STRICTLY PRIVATE AND CONFIDENTIAL

NeuConnect

ENVIRONMENTAL STATEMENT VOL 1 - NON-TECHNICAL SUMMARY-5471137

NEU-ACM-CON-UK-AP-PN-0002

ASITE DOCUMENT NUMBER

Revision Tracking

Revision No.	Revision Date	Author	Checked By	Approver	Revision Notes
P01	16/04/2021	AECOM		NeuConnect	

Originator's Reference:	ITT Reference Number:
N/A	

AECOM Imagine it. Delivered.

NeuConnect: Great Britain to Germany Interconnector

GB Onshore Scheme

Environmental Statement
Volume I: Non-Technical Summary

NeuConnect Britain Ltd

September 2019

Prepared for:

NeuConnect Britain Ltd
105 Piccadilly
London, W1J 7NJ
United Kingdom

Prepared by:

AECOM Infrastructure & Environment UK Limited
1 Tanfield
Edinburgh EH3 5DA
United Kingdom

T: +44 131 301 8600
aecom.com

Table of Contents

Figures

Tables

Glossary & Abbreviations

Glossary

Term	Meaning
NeuConnect	Also referred to as the Project, which includes all components of the interconnector between the Isle of Grain, UK and Wilhelmshaven, Germany.
GB Onshore Scheme	Includes all components of the interconnector from the connection to the existing overhead line at Perry's Farm, Grain, to Mean Low Water Spring.
the proposed substation	This is the substation that will be built and operated by National Grid Electricity Transmission to connect the interconnector to the National Electricity Transmission System.
the proposed converter station	This is the converter station proposed to be operated by NeuConnect Britain Limited on land at Perry's Farm, Grain.
GB Offshore Scheme	The subsea Direct Current cable, extending between Mean High Water Spring and the point of transition between Dutch and UK waters.
landfall	The area where offshore cables come ashore.
proposed landfall site	Also referred to as the proposed landfall, located to the north/ northwest of the settlement of Grain.
Transition Joint Pit	Buried concrete pad with joint connecting subsea and underground Direct Current cables at the proposed landfall site.
proposed DC cable route	Also referred to as the Direct Current (DC) cable route (from Mean Low Water Spring to the proposed converter station).
proposed DC cable working width	Typically 30 metre wide works corridor in which Direct Current cable installation will occur. This corridor increases in width at the West Lane crossing and at the proposed landfall.
joint bays	Buried concrete pad where adjacent sections of onshore cable are connected.
temporary construction area	Any area to be disturbed during construction. This will include working areas (i.e. Alternating Current and Direct Current cable troughs, converter station and substation footprints) in addition to the working width, temporary access tracks and temporary construction compound.
temporary construction compound	Compound for site offices, storage, welfare facilities etc.
converter station	Specialist facility to convert electricity Alternating Current to Direct Current or vice versa.
proposed converter station site	The complete converter station site including temporary working areas.
the permanent converter station area	The permanent converter station area (approx. 5 hectares).
proposed permanent access road	The permanent access to the converter station and substation from the B2001/ Grain Road.
proposed substation site	The complete substation site including temporary working areas.
permanent substation area	The permanent substation area (approx. 0.72 hectares).
Rochdale Envelope	The maximum parameters in which the converter station and substation will be designed.
the Applicant	The proponent of the Project, NeuConnect Britain Limited.
the Contractor	Party or parties responsible for the detailed design and construction.

Abbreviations

Abbreviation	Definition
AADT	Annual Average Daily Traffic
AC	Alternating Current
AIL	Abnormal Indivisible Loads
AOD	Above Ordnance Datum
BAP	Biodiversity Action Plan
BGS	British Geological Society
BNL	Basic Noise Level
BPM	Best Practicable Means
BS	British Standard
CBS	Cement Bound Sand
CEMP	Construction Environmental Management Plan
CKD	Cement Kiln Dust
CoCP	Code of Construction Practice
CO_2	Carbon Dioxide
COPC	Chemicals of Potential Concern
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual Site Model
dB	Decibel
DC	Direct Current
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EC	European Commission
EIA	Environmental Impact Assessment
EMF	Electric and Magnetic Fields
ES	Environmental Statement
EU	European Union
FRA	Flood Risk Assessment
GB	Great Britain
GI	Ground Investigation
GW	Gigawatt
ha	Hectare
HDD	Horizontal Directional Drilling
HE	Historic England
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HRA	Habitat Regulations Assessment
HVDC	High Voltage Direct Current
JNCC	Joint Nature Conservation Committee
km	Kilometre
kV	Kilovolt

Abbreviation	Definition
LCA	Landscape Character Area
LCT	Landscape Character Type
LGV	Light Goods Vehicle
LNG	Liquefied Natural Gas
LOAEL	Lowest Observable Adverse Effect Level
LPA	Local Planning Authority
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
m	Metres
m^2	Square metre
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MW	Megawatt
NCA	National Character Assessment
NE	Natural England
NETS	National Electricity Transmission System
NGET	National Grid Electricity Transmission
NNR	National Nature Reserve
NOEL	No Observed Effect Level
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSR	Noise Sensitive Receptor
Ofgem	Office of Gas and Electricity Markets
OHL	Overhead Line
OS	Ordnance Survey
PAH	Polycyclic Aromatic Hydrocarbons
PPV	Peak Particle Velocity
PRA	Preliminary Risk Assessment
SAC	Special Areas of Conservation
SOAEL	Significant Observed Adverse Effect Level
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
TCC	Temporary Construction Compound
TJP	Transition Joint Pit
TMP	Traffic Management Plan
UAEL	Unacceptable Adverse Effect Level
UK	United Kingdom
UKPN	UK Power Networks
VSC	Voltage Source Converter

1. Introduction

Introduction

1.1 NeuConnect Britain Limited has submitted a planning application to Medway Council to develop the GB onshore components of NeuConnect, (or 'the GB Onshore Scheme'). The GB Onshore Scheme consists of various specialist electrical equipment including an electricity converter station, a substation, a cable sealing end compound, and underground Direct Current (DC) and Alternating Current (AC) cables, as well as an access road, landscaping and drainage ponds.

1.2 An Environmental Statement (ES) accompanies the planning application, which reports the detailed results of the Environmental Impact Assessment (EIA) for the GB Onshore Scheme. This Non-Technical Summary (NTS) of the ES provides readers with a broad understanding of:

- The GB Onshore Scheme, its location and the components it consists of;
- The existing environmental conditions of the surrounding area, including identification of key receptors that may be impacted as a result of the GB Onshore Scheme;
- The likely significant environmental effects during the construction and operation of the GB Onshore Scheme and;
- Some of the proposed mitigation measures within the GB Onshore Scheme's design, and measures that will be implemented during construction and operation of the GB Onshore Scheme.

About NeuConnect

1.3 NeuConnect (the 'Project'), is a 1,400 megawatt (MW) interconnector between Great Britain and Germany. The Project will create the first direct electricity link between Great Britain and German energy networks; two of the largest electricity markets in Europe. The new link will create a connection for electricity to be transmitted in either direction between Great Britain and Germany. The Project comprises approximately 700 kilometres (km) of subsea and underground High Voltage Direct Current (HDVC) cables, with onshore converter stations linking into the existing electricity grids at Grain in Great Britain and at Wilhelmshaven in Germany. The subsea cables will traverse through British, Dutch and German waters. An overview of the components of the Project is illustrated in Figure 1.

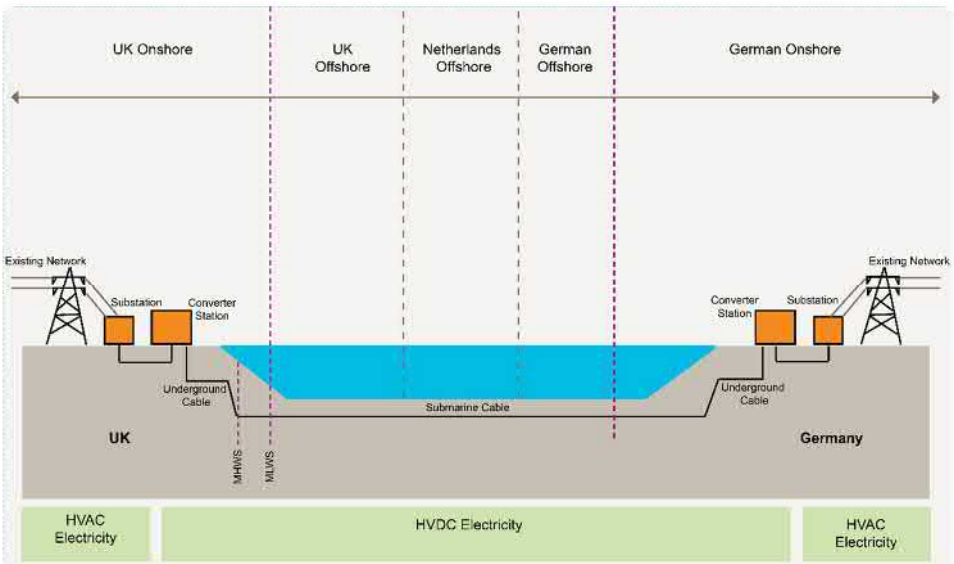


Figure 1 – Overview of NeuConnect Project

The GB Onshore Scheme

1.4 In Great Britain the onshore components of the Project (the 'GB Onshore Scheme') extend as far as Mean Low Water Springs (MLWS). The location and planning application boundary (the 'Project Area') of the GB Onshore Scheme is illustrated in Figure 2.

1.5 This ES assesses the likely significant environmental effects of the GB Onshore Scheme only. A separate ES assesses the GB Offshore Scheme. Environmental assessments will accompany the permit applications within Dutch and German jurisdictions.

1.6 The GB Onshore Scheme will comprise the following main elements extending as far as MLWS:

- Fenced cable sealing end compound;
- Substation within a fenced compound comprising a single building, some outdoor electrical equipment and an internal road for equipment access;
- Approximately 50 metre (m) long AC cable route from the substation to the converter station. The AC cable may be either underground or above ground;
- Converter station within a fenced compound comprising buildings, some outdoor electrical equipment and internal access roads;
- Improvement works at the existing B2001 / Grain Road junction to provide access to both the proposed converter station and substation compounds;
- An approximately 1,550 m long underground DC cable route from the converter station to the landfall point;
- A Transition Joint Pit (TJP) at the landfall point where underground and subsea DC cables are joined together (subsea cables are slightly larger than underground cables due to additional protective armouring) and;
- An approximately 1,700 m long section of buried ducts for the subsea DC cables from the TJP and across the intertidal zone.
- Access to the GB Onshore Scheme will be taken from the existing junction on the B2001/ Grain Road. The existing junction will be improved and a new approximately 850 m long permanent access road will be constructed. This will provide access to the proposed converter station and substation compounds and the cable sealing end compound.
- On the southern and western boundaries of the GB Onshore Scheme, boundary planting is proposed to better integrate the proposed converter station and substation buildings in to the existing landscape. These boundaries are comprised of native species which will also increase biodiversity and help screen or soften some views of the GB Onshore Scheme from viewpoints in the vicinity.

1.7 To connect the Project to the electricity transmission system, there will be modifications required to the existing overhead line (OHL) which runs roughly east to west across the Isle of Grain. These works will be subject to a separate application made by National Grid Electricity Transmission (NGET) once the design of the connection is finalised. The works are not yet confirmed and will be subject to detailed design, however they are likely to include:

- A new 50 m tall lattice tower immediately north of the proposed substation;
- Down leads from the new tower to the proposed substation;
- Down leads from the new tower to the proposed cable sealing end compound;
- Approximately 200 m long underground AC cable route between the proposed cable sealing end compound and the proposed substation; and
- A temporary diversion of the existing OHL may also be required to accommodate the construction of a new tower on the existing route.

Need for the Project

1.8 By connecting two of Europe's largest energy markets for the first time, the Project will offer a more diverse and sustainable electricity supply, offering much needed resilience, security and flexibility in Great Britain and Germany. Increased competition in Great Britain's market could also lead to lower costs for consumers and businesses, while in Germany the new link will help reduce 'bottlenecks' by opening up an important new export market for excess renewable energy.

1.9 Electricity interconnectors play a key role in supporting Great Britain and Europe's transition away from existing fossil fuel-driven power generation by allowing electricity to be imported and exported overseas according to supply and demand.

Requirement for EIA

1.10 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (EIA Regulations) apply to applications for planning permission made under the Town and Country Planning Act 1990.

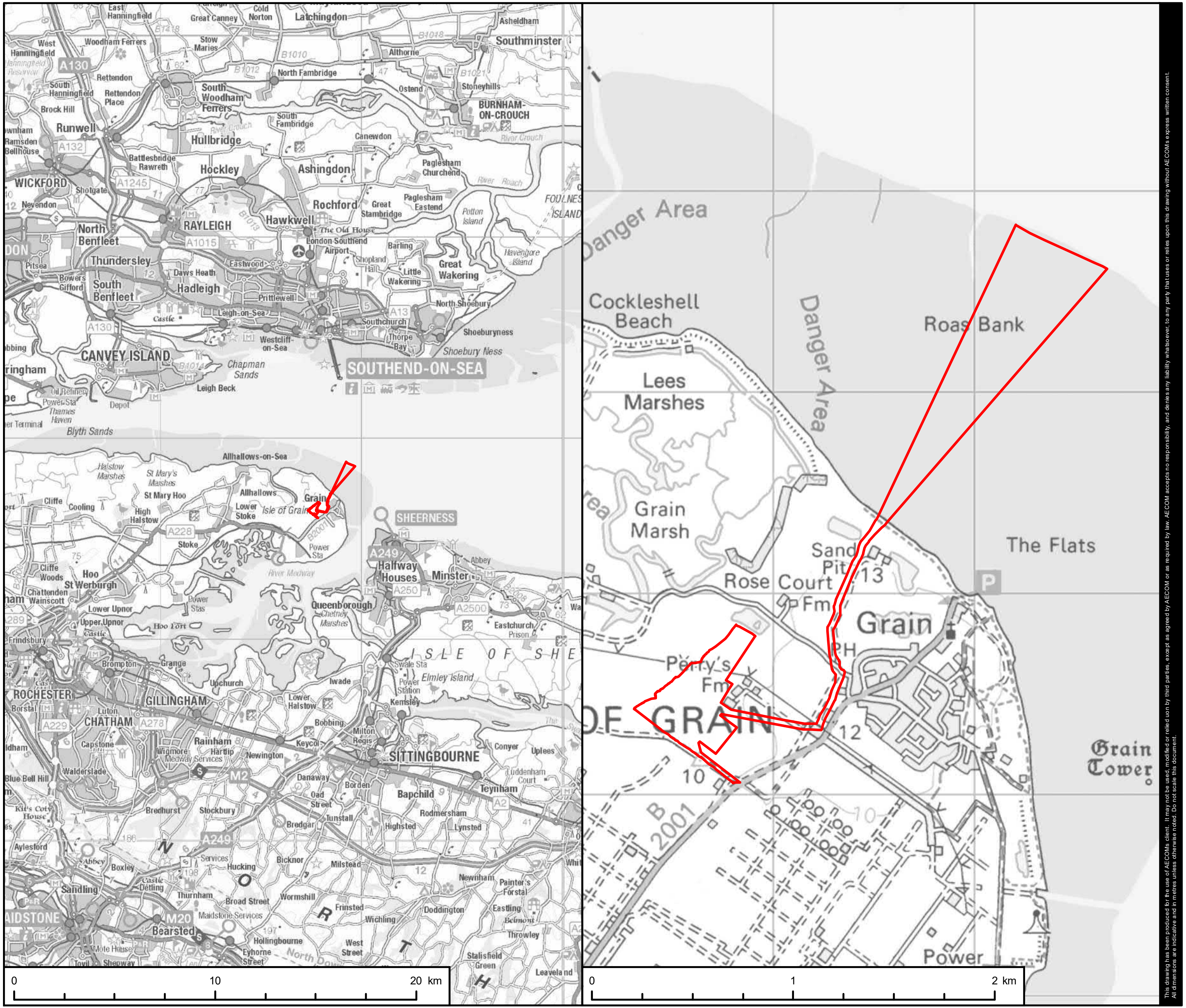
1.11 As part of a formal request process for an EIA Screening Opinion from Medway Council, it was determined that an EIA would be required in support of the planning application for the GB Onshore Scheme.

The Environmental Statement ('ES')

1.12 The ES accompanies planning applications and reports on the outcomes of the EIA. The ES includes the specialist assessments of the existing environment, sensitive receptors relevant to and/ or within the vicinity of the GB Onshore Scheme and the potential for the GB Onshore Scheme to result in likely significant environmental effects.

1.13 The purpose of this NTS is to provide readers with a summary of the ES.

Project Management Initials: DR Designer: LC Checked: TC Approved: DR



Scale @ A4 1:250,000 / 1:25,000

Contains Ordnance Survey Data © Crown copyright and database rights 2018 Ordnance Survey 0100031673

Coordinate System: British National Grid

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY
🟥 Application Boundary

TITLE
FIGURE 2
SITE LOCATION AND APPLICATION BOUNDARY

REFERENCE
NC_191002_UKON_NTS_2_v1

SHEET NUMBER	DATE
1 of 1	02/10/19

2. Project Description

Introduction

2.1 This chapter describes the GB Onshore Scheme comprising all elements above MLWS. This includes:

- A proposed substation and cable sealing end compound to connect to the existing electricity network;
- A proposed converter station including the Direct Current (DC) cable route from the converter station to the landfall point and through the intertidal area to MLWS (overlapping with the subsea DC cable between Mean High Water Springs (MHWS) and MLWS) and;
- A new access track from the B2001/ Grain Road to access both the converter station and substation.

The Proposed Converter Station and Substation

General Overview

2.2 The Project Area (as shown on Figure 3) includes all land necessary to accommodate the proposed components of the GB Onshore Scheme as well as the land required to facilitate construction, and the proposed mitigation and landscaping. The GB Onshore Scheme is illustrated on Figure 3. The Project Area covers approximately 68 ha.

2.3 From the point of connection to the National Electricity Transmission System (NETS) via the existing OHL, is the proposed substation located adjacent to the previous landfill site (to the east) and south of the existing OHL to best 'fit' within the existing land use and landscape. The proposed substation compound will occupy an area of approximately 0.64 ha. The proposed substation will connect directly to the proposed converter station via up to six proposed AC cables across a common boundary between the two components. To the north of the proposed substation will be a cable sealing end compound, which will facilitate the connection of one of two circuits from the existing OHL to the proposed substation.

2.4 The proposed converter station will convert electricity from DC to AC (or vice versa depending on the direction of operation of the interconnector) and will therefore be connected to both the AC and DC cables. Immediately adjacent to the proposed converter station and substation platforms are two construction laydown areas which will be utilised by the appointed Contractor(s) on site for offices, welfare facilities, and material and plant storage.

2.5 Along the southern boundary of the Project Area is the proposed access track, which will allow access to the proposed converter station, proposed substation and proposed cable sealing end compound. The existing junction to the B2001/ Grain Road will be widened and improved to allow safe access to and from the Project Area. For the construction and operational phases of the GB Onshore Scheme, this access point will limit the number of vehicles that will pass residential properties and avoid the need for additional traffic in Grain village.

2.6 To the north of the proposed cable sealing end compound is the proposed attenuation basin which is incorporated within the wider landscaping plan of the Project Area. The attenuation basin will provide storage of surface water from the new platforms of the converter station and substation which require the reprofiling of the area to accommodate the GB Onshore Scheme. The attenuation basin is connected to the drainage of the platforms via a swale that extends down the western side of the Project Area. The swale also offers a boundary between the infrastructure of the GB Onshore Scheme and the landscaping to the west and south of the Project Area. The landscaping has been designed to help phase the perceived scale of the proposed converter station and substation buildings. Landscaping design also helps soften the boundary between the open marshes and the GB Onshore Scheme, whilst also providing greater biodiversity to the area from the inclusion of a variety of native plant species.

Proposed Converter Station - Outline Design

2.7 Converter stations are key parts of DC electricity systems. They convert electricity from AC to DC, or vice versa, depending on the direction of operation of the interconnector.

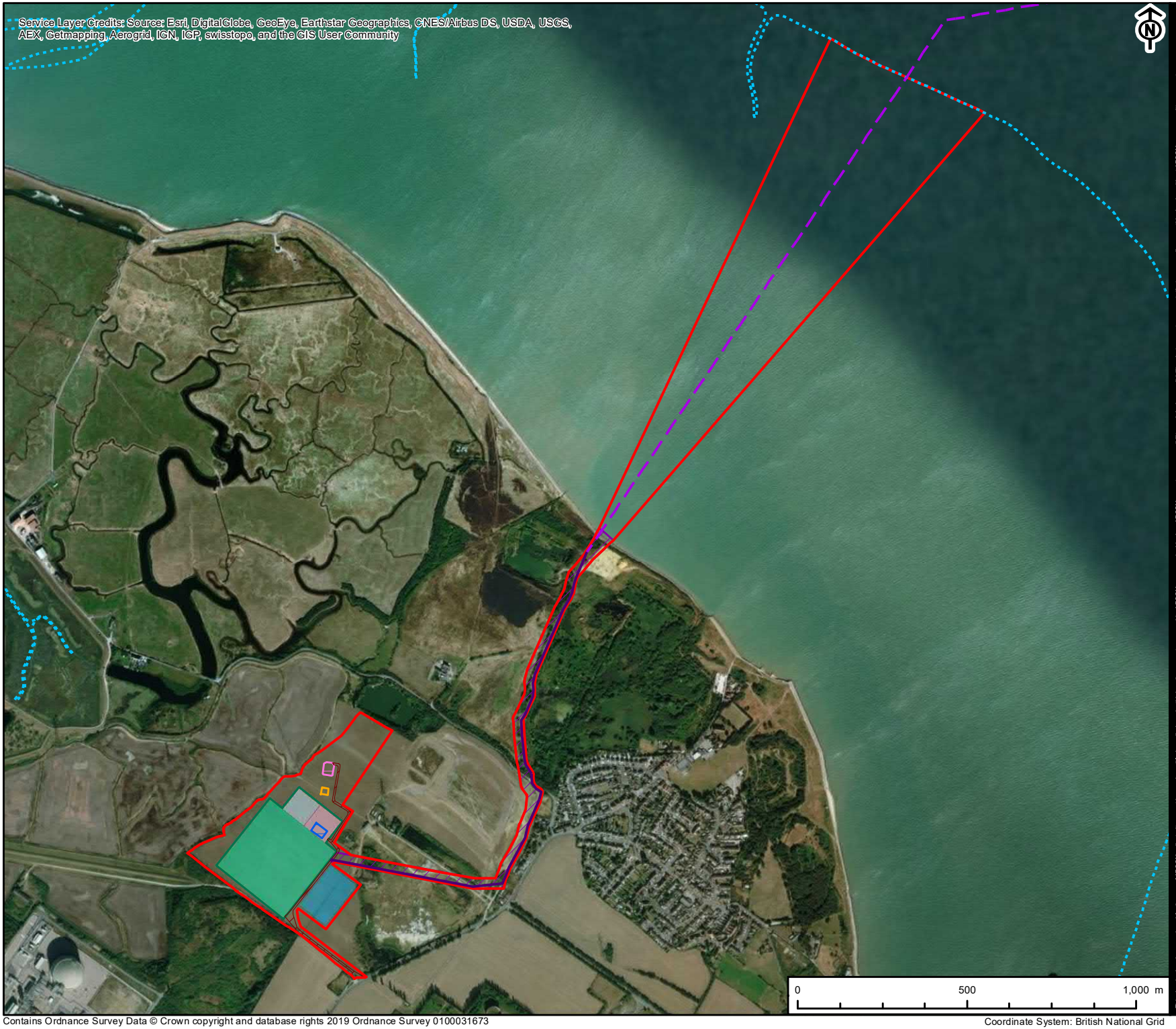
2.8 The footprint of the proposed converter station at Grain is expected to be up to approximately 250 m by 250 m (to the perimeter security fence). This area will comprise specialist electrical equipment, most of which will be located indoors in one or two building units in order to provide protection from the increased levels of salinity of the air. The building units will range in height according to the electrical equipment they contain including required safety clearances up to a maximum building height of up to 26 m. There will be a 2 m exclusion zone around the perimeter fencing.

2.9 The building units which make up the proposed converter station will be constructed to a similar specification to one another. Whilst their exact appearance is subject to detailed design, the cladding of the building units will utilise similar colours and materials to those used on developments in the immediate vicinity to help effectively integrate the converter station into its surroundings.

2.10 A description of the main components of the proposed converter station is provided in Table 2.1.

Table 2.1 Proposed Converter Station – Key Components

Component	Description
DC switch hall	This contains the termination of the DC onshore underground cables together with HVDC switchgear (specialist DC electrical equipment) to connect these to the power electronics. This equipment will be enclosed in a building up to 26 m high.
Valve halls and AC reactor (ancillary equipment)	This contains high voltage power electronics equipment that converts electricity from DC to AC and vice-versa. This is located indoors in buildings up to 26 m high. It also contains specialist equipment to control the environmental conditions within the building.
Control building	This contains control panels and associated operator stations for operating the converter station as well as protection and communication equipment. Offices, welfare facilities and other auxiliary systems are also located within the control building.
Cooling fans	This comprises external fan units located outside of the Valve Halls. The fans are used to cool down the valves. Power electronic valves may be cooled by water or glycol. Coolant is pumped through the fan units.
Transformers	These are normally located outdoors and change the AC voltage electricity between the voltage needed for transmission via the AC transmission system (the NETS) and the voltage needed to connect to the power electronic equipment for conversion from AC to DC within the Valve Halls. The transformers are separated by valve halls.
AC switchyard	This connects the proposed converter station to the NETS. It includes a range of electrical equipment which is located outdoors including harmonic filtration and reactive power compensation equipment, circuit breakers, transformers, busbars, insulators and subject to detailed design shunt reactors. Note, the AC switchyard could be located within a building, however, this is subject to detailed design.
Diesel backup Generator	This would be used in the event of a failure of the low voltage electricity supply provided by the Distribution Network Operator (DNO).
Spare parts building	This building house spare parts and components. Adjacent hardstanding areas provide storage for a spare transformer and spare cable drums.



Project Management Initials: DR Designer: LC Checked: TC Approved: DR

Scale @ A4 1:15,000

Coordinate System: British National Grid

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY
- Application Boundary
- Mean Low Water Springs

Indicative Location of:
- Offshore Cable Route
- Onshore DC Cable Route
- DC Cable Route - 30m Working Width
- Converter Station and Substation Platform - 2m Fence Line Security & Maintenance Corridor
- Access Road
- Converter Station Platform
- Substation Platform
- Construction Laydown Area
- Construction Laydown Area and Potential Substation Expansion Site
- National Grid Proposed Tower
- National Grid Proposed Sealing End Compound
- National Grid Proposed GIS Building (Maximum Parameters)

NOTE
The location of all components identified is indicative only, but is representative of the maximum parameters of each component. The GB Onshore Scheme is subject to detailed design.

TITLE
FIGURE 3
PROPOSED GB ONSHORE SCHEME

REFERENCE
NC_191002_UKON_NTS_3_v1

SHEET NUMBER
1 of 1

DATE
02/10/19

Proposed Gas Insulated Substation and Cable Sealing End Compound - Outline Design

2.11 Substations contain equipment necessary to facilitate the connection of high voltage transmission systems to electricity distribution systems which then distribute electricity across the network in typically lower voltages. This system can also be operated in reverse, to increase the voltage from domestic supply networks to a voltage more readily used by long distance, high voltage, links.

2.12 The footprint of the proposed substation is expected to be approximately 80 m by 80 m (to the perimeter security fence, and the boundary of the proposed converter station), as illustrated on Figure 3. The substation will comprise specialist electrical equipment which will be located within a single building unit. The building will have a maximum height of approximately 14 m. The electrical equipment will likely be enclosed for protection against corrosion from increased levels of salinity in the air. The area will be surrounded by palisade security fencing.

2.13 As per the proposed converter station, the design and layout of the substation is subject to further design however, it will be completed such that the appearance is in keeping with the existing industrial units in the area.

2.14 The substation will be connected to the existing OHL via a new tower immediately north of the proposed substation in the centre of the Project Area, and also via the proposed cable sealing end compound. A temporary diversion of the existing OHL may be required to facilitate the connection, and/ or modifications to the existing tower structure.

2.15 The proposed cable sealing end compound footprint will be approximately 40 m by 40 m and will also be enclosed within a security fence. The cable sealing end compound will include an approximately 14 m high gantry which will facilitate the safety separation for the electrical connection from the new tower. The downleads from the tower will connect onto the gantry and then the downdroppers will be connected to cable sealing ends within the compound. From here the AC cables will be undergrounded to connect to the proposed substation.

Design Mitigation Measures

2.16 The orientation of the site has been determined from review of the potential impact to surrounding residents from noise and visual amenity. The proposals for the GB Onshore Scheme have been developed in parallel with the EIA providing opportunities to embed mitigation measures within the design. Mitigation measures have been incorporated into the design of the proposed converter station and substation and therefore form part of the planning application. These measures include:

- Landscape planting;
- Noise mitigation;
- A drainage strategy;
- Pollution prevention measures; and
- Ecological mitigation and enhancement.

2.17 The landscaping strategy included within the design is outlined in Figure 4.

2.18 Due consideration has been given to electric and magnetic fields (EMFs) produced by the proposed converter station and onshore high voltage DC. It is acknowledged that equipment which generates, distributes or uses electricity produces EMFs. There is some scientific evidence of possible effects at lower levels; the electricity industry takes this evidence seriously and recognises that it can generate public concern. This evidence has been extensively reviewed and the UK Government have not considered it appropriate to implement any restrictions or guidelines. The GB Onshore Scheme uses both AC and DC technology and will produce both static (DC) and alternating (AC) electric and magnetic fields. The GB Onshore Scheme will therefore be designed to ensure that it is compliant with International Commission on Non-Ionising Radiation Protection (ICNIRP) public exposure guidelines for EMFs outside the boundary fence, to avoid all established effects on the human population.

Approx 4500m3 proposed attenuation basin

1:4 maximum side slope

5m intervals

Control structure restricting flows to greenfield runoff rate.

Connection into existing watercourse adjacent to site

Swale/ Channel

3000m3

250

250

0 250 500 m

Scale @ A4 1:5,000

Project Management Initials: CA Designer: PT Checked: RM Approved: DR

Coordinates System: British National Grid

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY

- Application Boundary
- SuDs Basin
- Swale Channel
- Reinstated Ground
- Permanent Water
- Wet Marginal Planting:
  Key species:
  -Phalaris arundinacea (Reed canary grass)
  -Lythrun salicaria (Purple loosestrife)
  -Sparganium emersum (Bur-reed)
- Woodland edge Planting:
  Key species:
  -Salix caprea (Goat Willow)
  -Salix viminalis (Osier Willow)
  -Betula pubescens (Downy Birch)
- Scrub Planting:
  Key species:
  -Salix cinerea (Grey Willow)
  -Viburnum opulus (Geulder Rose)
  -Prunus spinosa (Blackthorn)
- Mixed Hedgerow Planting:
  Key species:
  -Corylus avellana (Hazel)
  -Crataegus monogyna (Hawthorn)
  -Prunus spinosa (Blackthorn)
- Species Rich Grassland:
  General purposed meadow

TITLE
FIGURE 4
LANDSCAPE MITIGATION DESIGN PLAN

REFERENCE
NC_191002_UKON_NTS_4_V1

SHEET NUMBER	DATE
1 of 1	02/10/19

Construction of the Proposed Converter Station & Substation

Construction Programme

2.19 Construction of the proposed converter station and substation is planned to begin in 2021 and is anticipated to last approximately three years.

2.20 Construction of the proposed substation will take approximately one year and will likely be aligned to be completed at the same time as the proposed converter station.

Construction Activities

2.21 Construction of the proposed converter station and proposed substation will be undertaken by the appointed Contractors.

2.22 Construction of the proposed converter station and the proposed substation will largely comprise similar outline activities as follows:

- Preliminary works: This will include further site investigation and preconstruction surveys required to be undertaken in advance of construction. This will also include utilities diversions as necessary.
- Site establishment: This includes vegetation clearance, soil removal and establishment of all temporary facilities including site offices, lay down and storage areas and welfare facilities, development of electricity and water supplies, erection of security fencing or hoarding and implementation of external lighting for security.
- Earthworks: This will include land re-profiling in order to establish the level platforms on which the proposed converter station and proposed substation will be constructed.
- Civil engineering works: This will include construction of building foundations, development of the platforms' permanent drainage system and construction of internal roads and car parking arrangements.
- Building works: This will include the construction of building units including erection of steel frames and cladding.
- Cable installation: This will include the installation of the proposed DC cables entering the proposed converter station as well as proposed AC cables between the proposed converter station and the proposed substation.
- Provision/ installation of permanent services: This will include water supplies, foul drainage, low voltage electricity supply and telecommunications.
- Mechanical and electrical works: This will include installation of high voltage AC and DC electrical equipment and transformers within the proposed converter station.
- Commissioning: Following completion of all construction works there will be a period of commissioning and testing.
- Site Reinstatement & Landscape Works: This will include removal of site offices and temporary facilities, land reinstatement and landscape works

Construction Site Layout

2.23 The exact layout of the site will depend on the Contractors appointed to design and construct the proposed converter station and proposed substation. An indicative layout is included below in Figure 5.

2.24 There will be temporary construction areas; 1.5 ha for the converter laydown and 0.64 ha for the substation laydown. These temporary construction compounds will accommodate temporary construction facilities and include provision for:

- Site offices including offices and meeting rooms;

- Staff welfare facilities including portable chemical toilets, kitchen and mess room;
- Storage areas for construction vehicles, plant, equipment and other materials;
- Appropriately bunded areas to be used for the storage of oils and other fuels;
- Wheel washing to be used by construction vehicles and plant;
- Segregated waste management and storage areas;
- Car parking for construction staff and site visitors; and
- Rock crushing and concrete batching facilities.

Operation of the Proposed Converter Station & Substation

2.25 The proposed converter station and substation will operate continuously throughout the year. Typically, the proposed converter station will import electricity from Germany to Great Britain (e.g. convert electricity from DC-from the interconnector-to AC for onwards transmission). However, the interconnector is bi-directional and will export electricity when required. Whether it is importing electricity (converting DC to AC) or exporting electricity (converting AC to DC) will depend on supply and demand of and for electricity in Great Britain and Germany.

2.26 During ordinary operation, the proposed converter station will be staffed by a small team on site. During regular maintenance and/ or repairs, the number of personnel present on site would increase with the number of staff proportionate to the nature of the maintenance or repair works being undertaken.

2.27 The proposed converter station will be operated by the Applicant. The proposed substation will be operated by NGET. Each site will be fully enclosed by palisade security fencing, and access to the sites will be restricted to authorised personnel throughout operation.

Decommissioning of the Proposed Converter Station & Substation

2.28 The anticipated operational life of the proposed converter station is approximately 40 years. It is likely that during this period, refurbishment and plant replacement will extend the life of the converter station rather than decommissioning taking place.

2.29 In the event that NeuConnect ceases operation at the end of its operational life, the proposed converter station would be decommissioned. In this scenario, the main components would be dismantled and removed for recycling wherever possible.

2.30 Where this is not possible, disposal would be undertaken in accordance with the relevant waste disposal regulations at the time of decommissioning. Site foundations would be removed to a level agreed with Medway Council and reinstated to agricultural land.

Project Management Initials: DR Designer: LC Checked: TC Approved: DR

Scale @ A4 1:2,500

Coordinate System: British National Grid

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY
- Application Boundary
- Indicative Location of:
  - Onshore DC Cable Route
  - Converter Station Layout and Maximum Building Parameters
  - DC Cable Route - 30m Working Width
  - Converter Station and Substation Platform - 2m Fence Line Security & Maintenance Corridor
  - Access Road
  - Converter Station Platform
  - Substation Platform
  - Construction Laydown Area
  - Construction Laydown Area and Potential Substation Expansion Site
  - National Grid Proposed Tower
  - National Grid Proposed GIS Building (Maximum Parameters)

NOTE
The layout presented is indicative only and is subject to detailed design.

TITLE
FIGURE 5
INDICATIVE CONVERTER STATION LAYOUT

REFERENCE
NC_191002_UKON_NTS_5_v1

SHEET NUMBER
1 of 1

DATE
02/10/19

The Proposed DC Cables

Overview of the Proposed DC Cable

2.31 From the proposed converter station, the proposed DC cable route extends east towards B2001/ Grain Road, it then extends north along the field boundary to West Lane, and after crossing West Lane follows the existing track (previously used for mineral extraction activities) to the point of landfall at the coast.

2.32 There will be two DC cables installed within a single trench, as well as up to four fibre cables for monitoring of the cables. The total length of the DC cable route between the proposed converter station and the landfall location is approximately 1.6 km. The Project Area accounts for space to facilitate the installation of the proposed DC cables, as well as allowing construction vehicle passage along the DC cable route. There is also allowance for potential variations in the DC cable route should there be technical issues or constraints during installation.

2.33 At the landfall location there will be a buried TJP, which will allow connection of the underground and subsea DC cables. From the TJP the subsea cables will be installed under the seabed out to MLWS.

2.34 The total length of the proposed DC cable route between the proposed converter station and MLWS is approximately 3.2 km. The DC cable route is illustrated in Figure 3.

Proposed DC Cables Outline Design

2.35 There will be two DC cables which will be approximately 20 cm in diameter, and both DC cables will be laid within a single trench between the proposed converter station and the TJP at the landfall location. The cable trench will be approximately 1 m wide by 1.5 m deep. The DC cables may either be laid directly within the trench, or ducts will be laid and the cables pulled through the duct.

2.36 Whilst there are only two DC cables, within the DC cable trench there may be up to four DC ducts installed within the trench. The spare ducts allow for repair or replacement works to be undertaken in the event of a cable failure. Alongside the DC cables there will also be up to four fibre cables, a temperature sensor and an optic cable. A working corridor of up to 30 m, as illustrated on Figure 3, will be required for the installation of the DC underground cables. This corridor allows for the cable trench, excavated spoil storage and plant operation, as well as allowing for some deviation of the proposed DC cable route should there be any unfavourable ground conditions or environmental sensitivities encountered during detailed investigation and/ or construction.

2.37 At the landfall location where the onshore underground cable transitions to the subsea cable a TJP will be installed. The TJP is a buried concrete pad where the underground and subsea cables are connected and will have an indicative footprint of up to 75 m^2 as a worst case (dimensions approximately 15 m by 5 m). The exact location of the TJP is subject to detailed ground investigation.

2.38 From the TJP, the proposed DC cables will be installed underneath the seabed in ducts. Each of the four DC cable ducts from the TJP will be installed using horizontal directionally drilling (HDD) methods as far as technically feasible through the intertidal area. It is assumed for this assessment that the maximum distance achievable for HDD is 800 m. As each duct is drilled individually, there will be up to four breakout points within the intertidal area. From these breakout points in the mid-intertidal area out to MLWS the proposed DC cables will be installed in three separate trenches – one for each of the DC cables and a separate trench for the fibre optic cable. These trenches will extend approximately 800 m to MLWS and the boundary of the GB Onshore Scheme application.

Proposed DC Cable Route

2.39 As illustrated on Figure 3, from the proposed converter station the DC cable route extends to the east towards B2001/ Grain Road across the former mineral extraction site. Prior to the B2001/ Grain Road the DC cable route extends to the north along the boundary of the capped landfill site utilising an existing track to West Lane. The DC cable route will pass underneath West Lane via an existing culvert and continue north towards the point of landfall following the existing access track previously used for mineral extraction activities. Between the proposed converter station and the landfall location, the proposed DC cable route will be approximately 1.6 km to the landfall location.

2.40 At the landfall location the proposed DC cable route will connect to the TJP. From the TJP the proposed DC cables will then extend another approximately 1.6 km, directly across the intertidal area to MLWS (where the scheme continues as the GB Offshore Scheme).

Design Mitigation

2.41 The route of the proposed DC cable has been chosen so that the new infrastructure is located in areas of previously disturbed land as far as reasonably practicable, including the use of the existing culvert at West Lane to limit the requirement to disturb vegetation and ecological receptors in the area. The use of the culvert at West Lane also minimises disruption to vehicle and pedestrian users of the road.

2.42 The proposed DC cable route also avoids the potential disturbance of the existing landfill site and contaminated land, therefore minimising the risk of creating new pathways of the contaminated material to impact the surrounding environment and also construction staff.

2.43 The proposed DC cable route and the installation methods have been identified and developed in parallel with the EIA providing opportunities to embed mitigation measures within the design, namely for the avoidance of impacts during installation.

Installation of the Proposed DC Cables

2.44 The preferred method for installation of the proposed underground DC cables will be by buried, open cut trenches with thermal stable backfill (subject to the ground conditions and cable specifications). The cable trench will be approximately 1 m wide by 1.5 m deep. There will be approximately 0.6 m of stabilised backfill material, along with concrete slabs (plus warning tape) and approximately 0.9 m of top soil.

2.45 Alternative methods of installation are available, such as laying the cable in surface troughs and covering or capping these, which has the benefit of not disturbing any areas of potentially contaminated ground, such as the historic landfills. The installation method will be confirmed following detailed ground investigations. Whilst there are only two DC cables, within the DC cable trench there may be up to four DC ducts installed within the trench. The spare ducts allow for repair or replacement works to be undertaken in the event of a cable failure with minimal impact to the surrounding area.

2.46 A working corridor of up to 30 m will be required for the installation of the DC underground cables. This corridor allows for the cable trench, excavated spoil storage and plant operation. Access to the working corridor will be achieved via the main Project Area access location from the B2001/ Grain, and also from West Lane. The arrangements and requirement for construction compounds and site laydown areas will be determined following the appointment of the DC cable Contractor, however it is likely that offices and welfare facilities will be located at the construction laydown area adjacent to the proposed converter station, as well as a smaller compound and storage area located at the landfall location.

2.47 The proposed DC cable from the TJP through the intertidal area will be installed in lengths of approximately 800 m. In between each length a joint bay will be required to join the lengths together. The joint bays will be similar in scale to the TJP, approximately 15 m by 5 m, and consist of a concrete slab for physically joining two lengths of cable together. The location of these and the number required is subject to detailed design, but for the purpose of the EIA it is assumed they are required every 800 m and therefore up to four will be required between the proposed converter station and MLWS as a worst-case scenario. The joint bays will be accommodated within the working width.

Installation of the Proposed DC Cable Route from MHWS to the Mid-Shore Intertidal Area

2.48 Installation of the DC cable from the landfall will be by Horizontal Directional Drilling (HDD) techniques and installing ducts through which the subsea cable is pulled. The maximum length of HDD possible is approximately 800 m, and therefore will not extend beyond the MLWS (located approximately 1.6 km from the landfall location). The remaining length of subsea DC cable required to be installed through the intertidal area to MLWS will likely be undertaken using open cut or trenching techniques.

2.49 HDD is a technique commonly used to install ducts underneath sensitive features such as rivers, highways, sea defences, and dune systems whereby a hole is typically drilled under the sensitive features, to a point a suitable distance away. A duct is inserted into the drilled hole which is then used as the duct into which the cables are installed.

2.50 Depending on the size of the duct and the ground conditions encountered the drilling operations will take place in a series of stages:

- Drill initial pilot hole (approximately 250 mm in diameter).
- Increase the pilot hole to a larger diameter (up to approximately 750 mm) in stages using “reaming/ hole opening” techniques (an operation that may be repeated a number of times to suit the diameter of the duct).

- Install the duct into the hole produced for cable installations, a messenger (draw) wire is installed within the duct (for subsequent cable pull in operations) or may be blown in afterwards using compressed air.

2.51 HDD operations utilise drilling fluids and additives such as bentonite, to assist in maintaining the integrity of the drilled hole and to transport the cutting materials out of the hole as drilling progresses. The choice of drilling mud required will be selected by the Contractor on the basis of drilling performance and environmental constraints. The majority of drilling fluids are biodegradable and have no harmful effect on the surrounding environment. It is extremely unlikely that any drilling fluids will be discharged into the marine environment.

2.52 Drilling fluid and cuttings are tested during drilling for contamination and possible reuse or disposal after the work has been completed. The drilling mud and cuttings will be transported to an appropriate licensed waste disposal site. Only licensed waste carriers will be used for the transportation of any drilling fluids.

2.53 Drilling fluid breakouts that may occur from the end of the duct will be dealt with by containing the flow within a small bunded pit, likely to be adjacent to the TJP. The drilling mud is then either pumped via a mud return line to the holding pits/ tanks located onshore or collected by a vacuum tanker. Any residual mud can then be cleaned up. The normal practice of having a supply of filled sandbags on site to contain any such breakouts will be followed.

Installation of the Proposed DC Cable Route from the Mid-Shore Intertidal Area to MLWS

2.54 From the mid-shore breakout points (from the end of the HDD) to MLWS a further approximately 800 m of cables will be laid via open cut/ trench and burial activities. Three separate trenches will be required to accommodate each of the two HVDC cables and the fibre-option cable.

2.55 Although installation details are not known at this stage, it is expected that the cable installation technique will be determined by sediment conditions. For the purposes of this assessment, cable installations which may be considered include:

- Boat based installation where the cable is ploughed, trenched or jetted using installation methods while the tide is high. A jack-up barge or anchored barge would likely be required in the low intertidal to facilitate cable installation activities. Small jack-up barges use legs with spudcans (approx. 2 m diameter). Anchor barges can utilise up to eight anchors to keep position, the anchors for this type of vessels can be large; between 1.5 m and 3 m in length. The placing and removal of anchors may result in anchor scars and seabed mounds. Designated (and as minimal as possible) anchoring areas and protocols shall be employed during marine operations. At low tide the barge/ vessel will ground and wait until next high tide to be able to move again.
- Shore based installation with trenches installed from using open cut techniques with a conventional excavator and rollers, while the tide is low. This would seek to achieve cable trenching of up to 3 m wide and between 1 and 1.5 m deep, subject to sediment conditions. Access to the installation site would be gained across the upper shore.

Operation of the Proposed DC Cables

2.57 Once operational, activity along the proposed DC cable route will be limited to non-intrusive inspections and cable repairs. Intrusive inspections would only be required in the unlikely event of a cable fault. Where a fault does occur, the location of the fault would be identified and the faulty section of the cable replaced. The activities involved in cable repair would be similar to those outlined above for installation albeit over a much smaller section.

Decommissioning of the Proposed DC Cable

2.58 In the event that the project ceases operation, the proposed underground DC cable would be decommissioned. Dependent on the prevailing requirements, the redundant cables would either be left in-situ or all parts of the cables could be removed for recycling. Where this is not possible, removed cables would be disposed of in accordance with the relevant waste disposal requirements at the time of decommissioning.

The Proposed AC Cables

Proposed AC Cables Outline Design

2.59 The specification of the proposed AC cables is subject to detailed design, and they may either be underground or above ground. If above ground these will likely be gas-insulated transmission line (GIL) tubes.

2.60 There will be up to six AC cables installed, which will be approximately 20 cm in diameter. The proposed AC cables will be installed directly between the proposed converter station and the proposed substation. They will be approximately 20 m long, with the route of the proposed AC cables dependant on the detailed design of both the proposed converter station and the proposed substation.

2.61 Through the co-siting of the proposed converter station and proposed substation, including the shared fence line, there are no further areas of disturbance required for the installation of the proposed AC cables. These will be installed within the footprint of the proposed converter station and the proposed substation, therefore reducing the overall footprint of the GB Onshore Scheme and the potential for disturbance of additional receptors within the area.

Installation of the Proposed AC Cables

2.62 If installed underground, the proposed AC cables will be installed in a similar way to the proposed DC cables – with all six cables either being installed in one or two trenches, or pulled through pre-installed ducts where necessary. Should the proposed AC cables be installed above ground these will be installed as six individual GIL tubes, which may be installed alongside one-another, or on top of one-another to best fit the technical layout of the proposed converter station and proposed substation.

Operation of the Proposed AC Cables

2.63 Similar to the proposed DC cable route operational activity for the proposed AC cables would generally be limited to non-intrusive inspections and cable repairs. The latter would only be required in the unlikely event of a cable fault. Where a fault does occur the location of the fault would be identified and the faulty section of cable replaced. The activities involved in cable repair would be similar to those outlined above for installation albeit over a much smaller section.

Decommissioning of the Proposed AC Cables

2.64 In the event that the project ceases operation, the proposed AC cable would be decommissioned. Dependent on the prevailing requirements, the redundant cables would either be left in-situ or all parts of the cables could be removed for recycling. Where this is not possible, removed cables would be disposed of in accordance with the relevant waste disposal requirements at the time of decommissioning.

3. Approach to EIA

Introduction

3.1 This chapter describes the method which has been used to undertake the assessment of likely significant environmental effects resulting from the GB Onshore Scheme. It outlines the key stages of the assessment process and the approach undertaken to identify and evaluate the potential environmental effects resulting from the GB Onshore Scheme.

3.2 The GB Onshore Scheme has three distinct phases: construction and installation, operation (including maintenance and repair) and decommissioning. This EIA considers the impacts of the GB Onshore Scheme during construction and installation as well as operation.

3.3 Due to the proposed operational lifespan of 40 years for the GB Onshore Scheme, it is recognised that the future baseline and therefore surrounding receptors are likely to change, and the works associated with the decommissioning of the GB Onshore Scheme will be subject to the relevant planning and legislative requirements adopted at that time.

About EIA

3.4 EIA is the process of identifying, evaluating and mitigating the likely significant environmental effects of a proposed development such as those potentially occurring as a result of the construction and operation of the proposed GB Onshore Scheme. Through the early identification and evaluation of the likely significant environmental effects of a proposed development, EIA enables appropriate mitigation (that is measures to avoid, reduce or offset significant adverse effects) to be identified and incorporated into the proposed development's design. EIA may also identify and specify other commitments to be made to environmentally sensitive construction methods and practices.

3.5 The EIA of the proposed GB Onshore Scheme has been undertaken in parallel with the development of the design thereby maximising opportunities to mitigate likely significant effects as they have been identified. This approach ensures mitigation is embedded in the design and forms an integral component of it.

3.6 The results of the EIA also ensure that decision makers, such as the Local Planning Authority (LPA), statutory consultees and other interested parties (including local communities) are aware of a proposed development's potential environmental impacts. Judgments can then be made as to whether impacts may be significant or not via the determination process for planning permission.

3.7 As described in Chapter 01 Introduction, in the case of the proposed GB Onshore Scheme the results of the EIA have been described within the wider ES which accompanies an application for outline planning permission to Medway Council. The results of the EIA have been reported such that Medway Council are aware of the likely significant effects of the proposed GB Onshore Scheme.

The Need for EIA of the GB Onshore Scheme

Underground AC and DC Cables, Converter Station and Substation

3.8 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (EIA Regulations) apply to applications for planning permission made under the Town and Country Planning Act 1990. It sets out two schedules of development (which are derived from Annex I and II of the amended EU 2011/92/EU (the 'Directive') on the assessment of the effects of certain public and private projects on the environment):

- Schedule 1 Development: EIA is mandatory for developments of a type referred to in Schedule 1. Such developments are considered to be "EIA development".

- Schedule 2 Development: EIA is not mandatory for developments of a type referred to in Schedule 2. Such developments may be "EIA development" only where they are considered likely to have significant effects on the environment by virtue of factors such as their nature, size or location.

3.9 There is no reference to interconnector projects or the components they comprise (e.g. converter stations, underground or submarine cables) in Schedule 1 of the EIA Regulations. Whilst the OHL works will be undertaken by NGET, for completeness consideration has also been given to whether or not these works would constitute EIA development. The construction of "overhead electrical power lines" is referenced within Schedule 1 of the EIA Regulations however the temporary diversion of the existing 400 kV OHL, and the proposed new connection between the substation and the adjacent lattice tower are below the 15 km length criteria. Therefore, EIA is not mandatory for the GB Onshore Scheme as per the EIA Regulations.

3.10 Similarly there is no reference to interconnector projects or the components that they comprise (e.g. converter stations, underground or submarine cables) in Schedule 2 of the EIA Regulations.

3.11 A request for an EIA Screening Opinion (MC/18/3363) was submitted to Medway Council the 20th November 2018 which provided an outline assessment of the likely significant environmental effects of the GB Onshore Scheme. In Medway Council's response dated the 20th December 2018 it was stated that an EIA would be required for any subsequent planning application on account of the proposal to install the DC cable within the ecologically-sensitive intertidal zone.

OHL Works

3.12 To facilitate the connection of the interconnector to the existing NETS, modifications to the existing OHL will be required. The modification works are not confirmed yet and will be subject to detailed design, however, they are likely to include:

- a new 50 m tall lattice tower immediately north of the proposed substation;
- down leads from the new tower to the proposed substation;
- down leads from the new tower to the proposed cable sealing end compound; and
- approx. 200 m long underground AC cable route between the proposed cable sealing end compound and the proposed substation.

Temporary Diversion

3.13 A temporary diversion to the existing overhead line may be required to accommodate the GB Onshore Scheme. The temporary diversion works will be undertaken by NGET and, subject to detailed design, it is hoped that these works will be undertaken in accordance with the exemptions to the requirement for section 37 consent under Regulation 3 of the Overhead Lines (Exemption) (England and Wales) Regulations 2009 (the 'Exemption Regulations'). The distance between the towers is 772 m, where the exemption is subject to a maximum distance of 850 m, and therefore the exemption applies if the diversion is not in place for more than six months.

3.14 For the purpose of this EIA the temporary diversion will be included within the assessment of cumulative effects as part of this EIA as assumed development.

Substation to New OHL Tower Connection

3.15 In respect of the new connection between the substation and new OHL tower (likely to be down leads connecting the cable sealing end compound to the tower), these will also likely be delivered by NGET. A section 37 consent would not be required provided that the electric line will be on premises which is (or will be) in the Applicant's or NGET's occupation or control (as provided for by section 37(2) of the Electricity Act 1989). The Applicant has an option over the land, and the Applicant or NGET will have occupation or control of the land.

3.16 As per the OHL works and the temporary diversion, for the purposes of the EIA of the GB Onshore Scheme these works are included within the cumulative assessment as assumed development.

Consultation & Stakeholder Engagement

3.17 As noted above, in November 2018 a Screening Opinion request was submitted to Medway Council as to whether or not an EIA was required. Medway Council were also asked to provide comment on the proposed technical or specialist assessments that would inform the design and accompany the subsequent planning application. The Screening Opinion request identified those aspects of the environment which were considered likely to be significantly affected by the proposed GB Onshore Scheme and the approach to the identification and assessment of those effects. It also scoped out those aspects of the environment which were considered unlikely to be significantly affected.

3.18 A simultaneous scoping exercise for associated technical assessments was undertaken during consultation with Medway Council and responsible authorities; consultation summaries are provided within the specialist technical assessment chapters where relevant.

3.19 Additional consultation has been undertaken throughout the development of the proposed GB Onshore Scheme and throughout the EIA informing the approaches to both baseline studies and assessment methods.

3.20 A public information event was held on 21st November 2018 during the development of the GB Onshore Scheme, with feedback helping to inform the design, such as the proposed DC cable route and the siting of the proposed converter station. Statutory and non-statutory consultees as well as members of the public provided feedback which helped to inform the selection of the proposed DC cable route and confirm the siting of the proposed converter station.

3.21 A further two pre-application consultation events were undertaken on the 20th and 22nd June 2019 to provide the local community and statutory and non-statutory consultees further information on the proposed GB Onshore Scheme initial design. Attendees provided feedback which helped to inform the design and appearance of the main structures. The approach to consultation with the community and a summary of the feedback that was received is provided in Appendix 3.B Statement of Community Involvement.

3.22 Technical specialists have also consulted with statutory and non-statutory authorities throughout the EIA process to inform approaches to specialist assessments including data requests, the scope of and approach to field surveys, assessment methods and details of other projects to be considered as part of cumulative assessments. The relevant technical chapters in the Environmental Statement summarise the topic-specific consultation which was undertaken and how it informed the scope of and/or approach to the EIA.

Approach to Environmental Impact Assessment

Overview

3.23 The assessment methodology follows a systematic approach in order to assess the potential impacts and subsequent effects of the GB Onshore Scheme on physical, biological and human receptors in a robust and transparent manner.

3.24 The GB Onshore Scheme aims to integrate environmental considerations into the design. Alternatives have been considered and assessed through desk studies and field surveys that have sought to avoid or reduce disturbance of known environmental constraints, where ever possible. The consideration of alternatives is discussed in further detail in Chapter four.

3.25 This ES aims to identify potentially significant adverse environmental effects and, if any, propose GB Onshore Scheme specific mitigation measures to avoid, reduce or offset adverse environmental effects or maximise environmental benefits. These can be incorporated into the configuration of the components of the GB Onshore Scheme.

Method of Environmental Impact Assessment

3.26 The EIA process involves the following main steps as presented in Figure 6:

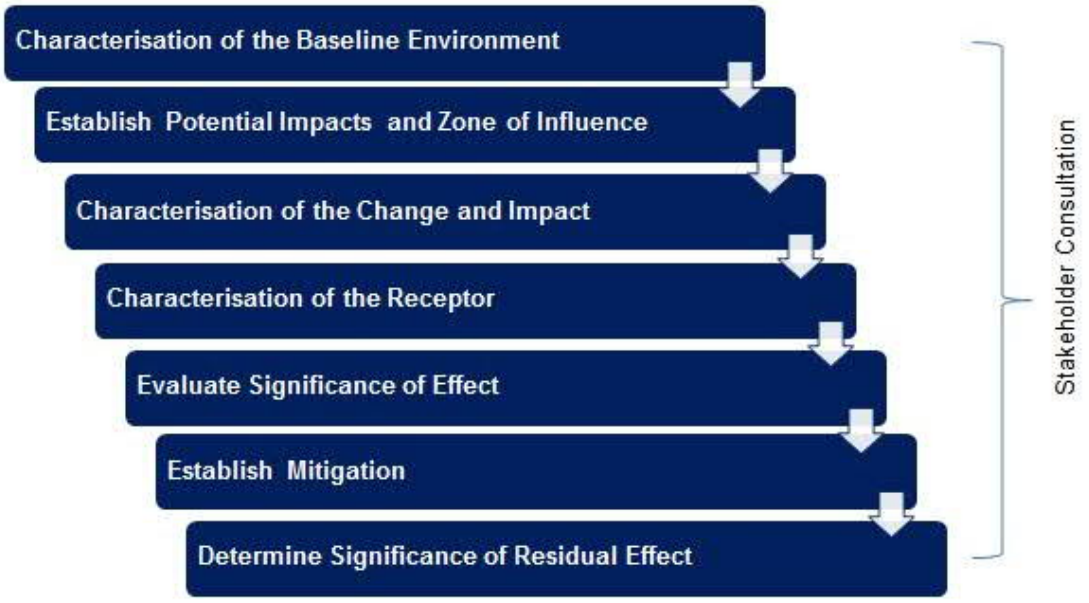


Figure 6 – EIA Process Summary

3.27 The steps are described in more detail below and are followed and presented within the receptor topic chapters of this report.

Characterisation of the Baseline Environment

3.28 In order to assess the potential impacts resulting from the GB Onshore Scheme, it is necessary to first establish the physical, biological and human conditions that currently exist along and within the vicinity of the proposed converter station and substation sites and DC cable corridors.

3.29 Appropriate understanding of the baseline for each environmental receptor has been achieved through some or all of the following:

- Review of primary baseline studies (field);
- Review of additional specialist baseline studies (desk-based);
- Detailed review of all secondary sources (i.e. existing documentation and literature);
- Stakeholder consultation.

3.30 The key data sources used to establish the baseline are described in each technical assessment chapter of the full ES. The following limitations or assumptions should be noted:

- Third party and publicly available information is correct at the time of publication.
- Baseline conditions are accurate at the time of physical surveys but due to the dynamic nature of the environment, conditions may change before or during the construction/installation and operation phases of the GB Onshore Scheme (although the effects of the natural variation are included in the assessment).

3.31 For each receptor topic, the baseline has been described at an extent relevant for their assessment between the cable sealing end compound location and Mean Low Water Spring (MLWS).

Establish Potential Impacts and Zone of Influence

3.32 The IEMA (2004) guidelines state:

"*The assessment stage of the EIA should follow a clear progression; from the characterisation of 'impact' to the assessment of the significance if the effects taking into account the evaluation of the sensitivity and value of the receptors*." (p11/2).

3.33 The prediction of potential impacts has been undertaken to determine what could happen to each environmental receptor as a consequence of the GB Onshore Scheme and its associated activities. The diverse range of potential impacts considered in the assessment process has resulted in a large range of prediction methods being used, including quantitative, semi-qualitative and qualitative. Potential impacts to be assessed are provided in each topic chapter of the full ES. The definitions used to describe impacts are presented in Table 3.1 below.

Table 3.1 Impact definitions

Term	Definition
Direct impact	Impacts that result from a direct interaction between the GB Onshore Scheme / GB Onshore Scheme activities and the receiving environment.
Indirect impact	Impacts on the environment, which are not a direct result of the GB Onshore Scheme / GB Onshore Scheme activities, often produced away from the activity or as a result of a complex pathway. For example, loss of existing screening vegetation resulting in the loss of visual amenity.
Cumulative impact	Impacts that result from incremental changes caused by other present or reasonably foreseeable actions together with the GB Onshore Scheme. Generally considered to be the same impact by from different projects e.g. construction traffic from two separate projects combining to affect the same network.
Beneficial impact	An impact that is considered to represent an improvement on the baseline condition or introduces a new desirable factor.
Adverse impact	An impact that is considered to represent an adverse change from the baseline condition or introduces a new undesirable factor.

3.34 For each potential impact, the 'Zone of Influence' (ZOI) – the spatial extent over which the activities are predicted to have an impact on the receiving environment – is established. This will vary for different activities and for the different stages of the GB Onshore Scheme (construction/installation, operation and decommissioning).

3.35 Establishing the ZOI for different activities and receptors has been undertaken quantitively where possible. Where necessary, it has been undertaken based on the GB Onshore Scheme description, project experience and literature reviews.

3.36 Potential for impacts on receptors which occur outside the ZOI and which cannot or are unlikely to travel into the zone can be screened out. Conversely, mobile species and other mobile receptors can travel into the ZOI, and may therefore be impacted by the GB Onshore Scheme.

3.37 The ZOI used in the assessment are described in the individual receptor topic chapters of this report. In some cases the ZOI only covers the GB Onshore Scheme site, in other cases, it extends further from project activities.

3.38 ZOIs have been considered for each potential impact on the receptor. Where a number of GB Onshore Scheme activities have the same impact, or the installation technique has not been determined, the largest ZoI has been applied.

Characterisation of the Change and Impact

3.39 In order to fully characterise an impact or level of change from baseline conditions, the parameters shown in Table 3.2 have been used to define the magnitude of change or the magnitude value for the impact based on the definitions provided in Table 3.2 and Table 3.3.

Table 3.2 Factors which determine the magnitude of an impact

Term	Definition
Scale of change	The scale of change refers to the degree of change to or from the baseline environment caused by the impact being described
Spatial extent	The extent of an impact is the full area over which the impact occurs

Term	Definition
Duration and frequency	The duration is the period within which the impact is expected to last prior to recovery or replacement of the feature. Frequency refers to how often the impact will occur

Table 3.3 Criteria for characterising the magnitude of an impact

Term	Definition
High	Long term (> 5 years) and/ or regional level loss; or major alteration to key elements/ features of the baseline condition such that post development character/ composition of the baseline will be fundamentally changed.
Medium	Medium term (1-5 years) loss and/ or local level change (greater than the GB Onshore Scheme footprint) or alteration to one or more key elements/ features of the baseline conditions such that post development character/ composition of the baseline condition will be materially changed.
Low	Short term (<1 year), site specific and/ or a minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material; the underlying character/ composition of the baseline condition will be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a "no change" situation.

Value of the Receptor

3.40 The value of a receptor or feature is characterised by the sensitivity, recoverability and importance of the receptor or feature (see Table 3.4). Characterisation of the receptor is achieved by balancing out these three considerations to determine the receptor's value.

Table 3.4 Factors which determine the value of the receptor

Term	Definition
Sensitivity	The sensitivity of the receptor relates to its vulnerability to change (including its capacity to accommodate change i.e. the tolerance/intolerance of the receptor to change).
Recoverability	The ability of the receptor to return to the baseline state before the GB Onshore Scheme impact caused the change.
Importance	The importance of the receptor or feature is a measure of the value assigned to that receptor based on biodiversity and ecosystem services, social value and economic value. Importance of the receptor is also defined within a geographical context, whether it is important internationally, nationally or locally.

Evaluate Significance of Effect

3.41 Having established the magnitude of change and the value of the receptor, the significance of the effect can be assessed using the significance matrix presented in Table 3.5.

Table 3.5 Significance matrix

		Magnitude of Change			
		Negligible	**Low**	**Medium**	**High**
Value of Receptor	**High**	Negligible	Moderate	Major	Major
	Medium	Negligible	Minor	Moderate	Major
	Low	Negligible	Negligible	Minor	Moderate
	Negligible	Negligible	Negligible	Negligible	Minor

3.42 The result of using this matrix approach is the assignment of the level of significance of the effect for all GB Onshore Scheme potential impacts. This is done prior to any mitigation.

3.43 Negligible or minor impacts are not considered to be significant.

Establish Mitigation

3.44 A standard hierarchical approach to identifying mitigation requirements has been used:

- Avoid or Prevent: in the first instance, mitigation should seek to avoid or prevent the adverse effect at source.
- Reduce: if the effect is unavoidable, mitigation measures should be implemented which seek to reduce the significance of the effect.
- Offset: If the effect can neither be avoided nor reduced, mitigation should seek to offset the effect through the implementation of compensatory mitigation.

3.45 Mitigation measures fall into two categories: mitigation by design which forms part of the GB Onshore Scheme design; and mitigation by practice which is part of the installation, operation and decommissioning of the GB Onshore Scheme.

Mitigation by Design

3.46 The GB Onshore Scheme has been developed through an iterative process which involved seeking to avoid or reduce potential environmental effects through location of the proposed converter station and substation and routeing of the marine cables. This was the first GB Onshore Scheme-specific step in mitigation potential effects by seeking to avoid or reduce environmental disturbance. Mitigation measures which form part of the initial design are an inherent part of the GB Onshore Scheme and are considered the 'base case' therefore they have not been included within the assessment. Following selection of the final site/ route to be considered for assessment, further mitigation measures by design have been identified and where applicable have been proposed within each of the topic chapters. GB Onshore Scheme specific mitigation by design may include, for example, micro routeing to avoid sensitive features identified during the assessment process.

Mitigation by Practice (Best or Good Practice)

3.47 Mitigation which helps reduce the likelihood or severity of potentially adverse environmental effects through measures implemented during installation, operation and decommissioning are referred to as 'mitigation by practice'. Such measures are often followed as a course of Best Practice or to comply with international statute. Within the topic chapters all proposed mitigation by practice measures have been recorded and referenced where applicable.

Determine Significance of Residual Effects

3.48 The significance assessment is repeated taking into consideration the application of Best Practice and GB Onshore Scheme specific mitigation measures. This determines whether there is likely to be a residual impact. When applied after mitigation, the resulting significance level is referred to as the residual significant effect. Tables within the topic chapters present the results of both assessments.

3.49 Residual effects as moderate or major after consideration of proposed mitigation measures will normally require additional analysis and consultation in order to discuss and possible further mitigate impacts where possible. Where further mitigation is not possible, a residual effect may remain.

Approach to Cumulative Effects Assessment

3.50 The term cumulative effects refer to effects upon receptors arising from the GB Onshore Scheme when considered alongside other plans and projects that result in an additive impact with any element of the project. Cumulative effects can be described as the net effect of both direct and indirect cumulative pressures, from different activities. An individual effect alone may be considered insignificant, but the additive effects of more than one effect, from any number of sources, could result in a significant cumulative effect, either beneficial or adverse.

3.51 Cumulative effect assessment identifies for each receptor, areas where the predicted effects of the GB Onshore Scheme could interact with effects arising from other projects, plans on the same receptor based on a spatial and/or temporal basis.

3.52 The cumulative effects assessment for the receptors is presented within each topic chapter of this report.

3.53 The convention on Environmental Impact Assessment in a Transboundary Context (UN, 1991) sets out the obligations of parties to assess the transboundary environmental effect of certain activities at an early stage of planning. It also lays down the general obligations of states to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental effect across boundaries.

3.54 It is anticipated that transboundary effects associated with the GB Onshore Scheme will be limited.

4. Results of the EIA

EIA Non-Technical Summary Structure

4.1 The following sections provide a summary of the results of each of the specialist assessments undertaken as part of the EIA for the GB Onshore Scheme. It is intended to:

- Highlight key sensitivities or receptors identified in undertaking baseline studies;
- Outline the key potential impacts of the proposed GB Onshore Scheme;
- Outline the key mitigation measures which the GB Onshore Scheme has committed to and;
- Provide a brief summary of the conclusion associated with the assessment.

4.2 This NTS is intended to provide a high-level summary of each specialist assessment undertaken as part of the GB Onshore Scheme EIA; for full details of each assessment, the full ES should be reviewed.

4.3 In order to provide this high-level summary, the structure of each specialist topic within this NTS is generally as follows:

- Overview
- Study Area and Baseline Summary
- Potential Impacts
- Mitigation
- Summary

4.4 The Cumulative Impact Assessment (CIA) summary section intentionally adopts a different structure; owing to its nature as a distinct theme and due to the complex process of CIA, only the summary, intra-project conclusions and inter-project conclusions are provided.

4.5 For purposes of brevity within this NTS, several aspects of each chapter have intentionally been omitted. This includes:

- The approach and method for each assessment;
- Details of any consultation undertaken;
- The full basis for the selected study area for each receptor;
- The approach to determining the specific value, sensitivity or significance of a receptors;
- The detailed baseline data which has been gathered to inform the assessment;
- Planning Policy, Applicable Legislation and the wider Regulatory Context;
- The residual impacts from the GB Onshore Scheme.

4.6 Each of these aspects are important parts of the EIA process and have been undertaken as part of the ES for the GB Onshore Scheme.

5. Landscape & Visual Amenity

Overview

5.1 The assessment considered the likely Landscape and Visual effects arising from the construction and operation of the proposed GB Onshore Scheme.

5.2 A detailed description of the GB Onshore Scheme and the Project Area is provided in Chapter 3, Proposed GB Onshore Scheme; the full assessment of Landscape and Visual Amenity can be found within Chapter 5 of the ES.

5.3 The scope of the landscape and visual assessment and methodology has been informed by and agreed through consultation with statutory stakeholders. In summary, the assessment included consideration of both the short term and long-term impacts in landscape character and landscape designations. The assessment also included changes in the visual amenity of residents or visits in the vicinity of the GB Onshore Scheme.

Study Area and Baseline Summary

5.4 The extent of the study area is determined by the potential visibility of the proposed GB Onshore Scheme in the surrounding landscape and is proportionate to its size and scale and the nature of the surrounding landscape. For the purposes of this assessment the study area has been defined by a combination of Zone of Theoretical Visibility (ZTV) analysis and professional judgement. The ZTV is shown on Figure 7 below.

5.5 Based upon the extent of visibility and professional judgement it is considered that it is highly unlikely that significant long-term residual landscape effects will be possible from further than 5 km from the Project Area boundary. The full ES provides further narrative and justification relating to this conclusion.

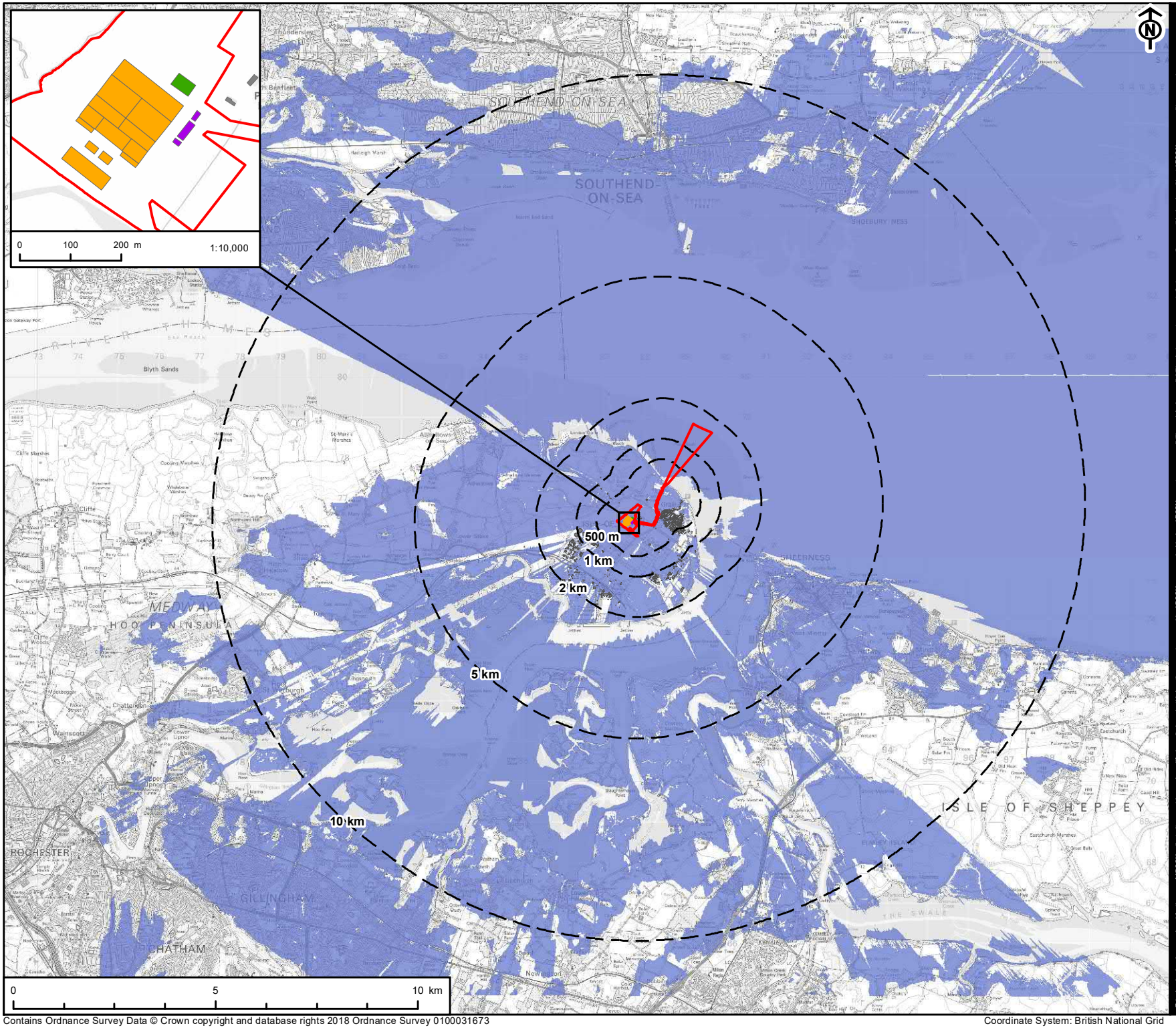
5.6 The landscape baseline analysis has identified several landscape receptors that have the potential to be significantly affected by the GB Onshore Scheme. The special qualities relevant to the North Kent Marshes Special Landscape Area (SLA) are embedded within the key characteristics of each of the relevant local Landscape Character Areas (LCAs). Some of the local LCAs-and the Sheppey Court Area of High Landscape Value-are highly unlikely to be significantly affected and have therefore been excluded from further assessment.

5.7 The landscape character areas considered for more detailed assessment include:

- Allhallows to Stoke Marshes;
- Hoo Peninsula Farmland;
- Lower Stoke Marshland;
- Industrial/Urban Area; and
- Chetney and Greenborough Marshes

5.8 A summary of impacts arising from the proposed GB Onshore Scheme follows; a full assessment on the extent and significance of impact on landscape character is considered within the ES.

Project Management Initials: DR Designer: LC Checked: AR Approved: RM



Scale @ A4 1:10,000

Coordinate System: British National Grid

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY
- Application Boundary
- Study Area
- Building - OS MasterMap
- Indicative Converter Station at 16m
- Indicative Converter Station at 26m
- Indicative Substation at 14m
- Indicative Converter Station / Substation Visible

NOTE:
Zone of Theoretical Visibility (ZTV) has been generated using Ordnance Survey Terrain 5 digital terrain model which does not take account of the screening effects of vegetation, buildings or other structures. Buildings from OS MasterMap within 2km have been incorporated into the DTM.

ZTV is based upon points taken every 10m around the edge and within the converter station and substation buildings on a levelled platform at 6m AOD using the following heights and an observer height of 1.6m:
Converter station - 16m / 26m
Substation - 14m

All heights mentioned are above ground level (AGL) unless otherwise specified.

The layout presented is indicative only and is subject to detailed design.

TITLE
FIGURE 7
ZONE OF THEORETICAL VISIBILITY
CONVERTER STATION AND SUBSTATION

REFERENCE
NC_191002_UKON_NTS_3_v1

SHEET NUMBER 1 of 1

DATE 02/10/19

Potential Impacts

Construction

5.9 Potential effects at the construction phase of the proposed converter station, substation and DC cable route would be most noticeable within the Allhallows to Stoke Marshes LCA which includes potential effects on the landscape fabric of the Project Area.

5.10 Construction activities would introduce several new elements into the landscape and the greatest potential for significant effects would primarily arise from the loss of existing landscape features and the visibility of construction activities associated with the proposed converter station and substation. Construction activities related to the DC cable route could also directly affect the existing fabric of the North Kent SLA including the coastal mudflats and marshland habitats.

5.11 The potential for temporary impacts on the landscape and visual resource of the study area may arise from the activities detailed in Chapter 3. Temporary impacts associated with the installation of the DC cable route would be experienced over one year whereas construction of the converter station and substation would be experienced within a three-year construction period. The main construction activities are summarised below:

- Preliminary works;
- Site establishment;
- Earthworks;
- Civil engineering works;
- Building works;
- Cable installation;
- Provision/ installation of permanent services;
- Mechanical and electrical works;
- Commissioning; and
- Site reinstatement and landscape works.

Operation

5.12 The potential for long-term, operational and permanent impacts on the landscape and visual resource of the study area may arise from the introduction of the converter station and substation. These are considered to be permanent features within the landscape and in views which would be apparent for the long-term.

5.13 The operational elements with the potential to affect the landscape and visual receptors within the study area include the permanent buildings, outdoor equipment and associated infrastructure. The greatest potential for significant effects on landscape and visual receptors would primarily arise from:

- Physical effects within the Project Area and direct effects on the landscape fabric of the Project Area and the Allhallows to Stoke Marshes LCA including the loss of characteristic landscape elements and the introduction of uncharacteristic elements;
- Effects on the character and setting of the North Kent Marshes SLA;
- The combination of all the project components could also affect the setting of the neighbouring character areas by appreciably extending the influence of the industrial complexes within the Hoo Peninsula and fragmenting the more scenic elements of the marshland landscape; and
- Visibility of the proposed converter station and substation which are likely to be prominent features on the skyline within the open flat and expansive marshland landscape from residential settlements and recreational routes.

5.14 Following installation of the proposed DC cables all areas of the DC cable will be reinstated. There would be no perceptible change to the landscape and visual receptors during operation and maintenance of the DC cables.

Decommissioning

5.15 The scale and nature of activities undertaken during decommissioning would be similar to those described previously for construction, however they would be temporary during the period of decommissioning activities on site. Following the removal of the structures and the reinstatement of the land there would be no further potential effects to the landscape and visual amenity.

Mitigation

5.16 The siting of the converter station and substation within the Project Area has been informed by the design development and assessment process. The location of the proposed converter station and substation has been located as close as possible alongside the existing industrial development at the National Grid Liquified Natural Gas (LNG) terminal and away from the majority of residential properties in Grain. The proposed siting and massing of converter station and substation alongside the existing industrial complexes and the proposed landscape reinstatement would improve the landscape fit and therefore reduce potential impacts on the setting of the North Kent Marshes SLA and Allhallows to Stoke Marshes LCA.

5.17 Appropriate boundary vegetation within the Project Area has been developed to improve the interface between the built edge of the converter station and substation and the transition to the adjacent marshland landscape. The combination of boundary vegetation on a slightly raised earth mound would also help to reduce the overall scale and mass of the proposed building façades. The proposed selection of scrub and wetland species has been developed in conjunction with ecologists and refers to the landscape character guidelines set out to improve and restore the characteristic feature of the Allhallows to Stoke Marshes LCA.

5.18 The proposed location and working width of the primary access road has been selected in part to minimise physical impacts on the Project Area and the immediate context. The proposed route and 5.5 m working width would be in keeping with the existing landscape pattern and layout with a simple connection to the B2001/ Grain Road.

5.19 The outline Landscape Plan has been developed to enhance the biodiversity found within the Project Area. The introduction of a SUDS detention basin, attenuation pond and swale each planted with marginal wetland species will create a green corridor and more complex vegetation structure and improve the biodiversity value within the Project Area.

Summary

5.20 The Landscape and Visual Impact Assessment (LVIA) considered the potential effects on the landscape and visual receptors at the construction phase, year one of operation and year 15 of operation from the GB Onshore Scheme.

5.21 The LVIA also assessed the likely significant cumulative effects of the GB Onshore Scheme when considered in combination with the cumulative schemes. Cumulative effects is a particularly important topic for the LVIA however, as with the other chapters, this is not included within the NTS for the purposes of brevity and is instead addressed fully within the ES.

5.22 In respect of effects on the landscape fabric and landscape character, the assessment found that significant effects during construction would be limited to the eastern edge of the Allhallows to Stoke Marshes LCA. Significant effects would arise from the loss of agricultural land as a result of construction activity at the proposed converter station and substation site as well as the DC cable route corridor. These effects would be short term during construction and there would be no physical change to the most distinctive landscape elements of the marshland. The landscape assessment concluded that there would be no significant effects at years one and 15 of operation. The assessment also concluded that the North Kent SLA would not be significantly affected.

5.23 In respect of visual amenity, of the nine viewpoints assessed during construction, visual receptors at three of the viewpoints would be significantly affected over the short term, with the furthest

viewpoint located 3.9 km from the Project Area. The source of significant effects was due to receptors of medium sensitivity where the scale and extent of construction activity would be a prominent addition within the overall composition of the view.

5.24 At year one of operation of the GB Onshore Scheme, the number of viewpoints significantly affected would be the same due to the scale and prominence of the proposed converter station and substation within close proximity views. At year 15 of operation of the GB Onshore Scheme, the number of viewpoints significantly affected would be reduced to one, at West lane. This finding relates to the establishment of landscape planting at the western edge of the Project Area which would reduce the prominence of the proposed converter station and substation over time.

5.25 The cumulative assessment concluded that there would be no significant cumulative effects on the landscape and visual receptors.

6. Ecology & Nature Conservation

Overview

6.1 The assessment considered the potential effects associated with the GB Onshore Scheme on Ecology and Nature Conservation. This includes nature conservation designations, priority habitats, protected species and invasive non-native species.

6.2 A detailed description of the GB Onshore Scheme and the Project Area is provided in Chapter 3, Proposed GB Onshore Scheme; the full assessment of Ecology and Nature Conservation can be found within Chapter 6 of the ES.

6.3 Consultation responses and scoping opinions were considered during the assessment and preparation of the ES. Where appropriate, consideration was also given to third-party projects and activities and specifically, to the potential for interaction between the GB Onshore Scheme and other projects resulting in cumulative effects.

Study Area and Baseline Summary

6.4 The Proposed Development area (the 'Site') is entirely within the boundary of Medway Council and is centred on the Isle of Grain located at the tip of the Hoo Peninsula between the Thames Estuary to the north and the Medway Estuary to the south.

6.5 The study areas used in the assessment were defined with reference to the likely zones of influence (ZoI) over which the GB Onshore Scheme may have potential to result in significant effects on relevant nature conservation features. The study areas also had regard to the precautionary principle to ensure sufficient data were gathered to meet worst case needs for impact assessment and ongoing design iterations.

6.6 It is important to recognise that the potential ZoI of the GB Onshore Scheme may vary over time (e.g. the construction zone of influence may differ from the operational zone of influence) and/ or depending on the individual sensitivities of different ecological features.

6.7 For the purpose of the assessment, the following study areas were used:

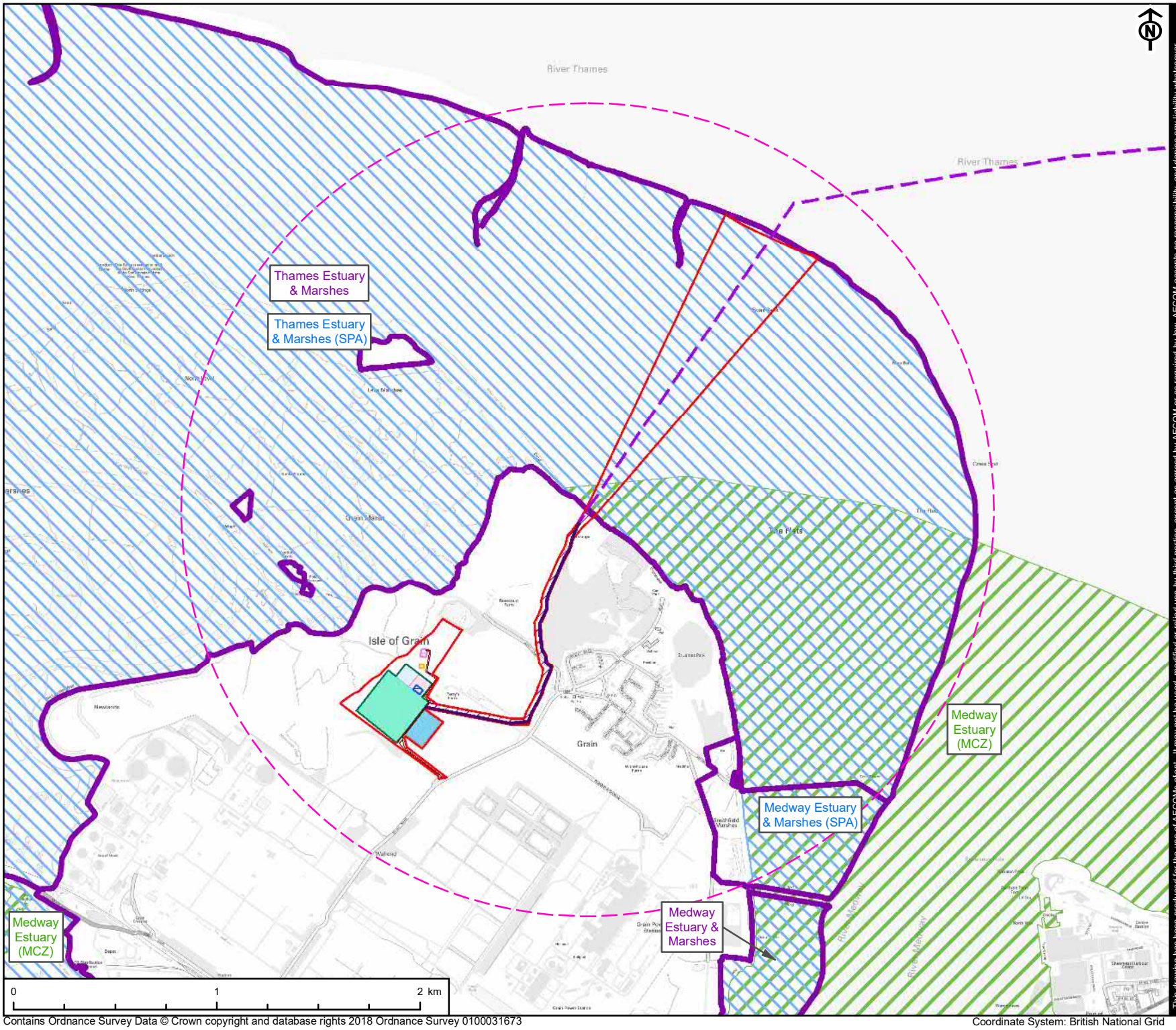
- up to 10 kilometres (km) from the Site boundary for all European statutory designated sites;
- up to 2 km from the Site boundary for all National statutory designated sites
- up to 2 km from the Site boundary for all non-statutory designated sites;
- up to 2 km from the Site boundary for records (within the last ten years) of protected/ notable species/ habitats;
- up to 50 metres (m) from the Site boundary for notable habitats;
- up to 50 m from the Site boundary for terrestrial and aquatic invertebrates;
- up to 50 m from the Site boundary for Badger *Meles meles*;
- up to 500 m from the Site boundary for Great Crested Newt *Triturus cristatus*;
- up to 100 m from the Site boundary for reptiles, Water Vole *Arvicola amphibius* and Otter *Lutra lutra*;
- up to 100 m from the Site boundary for bat roosts and notable foraging/ commuting habitat;
- up to 100 m from the Site boundary for breeding and wintering birds (although habitats within the Site boundary are given greater emphasis); and
- up to 500 m from the Site boundary for waterbirds using the intertidal areas.

6.8 There are seven statutory sites of International Importance within 10 km of the Site; they include Special Area of Conservation (SAC), SPA and Ramsar designations. There are three sites of

National Importance (two SSSI and one MCZ) designated for ecological reasons within 2 km of the Site. Ecologically designated sites are shown on Figure 8 below.

6.9 There are various other non-statutory, regional and local features within the study area; for the purposes of brevity within this NTS, they are not discussed here. Full details of these features and any specific considerations for them can be found within Chapter 6 of the full ES.

Project Management Initials: DR Designer: BF Checked: AB Approved: NG



Scale @ A4 1:25,000

Coordinate System: British National Grid

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY
- Application Boundary
- Indicative Location of:
- Offshore Cable Route
- Onshore DC Cable Route
- DC Cable Route - 30m Working Width
- Converter Station and Substation Platform - 2m Fence Line Security & Maintenance Corridor
- Access Road
- Converter Station Platform
- Substation Platform
- Construction Laydown Area
- Construction Laydown Area and Potential Substation Expansion Site
- National Grid Proposed Tower
- National Grid Proposed Sealing End Compound
- National Grid Proposed GIS Building (Maximum Parameters)
- Designated Sites
- Search area
- Special Protection Area (SPA)
- Ramsar
- Marine Conservation Zone (MCZ)

NOTE
The location of all components identified is indicative only, but is representative of the maximum parameters of each component. The GB Onshore Scheme is subject to detailed design.

TITLE
FIGURE 8
Designated sites within 2 km of the Site

REFERENCE
NC_191002_UKON_NTS_8_v1

SHEET NUMBER 1 of 1

DATE 02/10/19

Potential Impacts

6.10 Comprehensive 'screening' of ecological impacts was undertaken within the full ES for both construction and operational impacts. Again, for the purposes of brevity, the full screening matrices are not supplied within this NTS but can be found within Chapter 6 of the full ES.

Construction

6.11 The potential effects of construction relating to relevant ecological features which were subject to further assessment are summarised below:

- temporary loss of natural or semi-natural habitats; and
- temporary disturbance from noise or light pollution, human activity and vehicular movement.

6.12 Construction lighting, if night working is required, has the potential to disrupt breeding Marsh Harrier through light spill and glare if this falls onto reedbed habitat outside of the Site boundary. However, construction lighting will be temporary. Task-specific lighting may be used during darkness hours that occur within regular working hours (i.e. in the winter months), or during periods of low levels of natural light, but these will be outside of the breeding season for Marsh Harrier (typically March to August inclusive). It is considered unlikely that any light pollution would impact upon breeding Marsh Harrier during the day.

6.13 Lighting associated with construction of the proposed DC cable corridor is unlikely to have an adverse effect on Marsh Harriers and the magnitude of impact is very low and is assessed as a short-term neutral effect on breeding Marsh Harrier that is not significant.

Operation

6.14 There are no pathways for effects on species or designated sites during operation of the proposed DC cables and therefore will not be further assessed within the Ecological Impact Assessment (EcIA). There will be no loss of reedbed habitat used by breeding Marsh Harrier, during installation of the proposed DC cables. Therefore, there will be no effects of habitat loss on Marsh Harrier.

Decommissioning

6.15 Decommissioning and demolition impacts are likely to be similar to those during construction. It is anticipated that the existing protected species legislation would remain in place.

Mitigation

6.16 The development design, impact avoidance and reduction measures that have been, or will be, adopted include:

- Recognition that the design of the GB Onshore Scheme needs to deliver compliance with industry good practice and environmental protection legislation during both construction and operation e.g. prevention of surface and ground water pollution, fugitive dust management, noise prevention or amelioration.
- The preparation and implementation of a Construction and Environmental Management Plan (CEMP) to manage the environmental effects of the GB Onshore Scheme and to demonstrate compliance with environmental legislation. This will then be implemented by the selected construction contractor.
- Standard environmental best practice and mitigation would be implemented to ensure construction and operation of the GB Onshore Scheme complies with legislation relating to protected species. It would also aim to ensure the GB Onshore Scheme does not compromise the local conservation status of ecological receptors present within or in the vicinity of the GB Onshore Scheme. Where protected species licences are required, these would be obtained from Natural England sufficiently in advance of the works to meet with the optimum time for mitigation and to minimise any changes to the construction programme.

- Production of mitigation strategies for protected species and application for species licences for translocation of animals away from construction areas where required.
- Site vegetation clearance, to avoid incidental injuring or killing of reptiles would be undertaken in advance of construction and at an appropriate time of year;
- Wetland habitats supporting Water Vole (a legally protected species) will be avoided, where possible. Where avoidance is not possible, mitigation measures will be implemented in consideration of the legal status of the species.
- Any habitat removed from within the DC cable corridor will be restored, post-construction;
- The wetland habitats (lagoons) outside of the Application Boundary will be retained;
- Soft landscaping on Site will create diverse habitats for locally important species, using trees and shrubs of local provenance;
- Site vegetation clearance would aim to avoid the nesting bird period i.e. March to September (inclusive). Any vegetation clearance proposed outside of this time would be checked for the presence of any nest by a suitably qualified ornithologist, prior to removal. If active nests are found, then appropriate buffer zones would be put in place and the area monitored until the young birds have fledged.
- An outline Lighting Strategy will be prepared. Any lighting that is required for the construction and operation of the GB Onshore Scheme will be directed away from surrounding habitat to minimise light disturbance to off Site habitats.

6.17 Good practice precautionary mitigation measures are required on the grounds of animal welfare and to ensure works are undertaken in a manner that provides certainty of compliance with relevant legislation and these will be implemented as detailed within the relevant mitigation strategies. This is considered to be adopted and implemented through the CEMP adopted prior to and throughout the construction phase of the GB Onshore Scheme.

6.18 To limit disturbance to wintering populations of birds utilising the mudflats for foraging when food availability is scarce, works will be scheduled to avoid the wintering months and will be undertaken in summer only (March to September).

6.19 No further mitigation is determined to be required for the construction of the proposed GB Onshore Scheme and no pathways to effects on ecology are predicted during operation of the GB Onshore Scheme. No mitigation or enhancement measures are identified as required for the decommissioning and demolition phases.

6.20 The design process for the GB Onshore Scheme includes consideration of ecological constraints and has incorporated, where possible, measures to reduce the potential for adverse ecological effects in accordance with the 'mitigation hierarchy' and relevant planning policy. The measures identified and adopted include those that can realistically be expected to be applied as part of construction environmental best practice, or as a result of legislative requirements.

Summary

6.21 The Ecological Impact Assessment (EcIA) considered the potential effects associated with the GB Onshore Scheme on Ecology and Nature Conservation. It evaluated relevant ecological receptors (including nature conservation designations, priority habitats, protected species and invasive non-native species (INNS)) associated with the GB Onshore Scheme, with each being assigned a nature conservation value (sensitivity).

6.22 Thereafter, the GB Onshore Scheme's potential impacts and effects on ecological receptor conservation status, inter-relationships, and their contribution to local (and if appropriate regional and national) biodiversity were identified. The assessment takes into account impact avoidance design measures and management activities when determining the significance of potential effects.

6.23 The assessment found that the residual effects – those that will remain after the implementation of mitigation measures – and not significant during construction or operation of the GB Onshore

Scheme. Requirements for mitigation relating to potential effects are minimal and relate primarily to requirements to comply with good practice and relevant legislation.

7. Noise and Vibration

Overview

7.1 The assessment considered the effects associated with noise and vibration occurring as a result of the construction, operation and decommissioning of the GB Onshore Scheme.

7.2 A detailed description of the GB Onshore Scheme and the Project Area is provided in Chapter 3, Proposed GB Onshore Scheme. The full assessment of Noise and Vibration can be found within Chapter 7 of the ES.

7.3 The scope of the assessment was to identify the potential for significant effects to occur at Noise Sensitive Receptors (NSRs) due to the following:

- Noise and vibration impacts from construction and/or decommissioning works;
- Noise impacts from the operation of the converter station and substation; and
- Noise impacts associated with road traffic movements attributable to the construction activities.

7.4 No sources of significant vibration, DC cable noise or significant volumes of road traffic were anticipated to be associated with the operation of the GB Onshore Scheme. Therefore, assessments of operational vibration, operational noise from the proposed DC cables and operational road traffic noise were scoped out of the assessment. A full justification of this judgment can be found within Chapter 7 of the full ES.

Study Area and Baseline Summary

7.5 The extent of the study area was defined to include the nearest NSRs in each direction from the Project Area and alongside the transport corridors that may be affected by changes in road traffic flows during the construction of the GB Onshore Scheme.

7.6 The Project Area is situated within the centre of the Isle of Grain to the west of Grain, the main settlement in the vicinity. The land surrounding the Project Area is either in agricultural use or is brownfield. In addition to Grain there are several scattered residential properties to the north and east of the Project Area.

7.7 The identified NSRs were those nearest the Project Area i.e. the NSRs that will experience the highest level of sound from the GB Onshore Scheme. Although sound may be perceivable at other NSRs in the area, effects will not be significant if they are suitability controlled at the identified NSRs.

7.8 The nearest NSRs to the Project Area were selected for assessment, where the intention was to apply appropriate sound level data at each NSR location for assessment purposes. Sensitive NSRs that were considered in the assessment and underpinning monitoring locations are detailed fully within Chapter 7 of the ES.

Potential Impacts

Construction

7.9 The construction activities have the potential to result in temporary noise and vibration impacts at the closest NSRs to the works. The main construction activities are:

- Preliminary works;
- Site establishment;
- Earthworks;

- Civil engineering works;
- Building works;
- Cable installation;
- Provision/installation of permanent services;
- Mechanical and electrical works;
- Commissioning; and
- Site reinstatement and landscape works.

7.10 As no predictions have been performed, the significance of the construction noise effect on NSRs without mitigation cannot be conclusively stated. Typically, earthworks cause the greatest noise impacts at NSRs due to the requirement for large numbers of noisy plant for a relatively long duration. The earthworks associated with the construction of the proposed substation and converter station are likely to have the greatest impacts on the residential property at Perry's Farm due to its proximity to these locations.

7.11 Given the proximity of the proposed DC cable route to residential properties on Grain Road (18 m to the site boundary) there is the potential for high construction noise levels to occur at these properties whilst works are undertaken in close proximity; however these works are likely to be of relatively short duration.

7.12 The potential for temporary construction vibration impacts is dependent on the need for construction activities which are a potentially significant source of vibration, such as piling, ground improvement or compaction works.

7.13 Mobile plant is unlikely to give rise to high levels of ground borne vibration. Typically, the levels of ground borne vibration from tracked earth moving equipment (such as a bulldozer or excavator) are imperceptible to humans at a distance of approximately 20 m, and those generated by vehicles with rubber tyres (e.g. a heavy lorry or dump truck) would be imperceptible at more than 10 m from the haul road[1]. Mobile plant may occasionally come within 10 or 20 m of an identified sensitive NSR; hence vibration may be perceptible but is highly unlikely to be of a magnitude that would cause complaint. Worst-case effects from vibration caused by mobile plant are therefore anticipated to be not significant.

7.14 Construction traffic can have a temporary noise impact on sensitive NSRs located along existing roads used by these vehicles. The potential for such impacts is dependent on the volume and route of construction traffic.

7.15 During the construction phase there would be additional vehicle movements from staff and delivery HGVs accessing the site from the surrounding road network. These vehicles have the potential to increase noise levels at nearby NSRs. The routes these vehicles would take will be included within the outline CEMP and will be restricted to the major roads in the vicinity, which would help minimise the potential for significant adverse effects at NSRs.

Operation

7.16 Operational noise impacts were also considered fully within the ES. In line with the guidance in BS 4142: 2014, it is considered that the contextual assessment has shown that the effect of the operational noise impacts will be not significant irrespective of the initial conclusion of the BS 4142 assessment.

7.17 For the purposes of brevity, the full operational assessment and supporting matrices underpinning this conclusion are not attached within this NTS. The full results of this assessment can be found within Chapter 7 of the ES.

[1] D.J.Martin (1977). Ground Vibrations Caused by Road Construction Operations. Transport and Road Research Laboratory.

Decommissioning

7.18 Decommissioning noise and vibration effects are anticipated to be similar to those during construction. These should be assessed at the time when the works are proposed.

Mitigation

7.19 A CEMP will be prepared and implemented by the construction contractors. The final CEMP will include the relevant noise and vibration criteria, giving regard to applicable criteria established within the assessment, proposed surveys and a range of Best Practical Means (BPM) which are likely to include the following:

- Implementing processes to minimise noise before works begin and ensuring that BPM are being achieved throughout the construction programme, including the use of localised screening around significant noise producing plant and activities where appropriate;
- Ensuring that modern plant is used, complying with the latest European noise emission requirements. Selection of inherently quiet plant where possible;
- Use of lower noise piling (such as rotary bored or hydraulic jacking) rather than driven piling techniques if any piling is required, where possible;
- Off-site pre-fabrication, where practical;
- All plant and equipment being used for the works to be properly maintained, silenced where appropriate, operated to prevent excessive noise and switched off when not in use;
- Ensuring contractors are made familiar with current legislation and the guidance in BS 5228 which should form a prerequisite of their appointment;
- Loading and unloading of vehicles, dismantling of site equipment such as scaffolding or moving equipment or materials around the Project Area to be conducted in such a manner as to minimise noise generation;
- Consultation with MC and local residents as appropriate to advise of potential noisy works that are due to take place; and
- Monitoring of any noise complaints and reporting to the contractor for immediate investigation.

7.20 Full details of these and additional mitigating measures is provided within the ES; given the extent of BPM and wider mitigation relating to Noise and Vibration, a comprehensive account is not included in the NTS for purposes of brevity.

Summary

7.21 The assessment considered the potential significant impacts from noise and vibration generated from the construction and operation of the GB Onshore Scheme. The assessment was based on existing noise levels monitored from various surrounding receptors, namely residential properties within close proximity to the Project Area.

7.22 From the assessment of the potential noise and vibration generated during construction, including noise generated by construction traffic, it was concluded that the potential impacts to adjacent residences would not be significant. This assessment was based on the adoption of ‘best practicable means’ of mitigation measures to control noise, which would be documented within a CEMP to ensure Contractor compliance. A project route map and delivery schedule would also be required to control construction traffic, in line with active onsite management of access points.

7.23 Noise emissions from operational activities will be considered during the detailed design, however the assessment concluded that the appropriate operational noise limits can readily be achieved at the nearest residential receptor, and therefore operational impacts will not be significant.

8. Archaeology & Cultural Heritage

Overview

8.1 The assessment considered the likely significant effects on Cultural Heritage as a result of the components of NeuConnect proposed on the Isle of Grain, Kent, (hereafter referred to as the 'GB Onshore Scheme').

8.2 A detailed description of the GB Onshore Scheme and the Project Area is provided in Chapter 3, Proposed GB Onshore Scheme; the full assessment of Archaeology and Cultural Heritage can be found within Chapter 8 of the ES.

Study Area and Baseline Summary

8.3 For designated assets (World Heritage Sites, Scheduled Monuments, Listed Buildings, Conservation Areas, Registered Parks and Gardens, Registered Battlefields), a 1 km Study Area around the Site was applied. The Study Area ensured that designated heritage assets were identified to a sufficient distance to anticipate or identify any likely changes to their setting. Given the low-lying location of the Site, the Study Area was extended to the west to take in the villages of Allhallows and Lower Stoke, which are located on higher ground.

8.4 For non-designated assets (archaeological sites, findspots, locally Listed Buildings and other non-designated buildings) a search of 3 km was used to obtain data from the Kent Historic Environment Record (KHER) and the Kent Archives.

8.5 Intertidal heritage assets located within the application boundary between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS) have been identified in a cultural heritage Desk Based Assessment (DBA) intended for the offshore aspect of the Scheme (GB Offshore Scheme ES Chapter 16)). These assets are referred to and cross referenced in this chapter where relevant but are assessed as part of the 'GB Offshore Scheme'.

8.6 A baseline summary is provided below. A full and detailed description of the baseline conditions within the Site and surrounding Study Area is provided within Chapter 7 of the full ES; it is supported by the full DBA which again is available within the ES. In summary, the baseline assets considered:

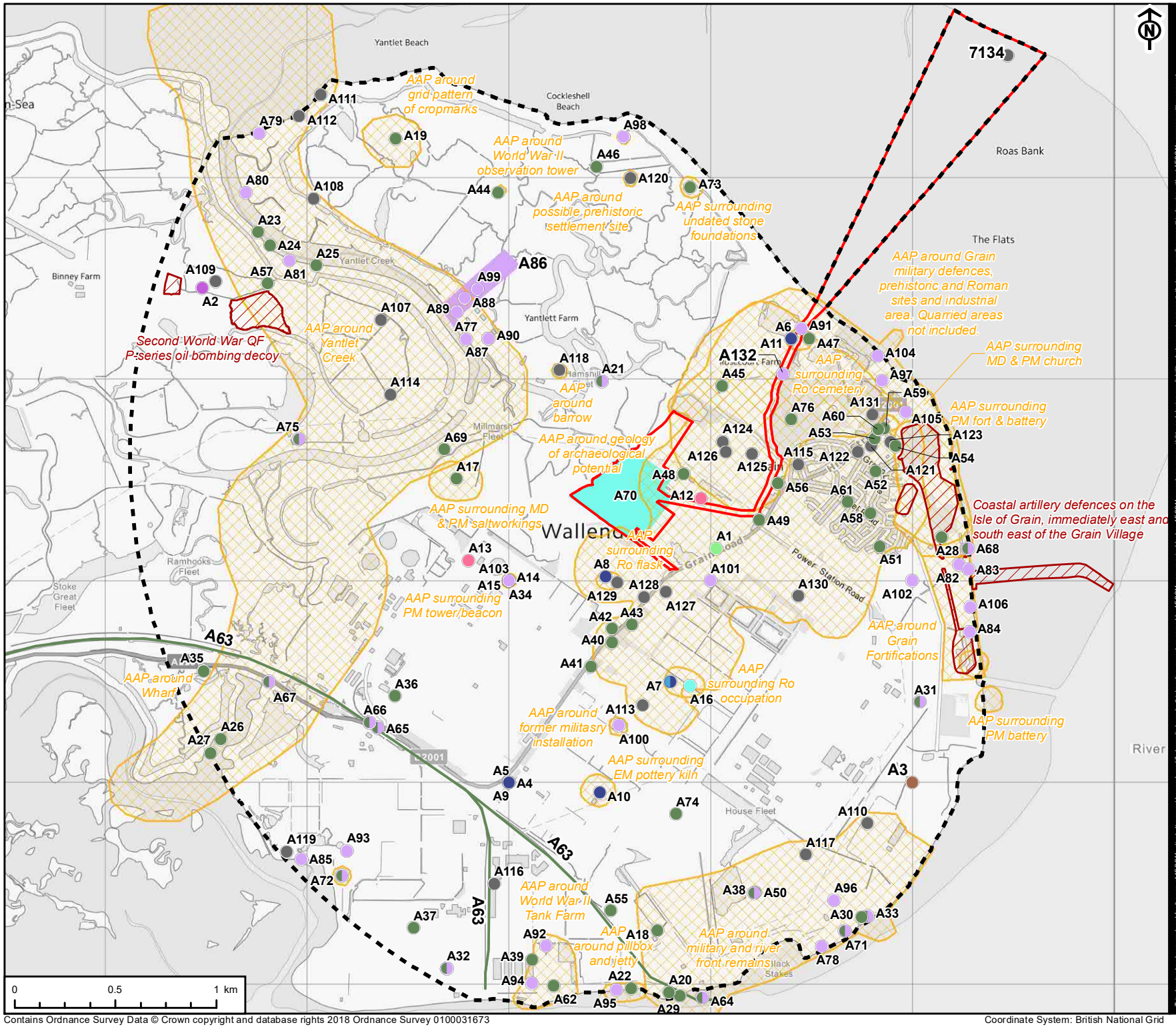
- The topography and geology of the Site (Cultural Heritage DBA section 4.1);
- The designated and non-designated heritage assets within the Site and Study Area (Cultural Heritage DBA sections 4.2, 4.3, and 4.4);
- The historic development of the Site and Study Area (Cultural Heritage DBA section 4.4);
- The historic landscape character within the wider area and features of the historic landscape within the Site (Cultural Heritage DBA section 4.5);
- The significance of the known designated and non-designated heritage assets within the Site and Study Area (Cultural Heritage DBA section 5.1 and 5.2);
- The potential for the survival of previously unknown archaeological remains within the Site and their heritage significance (value) (Cultural Heritage DBA section 5.3); and
- The character of the historic landscape and its sensitivity to change within the Site (Cultural Heritage DBA section 5.4).

8.7 Figure 9 below depicts the study area and these features.

8.8 There are no World Heritage Sites, Scheduled Monuments, Registered Battlefield or Registered Parks and Gardens within the Site. Two Scheduled Monuments, one grade I listed and two grade II Listed Buildings (Figure 10) are located in the Study Area. A further two Listed Buildings, one grade I and one grade II, are located within the village of Allhallows approximately 4 km to the west of the Site.

8.9 Five non-designated archaeological assets have been identified within the application boundary, in addition to two Areas of Archaeological Potential (AAP) as shown on Figure 9. These non-designated assets are archaeological in nature and date from the Iron Age to the post-medieval periods. The AAPs date to the Palaeolithic and the Iron Age and Roman periods respectively.

8.10 A further 143 non-designated assets lie within the Study Area, 11 of which are built heritage assets, while the remainder are archaeological; these features are assessed in full within Chapter 8 of the ES.



Contains Ordnance Survey Data © Crown copyright and database rights 2018 Ordnance Survey 0100031673

Coordinate System: British National Grid

Project Management Initials: DR Designer: SM Checked: LB Approved: TC

Scale @ A4 1:25,000

This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY
- Application Boundary
- Heritage Study Area
- Area of Archaeological Potential (AAP)
- Scheduled Monument

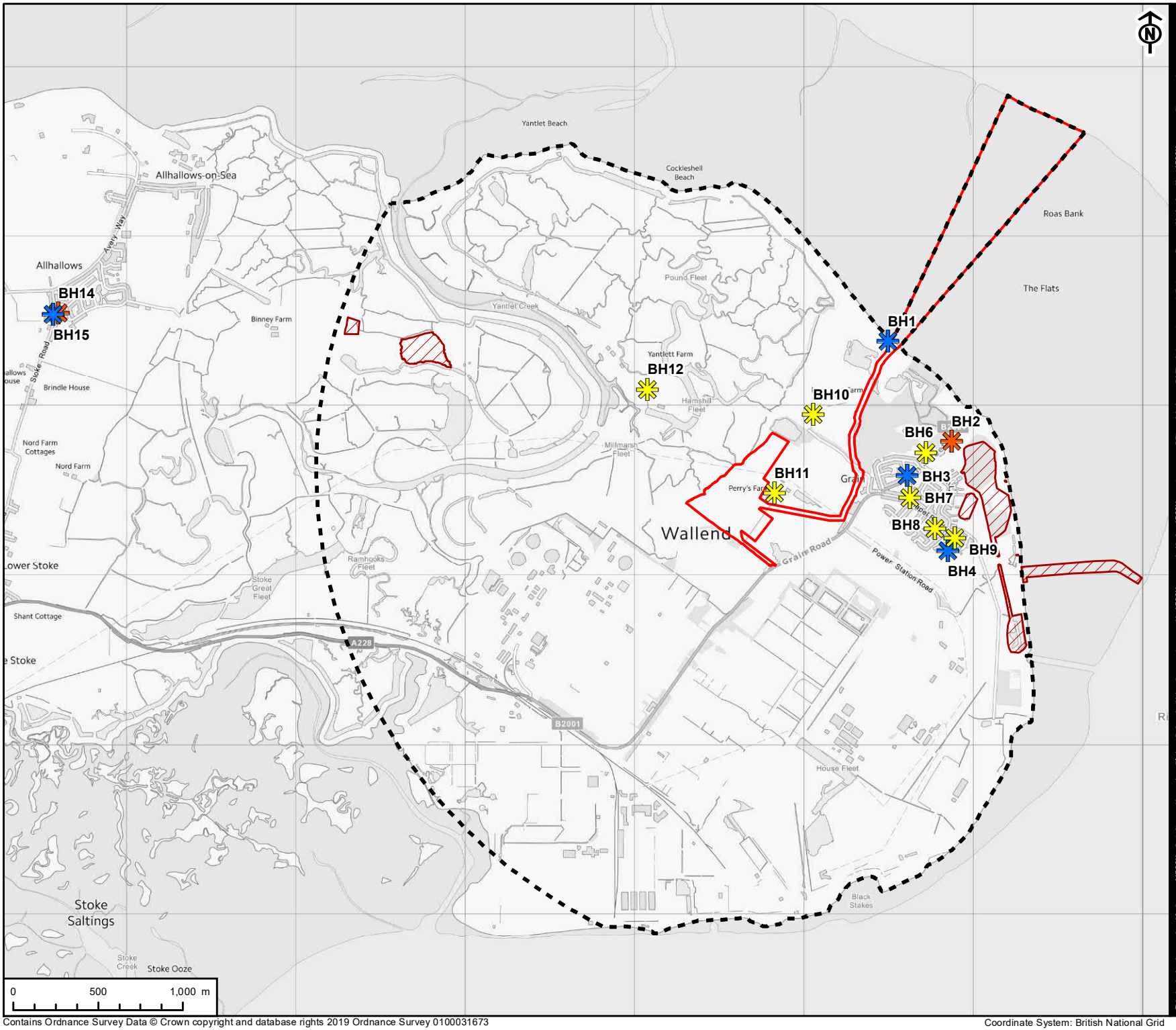
Archaeological Assets
- Palaeolithic
- Lower Palaeolithic
- Neolithic
- Iron Age
- Iron Age to Roman
- Roman
- Early Medieval
- Medieval
- Post-medieval
- Post-medieval to Modern
- Modern
- Unknown
- Post-medieval
- Medieval
- Modern

TITLE
FIGURE 9
ARCHAEOLOGICAL ASSETS

REFERENCE
NC_191002_NTS_9_v1

SHEET NUMBER
1 of 1

DATE
02/10/19



Contains Ordnance Survey Data © Crown copyright and database rights 2019 Ordnance Survey 0100031673

Coordinate System: British National Grid

Project Management Initials: DR Designer: LC Checked: TC Approved: DR

Scale @ A4 1:30,000

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY
- Application Boundary
- Heritage Study Area
- Scheduled Monument

Built Heritage Assets
- Grade I Listed Building
- Grade II Listed Building
- Non-designated Heritage Asset

TITLE
FIGURE 10
BUILT HERITAGE ASSETS

REFERENCE
NC_191002_UKON_NTS_10_v1

SHEET NUMBER
1 of 1

DATE
02/10/19

Potential Impacts

Construction

8.11 Construction of the converter station will entail the following activities which may impact the cultural heritage resource outlined above:

- The construction of access roads, which are expected to be topsoil stripped to a depth of 0.4 m below surface;
- The establishment of temporary facilities including site offices, lay down and storage areas and welfare facilities, development of electricity and water supplies, erection of security fencing or hoarding and implementation of external lighting for security. Approximately 1.5 ha will be required for the construction compound, laydown, and storage areas, which are expected to be stripped of topsoil to a depth of approximately 0.4 m below surface;
- The levelling and land re-profiling in order to establish a level platform on which the proposed converter station will be constructed. The areas are expected to be levelled to a depth of approximately 5.8 m above Ordnance Datum (AOD);
- The construction of a converter station approximately 250 m by 250 m (or up to 5 ha) with a maximum height of approximately 26 m. The layout of this zone is still in the design stages but is expected to include a DC switch hall, valve halls, a control building, cooling fans, transformers, Alternating Current (AC) switchyard, diesel backup generator, and a spare parts building. Some of these structures will be placed on piled foundations;
- The installation of an AC cable route from the substation to the converter station, which may be either above or below ground. For this assessment it is assumed to be underground and laid within a trench 1 m wide and 1.5 m deep; and
- The excavation of an attenuation pond approximately 1.1 ha in size and a smaller overflow pond approximately 0.3 ha in size connected by a swale/ channel. The larger pond is expected to extend to a depth of approximately 2 m below surface.

8.12 Construction of the substation would entail the following activities which may impact the cultural heritage resource outlined above:

- Preliminary works, which would include utilities diversions as necessary;
- The establishment of a lay down and storage areas of approximately 0.64 ha would be required, which is expected to be stripped of topsoil to a depth of approximately 0.4 m below surface;
- The levelling and land re-profiling in order to establish a level platform on which the proposed substation would be constructed. The areas are expected to be levelled to a depth of approximately 5.8 m AOD;
- The construction of a new substation approximately 80 metres (m) by 80 m (or up to 0.64 ha) with a maximum height of approximately 14 m and which may be placed on piled foundations.

8.13 Construction of the proposed DC cable route would entail the following activities which may impact the cultural heritage resource outlined above:

- An underground DC cable route from the converter station to the landfall point, and through the intertidal area to MLWS (overlapping with the subsea DC cable between MHWS and MLWS). The 30 m easement is expected to be topsoil stripped to approximately 0.4 m depth and the cable is expected to be placed in an open cut trench 1 m wide and 1.5 m deep;
- The construction of a concrete pad (TJP) of 15 m by 5 m where the subsea cable and onshore underground cables meet, which will be excavated to a depth yet to be determined;
- The laying of buried concrete pads 15 m by 5 m placed every 800 m to connect the cables. These areas will be excavated to a depth of 1.5 m;
- Three open-cut trenches approximately 800 m in length to carry the subsea DC cables and optic cable from the last breakout point in the mid-intertidal area to MHWS.

8.14 A detailed assessment of the potential for these impacts to effect local receptors is provided within Chapter 8 of the full ES; given the extent of analysis carried out, for the purposes of brevity within this NTS, it is not included here.

Operation

8.15 Effects once the GB Onshore Scheme is complete and occupied comprise operational effects arising from the presence of permanent structures, enclosing security palisade, maintenance activities, road traffic, and lighting. The Site is expected to be in operation for approximately 40 years prior to decommissioning.

8.16 All physical impacts on the archaeological resource will occur during the construction stage of the GB Onshore Scheme. Therefore, it is considered that there would be no additional impacts to the archaeological resource once the GB Onshore Scheme is operational.

Decommissioning

8.17 The scale and nature of activities undertaken during decommissioning would be similar to those described previously for the construction phase, however they would only be temporary over the period of activities on site and would not extend beyond the footprint and depth of the existing structures.

Mitigation

8.18 Typical appropriate measures that may be employed to achieve preservation by record of any surviving archaeological remains are summarised below.

8.19 The first stage of investigation would be archaeological monitoring of any new geotechnical investigations in order to understand the nature of the made ground and magnitude of previous ground disturbance. This would be particularly relevant along the proposed DC cable route to clarify the extent of gravel extraction activities and determine whether there is any potential for undisturbed archaeological deposits to have survived. The result of this monitoring would be used to inform the need for further archaeological evaluation in the form of targeted trial trenching evaluation within the area of impact.

8.20 Archaeological trial trench evaluation would be targeted to investigate areas of proposed ground disturbance resulting from topsoil stripping and areas of intrusive excavation of the underlying surficial deposits. Areas of topsoil stripping would be investigated to determine the presence/ absence and extent of any surviving archaeological remains dating to the Iron Age, Roman, medieval, post-medieval, or modern periods cutting into the underlying superficial deposits, whereas areas of deeper excavation would be investigated to determine the presence/ absence of Palaeolithic material.

8.21 A programme of sample recovery and analysis undertaken to investigate palaeoenvironmental conditions and soil sediment development that may be relevant to the research of archaeological remains recovered within the vicinity. Achieved through trial pit excavations or other geotechnical soil sample retrieval methods (such as soil cores or boreholes).

8.22 A programme of observation, investigation and recording of archaeological remains during or alongside construction activities in which the contractor's preferred method of working would be controlled as necessary to allow archaeological recording to take place to the required standard.

8.23 A programme of observation, investigation and recording of archaeological remains during or alongside construction activities in which the contractor's preferred method of working would be controlled as necessary to allow archaeological recording to take place to the required standard.

8.24 A flexible programme of fieldwork, which is of particular value where the presence of archaeological remains is known but the extent of areas requiring archaeological excavation is unclear. Topsoil and overburden would be stripped under archaeological control, over a defined area, in order carefully to expose archaeological remains. This work will be undertaken prior to the main construction programme in order to allow sufficient time for archaeological recording. A

scope of work appropriate to record any archaeological remains exposed would be agreed on site during consultation with KCC archaeological officer and implemented immediately

8.25 Either targeted or sample-based investigation in which mechanical excavated trenches are excavated in order to establish the presence/absence, location, extent, and character of archaeological deposits or activity foci identified by non-intrusive baseline survey methods. Trial trenching would also inform the need for any further appropriate mitigation strategy. Trial trenching would also be applied to areas where no significant archaeological remains have been identified to control the risk to the construction programme and the risk for disturbing 'unforeseeable' finds.

8.26 Detailed Excavation would be undertaken where significant archaeological remains are either known previously or discovered during the course of the works. This may be targeted at specific area locations such as the sites of archaeological interest identified during the baseline assessment or identified as the result of a programme of trial trench evaluation or watching brief monitoring.

Summary

8.27 The cultural heritage assessment considered the potential impact of the GB Onshore Scheme on designated and local heritage assets and their setting during construction and operation; the assessment also considered the likely risk of disturbing previously unrecorded assets.

8.28 The GB Onshore Scheme would not affect any World Heritage Sites, Registered Battlefields, Registered Parks and Gardens or Scheduled Monuments. It will cause change to the settings of two Listed Buildings, and two non-designated built heritage assets. Furthermore, the GB Onshore Scheme would directly impact on five non-designated archaeological assets located within the Site and may impact on potential archaeological remains dating to the Palaeolithic, Iron Age, Roman, medieval, post-medieval, and modern periods.

8.29 The construction phase of the GB Onshore Scheme would have a temporary Minor adverse effect on the grade II listed World War II Anti-Tank Obstacles on the foreshore. The operational phase of the GB Onshore Scheme would have a Minor adverse effect on the Church of All Saints, Allhallows. Convention and professional judgement dictate that neither effect is significant.

8.30 The construction and operational phases of the GB Onshore Scheme would have Negligible to Minor adverse effects on the non-designated built heritage assets of Rosecourt Farm and Perry's Farm and Wilford's Farm. Convention and professional judgement dictate that these effects are not significant.

8.31 Five archaeological assets have been identified within the Site consisting of the remains of the post-medieval White Hall Farm, the remains of medieval ridge and furrow, the remains of a Second World War camp, and the remains of the a modern outfarm south of White Hall Farm. The fifth asset consists of a dipole anomaly of possible anthropogenic origin which is assessed in the GB Offshore Scheme ES (Chapter 16). It has also been determined that the Site holds a potential to contain Palaeolithic, Iron Age, Roman, medieval, post-medieval and modern remains ranging in value from negligible to high.

8.32 It has been established that the GB Onshore Scheme would result in the truncation and/ or removal of archaeological assets, resulting in, at most, a permanent major adverse effect to the archaeological resource which would be significant. It has been recommended that a staged program of archaeological investigations is undertaken to identify the extent and further assess the significance of known and potential archaeological remains within the Site.

9. Water Resources & Flood Risk

Overview

9.1 The assessment considered the potential effects of the GB Onshore Scheme on water resources and flood risk. It identified the likely impact risks and mitigation measures and/ or best practice measures that will be incorporated into the construction and operational phases of the GB Onshore Scheme in order to avoid, reduce or offset potential adverse effects, or enhance potential beneficial effects.

9.2 The potential impacts considered include those on hydrology and surface water resources that form part of the onshore environment to mean low water (MLW). Impacts on hydrogeology and groundwater are considered in Chapter 11: Ground Conditions. Impacts associated to receptors within the coastal and offshore waters are assessed within the GB Offshore Scheme Environmental Appraisal.

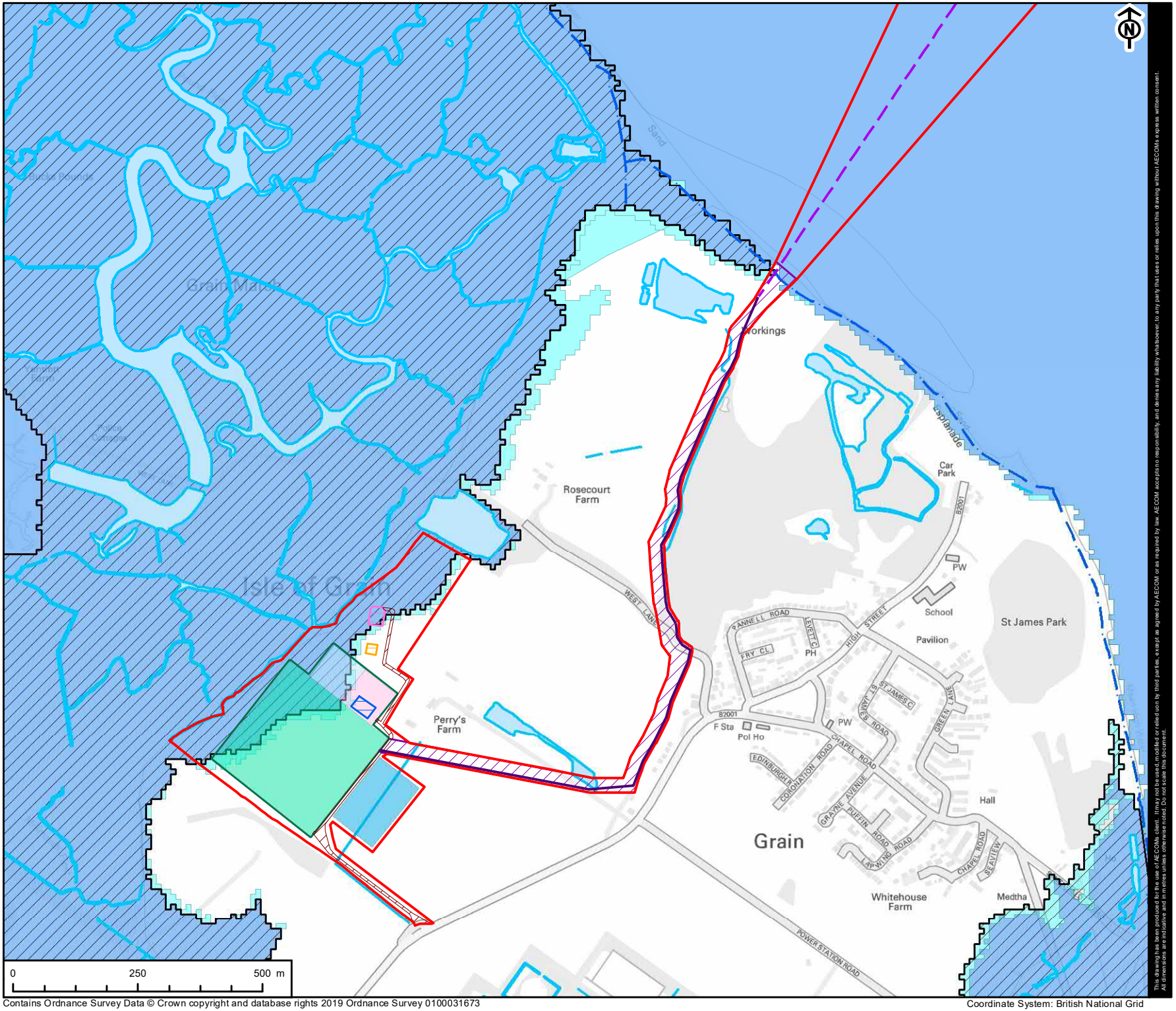
Study Area and Baseline Summary

9.3 The importance of receptors was identified from a review of Project Area and land uses within the surrounding area with respect to the vulnerability classifications as set out in the Planning Policy Guidance (PPG). With respect to flood defence and flood storage features, as is typical for EIA, the value of the receptor is based on the scale and type of development that is being protected.

9.4 There are several land drains and unnamed ponds within the Project Area, and a number of tidal creeks, ponds and ordinary watercourse to the west of the site within the Grain Marsh, including the Hamshill Fleet (ordinary watercourse) and Millmarsh Fleet (Main River).

9.5 These waterbodies are within the Medway Lower operational area. The Catchment Data Explorer identifies that none of these waterbodies have a designated WFD status. The Grain Marsh is a designated Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar site.

9.6 The importance of these and other receptors is considered fully within Chapter 9 of the ES. Given the variety and diversity of features in the study area, for the purposes of brevity, they are not detailed fully within the NTS. Figure 11 below depicts the study area and receptors of relevance to this topic.



Project Management Initials: DR Designer: LC Checked: SL Approved: TC

Scale @ A4 1:10,000

Coordinate System: British National Grid

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY
- Application Boundary
- Indicative Location of:
  - Offshore Cable Route
  - Onshore DC Cable Route
  - DC Cable Route - 30m Working Width
  - Converter Station and Substation Platform - 2m Fence Line Security & Maintenance Corridor
  - Access Road
  - Converter Station Platform
  - Substation Platform
  - Construction Laydown Area
  - Construction Laydown Area and Potential Substation Expansion Site
  - National Grid Proposed Tower
  - National Grid Proposed Sealing End Compound
  - National Grid Proposed GIS Building (Maximum Parameters)
- Surface Water (OS)
- Flood Defences
- Areas Benefiting from Flood Defences
- Flood Zone 3
- Flood Zone 2

NOTE
The location of all components identified is indicative only, but is representative of the maximum parameters of each component. The GB Onshore Scheme is subject to detailed design.

TITLE
FIGURE 11
WATER RESOURCES AND FLOOD RISK

REFERENCE
NC_191002_UKON_NTS_11_v1

SHEET NUMBER 1 of 1

DATE 02/10/19

Potential Impacts

Construction

9.7 The following potential impacts on water resources and flood risk during the construction phase have been identified:

- The proposed works include the installation of a cable beneath the natural embankment that forms the existing tidal flood defence line. The works may have the potential to increase the risk of tidal flooding.
- Processes during the construction phase may require significant volumes of water supply.
- Processes during the construction phase may generate significant volumes of wastewater.
- There is potential for machinery and construction works on the site to cause a disturbance of the ground leading to an increase in sediment runoff to surrounding surface water resources.
- Leakages and spillages from machinery during construction have the potential to result in pollutant pathways that may impact surrounding groundwater and surface water resources.
- Increased areas of hard standing across the site may alter surface water runoff rates and patterns to the Project Area and receiving Grain Marsh during the construction phase.
- Uncontrolled surface water runoff may lead to surface water flooding on the Project Area and surrounding area.
- There is a risk of flooding to the Project Area should significant amounts of groundwater be encountered during construction.
- The Project Area is partially located within an area that is at residual risk of tidal flooding; there is residual risk of tidal flooding to the GB Onshore Scheme.

9.8 For the purposes of brevity, construction impacts are only briefly referenced within this NTS but are fully assessed within Chapter 9 of the ES.

Operation

9.9 The following potential impacts on water resources and flood risk during the operational phase have been identified:

- The operation of the GB Onshore Scheme will not require the use of significant volumes of water, nor will it generate significant volumes of wastewater on account of the limited staff required for operation, therefore the site is unlikely to have significant impacts on water supply and wastewater generation.
- Increased areas of hard standing and modifications to land drains within the Project Area may alter surface water runoff rates and patterns to the Project Area and surrounding area.
- Uncontrolled surface water runoff may lead to surface water flooding on the Project Area and surrounding area.
- The GB Onshore Scheme is partially located within an area that is at residual risk of tidal flooding.

9.10 For the purposes of brevity, operational impacts are only briefly referenced within this NTS but are fully assessed within Chapter 9 of the ES.

Decommissioning

9.11 The potential effects during the decommissioning and demolition phase are very similar to those identified during the construction phase. The same mitigation measures will therefore be applied during the decommissioning and demolition phase.

Mitigation

9.12 Through the adoption of best practice construction methods, operational management, and design of the GB Onshore Scheme, there are several measures that will reduce the risk and hence likelihood that some potential impacts on water resources or flood risk would occur. Mitigation measures for the proposed converter station, substation and DC cable have been assessed collectively.

9.13 For construction related impacts, these measures will be developed, detailed and implemented via a Construction and Environmental Management Plan (CEMP).

9.14 During construction, the embankment along the coastline will be avoided by the use of horizontal directional drilling (HDD) construction methods (as opposed to trenching or cut and cover techniques) to drill underneath the defences. The depth of the defences and appropriate standoff distances will be agreed in consultation with the Environment Agency prior to the submission of a Flood Risk Activity Permit (FRAP) application and works being undertaken.

9.15 Processes during the construction phase that may require significant volumes of water supply include supply for washing down and potable water for sanitary facilities for site staff. The most intensive use of water, for the mixing of concrete, will be done off-site where possible and therefore will not affect water supply to the Project Area.

9.16 Water supply to the site during construction phase will be provided from the existing Southern Water sources, via an application to use an existing water supply for building purposes.

9.17 Wastewater generation on construction sites includes effluent from sanitary facilities provided on-site and from washing down and wheel wash facilities. It is expected that foul water generated at the Project Area will be drained via the existing combined sewers in the surrounding area, following treatment if required. If dewatering is required during excavations, then abstracted water may be discharged to the Southern Water network, following sediment removal.

9.18 As detailed in Appendix 9B, suitable construction phasing should be used to enable the SuDS features to be constructed at the beginning of the works. This would ensure that any rainfall events during construction of the substation and converter building would be intersected and attenuated by the SuDS before being discharged at a restricted rate into the agreed receiving waterbody.

9.19 It is proposed that surface water quality monitoring of the receiving waterbodies should be undertaken throughout construction to ensure any discharges from the works are not adversely impacting these waterbodies.

9.20 Should any negative impacts be identified such as water pollution, site drainage pathways will be immediately reviewed.

9.21 The following mitigation measures will be put in place and embedded within the CEMP:

- Development of an Erosion and Sediment Control Plan prior to execution of the project;
- Sufficient rumble pads will be provided at site access points to prevent tracking of sediments onto public roads;
- Sediment traps will be provided at downstream edges of site to treat runoff prior to it leaving site; and,
- Where possible, all runoff will be directed to the onsite sediment basin for treatment.

9.22 There is potential for hydraulic leaks from plant and machinery, as well as spills from chemical storages and sources such as concrete mixing to result in pollutant pathways to surrounding water resources.

9.23 In relation to leaks and spillages of contaminants, the following mitigation measures will be embedded within a CEMP to reduce the risk of leaks and spills:

- An emergency spillage action plan will be produced and included within the CEMP, which site staff will have read and understood, and will have been trained in its implementation on site;
- Any damage to the drainage network will be repaired as soon as practical;
- Any maintenance of plant and machinery will take place in a bunded impermeable area a minimum 20 m from any external drainage lines and the onsite waterbodies and those adjacent to the boundary;
- The majority of concrete used will be pre-mixed and delivered from an off-site source, thereby negating the need to mix concrete on-site and reducing the creation of alkaline wastewater. Any mixing and handling of wet concrete on-site will be undertaken in designated impermeable areas, away from any drainage channels or surface water; and,
- A designated impermeable area will be used for any washing down or equipment cleaning associated with concrete or cementing processes and wastewater will be discharged to the foul drainage system (with approval from Southern Water) or contained and removed by tanker to a suitable discharge location via a licensed waste operator.

9.24 Water requirements and wastewater generation during operation will be minimal; and will entail provision of sanitary facilities for a small team of onsite staff.

9.25 Should larger teams of site personnel be needed for periods of maintenance, temporary welfare facilities will be provided and suitable arrangements made at that time.

9.26 The proposed Drainage Strategy for the site is described in Appendix 9B and summarised below.

9.27 During operation, the GB Onshore Scheme will generate several storm and wastewater sources including process waste, foul waste from sanitary facilities and surface water runoff from buildings, car parks and landscaped areas. Process and foul water management will be addressed as information about the sources of these flows becomes available and the design progresses.

9.28 All surface water will be collected by rainwater pipes, gullies and linear drainage channels from all areas of hardstanding including building roofs, carparks and access roads. Runoff will be attenuated onsite by the proposed SuDS features, prior to being conveyed via swales to discharge at greenfield runoff rates to the agreed receiving waterbodies.

9.29 The total volume of storage required, to attenuate surface water runoff arising from the 100 year plus 20% climate change storm event, is approximately 6000 m^3.

9.30 Silt traps will be incorporated into the surface water pipe networks to intersect silt and sediment before runoff is attenuated within the SuDS features. Silt traps will require periodic maintenance to ensure they remain operational throughout the design life of the GB Onshore Scheme.

9.31 There is a residual risk of silts and sediments entering the SuDS features. However, the nature of the proposed SuDS will provide a treatment train and will trap potentially contaminated sediments within the vegetation, thus preventing the conveyance of silts and sediments into the receiving waterbodies

9.32 Oil separator units will be installed upstream of all attenuation systems on all drainage serving roads and yard areas, where potential hydrocarbon contamination could occur.

9.33 The proposed converter station and substation are located in the southwestern part of the Project Area, located away from the settlement of Grain and towards the existing industrial developments in the vicinity.

9.34 Correspondence with the Environment Agency included in the FRA Report has confirmed that proposed infrastructure associated with the convertor station and substation should be set above the flood level for the defended 0.5% AEP flood event, including climate change over the lifetime of the development. In this location, this corresponds to a flood level of 3.1 m AOD.

The platform for the converter station and substation will be set above this level including a suitable freeboard.

Summary

9.35 As part of the development of the design of the GB Onshore Scheme Sustainable Drainage Systems (SuDS) have been incorporated within the landscaping masterplan, including two attenuation basins connected via swales to collect runoff from the Project Area. These SuDS have been designed to accommodate increased runoff from the areas of hardstanding introduced to the area, and also compensation for some loss of flood storage capacity.

9.36 The phasing of construction activities will be managed to ensure that the SuDS measures are implemented at the beginning of construction to allow these measures to mitigate potential impacts from runoff. Further good practice measures will be embedded within the CEMP to avoid impacts from leaks and spillages of contaminants and sediment in runoff during construction, such as the use of rumble pads and sediment traps, and the use of hardstanding, bunded areas for the storage and use of potential contaminants.

9.37 A Flood Warning and Response Plan will be prepared prior to construction commencing detailing the planned response in the event of receiving a flood warning from the Environment Agency.

9.38 Based on the implementation of such mitigation measures there will be no significant residual effects during the construction of the GB Onshore Scheme.

9.39 No significant effects to water resources and flood risk are expected during the operation of the GB Onshore Scheme assuming a suitable Flood Warning and Evacuation Plan is established.

10. Transport & Access

Overview

10.1 The assessment considered the potential effects of the GB Onshore Scheme on transport and access. It identified the likely impact risks and mitigation measures and/ or best practice measures that will be incorporated into the construction and operational phases of the GB Onshore Scheme in order to avoid, reduce or offset potential adverse effects, or enhance potential beneficial effects.

10.2 Traffic and transport impacts are interrelated with Noise and Vibration impacts, and therefore reference should also be made to that section the Noise and Vibration section of this NTS and Chapter 7 of the full ES.

Study Area and Baseline Summary

10.3 The southern boundary lies adjacent to the B2001 Grain Road. The B2001 heads west, continuing into the A228 and is the only route along the along the Hoo Peninsula to the Isle of Grain, linking the site with Rochester, Chatham Docks and the A2/ M2 for onwards destinations. The following roads on the surrounding highway network were considered as part of the assessment:

- The B2001 Grain Road / High Street;
- The A228;
- Chapel Road;
- Power Station Road;
- The A289; and
- The M2 / A2.

10.4 Baseline traffic levels were established in order to quantify the magnitude of impact of the development traffic. Automatic Traffic Counters (ATC) and data obtained from the Department for Transport (DfT) were used to inform and define the baseline.

10.5 ATCs were placed on the B2001 Grain Road near the site access and recorded 24-hour traffic flows over a seven-day period. The surveys were initially conducted from the 1st November 2018 – 7th November 2018. ATC one and three were found to be faulty and were subsequently re-surveyed from the 9th November to the 15th November.

10.6 Collision Data was analysed to determine the presence of any underlying road safety issues on the surrounding highway network. STATS19 data obtained from ‘crashmap.co.uk’ for the most recent five-year period available was analysed within the study area covering the village of Grain and the B2001 continuing west along the A228 until Upper Stoke.

Potential Impacts

Construction

10.7 The prediction of construction effects focused on activities that could directly and indirectly impact on receptors within the defined study area. The ZoI includes those roads which may be utilised during construction, and upon which there is the potential for a significant impact.

10.8 The worst-case potential impacts of traffic are likely to be temporary in nature (e.g. the peak period of construction). Whilst traffic would be expected throughout the construction period, only the peak month for traffic has been assessed. This ensures that a robust worst-case traffic scenario is considered.

10.9 A number of impacts were specifically assessed:

- HGV construction traffic;
- Road Safety;
- Severance; and
- Pedestrian/ Cycle amenities.

10.10 The assessment of significance of each of the above elements has been assessed within Chapter 10 of the full ES. Owing to the level of detail in this assessment and the high-volume of supporting figures, it is not included within this NTS for the purpose of brevity.

Decommissioning

10.11 The effects during the decommissioning phase would be no worse than those presented in the construction assessment, as decommissioning would essentially be the reverse of the construction period.

Mitigation

10.12 By way of design mitigation, the permanent access road will provide access during the construction of the proposed development. As additional design mitigation, Highway improvements would also be included on the B2001 itself, with a right turn ghost island and acceleration/ deceleration lanes incorporated, designed in accordance with Design Manual for Road and Bridges (DMRB) (Ref 25-4) standards.

10.13 In order to minimise any effect relating to traffic and transport, several mitigation measures have been proposed. Mitigation would be committed and delivered through the outline Construction Traffic Management Plan (CTMP) which will be agreed prior to construction with Medway Council.

10.14 CTMP Mitigation relating to traffic movements associated with the proposed converter station, proposed DC cable route and permanent access road would be focused primarily on HGV traffic, as the additional car/ Light Goods Vehicle (LGV) trips will have a negligible impact on future traffic flows. However, the impacts of car/ LGV trips could also be mitigated through the encouragement of worker car share.

10.15 The CTMP will include the following:

- Location of site and the entry/ exit arrangements;
- Traffic routeing plans – defining the routes to be taken by HGVs to the site. For example, prioritising the use of A and B-roads as far as possible, avoidance of built-up areas and other sensitive locations;
- Construction hours and delivery times stipulated to best avoid peak periods;
- Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions, timing restrictions and where access is prohibited;
- Measures to protect the public highway (e.g. wheel wash facilities);

- Measures for the monitoring of the CTMP to ensure compliance from drivers and appropriate actions in the event of non-compliance;
- Mechanism for responding to traffic management issues arising during the works (including concerns raised from the public) including a joint consultation approach with relevant highways authorities;
- Details of traffic management requirements; and
- Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions (statutory limits: width, height, axle loading and gross weight), timing restrictions (if applicable) and where access is prohibited.

10.16 Control measures will include:

- All construction traffic to adhere to the Traffic Route Plans included in the CTMP;
- All vehicles will be able to access and egress the site in a forward gear, with sufficient room off the public highway to allow them to wait without blocking the main carriageway;
- Welfare facilities will be provided so as to minimise the need for off-site trips by staff during the working day;
- At all site accesses, suitable supervision will be provided as required to ensure that traffic is controlled at access points during construction (for example banksman checking road traffic and controlling construction vehicle movements) and mud deposits on the roads are minimised; and
- Where required, traffic signals (in accordance with New Roads and Street Works Act (NRSWA), (Ref 25-7) or stop-go boards will be used to control road traffic. Road signs will conform to Chapter 8 of TSRG (Traffic Signs Manual, Ref 25-8) and NRSWA.

10.17 In terms of road safety, whilst the majority of impacts are ‘Negligible’ or ‘Minor’, the access from the public highway at the B2001 would use Banksmen to manage the movement of HGVs on and off the public highway. Warning signage would be provided on the approaches to the access junction.

10.18 There would however be very few pedestrian/ cyclist movements expected as part of the construction phase of the development, which relates to the relatively low number of additional workers expected.

10.19 A Travel Plan would be introduced in order to encourage sustainable travel to the site. The Travel Plan would include measures such as; encouragement of car sharing and public transport usage, better marketing of information and implementation of a Travel Plan Co-ordinator. Where appropriate, a shuttle bus to transport workers to key interchange locations could be introduced.

10.20 The applicant will ensure, in line with NRSWA and any Section 278 Agreements with the Highway Authorities, that the Contractor maintains good communication with affected communities, keeping them informed about the timing and extent of activities which may affect them.

10.21 So far as practicable material will be retained on site including the retention of all soils and spoils, therefore minimising the need to move material on and off the site.

10.22 It is considered that with the implementation of the above measures, any minor effects on road users during the construction period will be reduced further. Where appropriate, HGVs would access and egress in a forward gear. At all accesses, warning signage will be provided on the approaches to the access junctions.

Summary

10.23 Access to the proposed converter station and substation will be via the B2001 Grain Road. An existing unnamed road runs west/ northwest from Grain Road along the southern boundary of the site, which is the preferred point of access during construction and operation of the GB Onshore Scheme.

10.24 Prediction of construction effects has focused on activities that could directly and indirectly impact on receptors within the defined study area. The ZoI includes those roads which may be utilised during construction, and upon which there is the potential for a significant impact.

10.25 The results of the assessments indicate that the impacts are likely to be not significant. However, some receptors experience an effect deemed 'moderate'. These concern Severance and Pedestrian facilities on Grain Road. These are not considered to be significant due to the lack of pedestrians or cyclists around to experience the effect brought on by the increase in HGV traffic.

11. Ground Conditions

Overview

11.1 The assessment considered the potential impacts from the construction and operation of the GB Onshore Scheme in relation to ground conditions; it included assessment of the potential for land contamination to impact upon the GB Onshore Scheme, or for contamination to be disturbed or caused by the GB Onshore Scheme.

11.2 A detailed description of the GB Onshore Scheme and the Project Area is provided in Chapter 03, Proposed GB Onshore Scheme; the full assessment of Ground Conditions can be found within Chapter 11 of the ES.

Study Area and Baseline Summary

11.3 The study area for the ground conditions assessment comprises the Project Area and an additional radial zone of 250 metres (m). A radial zone of 1 kilometre (km) is considered for groundwater, and surface water abstractions within the context of identifying potential receptors to any soil and/ or groundwater contamination and is herein referred to as the 'extended study area'.

11.4 This study area was deemed appropriate for the consideration of historical and current potentially contaminative land uses which may have resulted in contamination and is consistent with how study areas for ground conditions are defined with other schemes.

11.5 Establishment of the baseline environment has involved reference to existing data sources and consultation with statutory bodies and other organisations. Information has been obtained from the following sources:

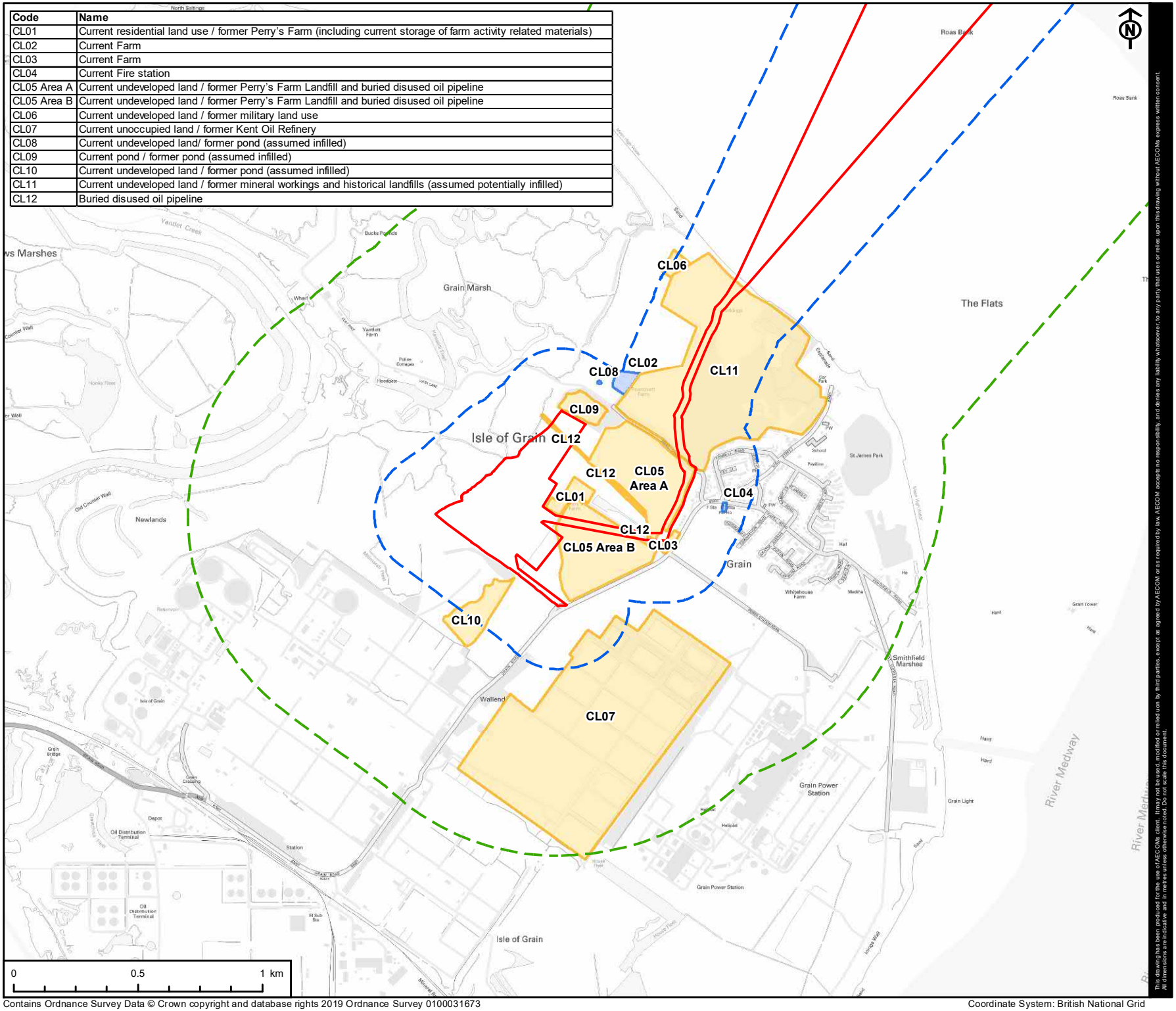
- BGS[2];
- DEFRA[3];
- Environment Agency[4];
- Landmark GIS Data[5];
- Natural England[6];
- Medway Council[7];
- GeoConservation website[8]; and
- Historical site investigation information pertinent to the ground conditions topic including any relevant information recorded in the Environmental Liability Desk Study.

11.6 Areas of land within and surrounding the Project Area are illustrated on Figure 12.

11.7 Given the range and diversity of considerations made as part of the baseline creation, full details are not provided within this NTS but can be found within Chapter 11 of the ES.

[2] British Geological Survey (BGS) (2019), https://www.bgs.ac.uk/.
[3] Department for Environment, Food and Rural Affairs (2019), https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs.
[4] Environment Agency (2019), https://www.gov.uk/government/organisations/environment-agency.
[5] Landmark Envirocheck Report (Order Number: 193022474_1_1, dated 5th February 2019).
[6] Natural England (2019), https://www.gov.uk/government/organisations/natural-england.
[7] Medway Council (2019), https://www.medway.gov.uk/.
[8] GeoConservation Kent (2019), https://www.geoconservationkent.org.uk/

Code	Name
CL01	Current residential land use / former Perry's Farm (including current storage of farm activity related materials)
CL02	Current Farm
CL03	Current Farm
CL04	Current Fire station
CL05 Area A	Current undeveloped land / former Perry's Farm Landfill and buried disused oil pipeline
CL05 Area B	Current undeveloped land / former Perry's Farm Landfill and buried disused oil pipeline
CL06	Current undeveloped land / former military land use
CL07	Current unoccupied land / former Kent Oil Refinery
CL08	Current undeveloped land/ former pond (assumed infilled)
CL09	Current pond / former pond (assumed infilled)
CL10	Current undeveloped land / former pond (assumed infilled)
CL11	Current undeveloped land / former mineral workings and historical landfills (assumed potentially infilled)
CL12	Buried disused oil pipeline



Project Management Initials: DR Designer: LC Checked: JOK Approved: DR

Scale @ A4 1:20,000

AECOM

PROJECT
NEUCONNECT

CLIENT
NeuConnect Britain Ltd.

KEY
Application Boundary
250m Study Area
1km Extended Study Area
Potential Sources of Land Contamination
Included in Risk and Impact Assessment
Excluded from Risk and Impact Assessment

TITLE
FIGURE 12
POTENTIAL CONTAMINATED LAND SITES

REFERENCE
NC_191002_UKON_NTS_12_v1

SHEET NUMBER 1 of 1

DATE 02/10/19

Coordinate System: British National Grid

Potential Impacts

Construction

11.8 Several activities will occur at the Project Area during the construction phase that have the potential to interact with the underlying ground conditions. These have been identified as:

- Soil stripping;
- Cut and fill earthworks;
- Excavations for foundations and ground works for the proposed substation, converter station and cable sealing end compound, drainage, utilities and AC cable route;
- Dewatering of excavations;
- Excavated materials management and soil storage; and
- Establishment of temporary construction compounds and the storage of hazardous materials within them for use in construction e.g. fuels and oils.

11.9 A comprehensive review of these and additional construction impacts is provided within the ES; for the purposes of brevity in this NTS, this is not included.

Operation

11.10 There are not expected to be any longer term operational or permanent impacts on ground conditions resulting from the operation of the proposed DC cable route. On completion, there will be limited permanent above ground infrastructure with the exception of cable marker posts at locations along the route and it is planned to restore the land and features that have been affected by the construction works to a condition suitable for its original use/ function.

11.11 In view of appropriate drainage solutions being implemented, no potential longer term, operational or permanent impacts on hydrogeological conditions associated within the proposed DC Cable Route have been identified.

11.12 There are not expected to be any operational risks from contaminated soil and groundwater to, or from, the proposed DC cable route.

Decommissioning

11.13 Decommissioning impacts are assumed to be similar to, but no worse than, the temporary impacts defined in the assessment of construction impacts on the basis of the similar nature of activities envisaged during construction and decommissioning

Mitigation

11.14 Mitigation by design has been a consideration since the early optioneering stages. Opportunities have been taken, where possible, to avoid potential ground constraints and in particular any areas of landfilling or potentially infilled ground in relation to the site selection for the proposed substation/ converter station and associated infrastructure.

11.15 Owing to the diverse range of mitigation proposed for this topic, a brief summary of some of the key mitigating measures is provided below:

- Chemical substances and hazardous materials will be stored in accordance with Environment Agency Pollution Prevention Guidance (withdrawn but widely considered good practice) and applicable storage regulations and it is assumed that accredited operational and environmental management standards will be employed for these activities.
- Materials used in buildings and infrastructure will be specified accordingly, taking due account of the ground conditions such as elevated sulphate or ground gases
- A CEMP will be developed and secured by planning condition that will contain measures to ensure compliance with relevant standards and legislation. The CEMP will set out the

environmental mitigation requirements and also the project level expectations on how the proposed substation, converter station, AC/ DC cable routes and ancillary infrastructure will be constructed. Measures contained within the CEMP would be designed to limit the potential for dispersal and accidental releases of potential contaminants, soil-derived dusts and uncontrolled run-off to occur during construction.

- A Pollution Response Plan will be in place prior to the commencement of construction works. The plan will outline key pollution mitigation measures to be adopted including a Control of Substances Hazardous to Health (COSHH)/ fuel inventory and key contacts to be notified in the event of a significant pollution incident, which may subsequently lead to the contamination of controlled waters or soils.
- All bulk fuel and COSHH items will be stored in accordance with the relevant Environment Agency Pollution Prevention Guidance notes40 (withdrawn but widely considered good practice) and storage regulations. Tanks and dispensing pumps will be locked when not in use to prevent unauthorised access.
- Any hazardous materials will be stored in designated locations with specific measures to prevent leakage and the release of their contents. This will include a requirement to position storage areas at least 10 m away from surface water features/ drains (and take into consideration the positions of any groundwater abstraction wells), on an impermeable base with an impermeable bund that has no outflow and is of adequate capacity to contain at least 110% of the contents. Valves and trigger guns will be protected from vandalism and kept locked when not in use.
- Only well-maintained plant will be used during construction to minimise the potential for accidental pollution from leaking machinery or damaged equipment. Static machinery and plant are expected to be stored in hardstanding areas when not in use and, where necessary, to make use of drip trays beneath oil tanks/ engines/ gearboxes/ hydraulics. Spill response kits containing equipment that is appropriate to the types and quantities of materials being used and stored during construction will be maintained on-site.
- The re-use of excavated materials during construction will be governed by either a Materials Management Plan developed in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice , an environmental permit or a relevant exemption. The CL:AIRE Code of Practice is a voluntary framework for excavated materials management and re-use. Following this framework results in a level of information being generated that is sufficient to demonstrate to any regulator that excavated material has been re-used appropriately and is suitable for its intended use. It demonstrates that waste material has not been used in the development.

11.16 Additional details of mitigation related to this specific topic can be found within Chapter 11 of the ES.

Summary

11.17 The ground conditions topic assesses the potential impacts of the construction and operation of the GB Onshore Scheme in relation to ground conditions.

11.18 The assessment of temporary effects has shown that whilst there are predicted minor adverse impacts associated with the construction stage, none of these would be regarded as significant following adoption of the measures as part of a CEMP which will be prepared prior to the commencement of construction activities.

11.19 There are not expected to be any significant operational effects on ground conditions as the design of the GB Onshore Scheme is expected to include measures that would contain and control any releases of contaminants to the Project Area and its associated infrastructure during the operation period.

11.20 It is not considered that any of the identified committed schemes will generate cumulative effects in relation to ground conditions.

12. Cumulative Assessment

Summary

12.1 A cumulative assessment has been undertaken to take in to account both inter-project and intra-project effects.

12.2 Intra-project effects have considered the impact of multiple environmental topics on the same receptor (i.e. the combined impact of increased disturbance (such as noise) and reduced visual amenity on walkers and visitors, as well as in-combination effects from different components the Scheme (i.e. the proposed DC cable route and the proposed converter station) on the same receptor.

12.3 Inter-project effects have considered the potential cumulative impacts from the simultaneous development of the UK Onshore Scheme with other projects within the near vicinity of the Scheme. A systematic review of projects either already within or known to soon enter the planning system were reviewed by each of the specialists to determine potential cumulative impacts.

Conclusions

12.4 The assessment potential cumulative effects on an individual receptor from different components of the GB Onshore Scheme, and from multiple sources has determined that whilst there have been some impacts identified these are not likely to be of greater significance than when considering the potential effects individually. Intra-project effects are limited to the amenity of residential receptors, and users of surrounding walking routes adjacent to the Project Area.

12.5 Of the four short-listed projects identified that had the potential to result in cumulative impacts when taken in to consideration with the Scheme, only potential traffic-related impacts associated with the construction and operation of the proposed cement plant at Thamesport was considered for further assessment. However, it was concluded that the network would not be significantly impacted as a result of the simultaneous development of the GB Onshore Scheme and the cement plant.

13. Schedule of Mitigation

Introduction

13.1 This chapter sets out in once place all of the measures proposed to mitigate the potential environmental impacts of construction and operation of the GB Onshore Scheme.

Approach to Mitigation

13.2 As set out in chapter 4 of the Environmental Statement a standard hierarchal approach to the development of mitigation measures has been followed with the aim of 'designing out' adverse effects as much as possible (avoiding or preventing, reducing adverse effects) as well as seeking opportunities to maximise or enhance beneficial effects. The Environmental Impact Assessment (EIA) has been undertaken in parallel with the development of the GB Onshore Scheme providing opportunities to incorporate mitigation measures into its design or how it will be constructed.

13.3 Mitigation measures fall into two categories: mitigation by design which forms part of the GB Onshore Scheme design; and mitigation by practice which is part of the installation, operation and decommissioning of the GB Onshore Scheme.

Purpose of the Schedule of Mitigation

13.4 The purpose of the Schedule of Mitigation is to set out in one place all of the measures which have been embedded with the design of the GB Onshore Scheme and how it will be constructed such that they can be easily transposed into the relevant construction management plans.

13.5 It should be noted that for some topics common mitigation measures have been identified for example pollution prevention measures may apply to water as well as ecology; for completeness these have been repeated for each specialist topic.

14. Summary & Conclusions

Introduction

14.1 This chapter summarises the results of the Environmental Impact Assessment (EIA) of the potential effects of the construction and operation of the components of NeuConnect (also referred to as 'the Project') that are located at Grain, UK to Mean Low Water Spring (MLWS) (the 'GB Onshore Scheme'), as presented in this Environmental Statement ES.

About NeuConnect

14.2 NeuConnect is a 1,400 megawatt (MW) bidirectional interconnector between Great Britain and Germany. The Project will create the first direct electricity link between Great Britain and German energy networks; two of the largest electricity markets in Europe. The new link will create a connection for electricity to be transmitted in either direction between Great Britain and Germany. The Project comprises approximately 700 kilometres (km) of subsea and underground High Voltage Direct Current (HDVC) cables, with onshore converter stations linking into the existing electricity grids at Grain in Great Britain and at Wilhelmshaven in Germany. The subsea cables will traverse through British, Dutch and German waters.

14.3 In Great Britain the GB Onshore Scheme extend as far as MLWS. The GB Onshore Scheme will comprise the following main elements:

- Cable sealing end compound within a fenced compound occupying an area of approximately 1,600 square metres (m^2) or 0.16 hectares (ha).
- Substation within a fenced compound occupying an area of approx. 6,400 m^2 or 0.64 ha. The substation will comprise a single building and some outdoor electrical equipment, and an internal road will allow access to equipment within the compound.
- Approximately 50 metre (m) long AC cable route from the substation to the converter station. The AC cable may be either underground or above ground.
- Converter station within a fenced compound occupying an area of approximately 62,500 m^2 or 6.25 ha. The converter station will comprise buildings and some outdoor electrical equipment, as well as internal roads around the buildings/ equipment.
- Access to the GB Onshore Scheme will be taken from the existing junction on the B2001/ Grain Road. The existing junction will be improved and a new approximately 850 m long permanent access road will be constructed. This provide access to both the proposed converter station and substation compounds.
- An approximate 1,550 m long underground DC cable route from the converter station to the landfall point.
- At the point of landfall, there will be a Transition Joint Pit (TJP), where underground and subsea DC cables are joined together (subsea cable are slightly larger than underground cables due to additional protective armouring).
- From the TJP and across the intertidal zone subsea DC cables will be installed in buried ducts for a distance of approximately 1,700 m.

Development of the GB Onshore Scheme

14.4 The development of the GB Onshore Scheme has been undertaken in parallel to the consideration of environmental and technical constraints and restrictions. The siting and orientation of the components of the GB Onshore Scheme, and the landscape of the Application Boundary have been designed to best align the development to the existing surroundings.

14.5 The GB Onshore Scheme is subject to further detailed design by the appointed Contractor, and as such the design of GB Onshore Scheme is set in terms of maximum parameters within which the final design will be constructed. In undertaking the EIA in parallel to the development of the

maximum parameters a number of embedded mitigation measures have been included within the design that have avoided or minimised potential environmental impacts. This approach allows for flexibility and efficiencies for the Contractor whilst also establishing commitments and requirements that will be embedded within the construction methods and final design of the GB Onshore Scheme.

Conclusions

14.6 The results of the EIA ensure that the LPA and statutory consultees as well as other interested parties including local communities are aware of the GB Onshore Scheme's environmental impacts and whether these may be significant or not. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that they may be considered alongside other material considerations in determining the applications for planning permission.

14.7 The EIA of the GB Onshore Scheme has identified and assessed the likely significant effects which would result from its construction and operation. Through the iterative development of the design in line with the EIA, NeuConnect Britain Limited, the Applicant, has prevented or reduced a number of potentially significant environmental effects. However, given the scale of the GB Onshore Scheme some significant environmental effects are unavoidable and as such some will remain following mitigation. As set out above, the significant environmental effects will be limited to landscape character during construction, visual amenity during construction and operation, and potentially to unrecorded archaeological assets during construction (although impact would be permanent. The operational impacts regarded to be significant are from West Lane only, which would include users of the road and users of the Coastal Path (which is yet to be established).

14.8 The GB Onshore Scheme has been designed to incorporate measures to help mitigate identified potential impacts, including the enhancement and establishment of boundary screening planting, for the provision of green corridors and to phase the development in to the existing landscape context including with the industrial units to the south of the existing overhead line. Further to this mitigation embedded in the design, the Applicant has committed to a number of additional measures to be implemented during construction to further avoid and minimise potential adverse impacts.

14.9 Should planning permission for the GB Onshore Scheme be granted the Applicant is committed to working with their appointed Contractor(s) to reduce the GB Onshore Scheme's environmental effects as far as practicable in finalising the detailed scheme design and undertaking construction works. This approach will ensure that the actual effects of the GB Onshore Scheme would be no greater than the likely effects identified and assessed in this ES.