOSED FRISTON CONNECTION - SHEET 1

Creator	Date	Checker	Date	Approver	Date
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref	Scale	Format	Sheets	Rev
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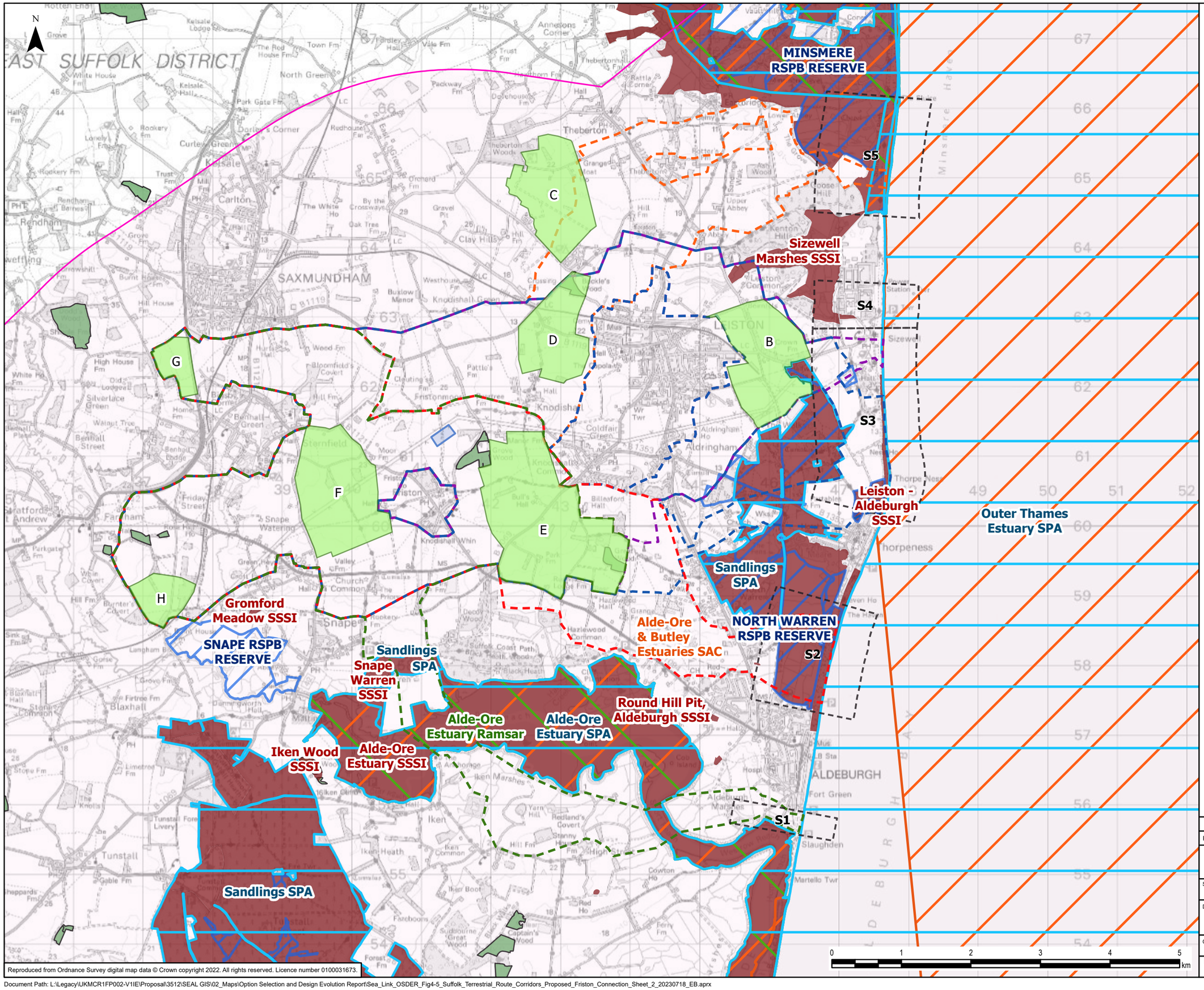

Legend

- Routeing and Siting Study Area
- Proposed Friston Substation
- Landfall Area of Search
- Converter Site Option Areas

Proposed Friston Substation Connection Point Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Ancient Woodland
- Site of Special Scientific Interest
- RSPB Reserve
- Special Area of Conservation
- Ramsar
- Special Protection Area

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS PROPOSED FRISTON CONNECTION - SHEET 2

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-5	1:50,000	A3	1	0

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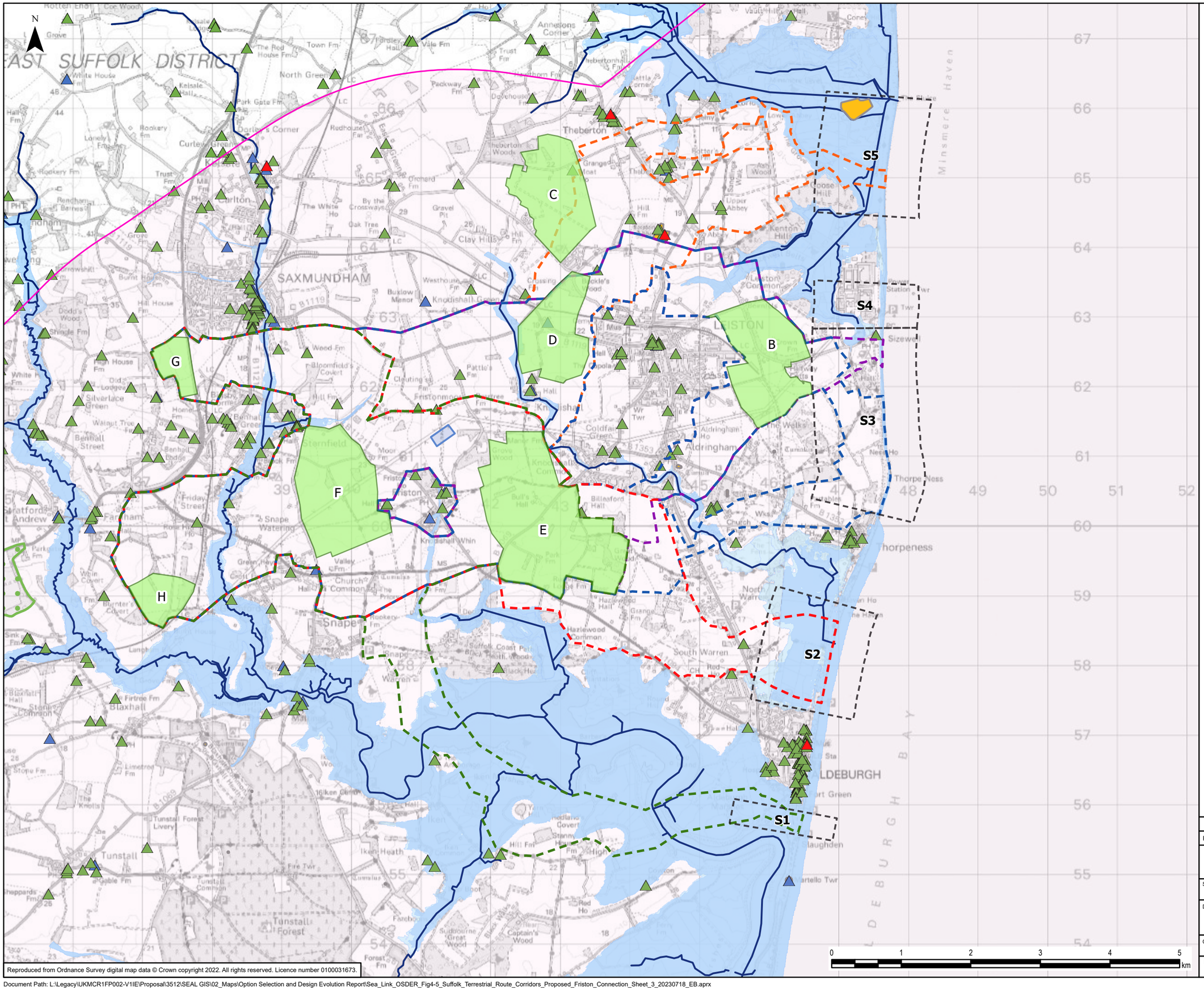

Legend

- Routeing and Siting Study Area
- Proposed Friston Substation
- Landfall Area of Search
- Converter Site Option Areas

Proposed Friston Substation Connection Point Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Listed Buildings - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Parks and Gardens - Grade II
- Scheduled Monuments
- Main Rivers
- Flood Zone 2
- Flood Zone 3

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS PROPOSED FRISTON CONNECTION - SHEET 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

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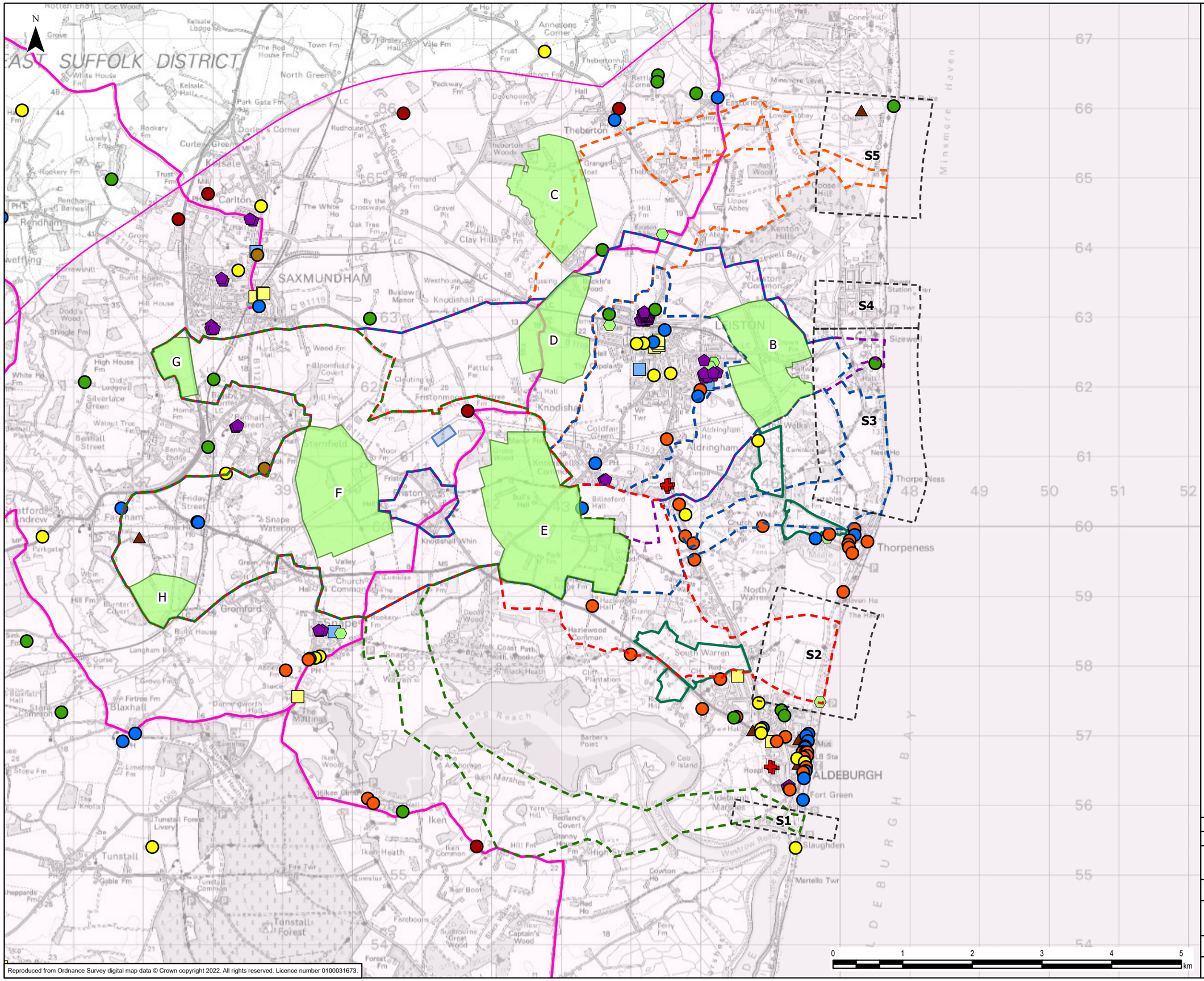

Legend

- Routeing and Siting Study Area
- Proposed Friston Substation
- Landfall Area of Search
- Converter Site Option Areas

Proposed Friston Substation Connection Point Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Bed and Breakfast
- Campsite
- Caravan Park
- Guest House
- Holiday Park
- Hotel
- Touring Park
- Cultural Facility
- Education
- Heritage
- Leisure Facility
- Medical
- Sports And Leisure Centre & Sports Club
- National Cycle Network
- Golf Course

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS PROPOSED FRISTON CONNECTION - SHEET 4

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
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EAST SUFFOLK DISTRICT

FRAMLINGHAM

SAXMUNDHAM

ALDEBURGH

S1

S2

S3

S4

S5

B

D

E

F

H

I

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Landfall Area of Search
- Converter Site Option Areas

New Connection Point Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Area of Outstanding Natural Beauty
- National Woodland Inventory
- Ancient Woodland

0 1 2 3 4 5 km

Rev	Date	Description	Drn	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

nationalgrid

Scheme: SEA LINK

Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS NEW CONNECTION - SHEET 1

Creator	Date	Checker	Date	Approver	Date
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref	Scale	Format	Sheets	Rev
FIGURE 4-6	1:60,000	A3	1	0

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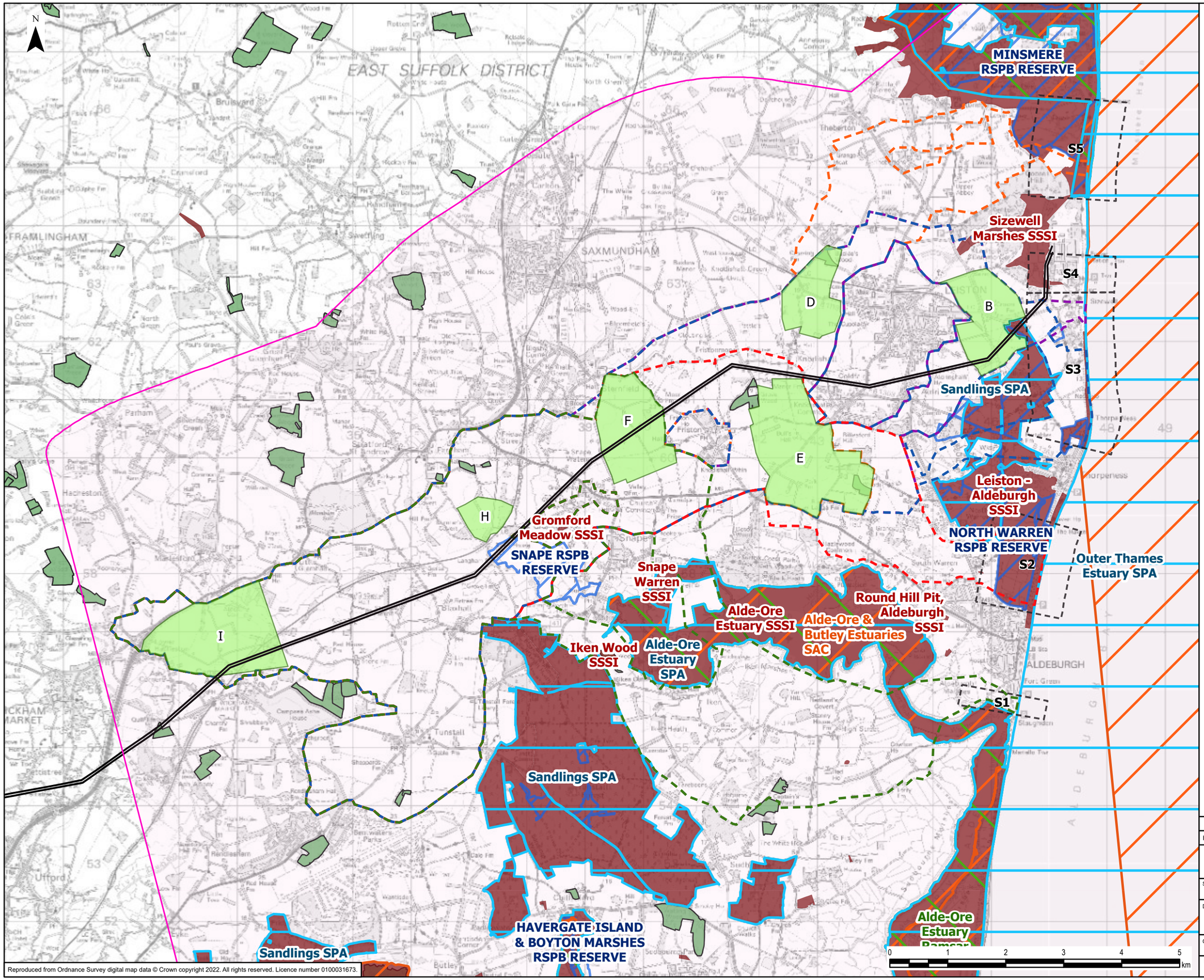

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Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Landfall Area of Search
- Converter Site Option Areas

New Connection Point Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Ancient Woodland
- Site of Special Scientific Interest
- RSPB Reserve
- Special Area of Conservation
- Ramsar
- Special Protection Area

Rev	Date	Description			
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS NEW CONNECTION - SHEET 2

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EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-6	1:60,000	A3	1	0

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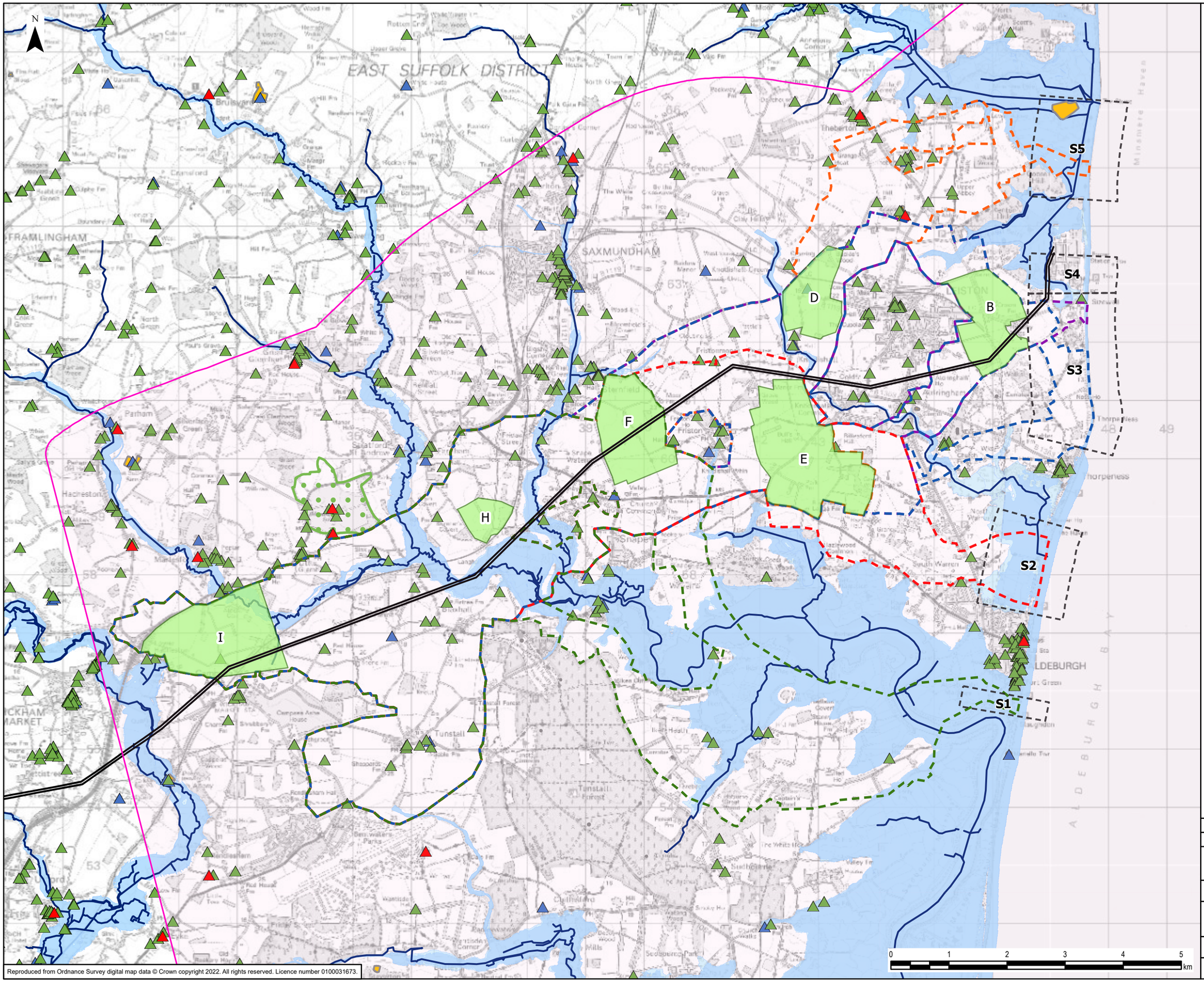

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Landfall Area of Search
- Converter Site Option Areas

New Connection Point Terrestrial Corridors

- Green
- Red
- Blue
- Purple
- Orange
- Listed Buildings - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Parks and Gardens - Grade II
- Scheduled Monuments
- Main Rivers
- Flood Zone 2
- Flood Zone 3

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK TERRESTRIAL ROUTE CORRIDORS NEW CONNECTION - SHEET 3

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EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-6	1:60,000	A3	1	0

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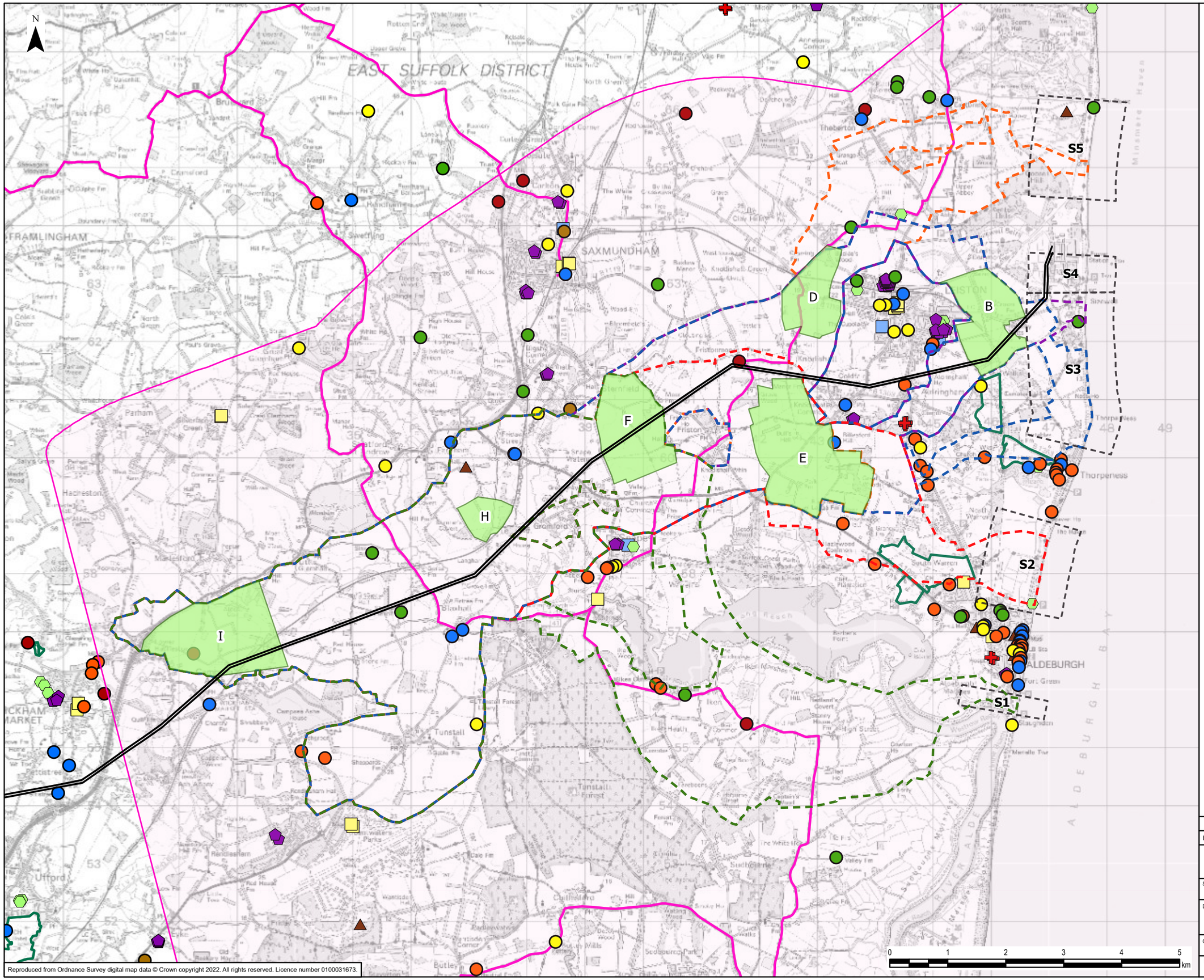

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Legend

- ☐ Routeing and Siting Study Area
- — National Grid Overhead Line - 400kV
- ⬚ Landfall Area of Search
- 🟩 Converter Site Option Areas

New Connection Point Terrestrial Corridors

- ⬚ Green
- ⬚ Red
- ⬚ Blue
- ⬚ Purple
- ⬚ Orange
- ● Bed and Breakfast
- ● Campsite
- ● Caravan Park
- ● Guest House
- ● Holiday Park
- ● Hotel
- ● Touring Park
- ■ Cultural Facility
- ⬟ Education
- ▲ Heritage
- ⬢ Leisure Facility
- ✚ Medical
- ■ Sports And Leisure Centre & Sports Club
- — National Cycle Network
- ☐ Golf Course

0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP
Rev	Date	Description	GIS	Chk	App

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Document Title:
SUFFOLK TERRESTRIAL ROUTE CORRIDORS
NEW CONNECTION - SHEET 4

Creator: EB	Date: 18/07/2023	Checker: DF	Date: 18/07/2023	Approver: NP	Date: 18/07/2023
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EAST SUFFOLK DISTRICT

SAXMUNDHAM

ALDEBURGH

Site 1

Site 2

Site 3

Site 4

Site 5

Site 6

Site 7

A

B

C

D

E

F

G

H

I

Legend

- National Grid Overhead Line - 400kV
- Proposed Friston Substation
- Converter Site Option Areas
- Potential Coordinated Converter Station Sites
- Area of Outstanding Natural Beauty
- National Woodland Inventory
- Ancient Woodland

0 1 2 3 4 km

Rev	Date	Description	Drn	Chk	Apv
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: POTENTIAL COORDINATED CONVERTER STATION SITES - SHEET 1

Creator:	Date:	Checker:	Date:	Approver:	Date:
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Document Ref:	Scale:	Format:	Sheets:	Rev:
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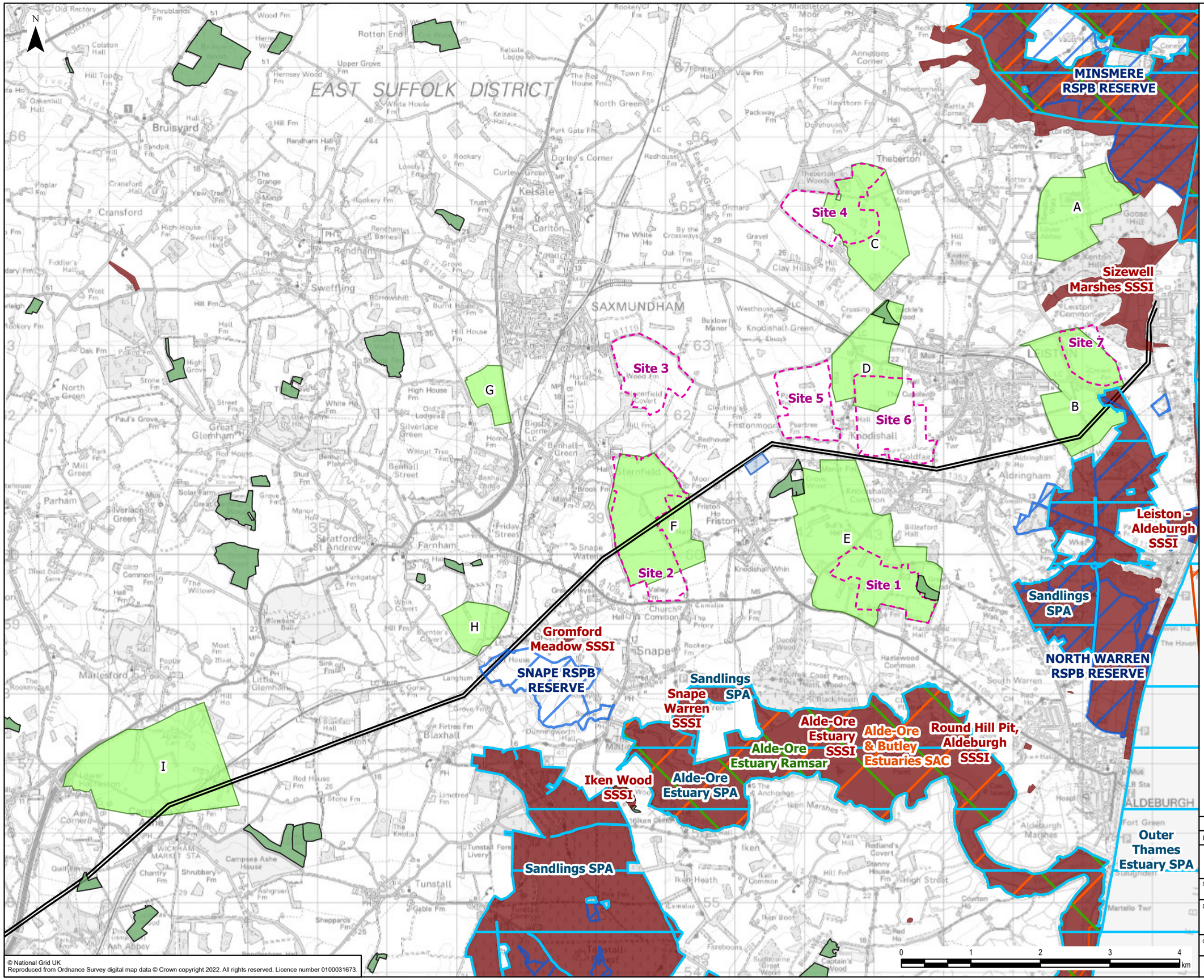

Legend

- National Grid Overhead Line - 400kV
- Proposed Friston Substation
- Converter Site Option Areas
- Potential Coordinated Converter Station Sites
- Ancient Woodland
- Site of Special Scientific Interest
- RSPB Reserve
- Special Area of Conservation
- Ramsar
- Special Protection Area

Rev	Date	Description			
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: POTENTIAL COORDINATED CONVERTER STATION SITES - SHEET 2

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Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-7	1:50,000	A3	1	0

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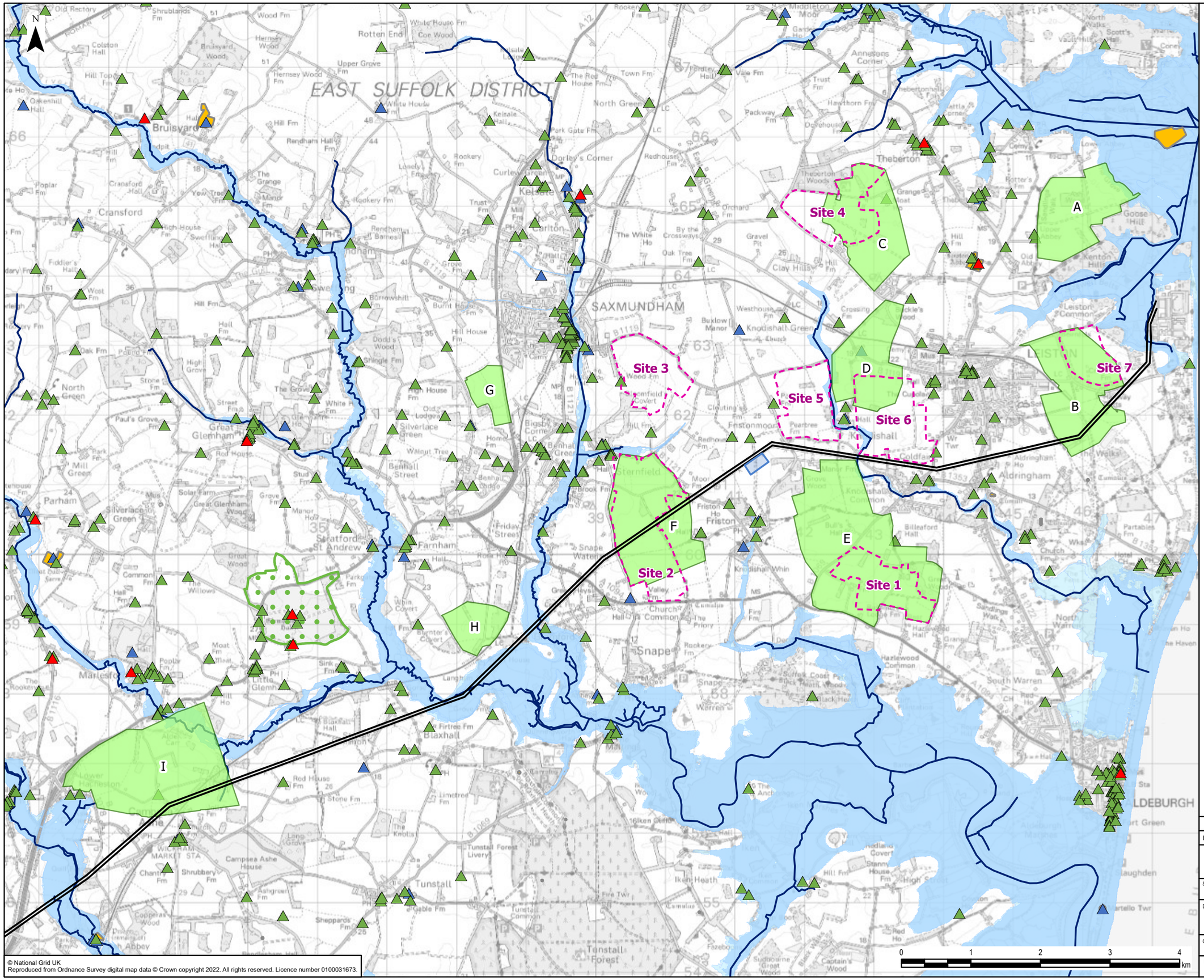

Legend

- National Grid Overhead Line - 400kV
- Proposed Friston Substation
- Converter Site Option Areas
- Potential Coordinated Converter Station Sites
- Listed Buildings - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Parks and Gardens - Grade II
- Scheduled Monuments
- Main Rivers
- Flood Zone 2
- Flood Zone 3

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: POTENTIAL COORDINATED CONVERTER STATION SITES - SHEET 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-7	1:50,000	A3	1	0

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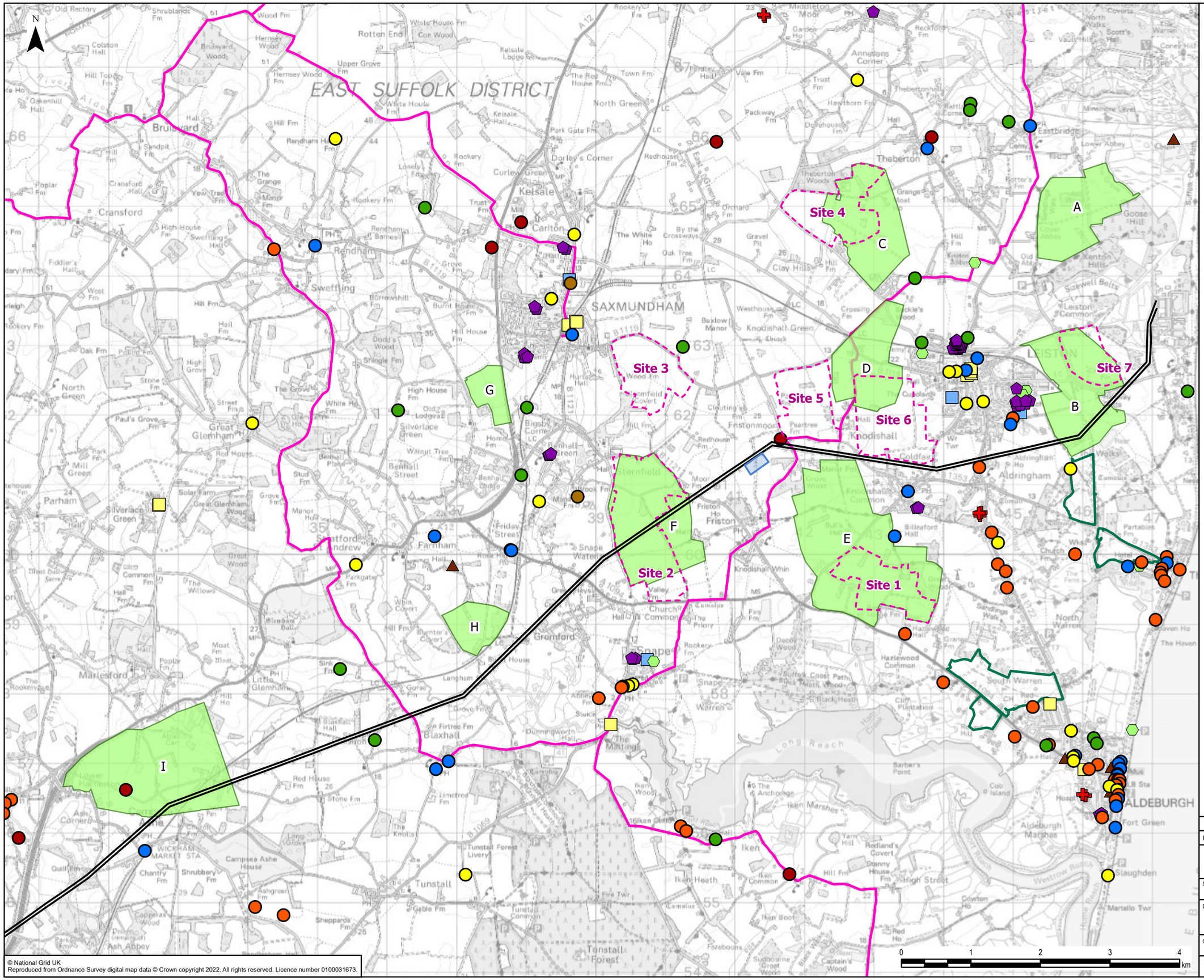

Legend

- National Grid Overhead Line - 400kV
- Proposed Friston Substation
- Converter Site Option Areas
- Potential Coordinated Converter Station Sites
- Bed and Breakfast
- Campsite
- Caravan Park
- Guest House
- Holiday Park
- Hotel
- Touring Park
- Cultural Facility
- Education
- Heritage
- Leisure Facility
- Medical
- Sports And Leisure Centre & Sports Club
- National Cycle Network
- Golf Course

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: POTENTIAL COORDINATED CONVERTER STATION SITES - SHEET 4

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EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-7	1:50,000	A3	1	0

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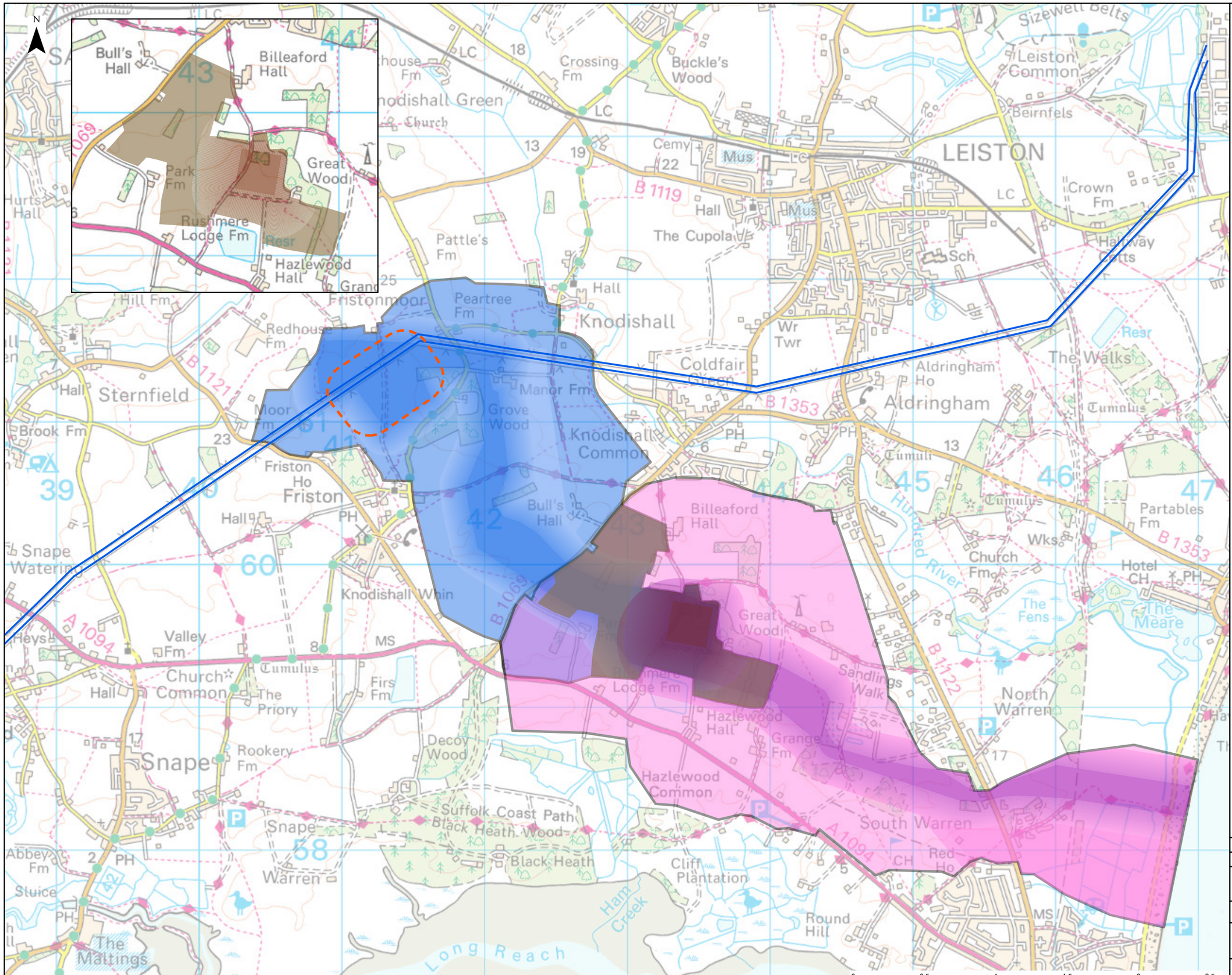

Legend

- National Grid Overhead Line - 400kV
- Proposed Friston Substation

Suffolk Converter Station Site 1

Preferred HVDC Graduated Swathe

Preferred HVDC Corridor

HVAC Graduated Swathe

HVAC Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	KS

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Scheme: SEA LINK

Document Title: SUFFOLK SITE 1 - EMERGING PREFERENCE

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	KS	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-8	1:25,000	A3	1	0

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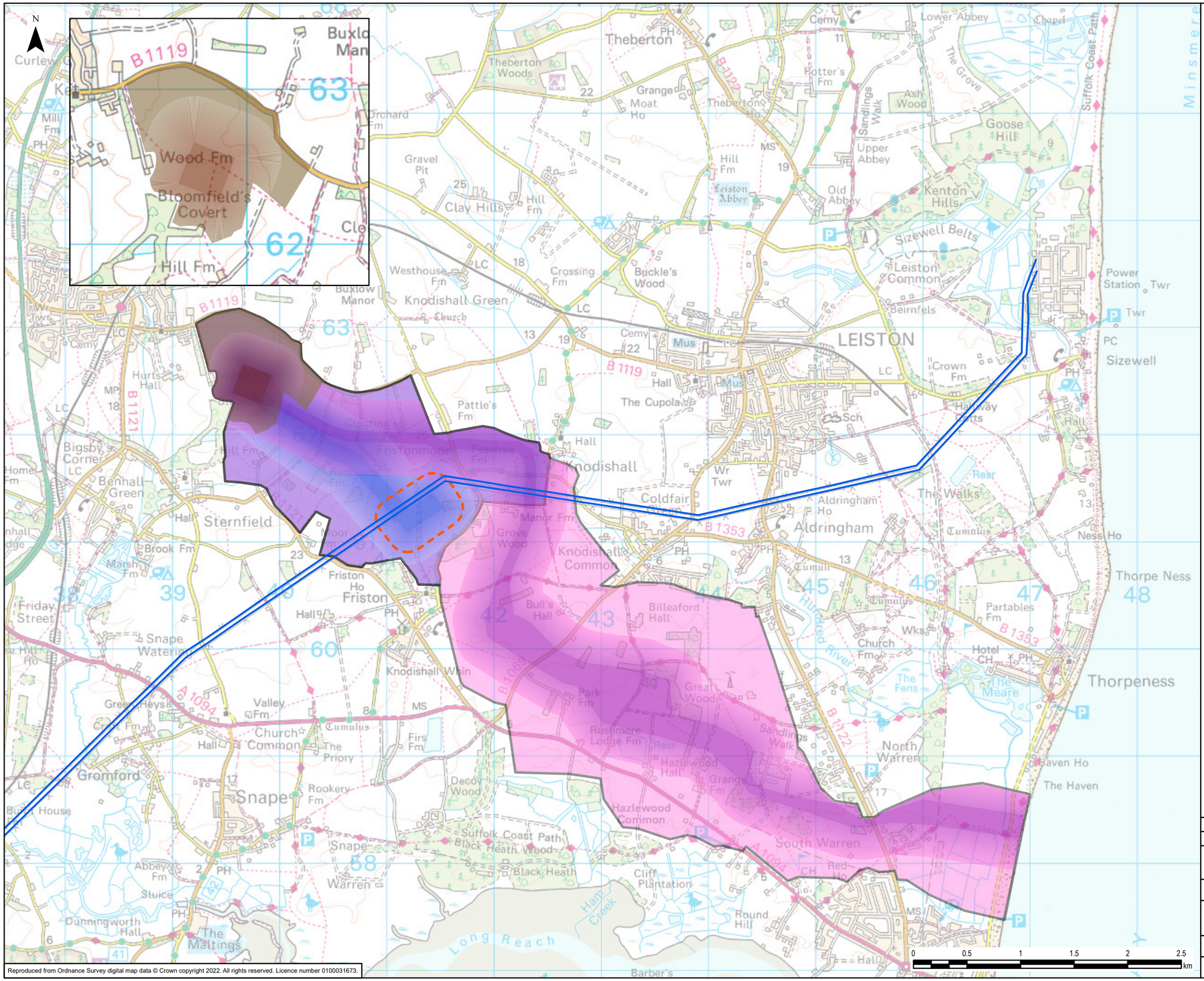

Legend

- National Grid Overhead Line - 400kV
- Proposed Friston Substation
- Suffolk Converter Station Site 3
- Preferred HVDC Graduated Swathe
- Preferred HVDC Corridor
- HVAC Graduated Swathe
- HVAC Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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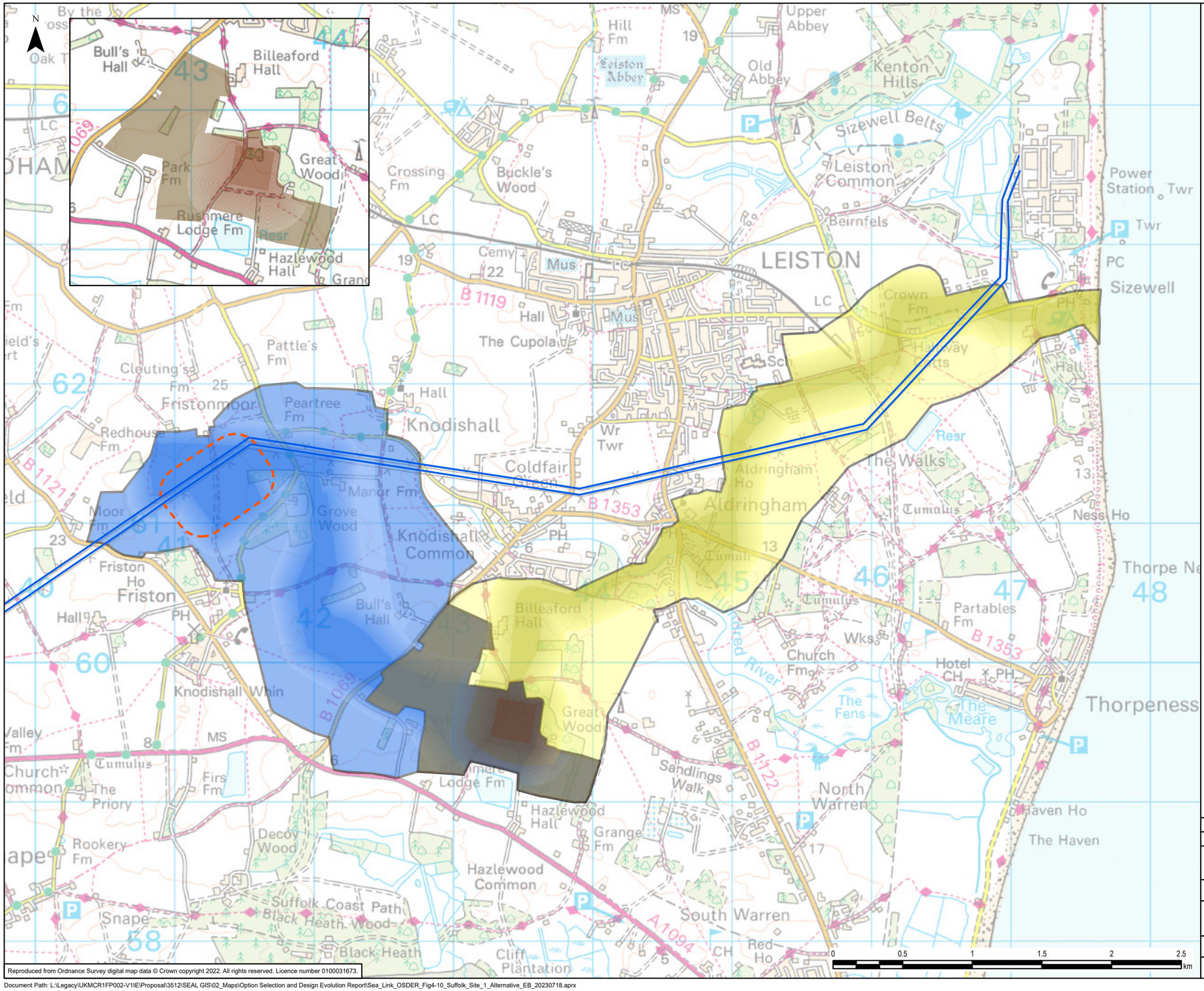

Legend

- National Grid Overhead Line - 400kV
- Proposed Friston Substation
- Suffolk Converter Station Site 1
- Alternative HVDC Graduated Swathe
- Alternative HVDC Corridor
- HVAC Graduated Swathe
- HVAC Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK SITE 1 - ALTERNATIVE

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EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-10	1:25,000	A3	1	0

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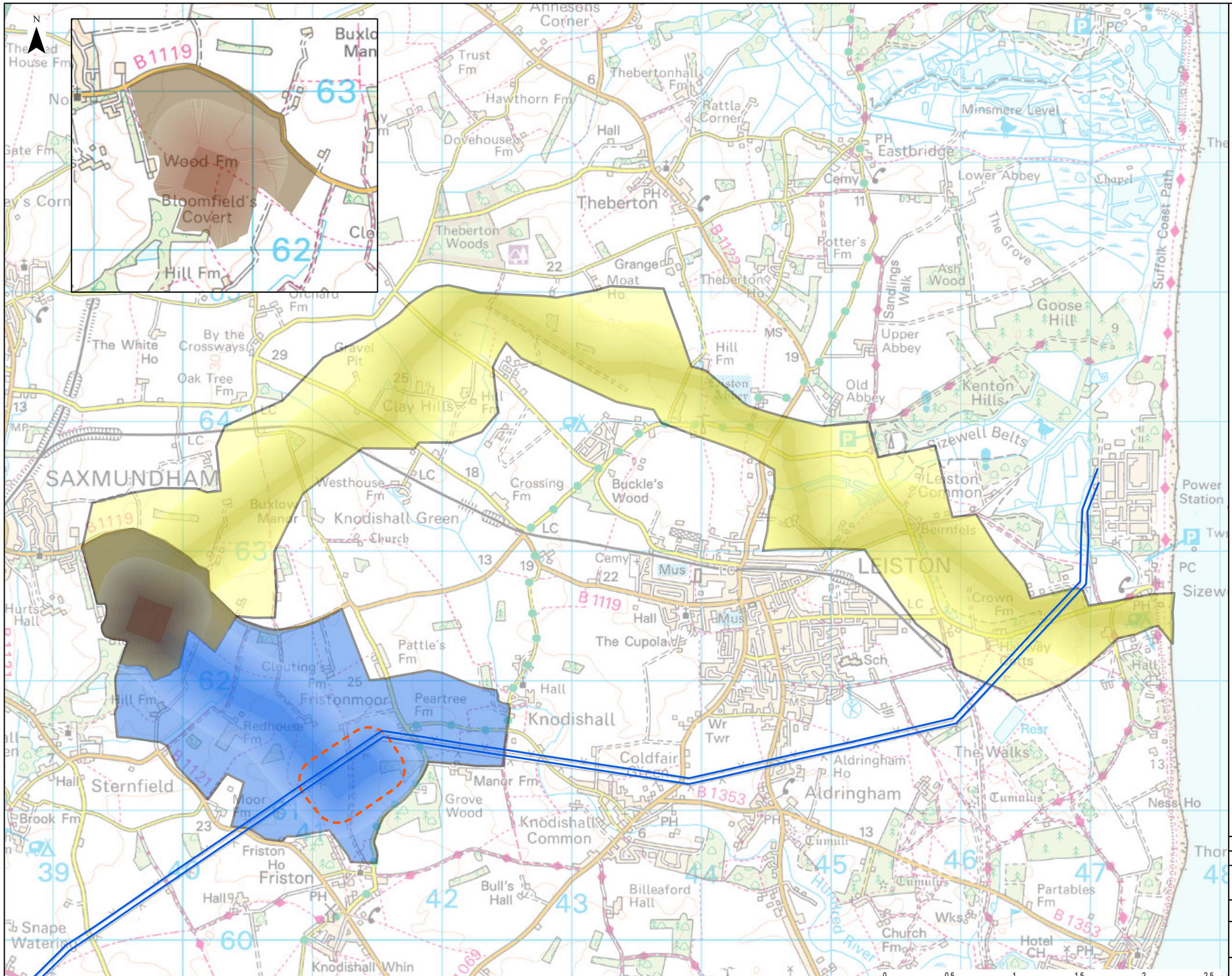

Legend

- National Grid Overhead Line - 400kV
- Proposed Friston Substation
- Suffolk Converter Station Site 3
- Alternative HVDC Graduated Swathe
- Alternative HVDC Corridor
- HVAC Graduated Swathe
- HVAC Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK SITE 3 ALTERNATIVE (OPTION 1)

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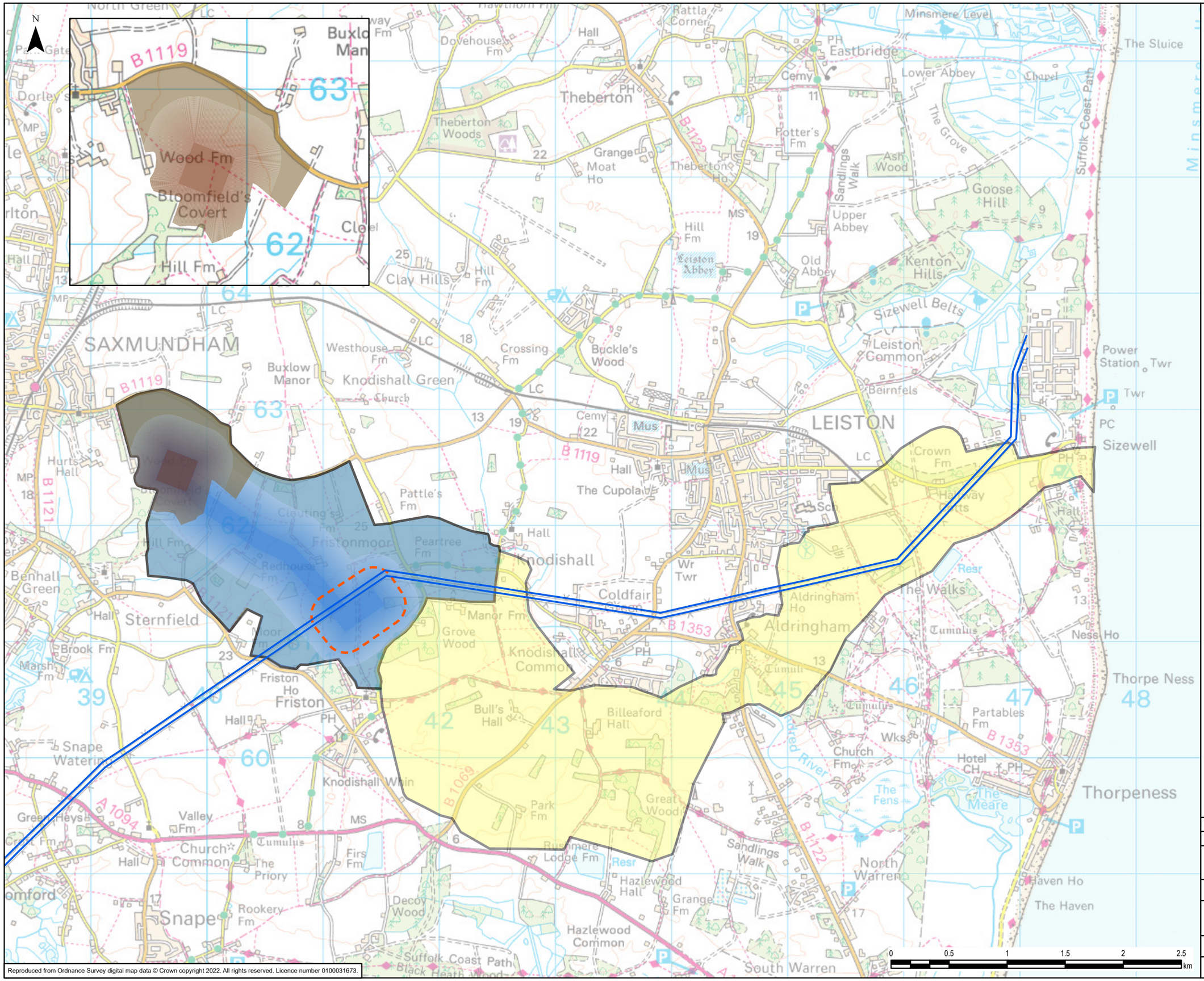

Legend

- National Grid Overhead Line - 400kV
- Proposed Friston Substation
- Suffolk Converter Station Site 3
- Alternative HVDC Corridor
- HVAC Graduated Swathe
- HVAC Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: SUFFOLK SITE 3 ALTERNATIVE (OPTION 2)

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Document Ref:	Scale:	Format:	Sheets:	Rev:
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Legend

- Routeing and Siting Study Area
- Landfall Area of Search
- Area of Outstanding Natural Beauty
- National Woodland Inventory
- Ancient Woodland

Rev	Date	Description	Drawn	Chk	Appr
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title:	KENT LANDFALL AREAS OF SEARCH SHEET 1

Creator	Date	Checker	Date	Approver	Date
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref	Scale	Format	Sheets	Rev
FIGURE 4-13	1:100,000	A3	1	0

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N

Margate and Long Sands SAC

Outer Thames Estuary SPA

Thanet Coast SAC

K1a

K4

K3

K2

K5

Tankerton Slopes and Swalecliffe SAC

Blean Complex SAC

Stodmarsh SAC

Stodmarsh SPA

Stodmarsh Ramsar

BLEAN WOODS RSPB RESERVE

Sandwich Bay SAC

K1

Thanet Coast & Sandwich Bay SPA

Thanet Coast & Sandwich Bay Ramsar

K1

LYDDEN VALLEY RSPB RESERVE

BROADSTAIRS

RAMSGATE

DEAL

0 2 4 6 8 10 km

Legend

- Routeing and Siting Study Area
- Landfall Area of Search
- Ancient Woodland
- Site of Special Scientific Interest
- RSPB Reserve
- Special Area of Conservation
- Ramsar
- Special Protection Area

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: KENT LANDFALL AREAS OF SEARCH SHEET 2

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Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-13	1:100,000	A3	1	0

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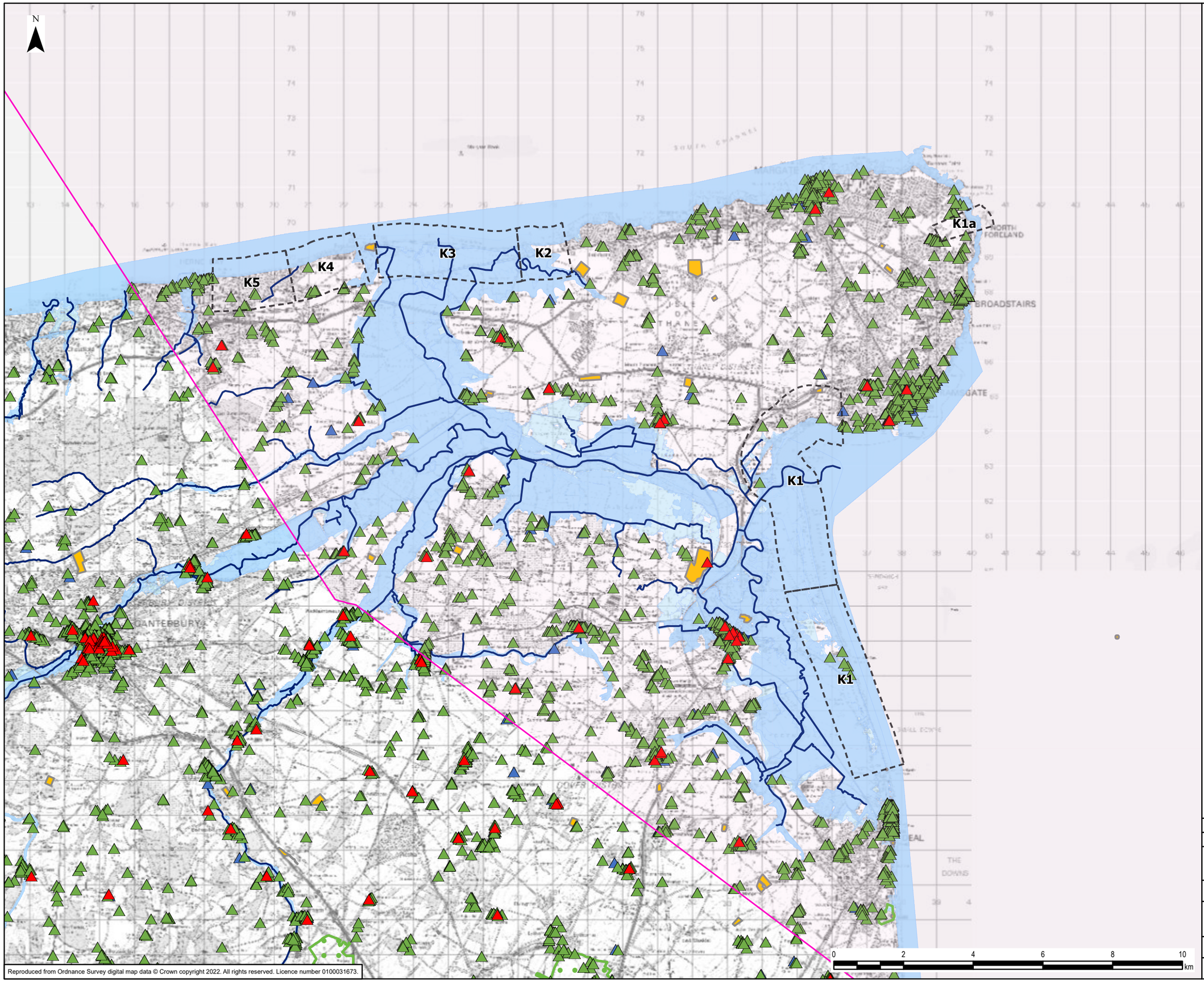

Legend

- Routeing and Siting Study Area
- Landfall Area of Search
- Listed Buildings - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Parks and Gardens - Grade II
- Scheduled Monuments
- Main Rivers
- Flood Zone 2
- Flood Zone 3

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: KENT LANDFALL AREAS OF SEARCH SHEET 3

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EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-13	1:100,000	A3	1	0

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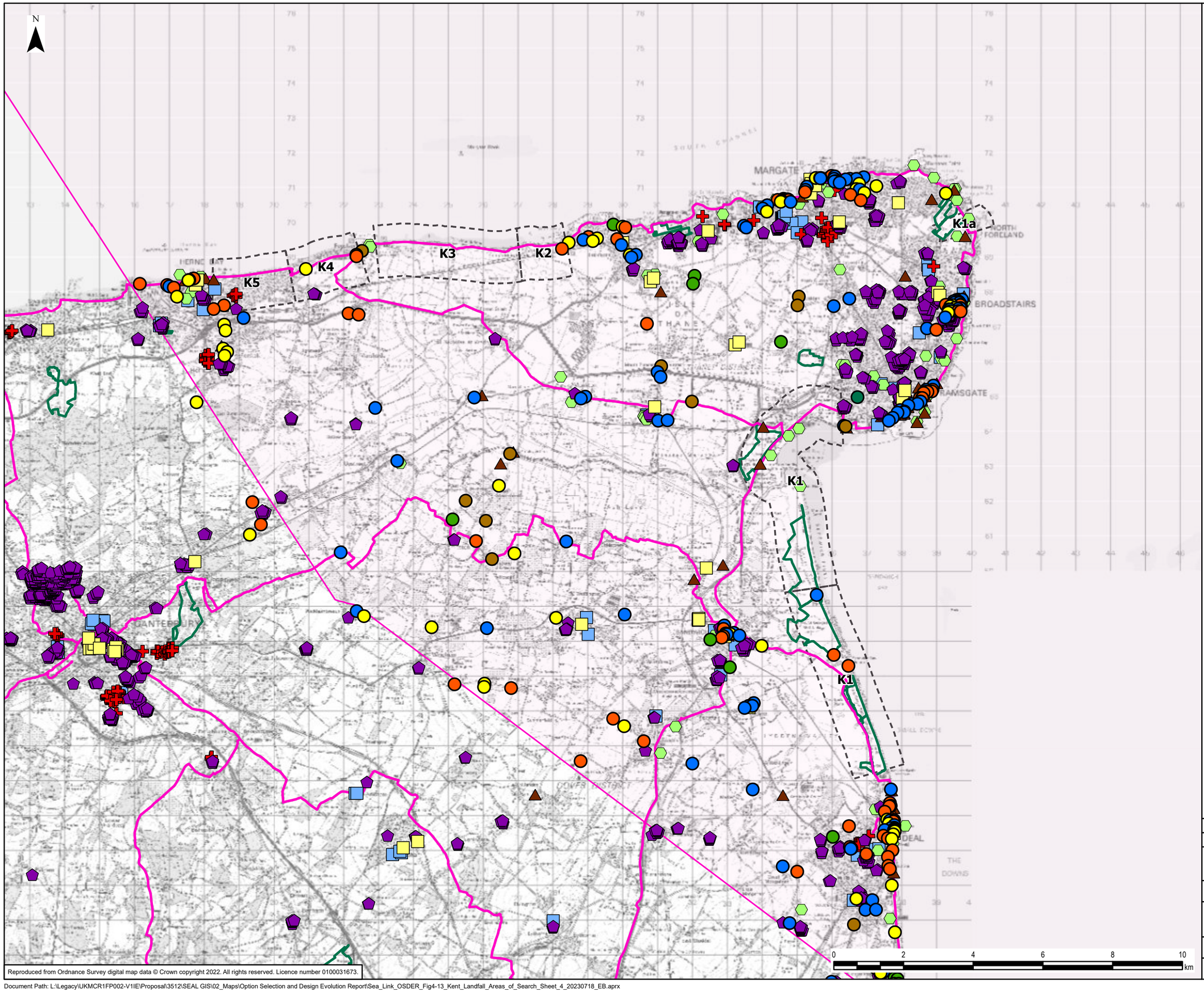

Legend

- Routeing and Siting Study Area
- Landfall Area of Search
- Bed and Breakfast
- Campsite
- Caravan Park
- Guest House
- Holiday Park
- Hotel
- Touring Park
- Cultural Facility
- Education
- Heritage
- Leisure Facility
- Medical
- Sports And Leisure Centre & Sports Club
- National Cycle Network
- Golf Course

Rev	Date	Description			
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: KENT LANDFALL AREAS OF SEARCH SHEET 4

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EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-13	1:100,000	A3	1	0

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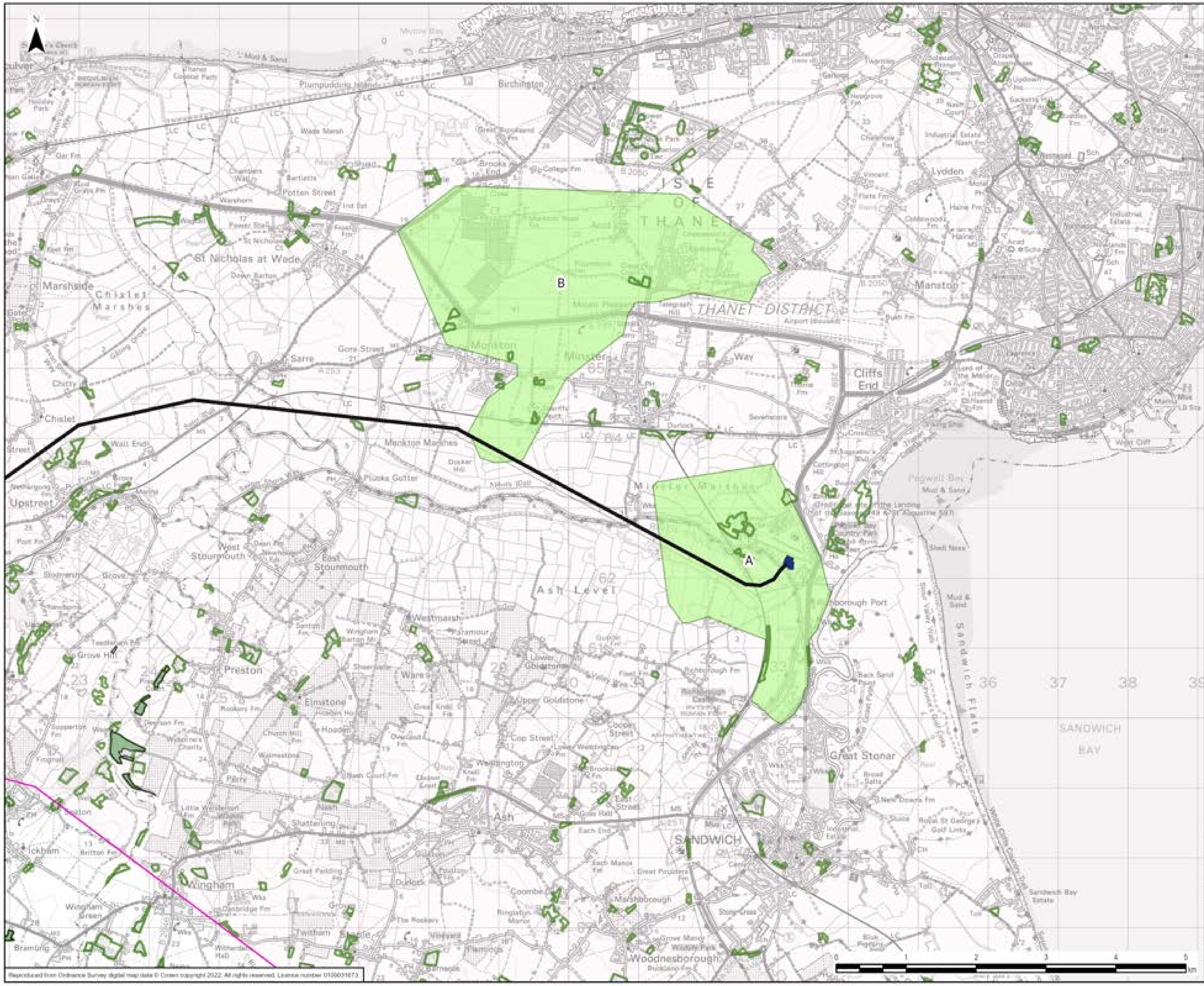

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Richborough Substation
- Converter Site Option Areas
- National Woodland Inventory
- Ancient Woodland

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: KENT CONVERTER SITE OPTION AREAS SHEET 1

Creator	Date	Checker	Date	Approver	Date
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref.	Scale	Format	Sheets	Rev
FIGURE 4-14	1:50,000	A3	1	0

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N

Outer Thames Estuary SPA

Thanet Coast SAC

Thanet Coast & Sandwich Bay SPA

Thanet Coast & Sandwich Bay Ramsar

Thanet Coast SSSI

B

A

Stodmarsh SPA

Stodmarsh SSSI

Stodmarsh Ramsar

Stodmarsh SAC

Preston Marshes SSSI

Thanet Coast SAC

Thanet Coast & Sandwich Bay SPA

Sandwich Bay to Hacklinge Marshes SSSI

Sandwich Bay SAC

LYDDEN VALLEY RSPB

Thanet Coast & Sandwich

0 1 2 3 4 5 km

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Richborough Substation
- Converter Site Option Areas
- Ancient Woodland
- Site of Special Scientific Interest
- RSPB Reserve
- Special Area of Conservation
- Ramsar
- Special Protection Area

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: KENT CONVERTER SITE OPTION AREAS SHEET 2

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-14	1:50,000	A3	1	0

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N

A

B

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Richborough Substation
- Converter Site Option Areas
- Listed Buildings - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Parks and Gardens - Grade II
- Scheduled Monuments
- Main Rivers
- Flood Zone 2
- Flood Zone 3

0 1 2 3 4 5 km

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: KENT CONVERTER SITE OPTION AREAS SHEET 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-14	1:50,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig4-14_Kent_Converter_Station_Site_Option_Areas_Sheet_3_20230718_EB.aprx

N

Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Richborough Substation
- Converter Site Option Areas
- Bed and Breakfast
- Campsite
- Caravan Park
- Guest House
- Holiday Park
- Hotel
- Touring Park
- Cultural Facility
- Education
- Heritage
- Leisure Facility
- Medical
- Sports And Leisure Centre & Sports Club
- National Cycle Network
- Golf Course

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

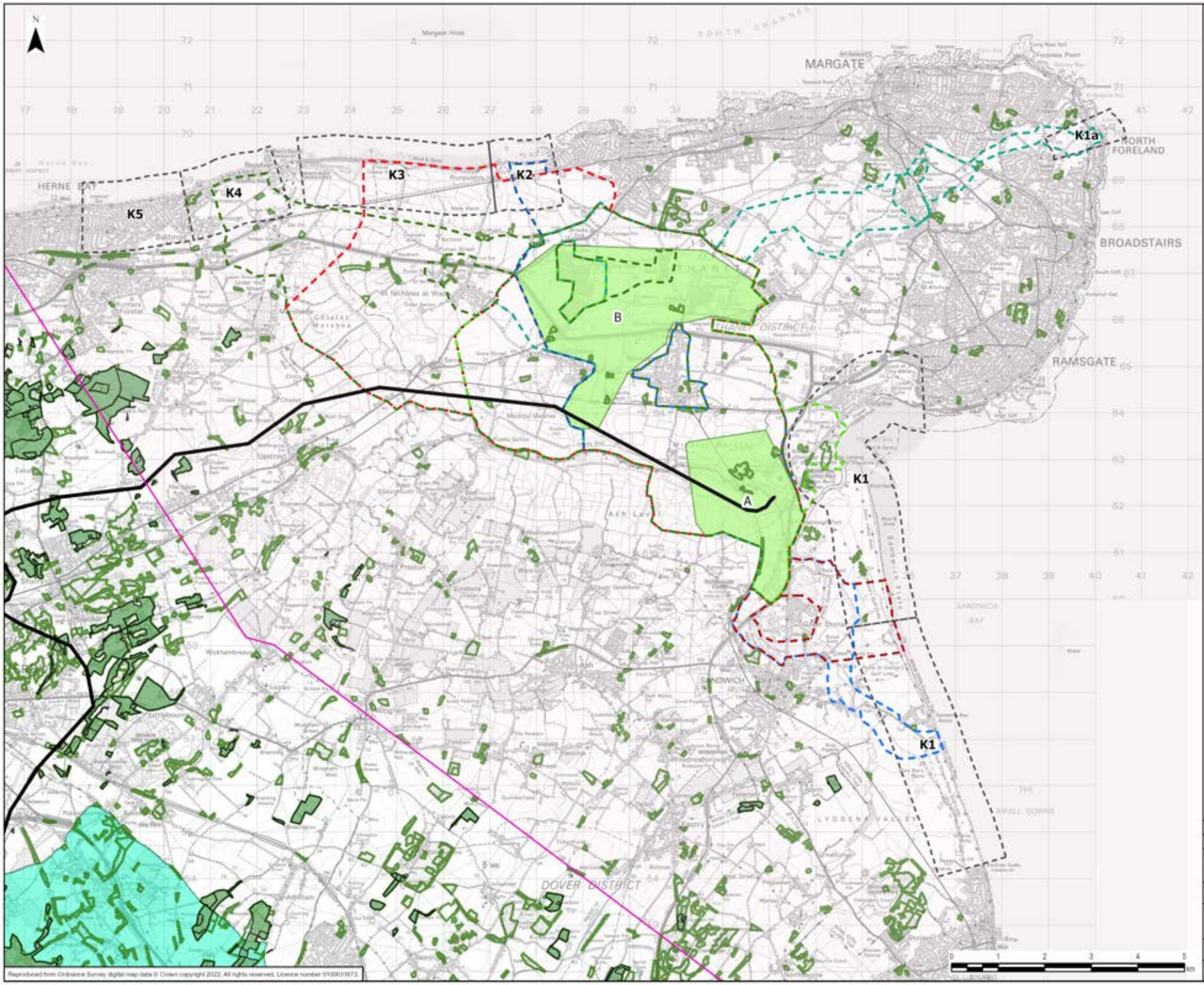
Document Title: KENT CONVERTER SITE OPTION AREAS SHEET 4

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-14	1:50,000	A3	1	0

0 1 2 3 4 5 km

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig4-14_Kent_Converter_Station_Site_Option_Areas_Sheet_4_20230718_EB.aprx



Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Landfall Area of Search
- Converter Site Option Areas

North Kent Coast Terrestrial Corridors

- Green
- Red
- Blue

Broadstairs Terrestrial Corridor

- Green

Pegwell Bay Terrestrial Corridors

- Green
- Red
- Blue

- Area of Outstanding Natural Beauty
- National Woodland Inventory
- Ancient Woodland

Rev	Date	Description	Drn	Chk	Appr
0	19/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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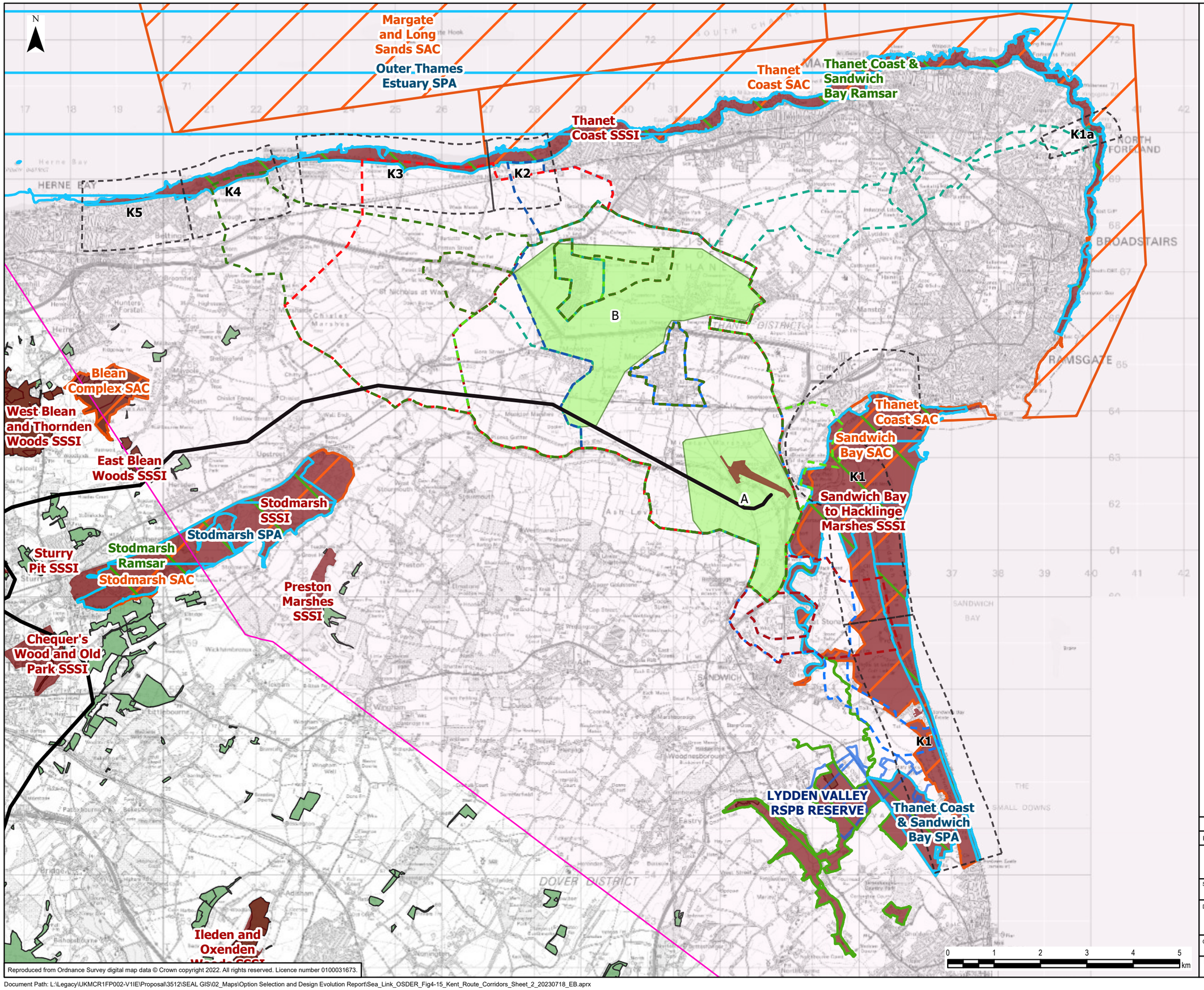
Scheme: SEA LINK

Document Title: KENT ROUTE CORRIDORS SHEET 1

Creator	Date	Checker	Date	Approver	Date
EB	19/07/2023	DF	19/07/2023	NP	19/07/2023

Document Ref	Scale	Format	Sheets	Rev
FIGURE 4-15	1:75,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1\E\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig4-15_Kent_Route_Corridors_Sheet_1_20230718_EB.aprx



Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Landfall Area of Search
- Converter Site Option Areas

North Kent Coast Terrestrial Corridors

- Green
- Red
- Blue

Broadstairs Terrestrial Corridor

- Green

Pegwell Bay Terrestrial Corridors

- Green
- Red
- Blue

- Ancient Woodland
- Site of Special Scientific Interest
- RSPB Reserve
- Special Area of Conservation
- Ramsar
- Special Protection Area

Rev	Date	Description			
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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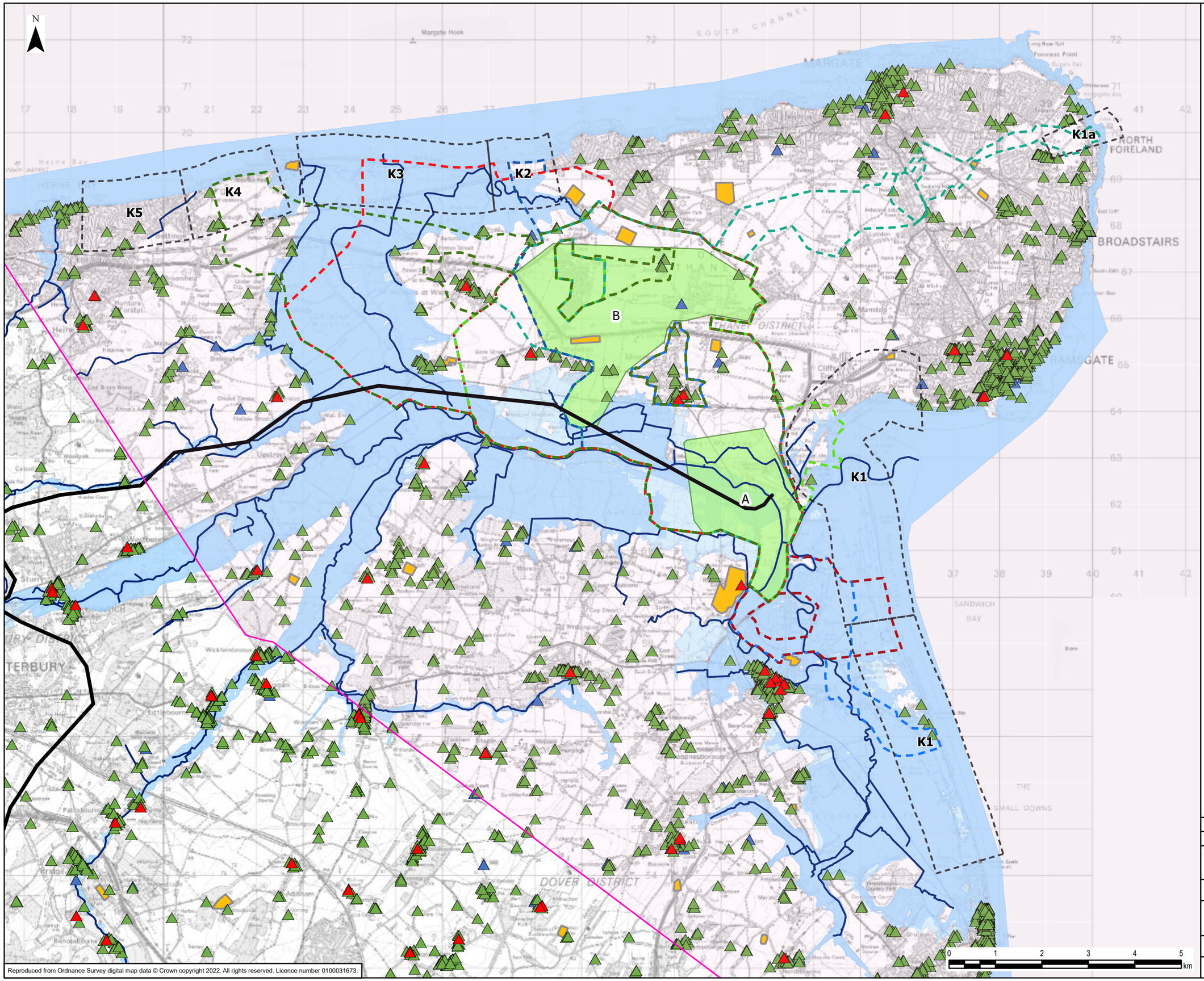
Scheme: SEA LINK

Document Title: KENT ROUTE CORRIDORS SHEET 2

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-15	1:75,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig4-15_Kent_Route_Corridors_Sheet_2_20230718_EB.aprx



Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Landfall Area of Search
- Converter Site Option Areas

North Kent Coast Terrestrial Corridors

- Green
- Red
- Blue

Broadstairs Terrestrial Corridor

- Green

Pegwell Bay Terrestrial Corridors

- Green
- Red
- Blue

- Listed Buildings - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Parks and Gardens - Grade II
- Scheduled Monuments
- Main Rivers
- Flood Zone 2
- Flood Zone 3

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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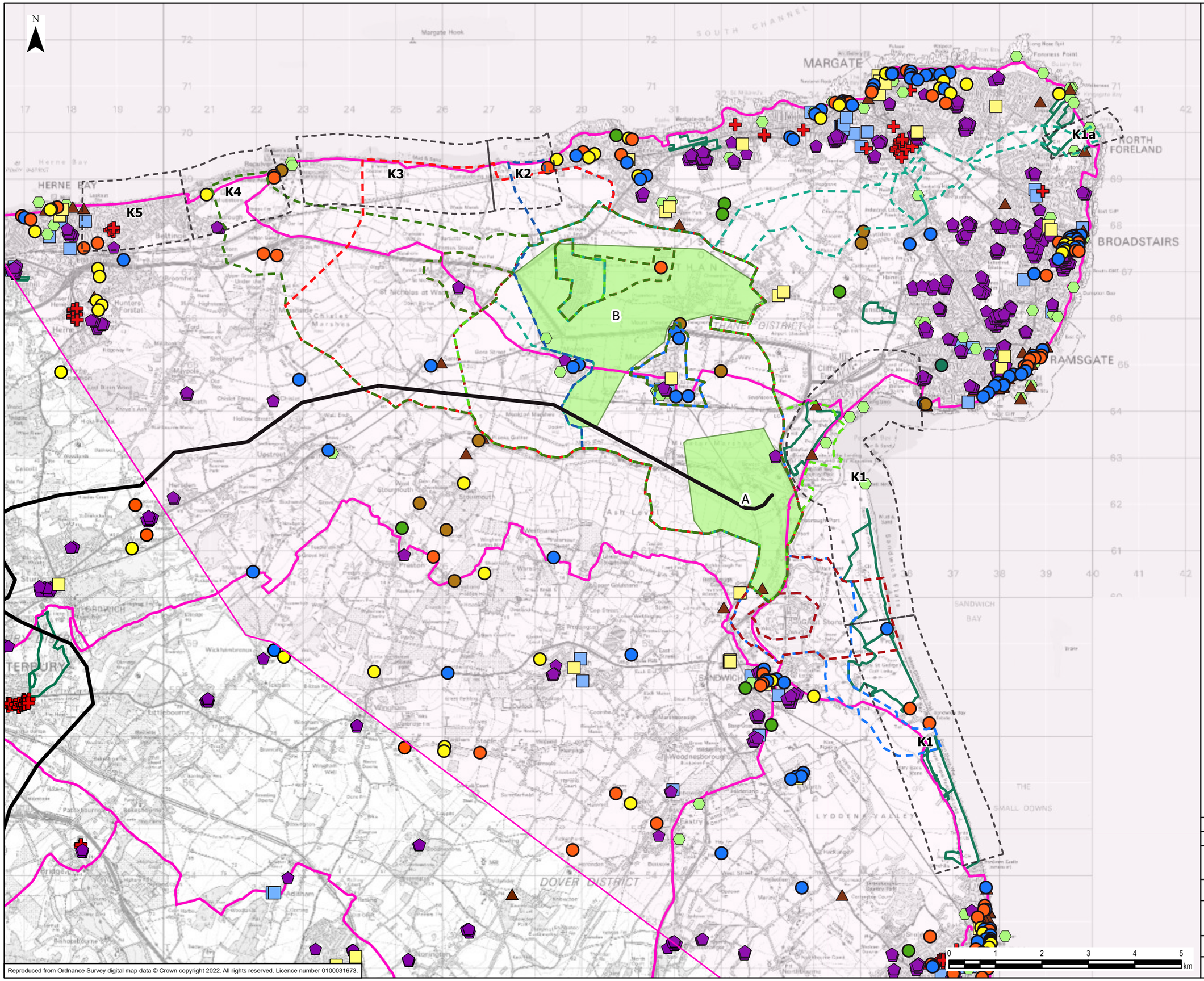
Document Title: KENT ROUTE CORRIDORS SHEET 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-15	1:75,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig4-15_Kent_Route_Corridors_Sheet_3_20230718_EB.aprx



Legend

- Routeing and Siting Study Area
- National Grid Overhead Line - 400kV
- Landfall Area of Search
- Converter Site Option Areas

North Kent Coast Terrestrial Corridors

- Green
- Red
- Blue

Broadstairs Terrestrial Corridor

- Green

Pegwell Bay Terrestrial Corridors

- Green
- Red
- Blue

- Bed and Breakfast
- Campsite
- Caravan Park
- Guest House
- Holiday Park
- Hotel
- Touring Park
- Cultural Facility
- Education
- Heritage
- Leisure Facility
- Medical
- Sports And Leisure Centre & Sports Club
- National Cycle Network
- Golf Course

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: KENT ROUTE CORRIDORS SHEET 4

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-15	1:75,000	A3	1	0

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N

Legend

National Grid Overhead Line - 400kV

Kent Converter Station Site

Preferred HVDC Graduated Swathe

Preferred HVDC Corridor

HVAC Graduated Swathe

HVAC Corridor

0 0.5 1 1.5 2 2.5 km

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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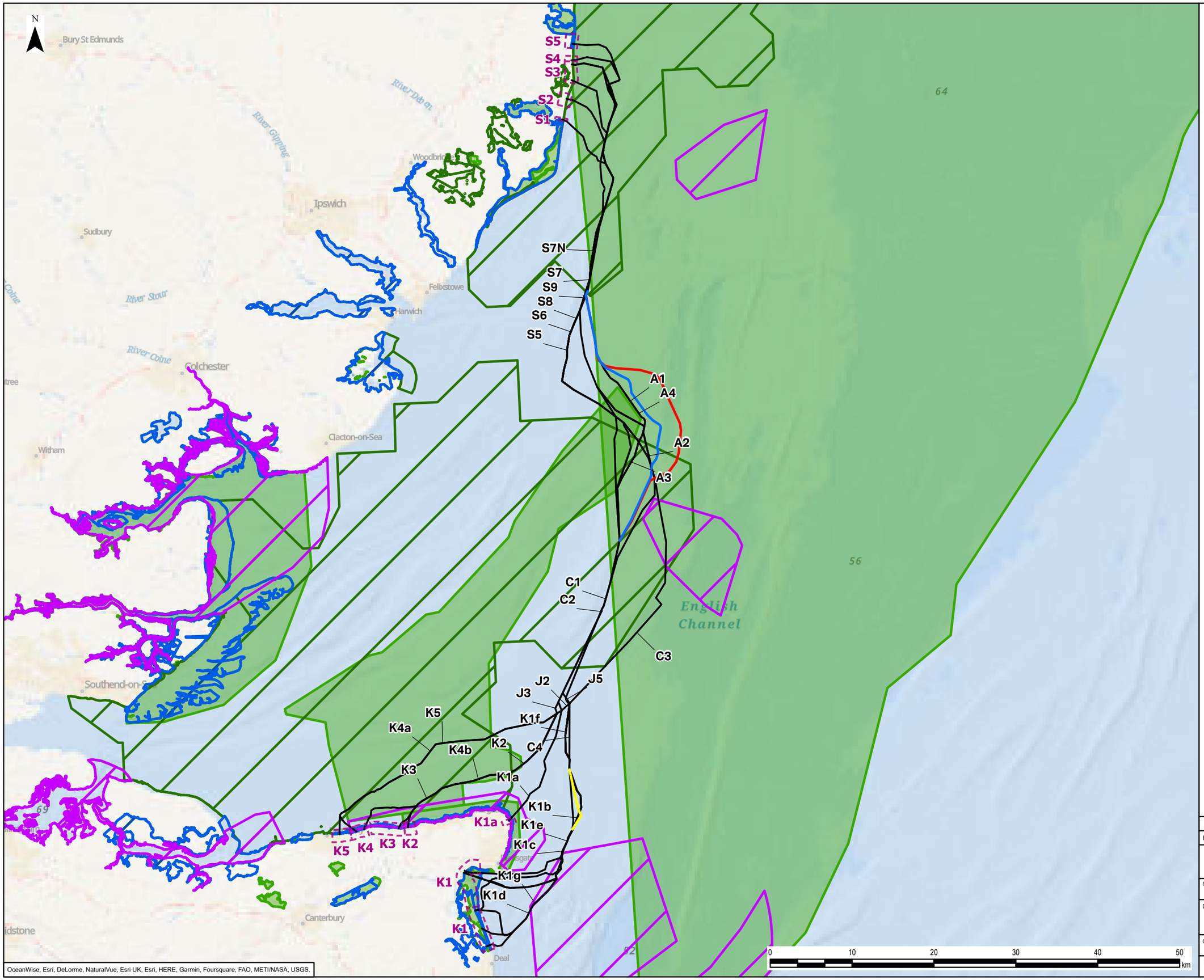
Scheme: SEA LINK

Document Title: KENT EMERGING PREFERENCE

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-16	1:20,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig4-16_Kent_Emerging_Preference_EB_20230718.aprx



Legend

- Marine Alignment
- Alignment C4A
- Alignment C8A
- Alignment C8B
- Landfall Area of Search
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar
- Marine Conservation Zone

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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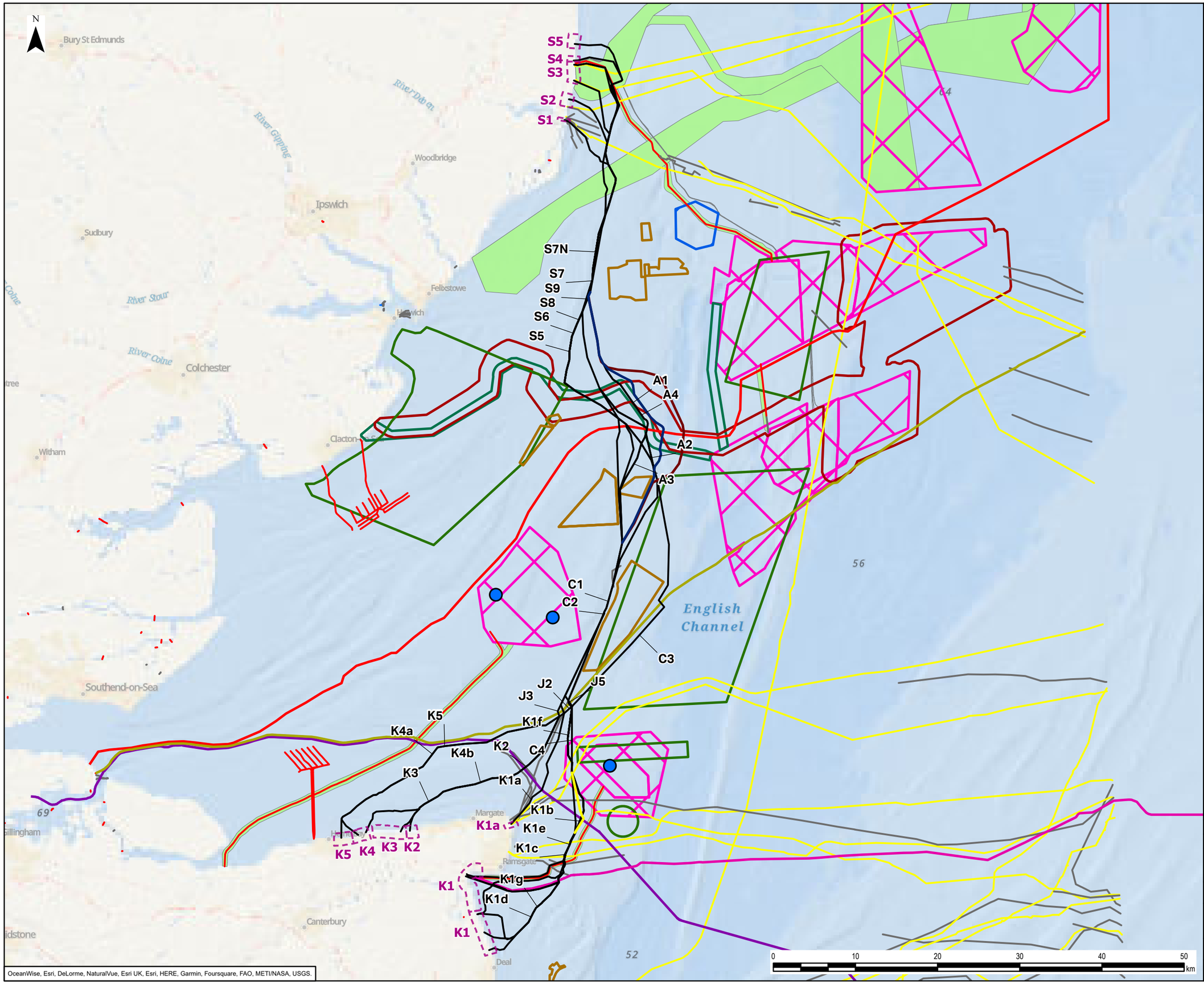
Scheme: SEA LINK

Document Title: MARINE ALIGNMENTS SHEET 1

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-17	1:425,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig4-17_Marine_Alignments_Sheet_1_20230718_EB.aprx



Legend

- Marine Alignment
- Alignment C4A
- Alignment C8A
- Alignment C8B
- Landfall Area of Search
- Offshore Substation
- BritNed
- NeuConnect
- Nemo Link
- GridLink
- Mooring cable/chain
- Power line
- Telephone
- Undefined
- Offshore Wind Farm Export Cable
- Offshore Wind Farms & Site Agreements
- North Falls Cable Corridors
- Five Estuaries Offshore Site Investigation
- Military Practice Area
- Mineral & Aggregate Extraction Site
- Areas of Identified Tidal Stream Resource (TIDE 1)

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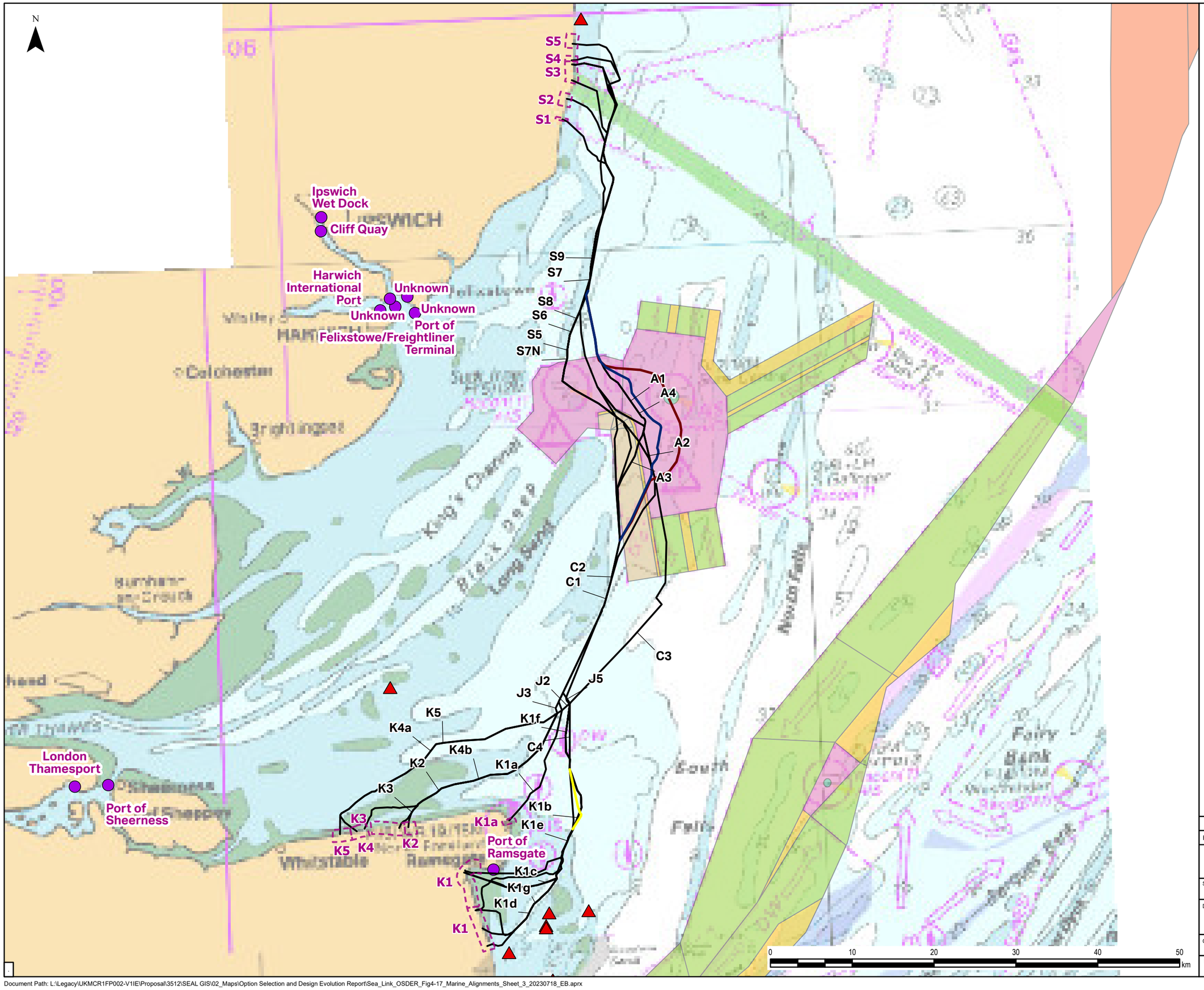
Document Title: MARINE ALIGNMENTS SHEET 2

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-17	1:425,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig4-17_Marine_Alignments_Sheet_2_20230718_EB.aprx



Rev	Date	Description			
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: MARINE ALIGNMENTS SHEET 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-17	1:425,000	A3	1	0

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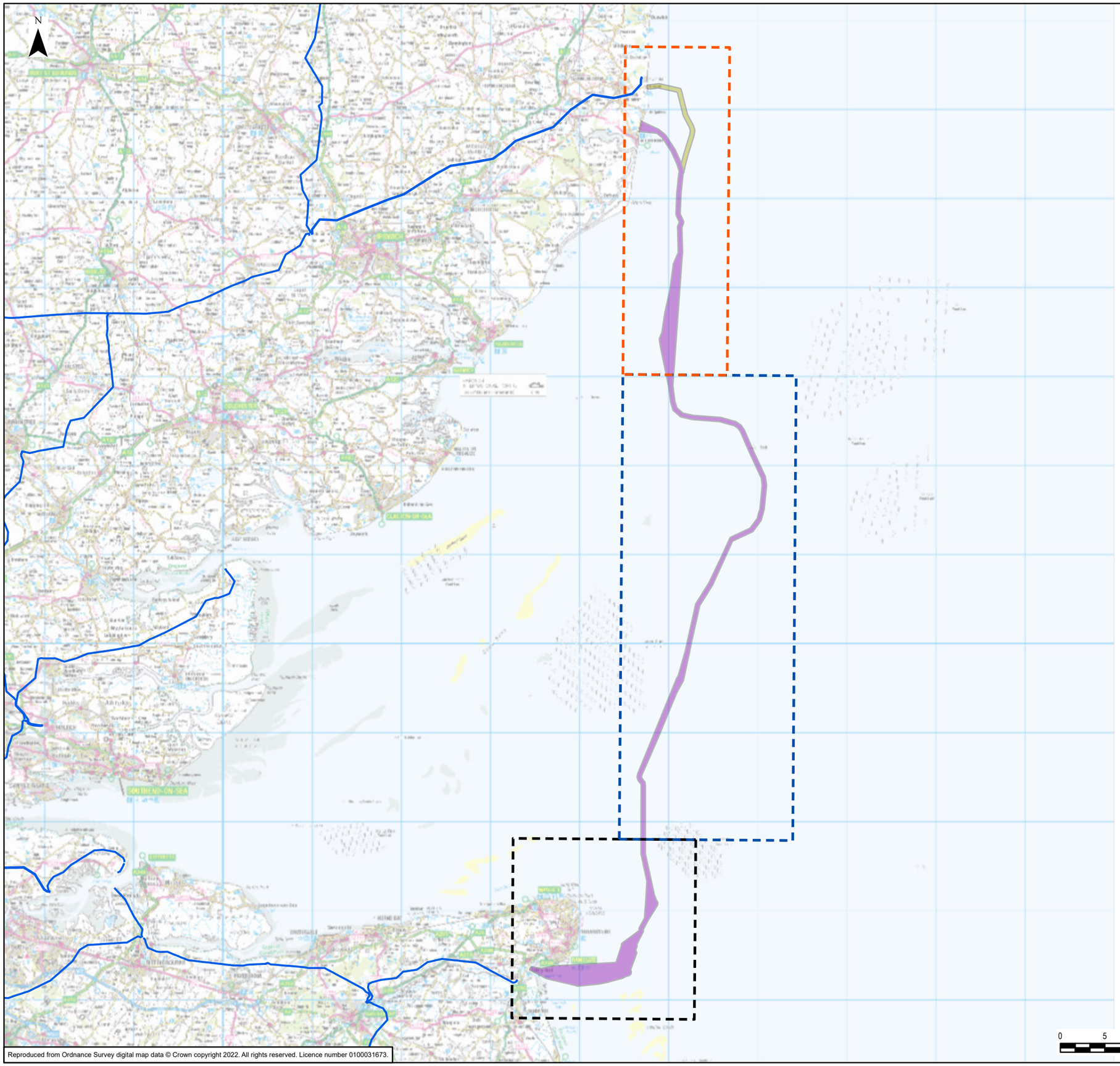

Legend

- National Grid Overhead Line - 400kV
- Marine Corridor Emerging Preference
- Marine Corridor Alternative
- Suffolk Marine Corridor
- Central Marine Corridor
- Kent Marine Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	KS

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Scheme: SEA LINK

Document Title: OFFSHORE SCHEME EMERGING PREFERENCE AND ALTERNATIVE

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	KS	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 4-18	1:425,000	A3	1	0

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N

Legend

National Grid Overhead Line - 400kV

Proposed Friston Substation

Suffolk Converter Station Site 3

Preferred HVDC Graduated Swathe

Preferred HVDC Corridor

HVAC Graduated Swathe

HVAC Corridor

0 0.5 1 1.5 2 2.5 km

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK ONSHORE SCHEME PREFERRED OPTION

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	KS	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 6-1	1:32,500	A3	1	0

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N

Legend

National Grid Overhead Line - 400kV

Kent Converter Station Site

Preferred HVDC Graduated Swathe

Preferred HVDC Corridor

HVAC Graduated Swathe

HVAC Corridor

0 0.5 1 1.5 2 2.5 km

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: KENT ONSHORE SCHEME PREFERRED OPTION

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EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 6-2	1:20,000	A3	1	0

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N

Legend

- National Grid Overhead Line - 400kV
- Marine Corridor Emerging Preference
- Suffolk Marine Corridor
- Central Marine Corridor
- Kent Marine Corridor

0 5 10 15 20 25 km

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: OFFSHORE SCHEME PREFERRED OPTION

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EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 6-3	1:425,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig6-3_Offshore_Scheme_Preferred_Option_EB_20230718.aprx

Legend

- Draft Order Limits
- National Grid Overhead Line - 400kV
- Proposed Friston Substation
- Proposed Friston Substation Indicative Location
- HVAC Corridor Graduated Swathe
- HVAC Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK ONSHORE SCHEME DESIGN EVOLUTION - HVAC CONNECTION

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-1	1:30,000	A3	1	0

0 0.5 1 1.5 2 2.5 km

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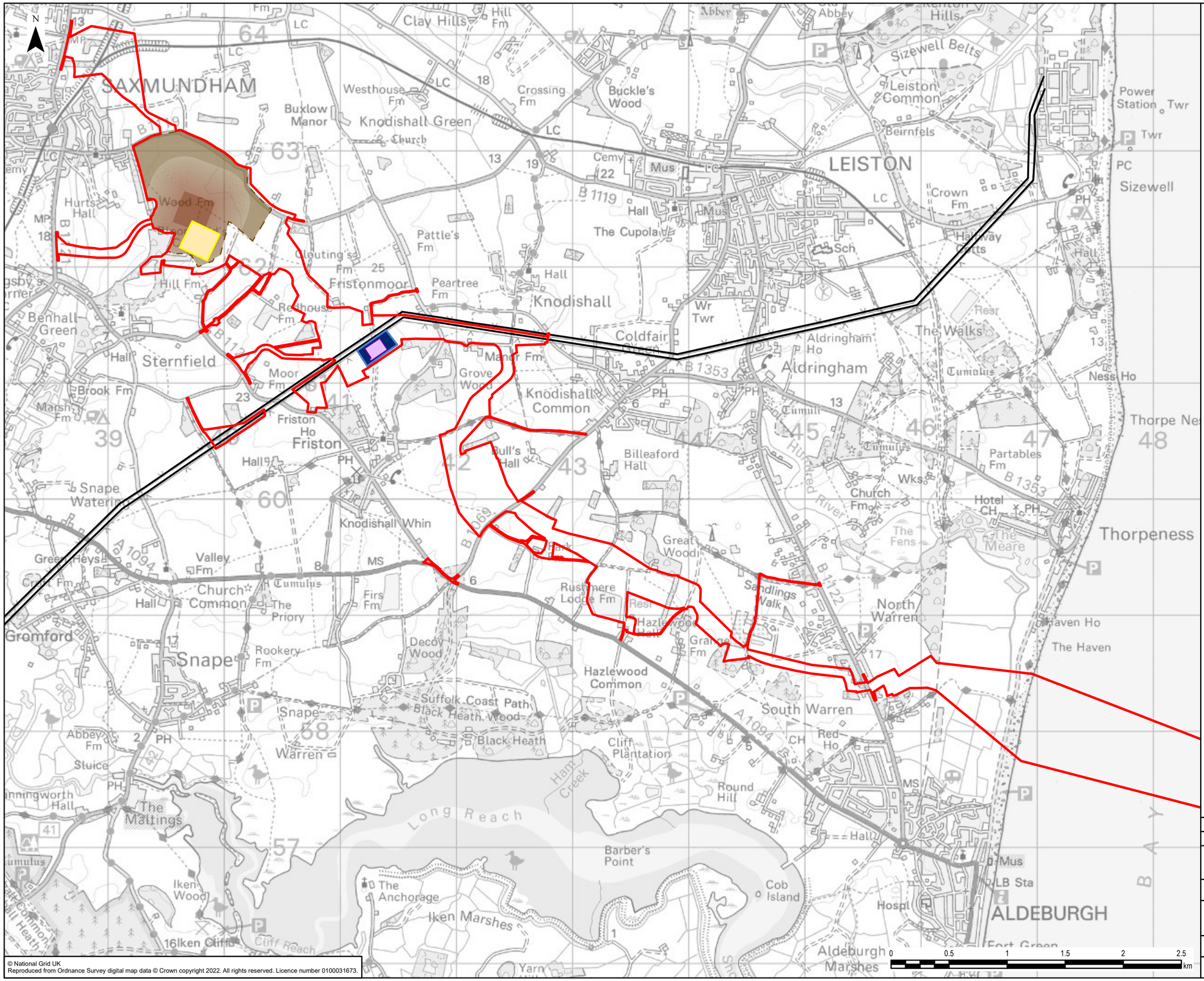

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK ONSHORE SCHEME DESIGN EVOLUTION - SAXMUNDHAM CONVERTER STATION

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-2	1:30,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig7-2_Suffolk_Onshore_Scheme_Design_Evolution_Saxmundham_Converter_Station_20230718_EB.aprx

N

Legend

- Draft Order Limits
- Proposed Friston Substation
- National Grid Overhead Line - 400kV
- HVDC Corridor Graduated Swathe
- HVDC Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

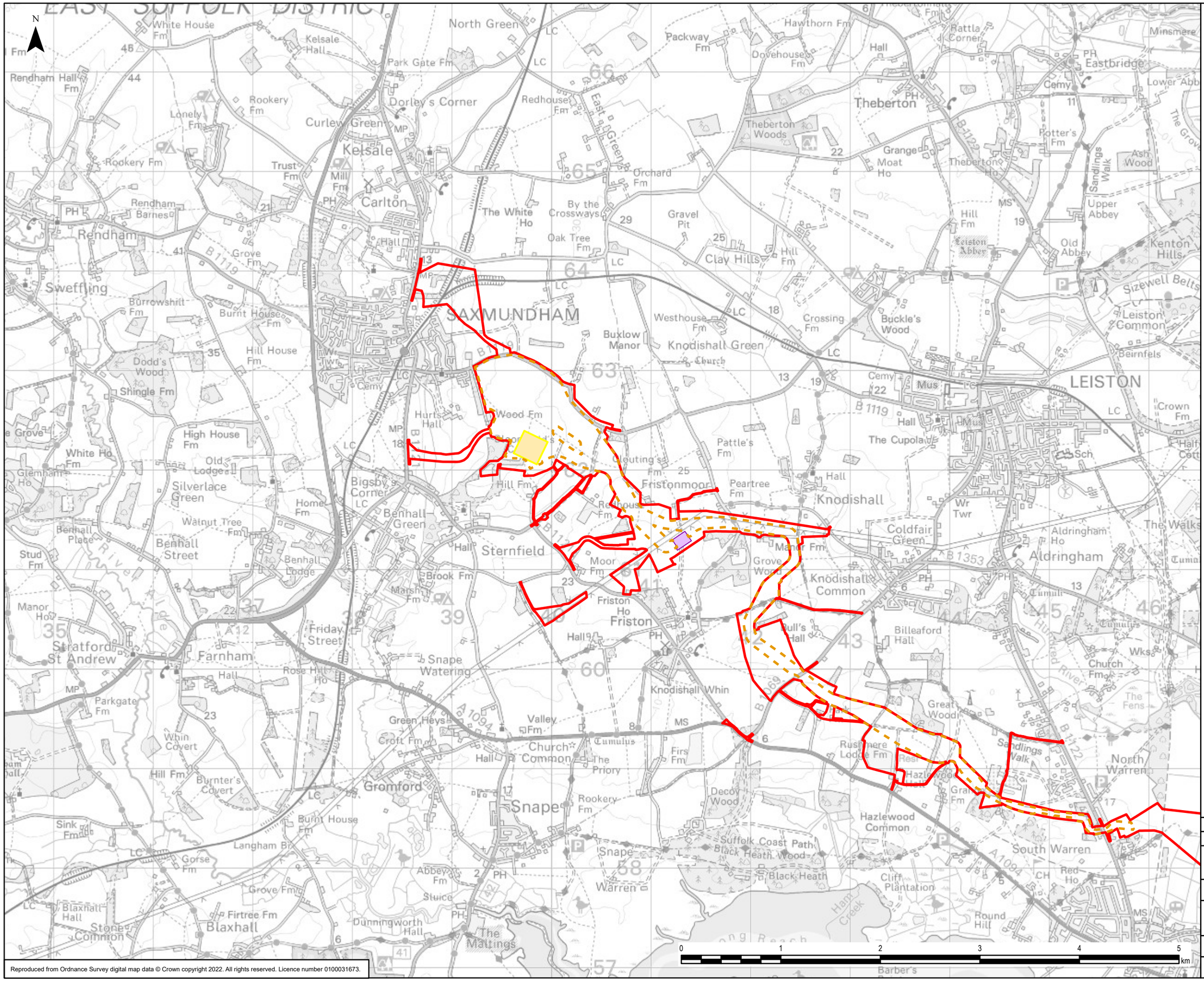
Document Title: SUFFOLK ONSHORE SCHEME DESIGN EVOLUTION - UNDERGROUND HVDC CABLES AND LANDFALL

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-3	1:30,000	A3	1	0

0 0.5 1 1.5 2 2.5 km

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig7-3_Suffolk_Onshore_Scheme_Design_Evolution_Underground_HVDC_Cables_Landfall_20230718_EB.aprx



Legend

- Draft Order Limits
- Lateral Limits of Deviation
- Proposed Friston Substation Indicative Location
- Proposed Saxmundham Converter Station Indicative Location

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: SUFFOLK ONSHORE SCHEME - PROPOSED PROJECT

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-4	1:35,000	A3	3	0

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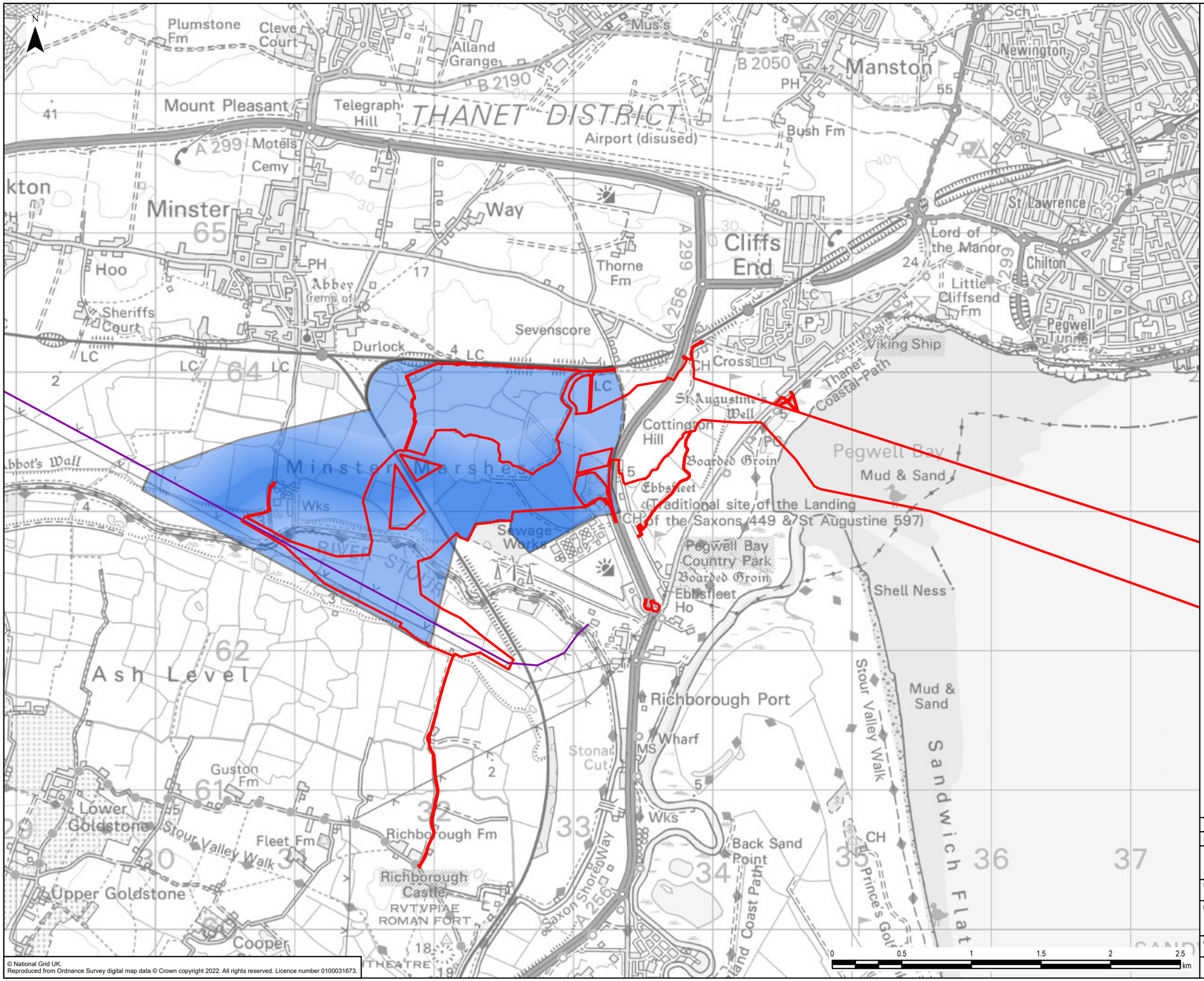

Legend

- Draft Order Limits
- National Grid Overhead Line - 400kV
- HVAC Corridor Graduated Swathe
- HVAC Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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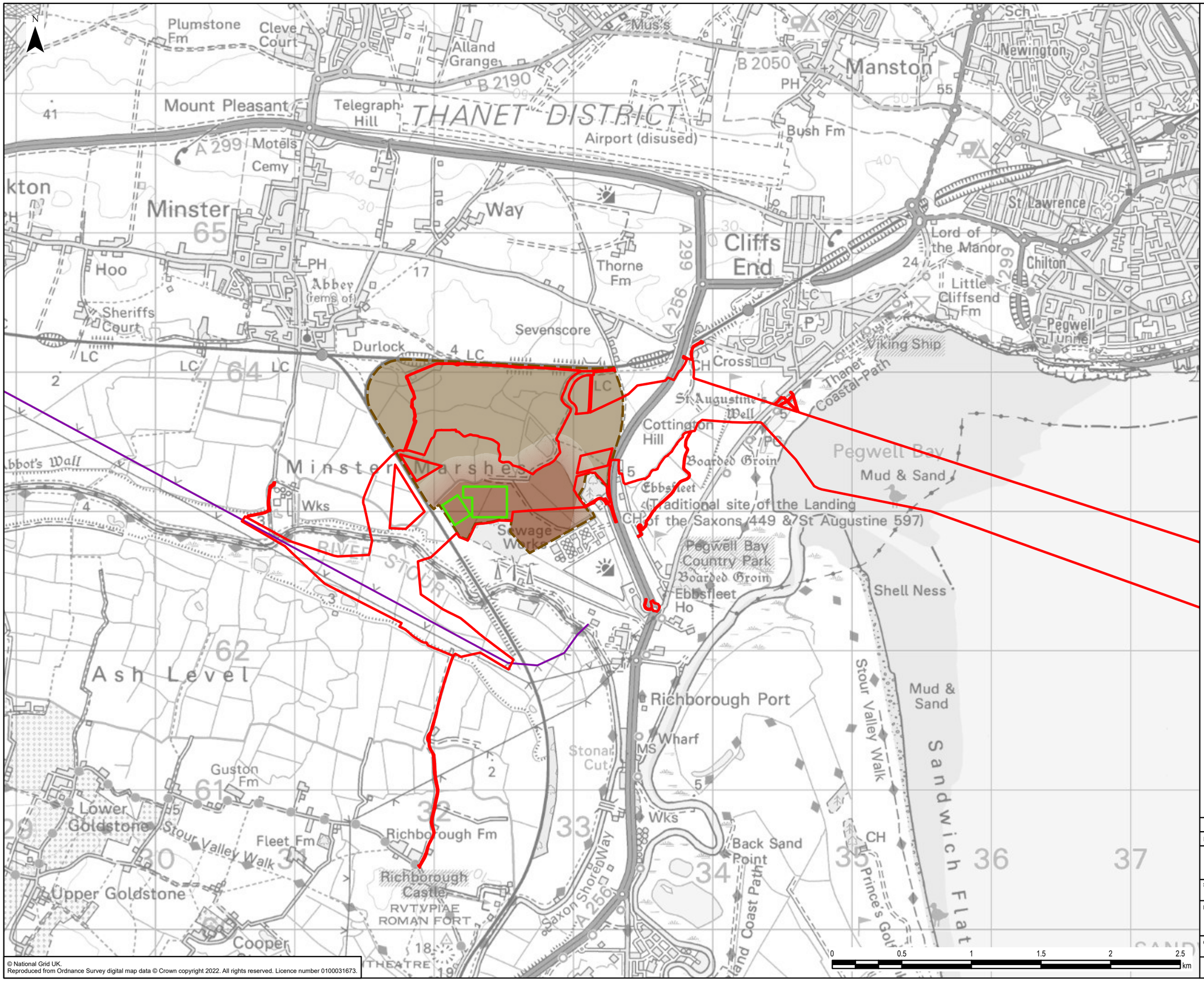
Scheme: SEA LINK

Document Title: KENT ONSHORE SCHEME DESIGN EVOLUTION - HVAC CONNECTION

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-5	1:25,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig7-5_Kent_Onshore_Scheme_Design_Evolution_HVAC_Connection_20230718_EB.aprx



Legend

- Draft Order Limits
- National Grid Overhead Line - 400kV
- Proposed Minster 400 kV Substation and Minster Converter Station Indicative Location
- Kent Converter Site/ Substation Option Area
- Kent Converter/Substation Site Emerging Preference Graduated Swathe

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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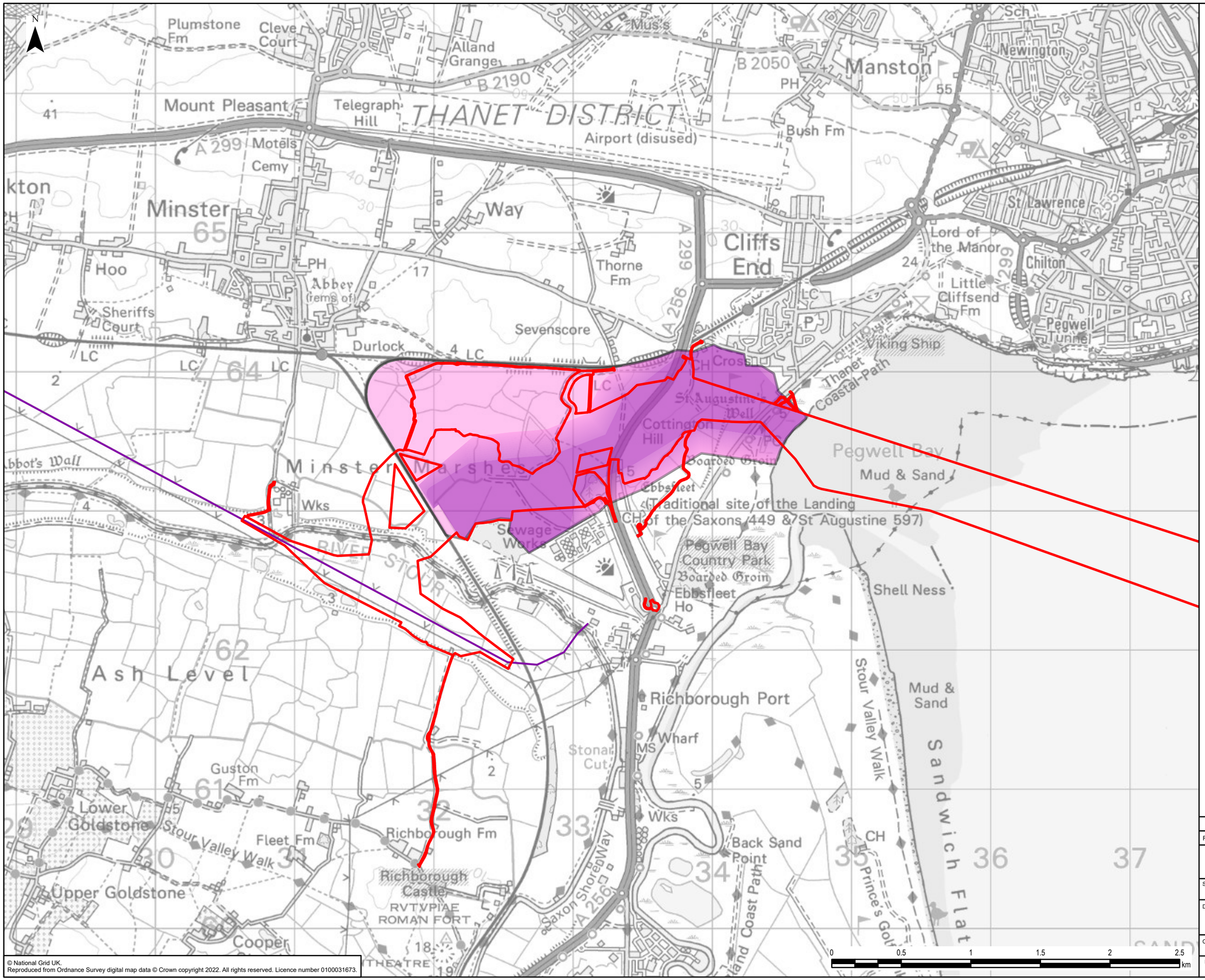
Scheme: SEA LINK

Document Title: KENT ONSHORE SCHEME DESIGN EVOLUTION - MINSTER 400KV SUBSTATION AND MINSTER CONVERTER STATION

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-6	1:25,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig7-6_Kent_Onshore_Scheme_Design_Evolution_Minster_400kV_Substation_Minster_Converter_Station_20230718_EB.aprx



Legend

- Draft Order Limits
- National Grid Overhead Line - 400kV
- HVDC Corridor Graduated Swathe
- HVDC Corridor

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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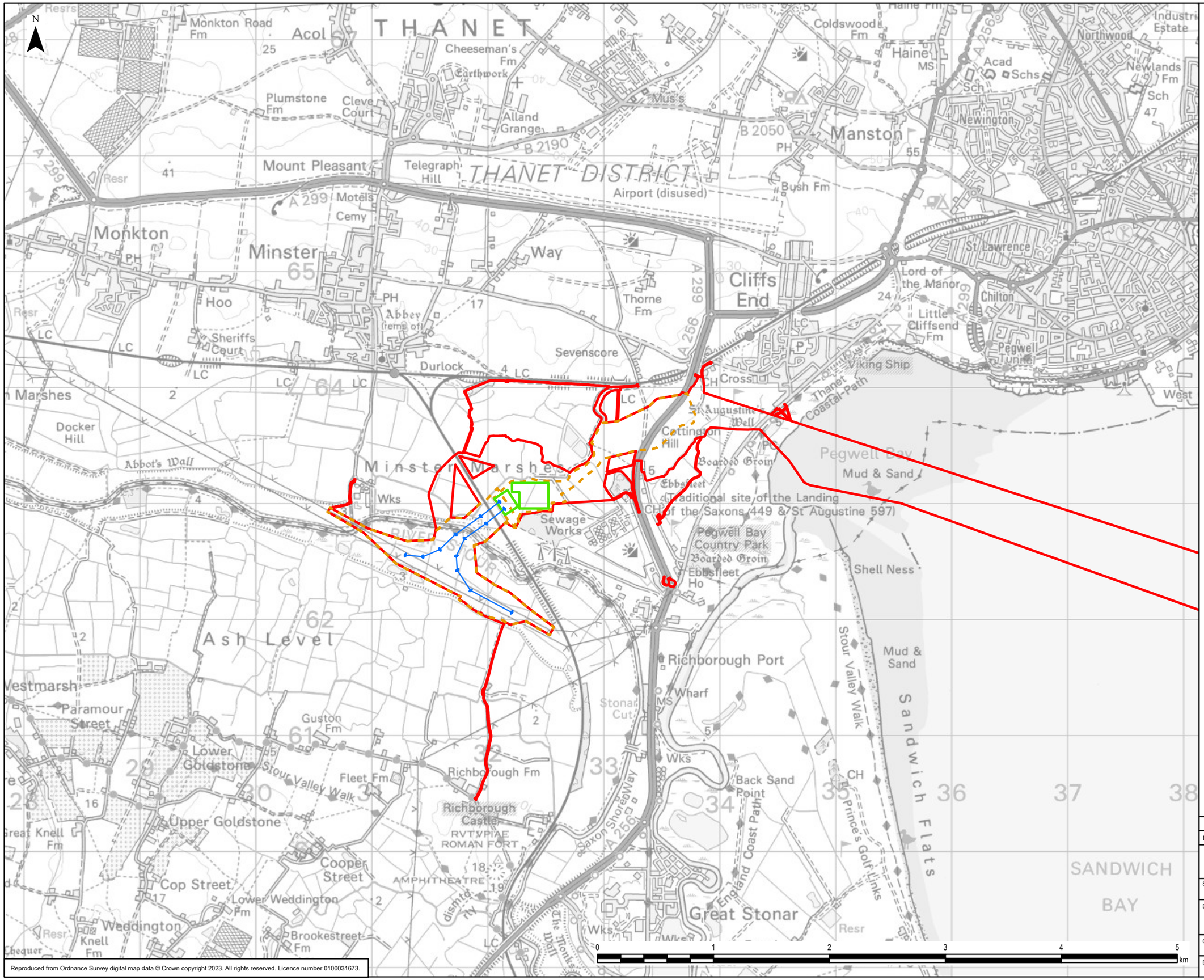
Scheme: SEA LINK

Document Title: KENT ONSHORE SCHEME DESIGN EVOLUTION - UNDERGROUND HVDC CABLES AND LANDFALL

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-7	1:25,000	A3	1	0

Document Path: L:\Legacy\UKMCR1FP002-V1IE\Proposal\3512\SEAL GIS\02_Maps\Option Selection and Design Evolution Report\Sea_Link_OSDER_Fig7-7_Kent_Onshore_Scheme_Design_Evolution_Underground_HVDC_Cables_Landfall_20230718_EB.aprx



Legend

- Draft Order Limits
- Proposed Minster 400 kV Substation and Minster Converter Station Indicative Location
- Proposed HVAC Connection Indicative Location
- Lateral Limits of Deviation

Rev	Date	Description	GIS	Chk	App
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Scheme: SEA LINK

Document Title: KENT ONSHORE SCHEME - PROPOSED PROJECT

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FIGURE 7-8	1:30,000	A3	1	0

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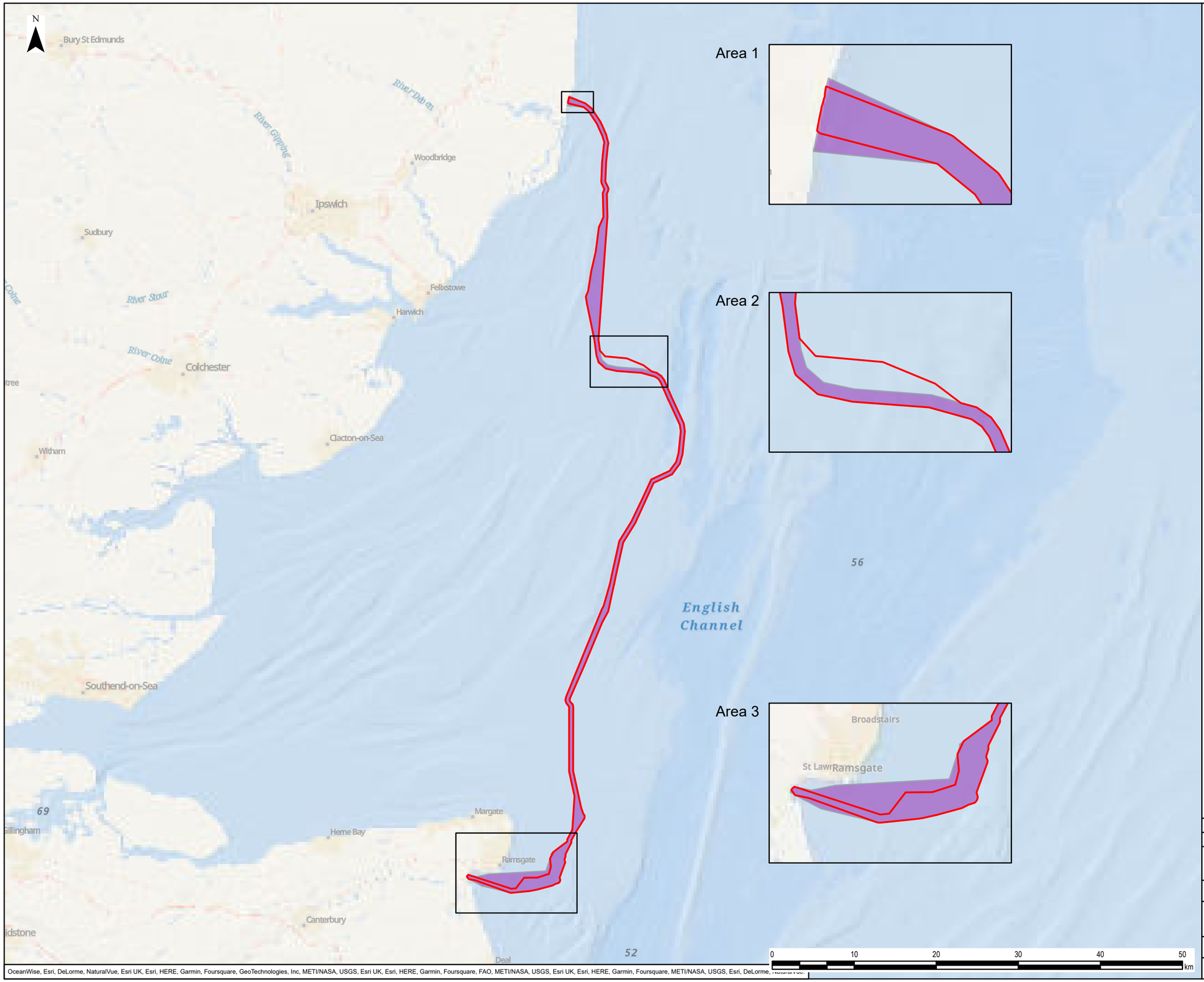

Legend

- Offshore Scheme Draft Order Limits
- Marine Corridor Emerging Preference

OceanWise, Esri, DeLorme, NaturalVue, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Esri UK, Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri UK, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS, Esri, DeLorme,

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Document Title: OFFSHORE MARINE SCHEME DRAFT ORDER LIMITS- SHEET 4 OF 5

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FIGURE 7-9	1:425,000	A3	1	0

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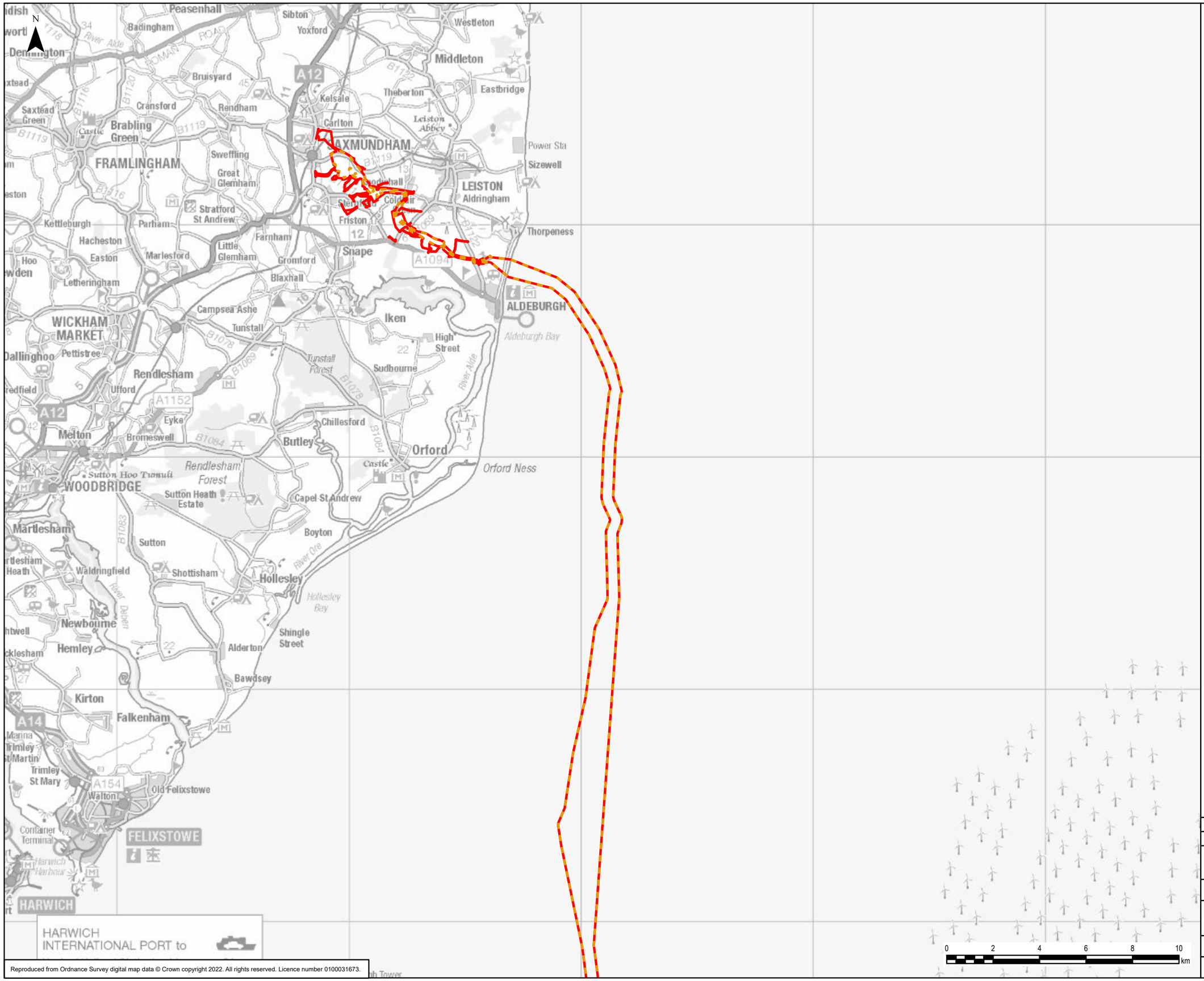

Legend

- Draft Order Limits
- Lateral Limits of Deviation

Rev	Date	Description	GIS	Chk	App
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Scheme: SEA LINK

Document Title: OFFSHORE SCHEME PROPOSED PROJECT SHEET 1 OF 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
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Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-10	1:150,000	A3	3	0

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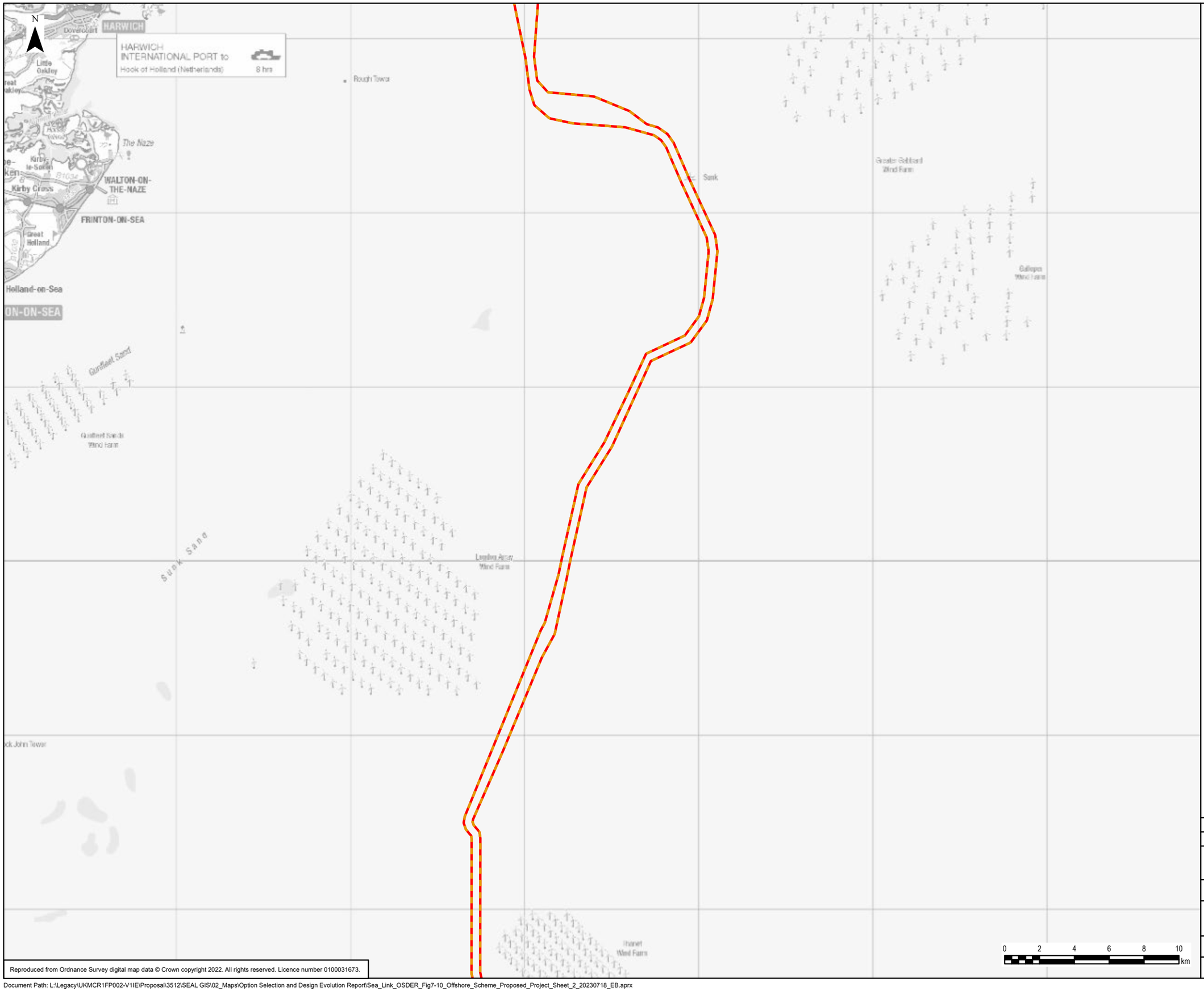

Legend

- Draft Order Limits
- Lateral Limits of Deviation

Rev	Date	Description	GIS	Chk	App
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Document Title: OFFSHORE SCHEME PROPOSED PROJECT SHEET 2 OF 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
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Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-10	1:200,000	A3	3	0

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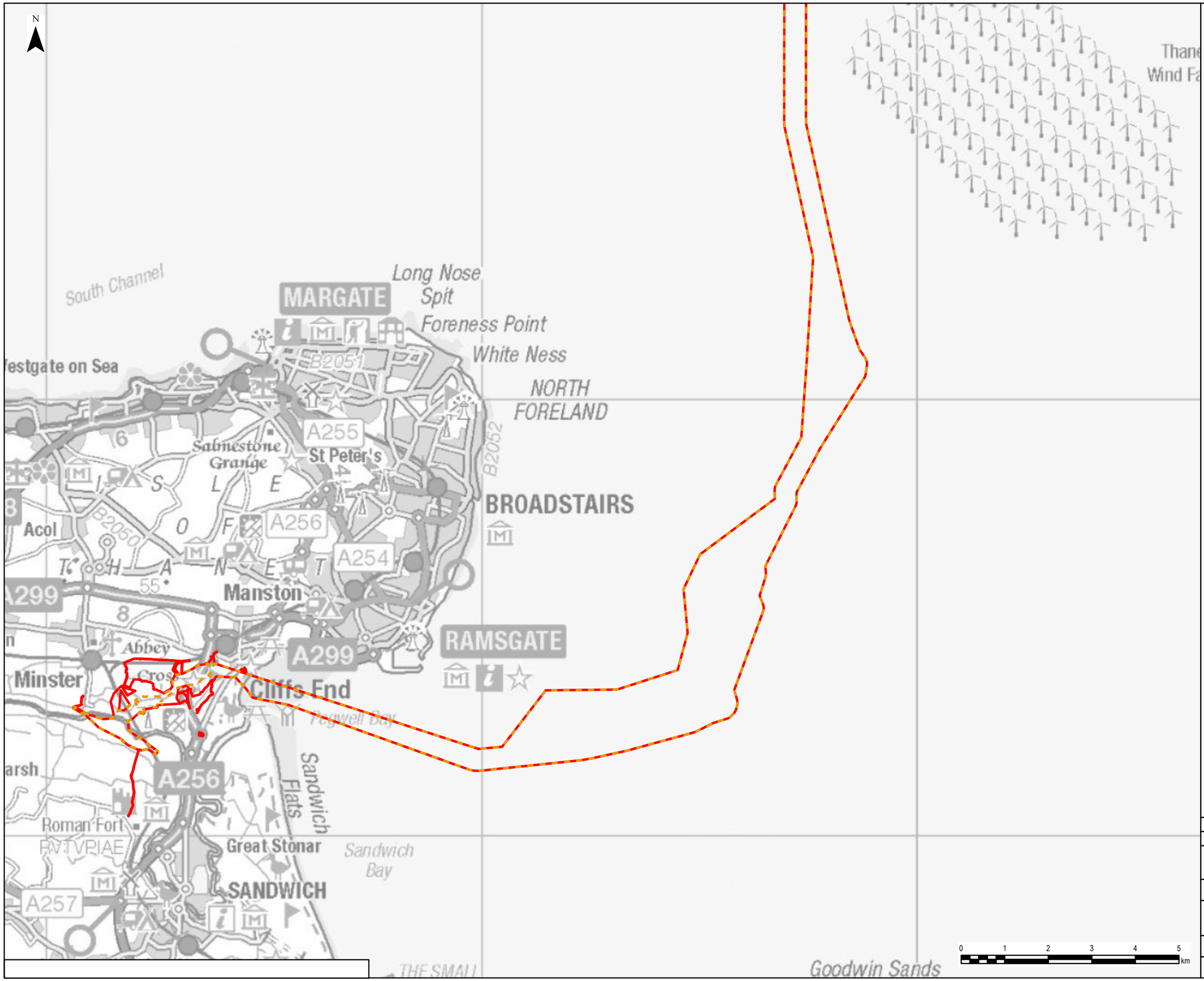

Legend

- Draft Order Limits
- Lateral Limits of Deviation

Rev	Date	Description			
0	18/07/2023	OPTION SELECTION AND DESIGN EVOLUTION REPORT	EB	DF	NP

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Document Title: OFFSHORE SCHEME PROPOSED PROJECT SHEET 3 OF 3

Creator:	Date:	Checker:	Date:	Approver:	Date:
EB	18/07/2023	DF	18/07/2023	NP	18/07/2023

Document Ref:	Scale:	Format:	Sheets:	Rev:
FIGURE 7-10	1:80,000	A3	3	0

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Appendix B Environmental and Socio-economic considerations

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Landscape and Visual	
National Parks	Primary consideration as expansive designation with limited opportunity to avoid if within the study area. Highly sensitive to above ground transmission infrastructure.
Areas of Outstanding Natural Beauty (AONBs)	Primary consideration as expansive designation with limited opportunity to avoid if within the study area. Highly sensitive to above ground transmission infrastructure.
Heritage Coasts	Coastal site which is defined rather than designated to conserve the best stretches of undeveloped coast. Highly sensitive to above ground infrastructure but limited in extent (confined to coastal areas).
National Trails	Long distance footpaths generally through areas designated for their landscape quality (AONBs, National Parks). Users of the National Trails are sensitive to above ground transmission infrastructure but sensitivity is likely to vary dependant on the specific location on the trail.
National Character Areas	A natural subdivision of England based on a combination of landscape, biodiversity, geodiversity and economic activity. National Grid have undertaken a high-level appraisal of those character areas relevant to the study areas in terms of their value and sensitivity to both a new overhead line and underground cable.
Marine Character Areas	Highlight the key natural, cultural and perceptual influences that make the character of each seascape distinct and unique. Limited sensitivity to marine cables but more sensitive to offshore substations and coastal infrastructure.

Historic Environment	
World Heritage Sites	Is a landmark or area which is selected by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as having cultural, historical, scientific or other form of significance, and is legally protected by international treaties. With regards to the study area they are discrete sites which are easily avoided however are highly sensitive to above ground transmission infrastructure.
Conservation Areas	Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance.
Scheduled Monuments	Is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State (SoS) for Digital, Culture, Media and Sport. Highly sensitive to direct effects from underground and above ground transmission infrastructure, however, generally they are discrete sites that are avoidable. Also sensitive to indirect setting effects. The sensitivity to setting effects varies dependant on the monument and the surrounding landform and landcover and at this stage National Grid have not assessed the sensitivity of each site.
Registered Parks and Gardens	Is a Register of Historic Parks and Gardens of special historic interest and are graded in a similar way to Listed Buildings. Sensitive to both direct impacts from underground and above ground transmission infrastructure and setting impacts. Generally, they are discrete sites so direct impacts can be avoided. Sensitivity varies for example a Grade I Park and Garden which has mainly inward facing views would be less sensitive than a Grade II Park and Garden with mainly outward facing views. At this stage National Grid have not undertaken a sensitive assessment of each site.
Listed Buildings	Buildings that are listed for their special architectural and historic interest. It is assumed that all buildings would be avoided in terms of direct effects. Sensitive to indirect setting effects. The sensitivity to setting effects varies dependant on the individual building and the surrounding landform and landcover and at this stage National Grid have not assessed the sensitivity of each site. In general Grade I and II* are considered more sensitive than Grade II.
Registered Battlefields	Register of Historic Battlefields to promote a better understanding of their significance and public enjoyment. There are none within the study area.
Conservation Areas	Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance.
Military Remains	Provides protection to military remains sensitive to direct impacts from underground or above ground transmission infrastructure however they are generally small discrete sites which can be avoided.

Historic Environment	
Protected Wrecks	Designated as being likely to contain the remains of a vessel, or its contents, which are of historical, artistic or archaeological importance. Sensitive to direct impacts from subsea transmission infrastructure however they are generally small discrete sites which can be avoided.

Biological Environment	
European Sites (SACs, SPAs and Ramsar Sites)	SPAs are a designation for the protection of certain over wintering, breeding and on passage bird species, SACs are designated for the protection of certain habitats and species that are most in need of conservation at the European level and a Ramsar site is a wetland site of international importance for nature conservation. The sensitivity of a European site varies depending the technology (overhead vs underground) and the reasons for the designation of the site. In general, coastal sites are more expansive with less opportunity to avoid than inland sites.
Sites of Special Scientific Interest (SSSIs)	National level designation for natural heritage (flora and fauna) as well as for geological and geomorphological reasons. As with Natura 2000 sites their sensitivity to either underground or overhead transmission infrastructure varies both due to the infrastructure and the reasons for the designation of the site.
MCZs	National level designation to protect a range of nationally important, rare or threatened habitats and species. As above their sensitivity to a subsea cable varies both due to the infrastructure and the reasons for the designation of the site.
NNRs	National level designation which were established to protect important habitats, species and geology in addition to a SSSI they also provide a recreational and educational environment. As above their sensitivity to either underground or overhead transmission infrastructure varies both due to the infrastructure and the reasons for the designation of the site.
RSPB Important Bird Areas (IBAs) and Reserves	In general, these are contiguous with the SPAs, Ramsar's and SSSI and protect rare or endangered bird species. IBAs are in general more expansive and their sensitivity to underground or above ground infrastructure varies dependant on the species and the timing of the installation. Reserves are generally more discrete site and also offer an educational and recreational facility.
Ancient Woodland	By definition ancient woodland is a woodland that has existed continuously since 1600 or before however there are different types and the ground flora is important as well as the trees. In general, has a high sensitivity to underground or overhead transmission infrastructure as loss is not considered temporary; however this can be reduced where there are opportunities to span for cross using a trenchless technique.
Local Nature Reserves (LNRs)	LNRs are a statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949. LNRs are for people and wildlife. They are places with wildlife or geological features that are of special interest locally.
Local Wildlife Sites (LWSs) / Sites of Importance for Nature Conservation (SINC)	LWSs are wildlife-rich sites selected for their local nature conservation value. They vary in shape and size and can contain important, distinctive and threatened habitats and species. In many parts of the UK, they are the principal wildlife resource but their designation is non-statutory and their only protection comes via the planning system. They are not protected by law like SSSIs or NNRs.

Physical Environment	
Topography	Generally considered under landscape, relevant in relation to Holford Rules 4 and 5: Choose tree and hill backgrounds in preference to sky, backgrounds, wherever possible; and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees. Prefer moderately open valleys with woods where the apparent height of the towers will be reduced, and views of the line will be broken by trees.
Watercourses	Any natural or artificial channel above or below ground through which water flows, such as a river, brook, beck, ditch, mill stream or culvert
Flood Zones	In general development in flood zones 2 and 3 should be avoided in favour of development in flood Zone 1. Almost always impossible for linear projects to avoid development in flood zone 2 and 3 however both underground cables and overhead lines are considered to have a low sensitivity as in the case of the former the effect is temporary and can be managed by good construction practice and construction techniques such as a ducted solution and in the case of the later flood water being able to inundate footprints. The siting of new substations and converter stations has a greater sensitivity as these would result in permanent infrastructure in the floodplain and would require an exception test to be passed as part of any flood risk assessment.
Source Protection Zones (SPZs)	SPZs are defined around large and public potable groundwater abstraction sites. The purpose of SPZs is to provide additional protection to safeguard drinking water quality through constraining the proximity of an activity that may impact upon a drinking water abstraction.
Landfill and Historic Landfill Sites	Areas of land in which waste is/has been deposited. They are carefully designed structures built into the ground so that waste is kept separate from the surrounding environment.
Superficial geology and bedrock geology	Superficial deposits refer to geologically recent unconsolidated sediments whereas bedrock geology is the main mass of rocks forming the Earth that are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.
Marine Environment	Bathymetry Offshore geology

Socio-economics	
Settlement and Population	Urban regions Main settlements Allocation and growth areas Residential density (people per hectare) Educational facilities Medical facilities
Tourism and Recreation	National Cycle Network Visitor attractions Accommodation facilities Historic Landmarks Sports and Leisure Centres and Sports Clubs
Land/Marine Use	Agricultural Land Classification (ALC) Golf Courses Allotments Forest and Country Parks Countryside and Rights of Way Access Land Land Allocations Major Planning Applications Fishing density Shipping and navigation Traffic and access Aquaculture areas Marine extraction and disposal sites Anchorage areas Other sea users
Infrastructure	Transmission network / subsea cables Gas transmission network / subsea pipelines Ports and harbours Aerodromes Offshore windfarms Motorways /Trunk roads Other Roads Railways

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Ntional Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com