AQUIND Limited

AQUIND INTERCONNECTOR

EIA Scoping Report

The Planning Act 2008

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 10

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EIA Scoping Report

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ACRONYMS

Acronym	Definition
µT	Microtesla
AA	Appropriate Assessment
ABP	Associated British Ports
AC	Alternating Current
ACOPS	Advisory Committee on Protection of the Sea
AIS	Air Insulated Switchgear
AIS	Automatic Identification System
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
BAP	Biodiversity Action Plan
BEIS	Department for Business, Energy and Industrial Strategy
BGS	British Geological Survey
BMV	Best and Most Versatile (agricultural land)
BoCC	Birds of Conservation Concern
BWD	Bathing Waters Directive
CBRA	Cable Burial Risk Assessment
CCTV	Closed-Circuit Television
CDE	Construction, Demolition and Excavation
Cefas	Centre for Environment, Fisheries, and Aquaculture and Science
CIA	Cumulative Impact Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists

CLB	Cable Laying Barge
CLV	Cable Laying Vessel
CO_2	Carbon dioxide
COLREGS	International Regulations for Preventing Collisions at Sea
CPT	Cone Penetration Test
CRPMEM	Comité Régional des Pêches Maritimes et des Elevages Marins de Bretagne
cSAC	Candidate Special Area of Conservation
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
DBT	Dibutylin
DC	Direct Current
DCLG	Department for Communities and Local Government
DCO	Development Consent Order
DDV	Drop Down Video
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DIRM	Direction Interrégionale de la mer Manche Mer du Nord
DMRB	Design Manual for Roads and Bridges
DP	Dynamic Positioning
DTS	Distributed Temperature Sensing
EA	Environment Agency
EcIA	Ecological Impact Assessment
ECMWF	European Centre for Medium-Range Weather Forecasts
EEZ	Exclusive Economic Zone
EHDC	East Hampshire District Council
EHLCA	East Hampshire Landscape Character Assessment
EHO	Environmental Health Officer

EIA	Environmental Impact Assessment
ELF	Extremely Low Frequency
EMF	Electro-Magnetic Field (or Force)
EMODnet	European Marine Observation and Data Network
EMP	Environmental Management Plan
EN-1	Overarching NPS for Energy
EODS	Explosive Ordnance Disposal Suite
EPC	Engineering, Procurement and Construction
EPUK	Environmental Protection UK
ES	Environmental Statement
EU	European Union
EUNIS	European Nature System
FOC	Fibre Optic Cable
FLO	Fisheries Liaison Officer
FRA	Flood Risk Assessment
FRP	Fibre-reinforced Plastic
FSA	Formal Safety Assessment
ft	Foot
GaIS	Gas Insulated Switchgear
GES	Good Environmental Status
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GLVIA 3	Guidelines for Landscape and Visual Impact Assessment, Third Edition
GT	Gross Tonnage
GWMP	Groundwater Management Plan
Ha or ha	Hectare
HBC	Havant Borough Council
HBIC	Hampshire Biodiversity Information Centre

HCC	Hampshire County Council
HD	Hydrodynamic
HDD	Horizontal Directional Drilling
HDPe	High-density polyethylene
HEDBA	Heritage Environmental Desk Based Assessment
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HIA	Health Impact Assessment
HMSO	Her Majesty's Stationery Office
HPI	Habitats of Principal Importance
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
Hz	Hertz
IAMMWG	Inter-Agency Marine Mammal Working Group
IAN	Interim Advice Note
IAQM	Institute of Air Quality Management
ICES	International Council for the Exploration of the Sea
ICNIRP	International Commission on non-Ionizing Radiation Protection
IEMA	Institute of Environmental Management and Assessment
IFCA	Inshore Fisheries and Conservation Authority
IFREMER	Institut français de recherche pour l'exploitation de la mer
IMO	International Maritime Organisation
INNS	Invasive non-native species
IOM	Institute of Occupational Medicine
JNCC	Joint Nature Conservation Committee
km	Kilometre
kV	Kilovolt

kV/m	Kilovolts per metre
LCA	Landscape Character Assessment
LGS	Local Geological Sites
LGV	Light Goods Vehicle
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LPA	Local Planning Authority
LSE	Likely Significant Effect
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
m	Metre
MAFF	Ministry for Agriculture, Fisheries and Food
MAI	Marine Aggregate Industry
MCA	Maritime and Coastguard Agency
MCA	Marine Character Area
MCA	Mineral Consultation Area
MCAA	Marine and Coastal Access Act 2009
MCZ	Marine Conservation Zone
MFE	Mass Flow Excavation
MHWS	Mean High Water Spring
MLWS	Mean Low Water Spring
mm	Millimetre
MMO	Marine Management Organisation
MMP	Materials Management Plan
MoD	Ministry of Defence
MPA	Mineral Planning Authority
MPS	Marine Policy Statement
MSA	Mineral Safeguarding Area
MSFD	Marine Strategy Framework Directive

mT	Militesla
MW	Megawatt (1000 watts)
NCAP	National Character Area Profile
NETS	National Electricity Transmission System
NERC	Natural Environment and Rural Communities
NFFO	National Federation of Fishermen's Organisations
NGET	National Grid Electricity Submission plc
NHL	National Heritage List
NHLE	National Heritage List for England
Nm	Nanometre
nmi	Nautical miles
NO_2	Nitrogen dioxide
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
NRA	Navigational Risk Assessment
NRHE	National Record for the Historic Environment
NRPB	National Radiological Protection Board
NSIP	Nationally Significant Infrastructure Project
nT	Nanotesla
NTS	Non-Technical Summary
NVQ	National Vocational Qualification
O&M	Operation and Maintenance
OESEA	Offshore Energy Strategic Environmental Assessment
OFGEM	Office of Gas and Electricity Markets
OHL	Overhead Lines
ONS	Office for National Statistics
OOS	Out of Service

ORPAD	Offshore Renewables Protocol for Archaeological Discoveries
OS	Ordnance Survey
PA 2008	Planning Act 2008 (as amended)
PAH	Polycyclic Aromatic Hydrocarbons
PAS	Portable Antiques Scheme
PCC	Portsmouth City Council
PCZ	Primary Consultation Zone
PEA	Preliminary Ecological Appraisal
PEIR	Preliminary Environmental Information Report
PEXA	Practice and Exercise Areas
PHE	Public Health England
PIA	Personal Injury Accident
PINS	Planning Inspectorate
PLB	Post Lay Burial
PLGR	Pre-lay grapnel run
PM	Particulate Matter
pMCZ	Proposed Marine Conservation Zone
PRA	Preliminary Risk Assessment
PRF	Potential Roost Feature
PRoW	Public Right of Way
PRR	Portable Relay Room
PSA	Particle Size Analysis
pSPA	Potential Special Protection Area
PUSH	Partnership for Urban South Hampshire
RIGS	Regionally Important Geological Site
RLB	Red Line Boundary
ROV	Remotely Operated Vehicle
RVEI	Road Verges of Ecological Importance
RYA	Royal Yachting Association

SAC	Special Area of Conservation
SCI	Sites of Community Importance
SDNP	South Downs National Park
SDNPA	South Downs National Park Authority
SF6	Sulphur hexafluoride
SIH	Système d'Information Halieutique
SINC	Site of Importance for Nature Conservation
SLB	Simultaneous Lay and Burial
SMP	Seabird Monitoring Programme
SMRU	Seal Mammal Research Unit
SoCC	Statement of Community Consultation
SoS	Secretary of State
SPA	Special Protection Area
SPI	Species of Principal Importance
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SWBGS	The Solent Waders and Brent Goose Strategy
SWMP	Site Waste Management Plan
TBT	Tributylin
tCO2e	Tonnes of Carbon Dioxide Equivalents
TCPA 1990	Town and Country Planning Act 1990 (as amended)
TJB	Transition Joint Bay
TJP	Transition Joint Pit
TraC	Transitional and Coastal
TSHD	Trailing Suction Hoppe Dredger
TSS	Traffic Separation Scheme
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office

UKPCZ	United Kingdom Pollution Control Zone
uPVC	Unplasticised polyvinyl chloride
USBL	Ultra-short baseline
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
V/m	Volts per metre
VALPENA	l'éVALuation des Pratiques de PEches au regard des Nouvelles Activités
VMS	Vessel Monitoring System
VP	Vantage Point
VSC	Voltage Source Converter
WaFD	Waste Framework Directive
WCA	Wildlife and Countryside Act
WCC	Winchester City Council
WCCLCA	Winchester Landscape Character Assessment
WeBS	Wetland Bird Survey
WFD	Water Framework Directive
WGS	World Geodetic System
WSI	Written Scheme of Investigation
XLPE	Cross-Linked Polyethylene
ZTV	Zone of Theoretical Visibility
ZVI	Zone of Visual Influence

PART 1: INTRODUCTION

1. INTRODUCTION

INTRODUCTION

1.1.1. AQUIND Limited (the 'Applicant') is proposing to construct and operate an electricity interconnector between France and UK (the 'Project'). This will include a new subsea and underground High Voltage Direct Current (HVDC) power cable transmission link between Normandie in France and the south coast of England, which will also include fibre optic data transmission cables. Converter stations will be needed in both England and France.

1.1.2. With a net capacity of 2000 megawatt (MW), the Project will significantly increase the cross-border capacity between the UK and France, increasing competition and improving security of the electricity supply in each of the respective countries. To enhance the security of the installation and the availability of its power transfer capability, the Proposed Development is being designed as two independent pairs of cables, each with the net capacity of 1000MW and a total import capacity of up to 2000MW[1].

1.1.3. The French and UK elements of the project will be consented within their respective jurisdictions. Consents and licencing for the UK elements will cover that part of the Project located in England and the UK marine area. Together the UK onshore elements of the Project and elements of the Project within the UK marine area comprise the "Proposed Development". This report relates to the Proposed Development only.

1.1.4. On 20 February 2018 the Applicant submitted a request for a Scoping Opinion to the Marine Management Organisation (MMO) under the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) for the elements of the Project within the UK marine area and received a Scoping Opinion in June 2018.

1.1.5. On 22 February 2018 the Applicant submitted requests for a Scoping Opinion under the Town and Country (Environmental Impact Assessment) Regulations 2017 to East Hampshire District Council (EHDC), Havant Borough Council (HBC) and Winchester City Council (WCC), Portsmouth City Council (PCC) for the UK onshore elements of the Project. Scoping Opinions were received in April and May 2018.

1.1.6. On 19 June 2018, the Applicant sought a direction from the Secretary of State for Business, Energy and Industrial Strategy (the SoS) under section 35 of the Planning Act 2008 (the 'PA 2008') that the Proposed Development be treated as development for which development consent under the PA 2008 is required. On

[1] The Project will comprise two independent symmetrical monopole HVDC links ("poles"). Each pole will have the export (leaving a national transmission system) capacity of 1037.5 MW and the import (incoming into a national transmission system) capacity of around 1000 MW, net of transmission and conversions losses, with the total import capacity of up to 2000 MW. Throughout this Report, the Project's capacity is referred to as 2000 MW.

30 July 2018, the SoS issued a Direction confirming that the Proposed Development by itself is nationally significant for the reasons set out in the Direction (see Appendix A).

1.1.7. The Applicant intends to prepare an application for a Development Consent Order (DCO) for the Proposed Development for submission to the SoS.

1.1.8. In light of the Direction and the change in consenting regime since the previous Scoping Opinions were issued, the Applicant has decided to submit a request to the Planning Inspectorate (PINS) (on behalf of SoS) for a Scoping Opinion under Regulation 10(1) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations').

1.1.9. This Scoping Report (the 'Report') forms a request for a formal Environmental Impact Assessment (EIA) Scoping Opinion from PINS.

1.1.10. In broad terms, the Project will comprise the following components; HVDC marine cables, HVDC underground cables, High Voltage Alternating Current (HVAC) underground cables, HVDC converter stations in the UK and France and fibre optic data transmission cables as illustrated in Figure 1.1 and summarised in Table 1.1.

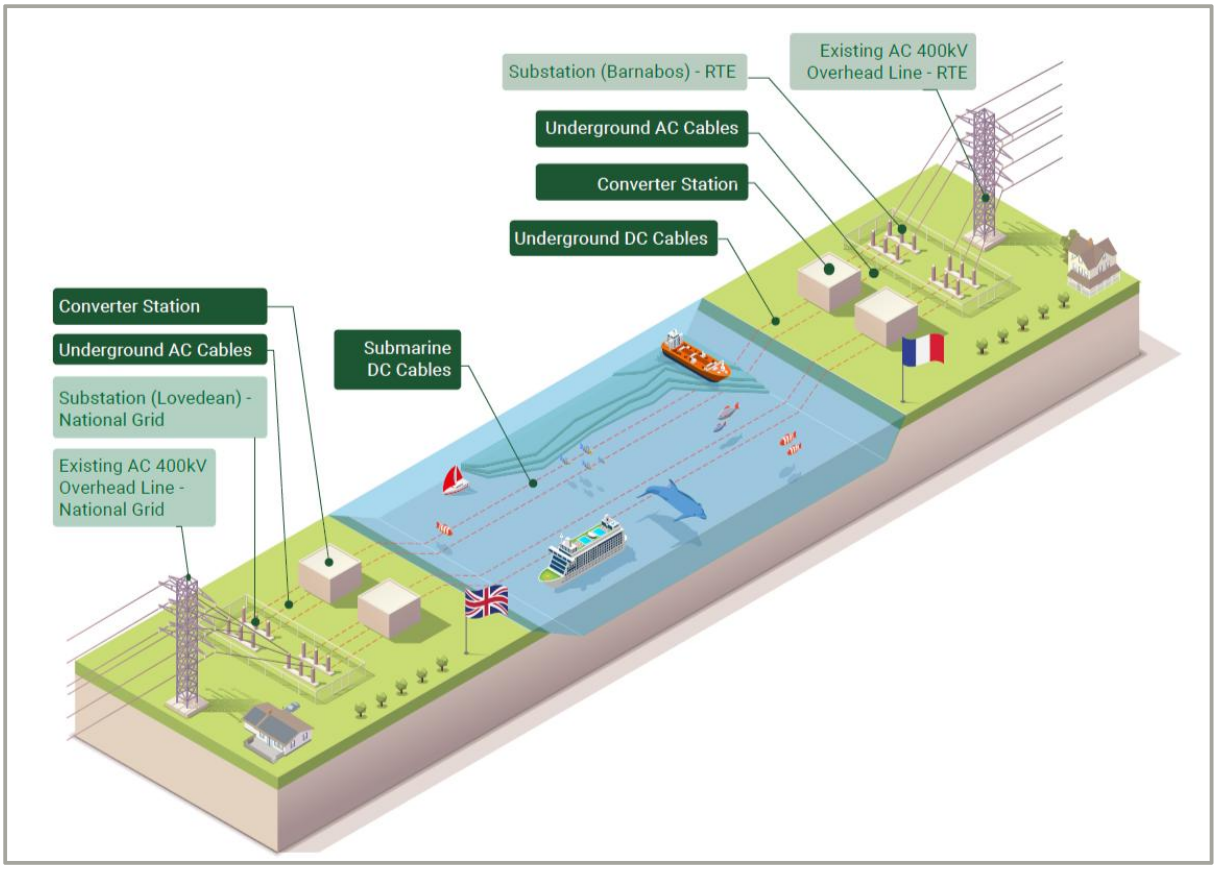


Figure 1.1 Aquind Interconnector project components

Table 1.1 Summary of the Project

	UK	France (excluded from the DCO)
Onshore	· HVAC cable route from National Grid substation at Lovedean to the AQUIND converter station (<2km). · AQUIND Converter Station and access road. · HVDC cable route (including fibre optic data transmission cables) from the AQUIND converter station to the UK landfall at Eastney (approximately 20km)	· HVDC cable route (including fibre optic data transmission cables) from the France landfall at Pourville to the AQUIND converter station (approximately 37km) · HVAC cable route from the AQUIND converter station to the RTE grid connection at Barnabos (approximately 2km).
Marine	· Marine HVDC cable route (including fibre optic data transmission cables) between UK landfall at Eastney and the UK Exclusive Economic Zone (EEZ) (approximately 109km). · The as-surveyed marine cable corridor runs from below Mean High Water Spring (MHWS) in the UK to the UK boundary of the EEZ and is the corridor within which the marine cables will be located. The inshore cable corridor is identified as that part of the corridor that runs from MHWS to the full extent of the 12 nm UK territorial limit. The offshore cable corridor is identified as that part of the corridor that runs from the 12nm UK territorial	· Marine HVDC cable route (including fibre optic data transmission cables) between the France landfall at Pourville and the French EEZ (approximately 73km)

	limit to the UK / France EEZ boundary line.	

1.1.11. The Applicant has appointed a Project Team, which includes:

- **WSP UK Ltd:** Engineering, UK DCO and onshore EIA;
- **Herbert Smith Freehills LLP:** Legal advisor;
- **GVA:** UK land agent;
- **Built Environment Communications Group:** UK stakeholder management and public engagement;
- **Arcadis:** French planning, terrestrial consents, stakeholder management and public engagement; and
- **Natural Power:** UK marine EIA and marine consents in the UK and France.

1.1.12. The use of the term 'Proposed Development' will differ throughout this Report depending on whether it is being used in reference to the onshore or marine components of the Proposed Development. The information in Table 1.1 differentiates the project components relevant to the onshore 'Proposed Development' and the marine 'Proposed Development'.

1.2 SCOPING AREAS

MARINE SCOPING AREA

1.2.1. The marine component of the Proposed Development is that part within the UK marine area, as defined at Section 42 of the Marine and Coastal Access Act 2009 (the 'MCAA 2009') i.e. from MHWS out to the UK/France EEZ. (Figure 1.2).

ONSHORE SCOPING AREA

1.2.2. The area upward of the Mean Low Water Spring (MLWS) level marks the extent of the onshore environment. Therefore, the onshore components of the Proposed Development comprise all development upward of the MLWS mark (Figure 1.3). Figure 1.4 illustrates the administrative boundaries of the relevant local planning authorities (LPA), within which elements of the Proposed Development are located.

1.3 PURPOSE OF THE SCOPING REPORT

1.3.1. This Report has been prepared in accordance with Regulation 10(1) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations').

1.3.2. In addition, this report provides formal notification to the SoS that the Applicant proposes to provide an environmental statement (ES) in respect of the Proposed Development. Notification of this requires the SoS to comply with the requirements of Regulation 11 of the EIA Regulations.

1.3.3. This Report includes the information specified in Regulation 10(3) of the EIA Regulations.

1.3.4. Regulation 10(3) stipulates the information the Applicant must provide, which includes:

a) a plan sufficient to identify the land;

b) a description of the Proposed Development, including its location and technical capacity;

c) an explanation of the likely to be significant effects of the Proposed Development on the environment; and

d) such other information or representations as the person making the request may wish to provide or make.

1.3.5. The purpose of this Report is to provide PINS with the following:

- A description of the Proposed Development, comprising the onshore and marine components;
- An overview of the existing physical, human and biological environment that has the potential to be impacted by the Proposed Development;
- The identification of the likely significant impacts of the Proposed Development on the existing environment, and conversely, those impacts that are considered to be non-significant and recommendations for them to be excluded (scoped out) of the EIA;
- A description of the scope of further studies and data collection required to describe the existing environment in sufficient detail to inform further assessment in the EIA; and
- A description of the methodology for the assessment as part of the EIA to ensure the significance of the impacts identified is fully assessed.

1.3.6. The outputs of the EIA will be a Preliminary Environmental Information Report (PEIR), produced in connection with the formal statutory consultation on the Proposed Development, and the ES produced in support of the application for the DCO.

1.3.7. The need for the development, as identified in Paragraph 3.2.17, below, will be provided in the PEIR and ES documents.

1.4 STRUCTURE OF THE SCOPING REPORT

1.4.1. This Report follows the structure as outlined in Table 1.2.

Table 1.2 Scoping report structure

Part	Contents
Part 1: Introduction **Chapters 1- 5**	• Introduction to the Project; • Purpose of the Report; • Policy and Legislative Context – a high level overview of where the Project sits within UK policy and legislation; • Project Description – a high level description of the onshore and marine components of the Project. Including a description of the proposed activities during construction, operation and maintenance and decommissioning; • EIA Methodology – an overview of the methodology for undertaking the EIA; and • Consultation History – Description of the consultation undertaken prior to submission of this Report to PINS.

Part 2: Marine UK
 	
Chapters 6-17
	• For each of the marine topics identified as requiring consideration, the following is provided:
	  ○ Description of the existing environmental baseline;
	  ○ Identification and discussion of the potential impacts associated with the construction, operation and maintenance and decommissioning stages of the Proposed Development;
	  ○ Discussion of the proposed mitigation in response to the identified impacts; and
	  ○ Outline of the approach to the EIA, including requirement for further studies and data collection.
	• Summary of potential marine cumulative impacts.
	• Summary of any potential marine transboundary impacts.

Part 3: Onshore UK
 	
Chapters 18-32
	• For each of the onshore topics identified as requiring consideration, the following is provided:
	  ○ Description of the environmental baseline;
	  ○ Identification and discussion of the potential impacts associated with the construction, operation and maintenance and decommissioning stages of the Proposed Development;
	  ○ Discussion of the proposed mitigation in response to the identified impacts, and;

	○ Outline of the approach to the EIA, including requirement for further studies and data collection. • Summary of potential onshore cumulative impacts. • Summary of any potential onshore transboundary impacts
Part 4: Consultation **Chapters 33**	• Overview of future consultation for the Proposed Development as part of the DCO application process.
Part 5: Summary and Conclusions **Chapter 34**	

2. PROJECT DESCRIPTION

2.1.1. This chapter provides of an overview of the key components of the Proposed Development. The activities and programme proposed for the construction, operation and maintenance and decommissioning of the Proposed Development are also described. Due to the nature of the Proposed Development, the marine and onshore components are described separately in the following sections.

2.1.2. The information provided is indicative to inform this Report and the Scoping process. The detail provided in this chapter will be further refined in the ES to provide the final proposals for which consent will be sought within the DCO application.

2.1 MARINE PROJECT DESCRIPTION

UK LANDFALL SELECTION

2.1.1. The initial landfall selection process included feasibility studies, site visits and cable route studies. From this the preferred UK landfall site at Eastney in Hampshire was identified.

MARINE CABLE CORRIDOR AND CABLE ROUTE

2.1.2. Following the identification of the UK landfall site at Eastney and the French landfall site at Pourville, the marine cable corridor was identified. The marine cable corridor will be further refined upon review of marine survey data prior to the submission of the DCO application. The marine cable corridor within the UK marine area and UK landfall location is presented in Figure 1.2. The total length of the UK marine cable corridor is approximately 109km from the UK/ France EEZ boundary line to the landfall at Eastney. The inshore cable corridor refers to the section of the marine cable corridor that runs from the UK landfall out to the 12nm limit of UK territorial waters. The offshore cable corridor is the section of the marine cable corridor from the 12nm limit out to the UK / France EEZ boundary line.

MARINE CABLE SYSTEM AND DESIGN

2.1.3. The Proposed Development will consist of four 320kV HVDC marine cables which will be installed for the majority of the cable route as two bundled pairs. There is the potential that the marine cables will be installed as four individual cables for up to approximately 200m at the landfall. Each pair will facilitate the transfer of 1000MW, resulting in a total net power transfer capacity of 2000MW. The final design details of the marine cables will be determined as part of the final design stage, which will be undertaken by the cable manufacturer following the appointment of the Engineering, Procurement and Construction (EPC) contractors.

2.1.4. The Proposed Development is proposing to use copper or aluminium conductors with Cross Linked Polyethylene (XLPE) insulation for the marine cables. The

cable has an XLPE insulation extruded over the conductor and covered with a water tight lead sheath to protect against water ingress. Over the lead is a polyethylene anti-corrosion layer, bedding layer, galvanised steel armour wires with a poly-propylene string layer overall. Each HVDC marine cable will have a diameter of approximately 140mm and an approximate weight of 50 kg/m (in air). Aluminium cables will likely have a larger diameter but will weigh less. Figure 2.1 illustrates the cross section of a typical marine XLPE cable.

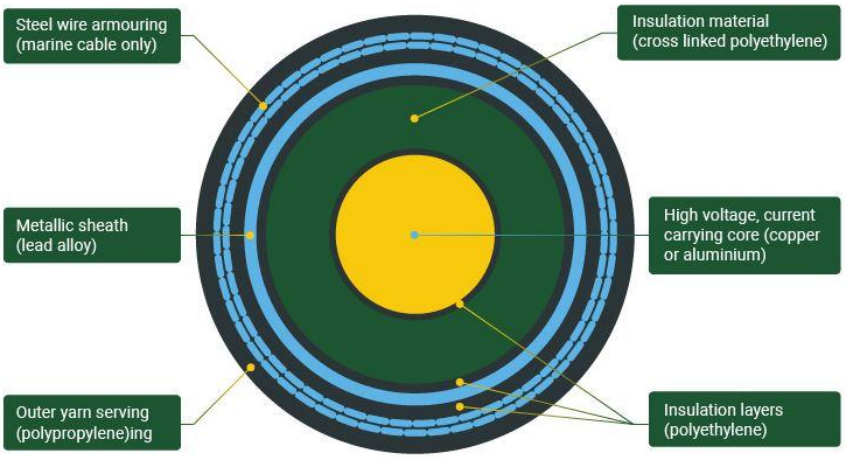


Figure 2.1 Cross-section of a typical marine XLPE cable

2.1.5. In addition to the four HVDC marine cables, two data transmission fibre optic cables (FOC), each approximately 35-40mm in diameter will be laid together with the marine cables within a shared trench (one per circuit) (Figure 2.2).

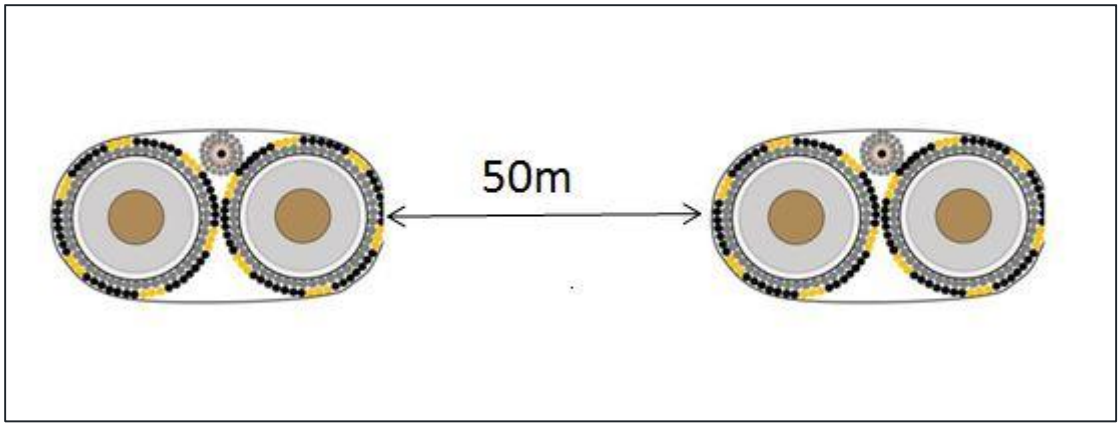


Figure 2.2 Configuration of the HVDC and FOC within the cable trench. Figure illustrates installation of cables as two bundled pairs.

PROGRAMME, DURATION AND SEQUENCE OF MARINE CONSTRUCTION WORKS

2.1.6. Marine construction works may take place throughout the year when weather conditions allow, however cable installation operations in European waters are typically limited to a 6-month window between April and October due to weather conditions.

2.1.7. It is anticipated that the marine installation will be capable of taking place during 2021-2022 and Table 2.1 outlines the indicative marine construction programme for the Proposed Development. These timescales are subject to cable production, installation campaigns and types of vessels used, environmental considerations and other circumstances which are not within the Applicant's control, such as weather conditions causing vessel down time. In the event of delay due to such circumstances, a second phase of UK marine cable installation would occur, which would take place during 2023. Noting there is potential for the installation period to be extended, the construction programme used for the purpose of the EIA will incorporate this potential delay as the likely worst-case scenario.

Table 2.1 Indicative marine construction programme

Activity	Indicative Programme
Seabed clearance / preparation (phased with installation)	2021 – 2022
UK Landfall Installation	2021
UK Marine Installation	2022

CABLE INSTALLATION

Marine Surveys

2.1.8. The following marine surveys have been undertaken and the survey data has been used to define the marine cable corridor, target burial depths, cable installation techniques and the requirement for cable and scour protection.

- Geophysical Survey (Nov 2017 – Mar 2018): bathymetric, side scan sonar, sub-bottom profiler and magnetometer;
- Geotechnical survey (Jun 2018 – Nov 2018): vibrocores, cone penetration testing and sediment laboratory testing;

- Benthic ecology survey (Jul 2017 – Mar 2018): grab samples, drop down videos (DDV).

2.1.9. The surveys listed above enable the identification of the following along the marine cable corridor:

- Sediment types (surface and shallow geology);
- Bathymetry and slopes;
- Seabed features (e.g. mobile sediments (sand wave and large ripples), boulders);
- Seabed ecology (benthic fauna and sediment);
- Seabed debris (e.g. abandoned fishing gear);
- Marine heritage and archaeological features; and
- In-service and Out of Service (OOS) and pipelines.

2.1.10. Prior to the installation of the marine cables, further ground condition surveys will likely be required to be undertaken by the appointed EPC contractors. These surveys would confirm that there have been no physical changes to the seabed, identify any unexploded ordnance (UXO) and allow the final cable route to be identified.

Route Preparation

2.1.11. Analysis of the survey data will identify the location and extent of route preparation along the marine cable corridor. Two types of preparation will be required prior to the installation of the marine cable corridor:

- Clearance of obstacles and seabed features:
  - Seabed debris (OOS, wires, abandoned fishing gear);
  - Boulders;
  - Sandwaves and large ripples;
  - Uneven seabed (gulleys, slopes, pits and free spans); and
- Construction of crossing structures over in-service cables.

2.1.12. In addition to the above marine surveys, UXO surveys have been undertaken to ensure the geotechnical survey locations were clear of UXO.

2.1.13. A further detailed UXO survey for the construction corridor will be undertaken as part of the pre-installation surveys. Where potential UXO are identified, the marine cable route will be refined, where possible, to avoid the potential UXO exclusion zones. If UXO cannot be avoided, they may require removal/detonation. Removal or detonation of UXO will be undertaken by registered Explosives and Ordnance Survey Disposal (EODS) specialist contractor. Details such as the number of UXO targets, types of UXO, potential removals or detonations and charge sizes will be confirmed by the pre-installation surveys. That information will be required to consent the carrying out of works to remove/detonate any UXO. Accordingly, any such works will be consented by a separate standalone marine licence. An application for a marine licence for those works, together with all necessary supporting environmental information, would be submitted for approval prior to any such works taking place in connection with the Proposed Development.

Seabed Debris

2.1.14. A pre-lay grapnel run (PLGR) will be undertaken to clear seabed debris in advance of the cable lay and burial. A grapnel hook will be towed by a vessel along the centre line of each bundled cable pair to a penetration depth of 1 m. Debris recovered by the grapnel will be collected on board the vessel for later recycling process or disposal at suitable onshore facilities.

OOS Cables

2.1.15. OOS cables that cross the marine cable corridor will be cut at an appropriate length and the cut section will be disposed of onshore. There are approximately ten OOS cables along the marine cable corridor.

Boulder Removal

2.1.16. Large boulders encountered on the seabed along the marine cable corridor will be removed by ploughs and/or grabs. A towed plough can create a swathe of up to 15 m wide, pushing the boulders present to one side.

Sandwaves and Large Ripples

2.1.17. The marine surveys have identified the presence of mobile sediments (i.e. sandwaves and large ripples) along sections of the marine cable corridor. In these areas where re-routing of the marine cables to avoid such features is not possible, clearance is required to reduce excessive inclines and create a flatter alignment for the installation equipment and enable burial in more stable sediment. Two clearance options are being considered to enable the cables to be buried to the required depth; Mass Flow Excavation (MFE) and dredging.

2.1.18. It is anticipated that approximately 700,000 to 1,700,000 m^3 of sediment along the marine cable corridor will need to be cleared by MFE and/or dredging. This volume also includes dredging/MFE required for other activities i.e. Horizontal Directional Drilling (HDD) exit pits and cable omega joints.

MFE

2.1.19. MFE is a form of jetting machine which uses high flow water jets to temporarily displace and suspend seabed sediments to create a trench into which the marine cables will be installed.

Dredging

2.1.20. Localised dredging will be undertaken using a Trailing Suction Hoppe Dredger (TSHD) which uses a suction pipe and drag head, lowered from a vessel, to suck up seabed material. The dredged material is vertically loaded into the 'hopper' or hold of the vessel. Once fully loaded there are different options for the discharge of the material from the vessel. These include, deposit of the material onto the seabed via bottom opening doors or release of material using a fall pipe below the sea surface

2.1.21. It is anticipated that some of the dredged material will be used as backfill (e.g. at cable joints), and the remaining material will be disposed of. Opportunities for disposal include beneficial re-use of the dredged material, to be considered as the preferred disposal option. Where this is not possible, alternatives methods will be sought, including disposal within the marine cable corridor. The options for disposal will be confirmed as the design of the Proposed Development evolves.

Uneven Seabed

2.1.22. The presence of gulleys, slopes and pits along the marine cable corridor may require the placement of rock and/or the installation of concrete mattresses to create a stable seabed surface to enable the safe installation of the marine cables. Free spans, areas where seabed sediment can no longer support the marine cables, created by a combination of uneven seabed, tidal currents and scouring effects may also require the placement rock and/or the installation of concrete mattresses. Similarly, HDD exit/entry points on the seabed may require rock placement and/concrete mattresses.

INSTALLATION METHODS

2.1.23. It is anticipated that the marine cables will be installed as two bundled pairs. Options for cable installation are dependent upon the characteristics of the seabed and the presence of seabed features. Initial survey data suggests that seabed sediments throughout the marine cable corridor are highly variable; gravel, sand, silt and clay have been recorded throughout the marine cable corridor.

2.1.24. The marine cables will be carried on a cable lay vessel (CLV) either or carousels or in cable tanks. The cables will be pulled via tensioners, overboard the vessel and onto the seabed.

2.1.25. Depending upon the burial technique adopted, burial can be simultaneous to cable lay, pre-lay burial or post-lay burial.

2.1.26. Cable installation methods can be split into two types; burial and non-burial and are also dependent on the depth of water where installation is taking place. Whilst similar cable installation techniques can be employed in deep waters (>10 m depth) and shallow waters (<10 m depth), the vessels that are used differ. In deep water installation, two types of CLV are commonly used; Dynamically Positioned (DP) vessels and cable lay barges (CLB). In shallow water installation, specialised CLV, typically CLB with shallower drafts. Further information on vessels is presented in Paragraphs 2.1.52 – 2.1.53.

Cable Installation

Cable Burial Methods

Ploughs

2.1.27. Ploughs are towed machines generally used for simultaneous cable lay and burial operations where the cable lay vessel controls the cable laying speed to match the plough performance and residual tension targets. Whilst they are essentially passive, ploughs can be steered and plough penetration depth is controlled remotely from the surface via an umbilical cable. There are two principal types of plough:

- **Displacement ploughs** which create an open v-shaped trench into which the cable is laid. Displacement ploughs are commonly used for pre-cut trenching for cable installation and are suitable for use with most types of sediment. The trench that is created may be backfilled using backfill blades at the rear of the machine, a second pass or left to backfill naturally. Displacement ploughs are suitable for use with most types of sediment.

- **Non-displacement ploughs** designed to slice through the seabed using a thin-bladed shear so as not to create an open trench and therefore causing minimal disturbance to the seabed. Non-displacement ploughs are suitable for use with most types of sediment.

2.1.28. In addition to the seabed characteristics, other considerations for the selection of ploughs as a burial technique include manoeuvrability requirements, depth of water, cable bending requirement and the requirement for pre-lay trenching.

Jet Trenching

2.1.29. Jet trenching machines are typically used post-cable lay, to bury marine cables. Within non-cohesive material (e.g. sands and gravels) high flow and low-pressure water jets are used to enable the sediments to be fluidised and displaced. Conversely, to trench a cable through cohesive sediments (e.g. clay), low flow and high-pressure water jets are utilised to mobilise clays. Use of water jets to fluidise the seabed sediments underneath the cables allows the formation

of a trench into which the cable can sink under its own weight, or by a depressor, to the required depth. The trench created may be partially or completely filled by the settling of the fluidised material. The previous seabed level typically recovers over time through natural sedimentation.

2.1.30. In addition to seabed characteristics, other considerations for the use of jet trenching as a burial technique include local water currents, water depth, organic content in seabed sediment, cohesiveness of sediment (increased clay content reduces the performance of jetting) and sediment size (larger sediments i.e. gravels reduce the performance of jetting).

Mechanical Trenching

2.1.31. Mechanical trenchers are typically mounted on tracked vessels and use a cutting wheel or a chain to cut a defined trench through the seabed. Mechanical trenchers can operate in the majority of sediments, including hard bedrock but do not work as effectively in mobile sands, unless scoop-like teeth are attached to the chains.

2.1.32. Mechanical trenchers are fitted with cutting teeth which cut the trench and mechanical scoops which transport the cut material away from the trench. The cable is then guided into the trench base by a depressor arm, in some instances divers are used to assist in the laying of the cable.

2.1.33. The trench created during mechanical trenching can be back filled or left to refill through natural sedimentation.

2.1.34. Mechanical trenchers can be used for pre-lay burial, post-lay burial and simultaneous lay and burial.

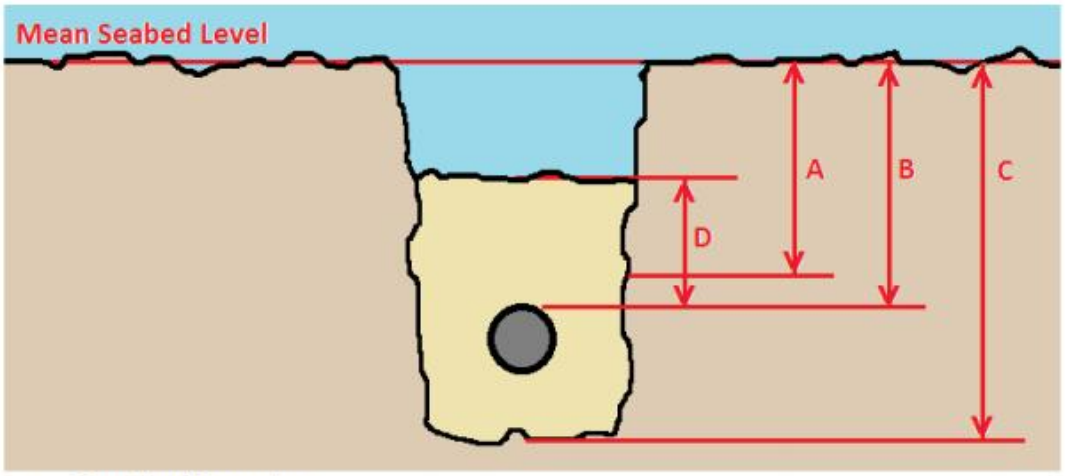
2.1.35. Seabed characteristics need to be considered prior to the use of mechanical trenching as a burial methodology. In areas of softer sediments, there is a risk of trench collapse due to instabilities, as all well as clogging of the cutters. Harder sediments, such as boulders, can also jam the cutters, resulting in the requirement for recovery and maintenance and therefore possible delays during installation. Mechanical trenchers have relatively low installation speeds and are therefore impracticable to use for long distances of cable.

Cable Burial Depth, Width and Spacing

2.1.36. The depth to which the marine cables will be buried through employing the methods listed above is dependent on local seabed characteristics, hydromorphological conditions and the risk and probability of likely hazards (i.e. snagging by fishing gear / anchors).

2.1.37. Burial depth will be informed by the results of the marine geotechnical survey and preliminary information from the Cable Burial Risk Assessment (CBRA). A target depth of lowering of 0.6m – 4.9 m is therefore being considered, otherwise the cable will be protected by non-burial protection.

2.1.38. The Carbon Trust produced CBRA Guidance (The Carbon Trust, 2015) which provides a best practice methodology to identify target burial depths for interconnector cables. Target burial depths are a balance between depths required to protect the cable from anthropogenic activities such as fishing and vessel anchoring, and the technical parameters achievable in designing and manufacturing cables and the time, cost, operational impacts (including thermal properties of cables) and (practicability of burying cables at greater depth than necessary. Figure 2.3 illustrates the definition as burial terms as presented in the CBRA Guidance.



A Depth of Lowering
B Target Depth of Lowering
C Target Trench Depth
D Depth of Cover

Figure 2.3 Definition of trench parameters (Carbon Trust, 2015)

2.1.39. Cable spacing between the two bundled pairs is driven by the operational spacing requirements of the installation equipment and the spacing requirement for future repair works. Spacing is typically three times the water depth and the final cable spacing requirements will be confirmed as part of the final design of the Project.

Non-Burial Protection Methods

2.1.40. Where it is not possible to bury the cable under the seabed to the target depth, non-burial protection will be required to protect the cables from anthropogenic (i.e. fishing and vessel anchoring) and natural hazards (i.e. currents and mobile sediments). Areas where the marine cables cannot be buried and where protection will be required include:

- In-service cable crossings;
- Across boulder or gravel fields where seabed clearance has not been possible;

- Areas of mobile sediment which are underlain by material in which minimum depth of lowering could not be achieved;
- Where burial installation activities have been unsuccessful (i.e. cable was surface laid or minimum depth of lowering could not be reached);
- At a cable repair/joint location; and
- At the transition between the landfall HDD exit and the buried cable.

2.1.41. Table 2.2 summarises the non-burial protection methods that are being considered for the Proposed Development.

Table 2.2 Methods of non-burial protection

Methods of non-burial protection	Description
Tubular Protection	Protective sleeves made of polyurethane or ductile iron within which the marine cable is placed. Potential risk of hydrodynamic loading and/or entanglement with vessel anchors and/or fishing gear. Commonly used in combination with mattresses or rock placement.
Mattresses (Frond and Concrete)	Pre-fabricated, flexible concrete coverings connected by polypropylene ropes which are laid on top of the cable to stabilise and protect it. The placement of mattresses is slow and as such is only used for short sections of cable. Typical dimensions are approximately 6 m x 3 m and either approximately 150 mm or 300 mm thick. There are variations dependent upon manufacturer. In areas of potential scour, frond mattresses could be used. Frond mattresses are designed to mimic natural seaweed to stimulate settlement of sediment over the cable. The mattresses comprise continuous lines of overlapping buoyant polypropylene fronds that, when activated, create a viscous drag barrier that significantly reduce current velocity. The frond lines are secured to a

	polyester webbing mesh base which is secured to the seabed.
Rock Placement	Placement of rocks of varying size to form a protective barrier over the marine cable. This method is typically used for scour protection, crossing of seabed infrastructure or where burial depth has not been reached.
Grout / Rock Bags	Bags filled with grout, sand or rock and placed over the marine cable. Generally applied to smaller areas.

2.1.42. The marine surveys outlined in Paragraph 2.1.9 and the CBRA will identify where cable protection is required.

LANDFALL INSTALLATION

2.1.43. The UK landfall forms the transitional area between onshore and marine environments and is where the onshore cable route corridor and marine cable corridor are joined together at the Transition Joint Bay (TJB).

Transition Joint Bay Installation

2.1.44. Four TJBs will be located above the MHWS mark at Eastney. The preferred location for these are in a car park, to the north of Eastney beach. These are not within the UK marine area and are therefore not discussed further in this section.

2.1.45. Further detail on the construction works for the TJB is provided in Paragraphs 2.2.28 – 2.2.30.

Horizontal Directional Drilling

2.1.46. Horizontal Direction Drilling (HDD) has been identified as the most suitable installation method at landfall. The HDD operations will drill holes under the intertidal area that will house ducts through which the marine cables will be pulled through into the TJBs at a later date.

2.1.47. HDD is a trenchless installation method used to cross beneath areas where conventional construction methods are unable to be used due to large constraints (e.g. areas of water, railways etc.), where other methods may cause damage, or where access is restricted. In intertidal areas, HDD enables deep burial of the cable to provide protection from wave action and coastal erosion.

2.1.48. HDD operations require a suitable space for the temporary construction area, which can be typically 50m x 50m but may vary depending on the length and size of the HDD works. The HDD operations require a working area to locate the drilling rig, generator, layout of ducts and construction equipment. Where

additional space is required for HDD crossings, adjacent fields or other areas which will minimise impacts will be utilised to facilitate the HDD construction works.

2.1.49. The exit/entry point of the HDD duct/cable within the marine environment is currently unknown but will be defined as part of the final design of the Project.

2.1.50. HDD is also proposed to be undertaken at Langstone Harbour to enable the cables to cross underneath Langstone Harbour from Portsea Island to the mainland. It is anticipated that no HDD works will occur within the marine environment of Langstone Harbour as the drilling will all be underneath the harbour area. The entry/exit points of the drill will be above the MHWS mark and is, in agreement with the MMO, considered to be exempt from requiring a Marine Licence.

INSTALLATION VESSELS

2.1.51. Cable installation activities will be undertaken on a 24 hour/7 day basis, unless interrupted by weather or other disruptions. This is necessary to maximise the available operational weather windows, efficient vessel and equipment time, and minimise navigational impacts on other users of the sea. Notices to Mariners will be issued in advance, and operations will be carried out in line with regulatory requirements.

2.1.52. A description of likely vessel groups to be utilised during the installation activities of the Proposed Development is provided below:

- Vessels for pre and post-installation surveys;
- Workboats/construction vessels and tugs for route clearance/preparation, installation of seabed mattresses and rock bags (if required) support for cable pull and floating in, and dive support etc., depending on requirements. These workboats often deploy Remotely Operated Vehicles (ROVs) and will utilise geophysical survey and positioning equipment to monitor the progress of the works, and for positioning of any ROVs or other underwater equipment needed to complete the works;
- CLV – CLB and Dynamic Position vessels;
- Guard vessels – if necessary, these will accompany the CLV to maintain surveillance around the worksite ensuring other vessels are kept clear, reducing the risk of collision and to protect the cable prior to burial;
- Rock placement vessel – if rock placement is required for additional cable protection (e.g. at cable crossings), a rock placement vessel may be used. Such vessels feature a rock storage hopper and

equipment by which rock can be placed in situ on the seabed. This can be one of a number of techniques, including side dumping, split hopper or fall pipe; and

- Jack up vessel – for the HDD works at the landfall, jack up vessels will be required to enable tidal marine works.

POST-LAY SURVEYS

2.1.53. Post installation, a survey will be undertaken along the marine cable corridor to ensure the marine cables are adequately buried and the risk to navigation reduced as low as reasonable practical and that the crossings have been constructed as designed. The timing of these surveys will be confirmed as part of the final design of the Project.

OPERATION AND MAINTENANCE

Surveys

2.1.54. The marine cable route and burial depths and/or non-burial protection will be designed to minimise the requirement for regular inspection surveys. However, some surveys may be required throughout the operational lifetime of the Project. The results of these surveys will be compared against the post-lay survey results. Cable inspection surveys will likely involve the use of a survey vessel with a ROV and geophysical survey equipment, including multi beam echo sounder, side scan sonar and magnetometer.

2.1.55. It is anticipated that inspection surveys would be undertaken every 6-12 months for the first 2-5 years, then reducing in frequency to every 1-5 years for the lifetime of the project.

Maintenance and Repair

2.1.56. The Proposed Development has been designed so that routine maintenance to the marine cable is not required during its operational lifetime. However, there may be the requirement to undertake unplanned repair works, due to the following:

- Mechanical/electrical failure of components within the cable;
- Exposure of, or damage to, the cable as a result of fishing activities and/or vessel anchoring; and
- Exposure of cable due to changes in seabed morphology (e.g. areas of free spanning) or changes in hydrodynamics (e.g. increase in bed erosion due to dredging works in the vicinity of the marine cable).

2.1.57. Repair works would require exposure of the cable at the point where the fault is identified, cutting the cable where damaged, recovery to the surface, repair and

re-deployment and re-burial to the seabed using methods similar to those employed during installation.

2.1.58. The installation of FOC as part of the Proposed Development is essential for operation. They will be utilised for condition monitoring of the marine cables as well as transmitting operational and other data.

DECOMMISSIONING

2.1.59. At the end of the cable's 40-year design life, the options for decommissioning and/or extension of operation will be evaluated.

2.1.60. The importance of considering the decommissioning process as part of the early stages of the DCO application process is acknowledged. Decommissioning activities would be determined by the relevant legislation and guidance available at the time of decommissioning. In addition, a decommissioning plan will be developed and agreed with The Crown Estate.

2.1.61. At the time of decommissioning, the options for decommissioning the cable will be evaluated and will likely include consideration of leaving the marine cables in situ, removal of the entire marine cable or removal of sections of the marine cables. These options will be evaluated against the environmental implications, safe navigability of the area for other sea users and liability risks. Current best practice is to leave the inert and environmentally benign cable in situ so to avoid unnecessary disturbance of the seabed. A similar process will be undertaken for other infrastructure installed as part of the project i.e. cable protection. FOC will be decommissioned in the same way as identified for the marine cables.

2.2 ONSHORE PROJECT DESCRIPTION

SITE CONTEXT

Substation

2.2.1. The Applicant has a Connection Agreement in place with National Grid Electricity Transmission plc (NGET) to connect to the existing 400kV Lovedean substation in Hampshire. To facilitate the connection of the new converter station, there will be a requirement to provide additional outdoor electrical infrastructure at Lovedean substation.

2.2.2. NGET is currently evaluating the extent and location of infrastructure works required at Lovedean substation to facilitate the connection of the Project to the GB National Electricity Transmission System (NETS). The extent of these works will be known prior to the submission of the ES.

2.2.3. The current installation at Lovedean uses Air Insulated Switchgear (AIS). If the bays for the Proposed Development also utilise AIS, the new equipment at the substation will be similar to the equipment already installed within the substation with a typical height of around 6-7m.

2.2.4. An alternative approach to AIS is Gas Insulated Switchgear (GIS) which is more compact. GIS is a common technology within NGET substations and uses sulphur hexafluoride (SF6) as an insulation medium. SF6 would be tightly controlled and monitored, due to it being a greenhouse gas.

2.2.5. Regardless of the technology type, each bay would require a Portable Relay Room (PRR), to store associated protection cubicles and batteries. Although specific details are still to be confirmed, a PRR would typically be a steel container with dimensions of approximately 8m(L) x 3.2m(W) x 4m(H).

Converter Station

Site Context

2.2.6. A new converter station (the "Proposed Converter Station") is proposed adjacent to the existing National Grid substation in Lovedean, Hampshire. The Proposed Converter Station will be located less than 2km from Lovedean substation and will be connected by two 400kV underground AC cable circuits.

2.2.7. There are currently two options being considered for the location of the proposed converter station. It is intended that only one option will be taken forward for assessment in the PEIR and ES. These sites, labelled Option A and Option B, are shown in Figure 1.3 attached.

Baseline Principles

2.2.8. An indicative converter station layout is illustrated in Figure 2.4, below. The proposed converter station footprint will be approximately 4-6ha and will be within a security fenced compound. The exact configuration and final compound footprint will depend on the technology provider selected to supply converter station and telecommunications equipment.

2.2.9. An indicative converter station layout is illustrated in Figure 2.5. The proposed converter station footprint will be approximately 4-6ha, but may be extended somewhat beyond this area, and will be within a security fenced compound. The exact configuration and final compound footprint will depend on local conditions, a technology provider selected to supply the converter station and telecommunications equipment.

2.2.10. The equipment for both circuits will be contained within the same compound.

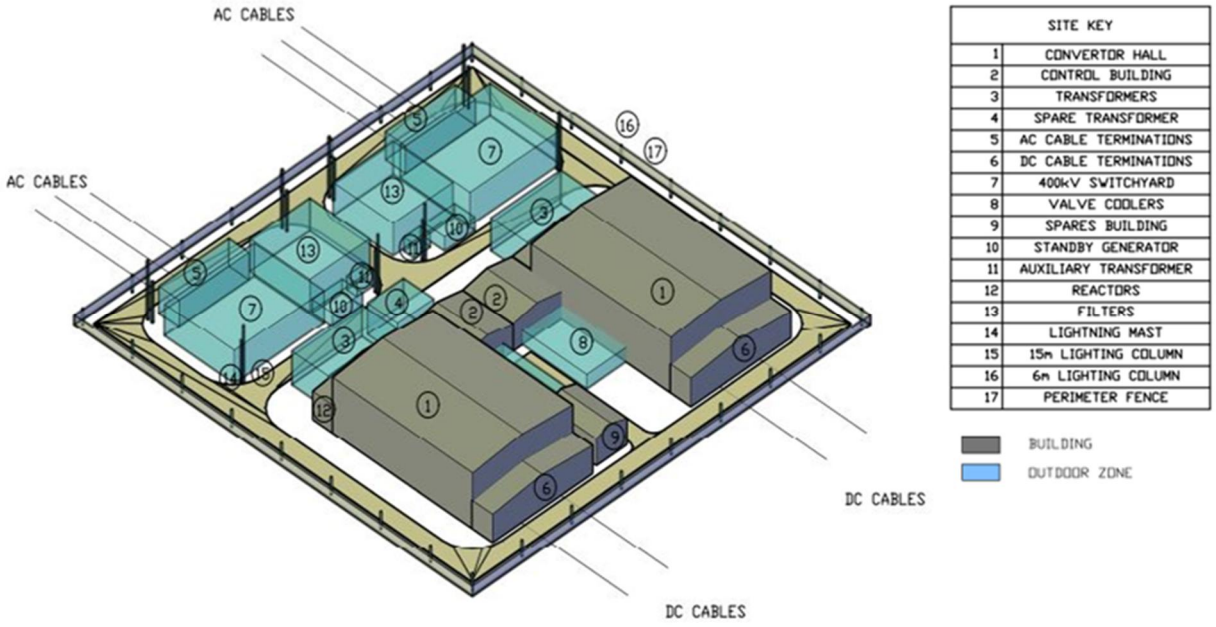


Figure 2.4 Indicative converter station general arrangement

2.2.11. The outdoor equipment which forms part of the proposed converter station will be similar to equipment that is found within typical electrical substations, such as the adjacent Lovedean substation. The 400kV switchyard (item 7 on Figure 2.4), transformers (item 3 on Figure 2.4) and AC/DC filters (item 13 on Figure 2.4) will be located outdoors.

2.2.12. Power electronics are required to convert the power between AC and DC or vice versa. This equipment is housed indoors, within the two converter hall buildings (item 1 in Figure 2.4), each of which will typically measure approximately 90m in length, 50m in width and 22m in height, but may differ somewhat depending on a particular engineering solution and supplier. It has associated infrastructure for cooling and control purposes, which is also housed indoors.

2.2.13. Depending on the detailed design, the building may be extended to include other equipment such as the AC reactors (item 12 on Figure 2.4) and DC cable terminations (item 6 on Figure 2.4), which are capable of being housed either indoors or outdoors. Reasons for housing these indoors would be to prevent exposure to saline pollution and, in the case of the AC reactors, aid noise attenuation.

2.2.14. A control building (item 2 on Figure 2.4) is also required, although this would be at a reduced height compared to the converter hall buildings and could be a two-storey arrangement. The spares building (item 9 on Figure 2.4) would be similar.

2.2.15. The lightning masts, with a height not likely to exceed 26m, are tall and narrow structures, with catenary wiring potentially strung between them to shield the outdoor equipment from direct lightning strikes (note this option depends on the

mast height and subsequent studies performed to ensure all equipment is protected from strikes).

2.2.16. Lighting columns, approximately 6m and 15m high (see items 15 and 16 Figure 2.4) are used to light the outdoor areas of the converter station during emergency situations, such as an intruder or unplanned maintenance work. The lights will not be used during normal operation.

2.2.17. The detailed design of the proposed converter station will be undertaken by an appointed EPC contractor taking account of technical specification and site-specific requirements. The detailed design will be required to be developed within the parameters to be approved as part of the DCO application, and controlled by requirements included within the DCO.

Construction Works

2.2.18. The construction of the proposed converter station is expected to be undertaken in 2020 - 2023. The start of the works will depend on a number of factors, including the progress of planning and permitting process in the UK and France. The programme of the construction and commissioning works may be affected by manufacturing and construction delays including re-works, earthworks, discovery of unknown archaeology etc.

2.2.19. Given the topography of the area, bulk earthworks would be required to create a level platform and construction laydown area to build the converter station. Currently the information from the geotechnical investigations has confirmed that excavated material is likely to be suitable for reuse in construction.

2.2.20. Materials excavated on higher parts of the site would be used to fill lower levels, to minimise material movement off site. It is anticipated that any surplus excavated material from the creation of the platform will be reused within the application site boundary to provide bunds in appropriate locations to provide some visual/acoustic mitigation.

2.2.21. All design and construction works will be undertaken to ensure the existing infrastructure are not encroached in a manner that inappropriately interferes with the utility owner's assets. Construction activities will be conducted in accordance with the recommended practice for safe working in proximity to OHL and underground cables and in accordance with Construction (Design & Management) Regulations 2015.

2.2.22. The engineering works associated with the construction of building platforms, the development of the site drainage system and the construction of permanent access, internal roads within the proposed converter station and car parking arrangements would be completed prior to the construction of buildings on site.

2.2.23. The buildings will typically be constructed of steel frame and cladding.

2.2.24. Landscaping (including bunding if/where appropriate and associated planting) will be implemented around the perimeter of the site and other

necessary/appropriate locations as identified in the Landscape and Visual Impact Assessment, to help integrate the proposed converter station into the surrounding environment.

2.2.25. A new permanent access road will be established from Broadway Lane to the proposed converter station site, which will be utilised accordingly throughout the construction period. It will also continue to be required for maintenance staff to access site. Access by maintenance staff will be limited to light vehicles i.e. normal traffic loads (e.g. cars, vans). Use by HGVs will only be required in the unlikely event of a major equipment failure, for example if the replacement of a transformer is needed at the converter station.

2.2.26. When the appointed EPC contractor mobilises, there will be activities undertaken to secure the site within a perimeter fence with access controlled through a security gate and the setting up of the temporary laydown areas which will include welfare facilities, vehicle parking, site offices, equipment storage, local power and water supplies and spoil/waste containment. These temporary laydown areas are likely to have a total footprint of approximately 4-5ha. All vegetation will be removed in this area and some earthworks may be required to create a level platform, which will be covered in gravel. This area will be in used for the duration of the construction and commissioning stages. Following the commissioning of the interconnector, the ground will be restored to its original condition or enhanced to provide landscape mitigation or biodiversity improvement.

Landfall

Site Context

2.2.27. The UK landfall forms the transitional area between onshore and marine environments and is where the onshore cable route corridor and marine cable corridor are joined together at the TJB.

2.2.28. The proposed landfall location is in the district of Eastney, to the south east of Portsmouth on Portsea Island, Hampshire. The preferred location for the landfall is within a car park to the south of Fort Cumberland Road, north of Eastney Beach.

Construction Works

2.2.29. It is anticipated that four TJBs will be located at the preferred landfall location in the car park, to the north of Eastney beach. Each TJB will require an excavation of approximately 15m x 5m. Once the joint is complete, these excavations are backfilled and the land reinstated. During the construction works, an area of approximately 15m x 5m adjacent to the TJBs is required for the jointing workshop, storage, parking, generator, welfare and security.

2.2.30. The cables will be pulled into the TJB, ready for jointing. During the cable pulling operation, an area of approximately 15m x 12m at either end of the TJBs are

required for the for the cable drum and stand, plus space for delivery and offloading of cable drums (at one end) and the winch and anchor (at the other end).

2.2.31. HDD works will be used to install the cables underneath the intertidal area between land and Eastney beach location prior to termination at the landfall location. The use of HDD avoids the need for any trenching operations on Eastney Beach or in the nearshore area. For more information on the HDD methodology, refer to Paragraphs 2.1.46 to 2.1.50, above.

Onshore DC Cable Route

Site Context

2.2.32. The proposed onshore cable route for DC cables and FOC ("the onshore cable route") will run from the proposed landfall site in Eastney (near Portsmouth) to the converter station at Lovedean, a route of approximately 20 km in length. From the Eastney landfall, the cables will either follow the A288 or utilise residential roads/green space to the east of A288, join the A2030, cross from Portsea Island to the mainland (utilising HDD), then follow the B2177, A3, B2150 and local country roads/fields before terminating at the proposed converter station.

2.2.33. The intention is to locate the cables within existing highways or road verges where practicable.

2.2.34. The majority of the route is expected to be navigated in the vicinity of the existing buried services. It is expected that the following services will be encountered throughout the route:

- Water main and distribution pipes;
- Drainage pipes;
- Sewage pipes;
- Gas main and distribution pipes;
- Electricity cables;
- Telecommunication cables;
- Street light power cables; and
- Traffic light power cables.

Baseline Principles

2.2.35. A typical cross-section of the cable trench arrangement in the highway is shown in Figure 2.5 (attached) showing each pair of DC cables in its own trench, along

with a separate duct for the FOC. The cross section based on a standard design and is subject to detailed design and may change to take into account local conditions e.g. navigation around or cross existing utilities that are encountered. Such modifications may include increasing the cable burial depth and spacing.

2.2.36. A typical spacing of approximately 5m is maintained between the trenches, to ensure the thermal independence of each circuit. This spacing means the cable pairs are usually installed in opposite sides of the carriageway.

2.2.37. Where there is insufficient space in the highway for two pairs, the cable pairs may take divergent routes or be routed outside the highway itself.

2.2.38. Each excavated trench will be approximately 0.7m in width, but could increase to 1.0m in order to facilitate the cables being installed deeper, when navigating existing utility services.

2.2.39. The sides of the trench will be shored, as necessary.

2.2.40. Following laying of the duct/cable, the trench will be backfilled with a material with suitable thermal resistivity, such as cement bound sand. The trench will also include a protection slab above the ducts and buried warning tape.

2.2.41. Link boxes (or pillars) are required approximately every 6km along the cable route. Link boxes are typically located alongside a joint bay and are accessed via a man-hole cover, installed at the same level of the surrounding ground. The dimensions of a link-box are approximately 0.8m x 0.8m x 0.6m. Link pillars are frequently used on arable land (instead of link boxes) and they are normally located adjacent to hedgerow. They are accessed via doors at the front of the link pillar and the dimensions are approximately 1.0m x 1.0m x 0.6m. The link boxes (or pillars) are connected to the metal casing of the joint via underground bonding leads.

2.2.42. Permanent easements along the entire route of the cable system will be required to allow future access for maintenance or cable repair works.

Construction Works

2.2.43. During construction work, there will be a variety of construction zones depending on the stage of work. The construction zone activities will cover the following:

- Excavation of the trench;
- Installation of the cable ducts and reinstatement of the final grade;
- Construction of joint bay;
- Cable drum area for pulling cable through ducts;
- Cable winch area at the other end of the cable section;

- Cable jointing work; and
- Filling of ducts with bentonite sand cement slurry (if applicable).

2.2.44. Temporary laydown compounds will be required for cable drum and accessory deliveries and temporary storage of cable laying plant. Assuming that cable and accessories are delivered to site as required a laydown area of approximately 100m x 50m is considered sufficient. It is anticipated that there will up to three such areas along the cable route during construction.

Excavation of Trenches

2.2.45. The cables will be routed to run in parallel or to cross over or under existing utility services. If the services are at 1m depth, or shallower, it is expected that the cables will cross underneath the service. It is possible for the cable to cross above the services, which would require the utility owner's agreement.

2.2.46. Where the cable route is in or immediately adjacent to roads, the installation will require traffic management measures. To minimise disruption, a single lane closure would be used whenever practicable, rather than a full road closure.

Installation of Cable Ducts

2.2.47. To minimise disruption, cable ducts will be used for installation. This allows short sections to be worked on at any one time and each length of cable pulled through, rather than needing to fully excavate each 600m-2,000m length (approximately). This range matches the typical cable drum lengths that will be delivered to site. The exact lengths depend on the size of drum that can be delivered to each location and on the characteristics of the cable route; in areas where there are more (or sharper) bends the length of cable that can be safely pulled is reduced.

2.2.48. There will be two ducts per trench to accommodate the DC cables, and one duct for the FOC. The installation of ducts minimises the duration of trenching operations, and allows highways to be reinstated more quickly. The cables are pulled through the ducts in sections. The cable ducts would be uPVC push-fit or HDPe welded. The ducts are usually supplied to site in 6m lengths.

2.2.49. In some locations the cable route may cross fields or other open land. The width of the temporary construction corridor within these locations will include all land necessary for access and construction works. Typically, the width of the temporary construction corridor required through fields/open land is approximately 23m (this includes a 5m haul road and safety clearance distance of 1m either side of this haul road).

2.2.50. The installation rate for cable ducts is approximately 18m-30m per day on average within urban areas and approximately 50m per day for areas of open land. These typical installation rates are per gang per shift and are highly dependent upon the level of obstacles and utility services encountered within the

road or constraints that need to be observed to minimise the impacts of construction.

2.2.51. The ducts may be diverted either towards the centre of the road (i.e. closer to the other pair of ducts installed on the opposite side of the road) or further from the verge towards private land to avoid existing utilities. Where increased burial depths are required, a further increase in the cable spacing and circuit separation would be necessary to avoid de-rating the circuits. Circuit de-rating is when the cables are operating at the maximum temperature and not achieving the maximum required current carrying capacity. When a circuit is de-rated, the only way to achieve the maximum circuit rating is to overload the circuit and this would reduce the lifetime of the asset.

2.2.52. At particularly constrained locations, it may be necessary to improve the thermal environment around the ducts in order to reduce the separation distance between the cable pairs or from adjacent third-party services. This can be achieved by using a low thermal resistivity material around the ducts (e.g. well-compacted cement) or by filling the ducts with bentonite sand cement slurry after cable installation. For the latter, filling and venting points would need to be installed. The frequency of these filling and venting points would be dependent upon the route profile, size of the duct and the viscosity of the filling medium. Filling the ducts would be an option of last resort, when low thermal resistivity material around the ducts would not achieve the desired conditions.

Joint Bay Construction and Cable Pulling

2.2.53. To correspond with the lengths of cable that can fit on a drum and pulling tension limits, joint bays will need to be positioned at approximately 600-2,000m intervals along the route.

2.2.54. The excavation for the joint bay (for each circuit) will be approximately 15m x 3m with the joints themselves being approximately 6m x 3m in size.

2.2.55. Joint bays will be positioned in verges, fields or car parks where possible, to limit any requirement for road closures. It is preferable to avoid the need for the DC cables to cross the highway to access a joint bay location.

2.2.56. Cable drums will hold the cable required to be pulled from one joint bay to the next, varying in length depending on the requirements of the route. The drum dimensions will depend on the cable contractor's cable design, traffic management considerations and cost optimisation. However, typical drum dimensions for up to 2,000m of cable (i.e. the largest cable drum anticipated) are a drum belly diameter of 2.5m, drum outside diameter of 4.9m and drum width of 3.0m, with a mass of 50T.

2.2.57. Delivering large cable drums will need planning and logistics to identify suitable routes, taking into account maximum road/bridge loadings and restrictions in height and width, which may result in requiring shorter sections of cables.

2.2.58. Cable winches will pull the cable through the duct system. The area around the winch will be fenced off and designated as a construction zone.

2.2.59. Each joint bay will be open during the cable pulling operation and the expected timescale associated with pulling is four days per joint bay (i.e. that associated with one DC circuit). This assumption has presumed a working day of 8am-6pm.

2.2.60. Once cables are installed in all ducts, the joint bays will be partially backfilled and covered with steel plates for protection whilst awaiting further jointing operation.

2.2.61. Due to a much smaller diameter, fibre optics cables can be installed in longer segments. The installation of the FOC will be undertaken concurrently with the installation of the power cables.

2.2.62. There may be occurrences where the cables will have to be laid / pulled in open trenches to be able to more precisely navigate around existing utility services or obstacles.

Jointing

2.2.63. Jointing of the cables will require the area of each joint bay to be fenced. Typically, in addition to the excavated bay (one per pole), there would be:

- One container for storage and a workshop;
- Welfare facilities;
- Generator, quiet where appropriate, and fuel;
- Temporary shelter installed over the joint bay, to provide a suitable environment for assembling the joints;
- Space at one or both ends of the joint bay for cable installation; and
- Space for parking operatives' vehicles

2.2.64. Typically, it takes 20 working days to complete one joint bay location. This timescale includes the excavation, set-up, cable pulling, jointing, bonding connections, testing and reinstatement (i.e. site cleared and reinstated to its original state). Where practicable, these 20 working days will be continuous, but in some cases cables may be pulled into joint bays, which would be temporarily backfilled, and jointing would take place later in the project.

2.2.65. The jointing operation is performed in joint bays (JB), which are located underground in line, or off to one side of the cable route. Each JB excavation will be approximately 15m x 3m, but additional space will be required for construction, cable installation, jointing and reinstatement. The excavation would be open for the 20 working days, but approximately 10m x 5m at one or both

ends of the JB would be required during cable installation (approximately one week) and 20m x 6m during jointing (approximately one week).

HDD Installation

2.2.66. There are five potential locations along the cable route which will likely require HDD. These locations are: at the Eastney landfall; the allotments north of Bransbury Park; the Portsea Island crossing; the railway crossing north of Farlington Playing Fields (Pipe Jacking or HDD); and the King's Pond Site of Special Scientific Interest (SSSI) near Anmore. Where additional space is required for HDD crossings, adjacent land (e.g. car parks, fields etc.) will be utilised to facilitate the HDD construction works.

2.2.67. HDD will be used to allow cables to cross under certain constraints along the route namely water ways, railways and environmentally sensitive areas. As discussed previously, a HDD installation method will also be used to install the marine cables in the intertidal area. The HDD method limits disturbance to the environment and the related constraints that the cable is being diverted around.

2.2.68. The HDD operations drill holes through the ground that will house ducts through which the cables will be pulled at a later date. The HDD methodology starts with the drilling of the pilot bore, which may be performed by a specialist sub-contractor, using wire-guiding techniques to set the profile of the crossing. The bore is then reamed to the required diameter. The ducts, HDPE, are welded together and laid in a single length at one end of the crossing, to be pulled in a continuous process.

2.2.69. The HDD operations require a suitable space for the temporary construction area, which can typically be up to approximately 50m x 50m depending on the length and size of the HDD works. The HDD operations require a working area to locate the drilling rig, water bowser/pump, generator, layout of ducts/pipes and other construction equipment.

2.2.70. The HDD drills that are required for each of the four DC cables would have to be suitably spaced to achieve the required cable rating. Typically, this suitable spacing is around 4 x 5m at the entrance and exit of the HDD and around 4 x 10m at the maximum burial depth. The maximum width of cable reserve has been assumed to be approximately 60m.

Onshore AC Cable Route

Site Context

2.2.71. There will be two 400kV AC cable circuits that will connect the proposed converter station to the existing NGET substation at Lovedean, passing through agricultural land. Each circuit will sit in a single trench.

Baseline Principles

2.2.72. Each AC circuit will require three cables, resulting in a total of six AC cables required for the connection.

2.2.73. Installed alongside the AC cables will be an insulated metallic conductor (earth continuity conductor) to provide a path to earth for any fault currents. The earth continuity conductor would be installed between the centre cable and one outer cable; this would cross to the other side of the centre cable at the mid-point of the AC cable route for technical reasons.

2.2.74. There is also a requirement for one FOC to be installed alongside the AC cable in each trench for control and protection purposes. A typical cross-section is shown in Figure 2.6 (attached), this may be subject to change based on local conditions and will be confirmed during the detailed design stage.

Construction Works

2.2.75. The design and configuration of the AC cables will be subject to detailed design and may be impacted upon by elements such as soil conditions, length of cable route, impact from the environment and existing infrastructure. The cable circuits will be installed in flat formation (3 phases (i.e. 3 cables) are required for each circuit).

2.2.76. The AC cables will be delivered to site within cable drums. Each cable drum will typically hold around 700m to 1,000m of cable.

2.2.77. It is anticipated that the AC cable route will also utilise a ducted installation method as previously discussed in the DC cable section, with ducts installed underground between the converter station and the National Grid Substation at Lovedean, prior to the AC cables being pulled through. Ducted installation provides benefits with regards to installation security and minimises potential interface issues with the cable route approach south of the Lovedean site.

2.2.78. The normal burial depth across agricultural land and open countryside is typically 900mm to the top of the protection covers. Where possible, a minimum buffer of 2m on either side of the cable trench to major tree roots will be employed. A buffer of approximately 5m between AC cable circuits ensures that the circuits are electrically and thermally independent of each other.

2.2.79. During construction works, an additional land area will be required for construction and laydown purposes. The length of cable route is anticipated to be less than 2km and for this short length it is not anticipated that a road (haul road) is required along the route to remove excavation spoil or provide access for the cable drum/large equipment. Space will be required at the excavation point for excavated material and this will generally be to the side of the route.

2.2.80. Figure 2.7 (attached) illustrates a section through a typical construction corridor for the AC cables. The overall width between the temporary fences will be approximately 23m depending on the local environment and selection of cable

design. It would be possible to reduce the width in places however this would require extra handling and a separate storage area for the excavated material. If the cable route length is increased then the haul road will be required and the construction corridor will be increased accordingly. The cable construction corridor is subject to change to take into account local conditions and will be confirmed during the detailed design stageFibre Optic Cables

2.2.81. Two FOC will be installed, one for each circuit. The FOC is used for inter-station communications, which are needed for control and protection systems hence the FOC are required in both the AC and DC trenches. Additionally, it also allows for condition monitoring of the cables, using Distributed Temperature Sensing (DTS). Spare strands of fibre may be leased to third parties for commercial telecoms purposes.

2.2.82. For the onshore cable route, the FOC will be installed in a 35-45mm diameter duct. For the marine cable route, the FOC will be bundled with the DC marine cables.

2.2.83. A suitable building (approximately 20m x 20m footprint) will be required within 1km of landfall to house amplification equipment associated with the FOC. This ensures the signal is strong enough to reach the remote converter station. This may be a new or existing structure.

2.2.84. The converter station will act as the FOC termination point. This will require telecommunications equipment to be housed at the converter station. Some equipment may belong to third party providers who lease additional FOC capacity. This third party equipment may be segregated within the proposed converter station buildings or housed separately in a building that is adjacent to the main converter station compound. In both cases, separate access will be provided to this equipment to allow 24hr third party access without the need to access the converter station itself

PROGRAMME OF ONSHORE CONSTRUCTION WORKS

2.2.85. Table 2.3 outlines the indicative programme for the construction works associated with the UK onshore elements of the Proposed Development.

Table 2.3 Indicative onshore construction programme

Activity	Indicative Programme
Cable manufacture commences	2020
Onshore cable installation	2021-2022 (inclusive)

Activity	Indicative Programme
Onshore converter station construction	2021-2022 (inclusive)
Site works at Lovedean Substation complete	2023
Commissioning	2023

OPERATION AND MAINTENANCE

Operation

2.2.86. The Proposed Converter Station will be designed for unmanned operation, but a small team of maintenance staff (typically 3-4) will be responsible for maintaining the plant and will be on 24/7 callout if required.

2.2.87. The interior roads (i.e. those associated with access to the converter station from existing highway network) will be provided during the construction stage and maintained during the operational stage of the Proposed Development. These roads will allow the movement of vehicles around the station during the construction stage and during normal operation or routine maintenance.

2.2.88. The station will be enclosed by a perimeter security fence. This will follow the required standard design of security fences around high voltage substations in the UK, i.e. an external steel palisade fence of approximatley 2.4m in height, with an inner electrified fence of approximately 3.4m in height. The fences are designed to prevent unauthorised access to the converter station because due to the nature of a high voltage station, it is dangerous for untrained personnel. Therefore, access to the converter station will be strictly controlled and only permitted to those with the appropriate training.

2.2.89. The main equipment access gate would be controlled by staff in the converter station control room. A personnel access gate would be operated by a key card or key pad security system.

2.2.90. Lighting columns will be installed along the perimeter fence and around the outdoor equipment areas. In normal night time operation there will be no illumination of the site to comply with a “dark skies” policy in the region close to the SDNP. Lighting would only be used in the event of unauthorised access to the site or if emergency repair work was required on the outdoor equipment. The light fittings will be appropriately designed to ensure light is directed only to the areas needed, but will be subject to detailed design and dealt with at the requirements stage.

2.2.91. There are no operational requirements associated with the proposed cable route and the associated cable equipment along the route.

Maintenance

2.2.92. The design life of all equipment, buildings and infrastructure would be 40 years, which is common practice for this type of development. After approximately 15-20 years, the control system and proposed converter technology is normally updated and overhauled. This is a considerable investment but will ensure that the interconnector can operate efficiently throughout the remainder of its life.

2.2.93. Cable systems are reliable and require very little maintenance. The maintenance that is required includes; cleaning of the air insulated terminations (typically cleaned every few years during circuit outages); where applicable visual inspection of pressure gauges at the cable terminations (located at the proposed converter station) to confirm there are no oil leaks and that the oil pressures are within the required level; visual inspection of the steel work at terminations (i.e. the supporting structure, cable cleats and link-boxes) to check for corrosion.

2.2.94. At the link-box locations there shall be periodic HV testing of the cable. These tests would be carried out every two years or before re-energisation of the interconnector after an outage period.

2.2.95. Visual inspection of the output of the DTS hardware which is located within the converter station would be required. Changes in the temperature profile (either hot spots or cold spots) could indicate changes has occurred along the cable route. Hot spots could indicate that ground levels have increased or another heat source has been installed adjacent to the power cables. Cold spots could indicate that marine cables have become exposed.

2.2.96. The onshore cables will not require any maintenance, however, cable failures are not uncommon, albeit rare in occurrence; onshore cable damage will typically leave the interconnector out of service for a couple of weeks during repair.

2.2.97. Regular access to the telecommunicatio equipment at the proposed converter station will be required and FOC amplification equipment near the coast will be be required.

Decommissioning

2.2.98. Given a design life of 40 years, major items of equipment (i.e. transformers, circuit breakers, reactors etc.) are designed to meet the lifetime of the Proposed Development and should remain operational for that time. However, some components within the station are consumable items, which will need replacement from the spares holding as required (e.g. valves). Some equipment may become obsolete, due to advancements in technology and can no longer be supported by suppliers and will need to be replaced by the latest versions available.

2.2.99. The current worldwide trend for interconnectors at the end of their operational lifetime is to re-furbish the station replacing major items of equipment, to extend the lifetime of the scheme.

2.2.100. Whilst the Project is designed to provide permanent electrical infrastructure, there may come a time where it may be appropriate to decommission the equipment. When it is considered suitable, the decommissioning of the station will involve each item of equipment being removed for recycling or disposal, as appropriate. Many plant items contain metals such as copper, steel and aluminium which are valuable and would be recycled. Other material such as plastics and rubber will need to be disposed of, according to the relevant environmental legislation effective at the time. All civil works within the Proposed Development, i.e. concrete and steel structures (including link boxes/pillars, joint bays, buildings, electrical outdoor infrastructure) will be removed to return the site to its previous state (agricultural or other).

2.2.101. It is expected that the cable's operational lifetime will exceed that of the converter station equipment, however at the end of the cable's life, the options for decommissioning will be evaluated. In some instances, the least environmentally impacting option may be to leave the cable in-situ. The final cable decommissioning plan is still to be determined, and may depend on requirements at the time. When decommissioning the onshore cables, every effort would be made to recycle as much material as possible. The FOC will be decommissioned in the same way as identified for the onshore cables.

3. POLICY AND LEGISLATIVE CONTEXT

3.1 INTRODUCTION

3.1.1. This chapter outlines the policy and consents framework under which the application to construct and operate the onshore and marine components of the Proposed Development within the UK will be considered. The Proposed Development is defined as the installation of up to four onshore cables running from Lovedean at the converter station to Eastney where they become marine cables within the marine cable corridor that runs from the MHWS mark within the UK out to the UK/France EEZ boundary line in the English Channel. The ES will include a chapter setting out the legislative and planning framework, a summary of which is provided below.

3.1.2. The Proposed Development is not of a type that is detailed within either Schedule 1 or Schedule 2 of the EIA Regulations. However, due to potential environmental and human sensitivities within and surrounding the Proposed Development the decision was taken to voluntarily undertake an EIA in support of any application for consent to report any likely significant effects.

3.1.3. Having been recognised as an NSIP, an application for development to construct and operate the Proposed Development within the UK will be made under the PA 2008. The PA 2008 provides the statutory framework for applications for development consent for NSIPs both on land and at sea.

3.2 UK PLANNING LEGISLATION

THE PLANNING ACT 2008

3.2.1. The PA 2008 (as amended) is the primary legislation that established the legal framework of requiring development consent to be obtained for NSIPs. Under the PA 2008, PINS is responsible for progressing the examination of all applications which are examined by a single person or a panel of persons appointed by the SoS who are responsible for examining and reporting on the application and a making recommendation to the relevant SoS, who will make the decision on whether to grant or to refuse development consent.

3.2.2. By letter to the SoS dated 19th June 2018, the Applicant formally requested that they exercise the power vested in them under Section 35 of the PA 2008 to direct that the proposed UK elements of the Project be treated as development for which development consent under the PA 2008 is required.

3.2.3. The SoS, in their Direction dated 30th July 2018 confirmed that they are of the view the proposed development is of national significance for the following reasons:

- 'The two giga-watt capacity of the proposed development is similar in terms of electrical capacity to a generating station that would

qualify to be considered under the PA 2008 process as nationally significant.

- By progressing the proposed Development through the PA 2008 development consent process, it would provide the certainty of a single, unified consenting process and fixed timescales.

- It will reduce the need to apply for separate consents from the MMO and local planning authorities'.

3.2.4. The Direction confirmed that the Proposed Development, together with any development associated with it, is to be treated as development for which development consent is required.

3.2.5. The SoS further directed in accordance with section 35ZA (5) of the PA 2008 that the Overarching National Policy Statement for Energy (EN-1) has effect in relation to an application for development consent under the Direction in a manner equivalent to its application to development consent for the construction and extension of a generating station within section 14(a) of the PA 2008 of a similar capacity as the Proposed Development so far as the impacts described in EN-1 are relevant to the Proposed Development.

3.2.6. A summary of National Policy Statement (NPS) and EN-1 is provided below.

MARINE AND COASTAL ACCESS ACT

3.2.7. The MCAA 2009 provides the legal mechanism to help ensure clean, healthy, safe, productive and biologically diverse oceans and seas by placing a management and protection system of the marine and coastal environment.

3.2.8. Under Part 4 of the MCAA 2009, the Marine Management Organisation is the competent marine planning authority on behalf of the UK Government, responsible for administering and issuing licences for activities within UK territorial waters and also regulating activities where they are undertaken beyond UK territorial waters (e.g. within the EEZ). The MMO is the UK Government's expert body on marine management and under the PA 2008, the MMO will act as a statutory advisor under Section 42 of the PA 2008 as well as an interested party during the examination stage of the application. The PA 2008 enables DCOs for projects which are located within the UK marine area to include provisions which deeming a marine licence to have been issued under Part 4 of the MCAA 2009.

NATIONAL POLICY STATEMENTS

3.2.9. The UK Government produces National Policy Statements (NPS) which provide the policy framework within which the Examining Authority make their recommendations to the SoS.

3.2.10. NPS comprise the UK Government's objectives for the development of nationally significant infrastructure in a particular sector and state, including:

- How this will contribute to sustainable development;
- How these objectives have been integrated with other government policies;
- How actual and projected capacity and demand have been taken into account;
- Consideration of relevant issues in relation to safety or technology;
- Circumstances where it would be particularly important to address the adverse impacts of development; and
- Specific locations, where appropriate, in order to provide a clear framework for investment and planning decisions.

3.2.11. There are 12 designated National NPS, setting out government policy on different types of national infrastructure development including Overarching National Policy for Energy (EN-1) which the SoS has directed has the relevant NPs for the proposed development. They also include any other policies or circumstances that ministers consider should be taken into account in decisions on infrastructure development.

3.2.12. The NPS that is relevant to the Proposed Development, as a consequence of the Direction made by the SoS regarding its effect in relation to the Proposed Development, is the NPS for Overarching Energy (EN-1).

Overarching National Policy Statement for Energy (EN-1)

3.2.13. The overarching NPS for Energy (EN-1) was adopted in July 2011 and sets out the national policy for delivering energy infrastructure. It is to be the primary basis for decision taken by the SoS for nationally significant energy infrastructure. Under the PA 2008 the SoS must also have regard to any local impact report submitted by a relevant local authority, any relevant matters prescribed by in regulations, the Marine Policy Statement (MPS) and any applicable Marine Plan, and any other matters which the SoS thinks are both important and relevant to its decision.

3.2.14. EN-1 covers government policy on energy and energy infrastructure development; the need and urgency for new nationally significant energy infrastructure; the principles which applications are to be assessed and determined in accordance with; and the generic impacts that are likely to arise from the development of energy infrastructure and the policy in respect of the consideration of those impacts.

3.2.15. Part 1 of NPS provides background and the scope of the NPS for energy as well as the geographic coverage of the statement.

3.2.16. Part 2 of the NPS of the statement sets out the Central Government policy context for major energy Infrastructure comprising:

- The need to meet legally binding targets to cut greenhouse gas emissions by 2050;
- Transitioning to a low carbon economy;
- Decarbonising the power sector;
- Reforming the electricity market;
- Security of energy supplies; and
- Delivering the Government's wider objectives.

3.2.17. Part 3 of the NPS sets out the need for new nationally significant energy infrastructure projects. Further detail on the need for the Proposed Development will be provided in the PEIR and ES.

3.2.18. Part 4 of the NPS sets out a number of assessment principles, including the presumption in favour of granting consent to applications for energy NSIPs, and the need to balance potential benefits against potential adverse impacts.

3.2.19. Part 5 of the NPS sets out policy in respect of the consideration of the impacts listed on that part.

3.2.20. EN-1 highlights that applicants should work with the MMO on NSIPs which would be likely to affect any relevant marine areas as defined in the PA 2008 (as amended by s. 23 of the MCAA, 2009). It further provides that PINs should cooperate closely with the MMO to ensure that the energy NSIPs are licensed in accordance with environmental legislation. PINs consent will include a deemed marine licence and the MMO will advise on what conditions should apply to that deemed marine licence.

3.2.21. EN-1 states that PINS must have regard to the UK Marine Policy Statement (MPS) and applicable Marine Plans in taking any decision which relates to the exercise of its function capable of affecting the whole or any part of the UK marine area. In the event of a conflict between any of the marine planning documents and an NPS, the NPS prevails for purposes of decisions making given the national significance of infrastructure.

3.3 MARINE PLANNING POLICY

UK Marine Policy Statement (2011)

3.3.1. The UK MPS is the framework for preparing Marine Plans and taking decisions affecting the marine environment. This policy aims to contribute to the

achievement of sustainable development in the UK marine area and was adopted for the purposes of section 44 of the MCAA 2009.

3.3.2. The MPS builds on the shared UK wide high level marine objectives, and provides an overview of relevant national policy, including the National Planning Policy Framework (NPPF) and associated NPS.

3.3.3. Marine plans in UK coastal areas overlap slightly with the area of jurisdiction of local authorities. Marine plans cover the area up to the MHWS tide whereas local authorities' responsibilities extend to the MLWS mark.

3.3.4. Decisions for NSIPs should made with regard to the existing Marine Plans, or in the absence of the Marine Plans, the MPS.

Marine Plans

3.3.5. The South Marine Plan has been prepared in accordance with, and gives consideration to, the MPS and EU Maritime Spatial Planning Directive (2014/89/EU) which supports the Integrated Maritime Policy for the European Union. The directive introduces a framework for maritime spatial planning and encourages sustainable development of marine areas and resources.

3.3.6. The aim of the South Marine Plans is to help ensure that the right activities happen in the right place and in the right way within the marine environment. It provides a framework that will shape and inform decisions over how the areas' waters are developed, protected and improved over the next 20 years.

3.3.7. The South Marine Plan (which includes South Inshore and South Offshore Marine Plan Areas) were adopted on 17 July 2018 and are now relevant consideration for the licensing activities within the South Marine Plan Area. The Marine elements of the Proposed Development are located within the South Marine Plan area.

3.3.8. There are two plan policies that specifically relate to marine cables that aim to meet Objective 2 (To manage existing, and aid the provision of new, infrastructure supporting marine and terrestrial activity) of the plan:

- S-CAB-1: Preference should be given to proposals for cable installation where the method of installation is burial. Where burial is not achievable, decisions should take account of protection measures for the cable that may be proposed by the applicant.

- S-CAB-2: Proposals that have a significant adverse impact on new and existing landfall sites for subsea cables (telecoms, power and interconnectors) should demonstrate that they will, in order of preference: a) avoid b) minimise, c) mitigate significant adverse impacts, d) if it is not possible to mitigate significant adverse impacts, proposals should state the case for proceeding.

3.4 ENVIRONMENTAL LEGISLATION

REQUIREMENT FOR EIA AND EIA PROCESS

3.4.1. EIA was introduced under the EU EIA Directive 85/337/EEC (as amended by Directive 97/11/EC, 2003/35/EC, 2009/31/EC, 2011/92/EU).

3.4.2. In April 2014, the EU's Official Journal published Directive 2014/52/EU, amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. The requirements of the updated Directive have been transposed into English law in connection with applications for which development consent is required by the EIA Regulations.

3.4.3. Whilst the Proposed Development does not constitute either a Schedule 1 or Schedule 2 development under the EIA Regulations, the Applicant has chosen to voluntarily undertake an EIA and prepare and submit an ES to report the likely significant environmental effects of the Proposed Development. The EIA and ES will be carried out in accordance with the requirements of the EIA Regulations.

OTHER RELEVANT LEGISLATION

3.4.4. The following international, European and national legislation is of relevance to the Proposed Development and will be outlined further in the ES:

- Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention);
- Habitats Directive (92/43/EC) and Birds Directive (2009/147/EEC) (transposed by the Conservation of Habitats and Species Regulations (2017));
- Water Framework Directive (2000/60/EC) (transposed by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- Marine Strategy Framework Directive (2008/56/EC) (transposed by the Marine Strategy Regulations 2010);
- Waste Framework Directive (2008/98/EC) (transposed by the Waste (England and Wales) Regulations 2010);
- Bathing Water Directive (2006/7/EC) (transposed by the Bathing Waters Regulations 2013);
- MCAA (2009);
- Countryside and Rights of Way Act (2000);
- The Wildlife and Countryside Act (1981); and

- Natural Environment and Rural Communities Act (2006).

3.4.5. The legislation and policy described above is not an exhaustive list of all the legislation, policy and guidance that is relevant or needs to be considered to the technical disciplines included within this Report and the ES. It serves to provide an overview of the leading key legislation that the Proposed Development will be assessed against. The technical disciplines assessed within the ES will provide further detail of the topic specific legislation and policy. Appendix B provides a high level overview of the relevant legislation and policy that will be considered as part of the PEIR and ES.

4. EIA METHODOLOGY

4.1 INTRODUCTION

4.1.1. This section confirms the proposed approach to the EIA and provides an appraisal of the key environmental effects to be covered in the EIA (i.e. ‘’scoped in’’) and the issues that do not require further consideration (i.e. ‘’scoped out’’) in the context of key legislative and policy documents. The assessment of environmental impacts will be conducted in accordance with best practice and relevant guidance. The following key stages will form the basis of the assessment process:

- Consultation with statutory and non–statutory bodies and relevant stakeholders;
- Establishing a robust baseline of the existing environment on and around the Proposed Development through desk-based assessment and surveys and identifying any future trends;
- Assessment of the environmental impacts (their significance, including any indirect, secondary and cumulative impacts);
- Development of mitigation measures and enhancement measures (where necessary); and
- Identification of residual environmental impacts.

4.1.2. The EIA process will be documented in a single ES for the entirety of the Proposed Development.

4.1.3. The ES will include a clear description of all the aspects of the Proposed Development, including timescales of the construction operation and decommissioning stages.

4.1.4. The EIA will be carried out in accordance with the requirements of the EIA Regulations. In addition, the approach to the EIA and production of the ES will have regard to the guidance and advice provided within the following:

- National Infrastructure Advice Notes in relation to the PA 2008 process;
- Overarching NPS for Energy (EN-1);
- Relevant guidance issues by other government and non-governmental organisations; and
- Receptor specific guidance documents.

4.1.5. The ES will report the likely significant environmental effects that have the potential to result as a consequence of the Proposed Development. Where such significant effects are identified, mitigation measures to prevent or reduce effects (either through project design or adoption of certain installation methodologies), will be proposed and incorporated into the assessment.

4.1.6. The ES will include the information required in accordance with Regulation 14(2) and Schedule 4 of the EIA Regulations.

4.1.7. A detailed description of the Proposed Development will be provided within the ES with sufficient information about the site, design, size and scale of the development such that PINSs and other interested parties can reasonably be satisfied that there is sufficient information for determination in full knowledge of the Proposed Development's likely significant effects on the environment.

4.2 POTENTIAL ENVIRONMENTAL EFFECTS

4.2.1. The Applicant is committed to ensuring that the likely significant environmental effects from the Proposed Development are identified and where possible addressed through the design process before the Application Plans to support the planning application for submission are fixed. The environmental specialists will therefore work with the design team to avoid or offset any likely significant effects through early design reviews and revisions to the Proposed Development to optimise the scheme shown on the Application Plans to support the planning application.

4.2.2. The potential sensitive receptors likely to be significantly affected by the Proposed Development will be identified based on desktop studies, site visits and surveys as well as from existing knowledge and understanding of the local area. This provides a comprehensive environmental dataset of potential sensitive receptors.

4.3 NON-SIGNIFICANT ISSUES SCOPED OUT OF THE EIA

4.3.1. Through the compilation of this Report, the Applicant will identify all potential routes to impact and likely effects on receptors. Through this process, evidence of the magnitude and consequence of effect on receptors will be appraised. Where sufficient evidence is thought to exist to provide confidence that no significant effects will arise from an effect, this Report will propose the potential impact to be 'scoped out' of the EIA and ES.

4.3.2. This process has been undertaken in a receptor specific manner and presented within Chapters 6-31.

4.3.3. Within the EIA Regulations, Regulation 5 and Schedule 4 require the following to be assessed within an ES:

a) Population and human health;

b) Biodiversity;

c) Land, soil, water, air and climate;

d) Material assets;

e) Cultural heritage; and

f) Landscape.

4.3.4. In agreement with the MMO during consultation, land, soil and climate in topic c) and topic d) are not considered to be relevant for assessment as part of the Marine UK topics and will therefore not be scoped in for further assessment. These topics will be covered more fully as part of the assessment of Onshore UK topics in this Report and the EIA. Topics b) and the remaining items of c) (i.e. water and air) will be assessed within Marine UK topics that investigate potential impacts on water quality and ecological receptors.

4.4 PROPOSED SCOPE

4.4.1. Based on the understanding of the potential impacts of the construction, operation and decommissioning of the Proposed Development, Table 4.1 summarises the topics that will be covered in the EIA:

Table 4.1 Scope of EIA

Onshore	Marine
Landscape and Visual	Physical Environment
Ecology (with Arboriculture)	Marine Water and Sediment Quality
Soils and Land Use	Intertidal and Benthic Ecology
Ground Conditions	Fish and Shellfish Ecology
Water Resources and Flood Risk	Intertidal and Marine Ornithology
Heritage and Archaeology	Commercial Fisheries
Traffic and Transport	Marine Mammals and Basking Shark

Air Quality	Shipping and Navigation
Noise and Vibration	Other Marine Users
Socio-economics	Marine Archaeology
Human Health	
Waste and Material Resources	
Carbon and Climate Change	

4.4.2. Chapters 6-32 this report set out the proposed scope and methodology for the assessment of the likely significant environmental effects of the installation, operation and decommissioning stages of the Proposed Development. The scope of the EIA is summarised in Appendix C and the proposed structure of the ES is outlined in Appendix D.

4.4.3. Following established best practice, the overall design of the Project will evolve in an iterative manner with the assessment process, led mainly by the consideration of constraints that exist within and around the Proposed Development (environmental, technical and economic). Once the preferred design is selected, this will form the basis of the EIA.

4.5 BASELINE INFORMATION

4.5.1. For each of the topics being assessed, the environmental baseline of the relevant study areas will be established. This will be achieved largely through consultation with relevant authorities and organisations, a desktop review of available data including that generated from consultations, and detailed interpretation of specialist field surveys. During the scoping process, it is anticipated that consultees will be able to identify additional datasets that can be incorporated into the baseline surveys and assessments, where appropriate.

4.5.2. Baseline surveys have been and continue to be carried out by specialist consultants in a number of different study areas following methodologies agreed with independent stakeholders. These surveys are aimed at gathering sufficient data to form a picture of the current status of environmental, social and physical elements in the vicinity of the Proposed Development, filling in any gaps in existing historical data. The ultimate aim is to allow the prediction of the potential effects of a subsequent detailed development proposal upon these physical, environmental and social elements.

4.5.3. Methodologies and extent of studies will be developed in consultation with statutory bodies and individual stakeholders to ensure the most appropriate techniques. The baseline studies and surveys are coordinated to ensure that, where they study separate elements of interacting systems, the methodologies and extent are compatible with one another and provide common data that allow the description and understanding of those systems. This then allows the prediction of indirect effects as well as direct effects of the development on sensitive receptors.

4.5.4. Figure 4.1(attached) illustrates the relevant environmental constraints for the Proposed Development that will be discussed as part of the baseline description for the technical disciplines.

4.6 ASSESSMENT OF THE PROPOSED DEVELOPMENT

4.6.1. As described above, the ES will be based on final design of the Proposed Development and will include embedded mitigation where possible. Environmental effects which cannot be avoided or mitigated through careful design will be assessed to determine their significance. A description of the iterative design process will be provided in the ES.

4.6.2. The EIA will be undertaken in accordance with the EIA Regulations and assessments will also adhere to relevant legislation, policy and guidance which relates to the specific disciplines discussed within the relevant technical chapters of the ES.

4.6.3. The assessment will consider effects at the construction, operation and decommissioning stages. The definitions of these are presented below:

- **Construction (Site Preparation and Installation):** Site preparation includes work required to prepare for construction including seabed preparation for marine works and demolition, earthworks, remediation (if required) and any archaeological excavation for onshore works. The construction stage includes all works associated with construction. It is known that the construction of the Proposed Development will extend over a number of years. Therefore, where feasible and where sufficient information exists, construction effects identified within the ES will be time bound and location specific;

- **Operation:** This relates to effects once the Proposed Development is installed and in use or occupied;

- **Decommissioning:** This relates to effects at the end of operation as the Proposed Development is shut down.

4.6.4. Information relating to phasing will not be applicable to the assessment process for all technical disciplines. At this stage a number of design details are still emerging, including the phasing, demolition, and construction programme.

Details of the phasing, demolition, and construction of the Proposed Development will be included within the ES, including an opening year which will be referenced consistently throughout each of the technical assessments within the ES.

DETERMINING THE SIGNIFICANCE OF EFFECTS

4.6.5. A number of criteria will be used to determine the significance of the potential effects of the Proposed Development and whether or no they are 'significant'. The effects will be assessed quantitatively wherever possible.

4.6.6. The significance rating for an effect will take account of the following criteria:

- Likelihood of occurrence;
- Geographical extent;
- Adherence of the proposals to legislation and planning policy;
- Adherence of the proposals to international, national and local standards;
- Sensitivity of the receiving environment or other receptor;
- Value of the affected resource;
- Whether the effect is temporary or permanent;
- Whether the effect is short, medium, or long-term in duration;
- Whether the effect is reversible or irreversible;
- Inter-relationship between effects (both cumulatively and in terms of potential effect interactions); and

4.6.7. In determining the significance of a potential effect, the magnitude of impact arising from the proposal is correlated with the sensitivity of the particular environmental attribute under consideration.

4.6.8. The magnitude relates to the level at which the receptor will be impacted, using the duration of the impact, timing, scale, size and frequency to determine the magnitude of the impact to each receptor. Magnitude of impact is evaluated in accordance with the definitions set out in Table 4.2 below. The definitions of magnitude in Table 4.2 should be used as a guide only and may be more specific for some receptors (e.g. marine mammals).

Table 4.2 Definitions of 'Magnitude' of impact

High	Total loss or major alteration to key elements/features of the baseline (i.e. pre-development) conditions.
Medium	Partial loss or alteration to one or more key elements/features of the baseline (i.e. pre-development) conditions.
Low	Minor shift away from baseline (i.e. pre-development) conditions.
Negligible	Very slight change from baseline (i.e. pre-development) conditions.

4.6.9. The sensitivity is assigned at the receptor level, and as such details will be provided within the receptor specific assessments presented in the ES. This may be defined in terms of quality, value, rarity or importance, and be classed as low, medium, or high. For certain assessment areas, guidance can be taken from value attributed to elements through designation or protection under law, e.g. ecological resources given various levels of protection under law.

4.6.10. Where an assessment of this nature takes place, the correlation of magnitude against sensitivity determines a qualitative expression for the significance of the effect, which determines the relevance of the effects to the terms that will be used in the ES to assess significance. This is demonstrated in Table 4.3.

Table 4.3 Matrix for determining the significance of effects

		Sensitivity of receptor / receiving environment to change			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Change	**High**	Major	Major to Moderate	Moderate	Negligible
	Medium	Major to Moderate	Moderate	Minor to Moderate	Negligible
	Low	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

4.6.11. The significance of the effect may also need to be qualified with respect to the international, national, regional or local scale over which it may be felt. The significance of an effect may also be affected by its duration (e.g. the length of the installation period) and by its reversibility, i.e. the degree to which a site could be returned to its baseline conditions following decommissioning. As detailed above, the significance of effects reflects judgements as to the importance or sensitivity of the affected receptor(s) and the nature and magnitude of the predicted changes.

4.6.12. When undertaking these assessments, a common outline methodology will be adopted wherever possible, in order to identify the significance of potential effects. This methodology may alter for individual topic assessments, but this section offers a broad outline of the methodology that will be adopted, further detail will be provide in the individual EIA topic chapters.

4.6.13. Best practice and guidance requires that certain technical disciplines are required to follow topic-specific criteria for determining significance. Where this is the case, the criteria to be used will be presented clearly in the EIA methodology section of the specific topic chapters within the ES or where appropriate within technical assessments.

4.6.14. In accordance with the matrix provided at Table 4.3, the following terms will be used in the ES, unless otherwise stated within individual chapters, to determine describe the significance of effects:

- **Major positive or negative effect** – where the Proposed Development would cause a large improvement (or deterioration) to the existing environment which will likely (but not exclusively) feature nationally or internationally important assets;

- **Major/Moderate positive or negative effe**ct – where the Proposed Development would cause a noticeable improvement or deterioration to the existing environment at a national or regional scale;

- **Moderate positive or negative effect** – where the Proposed Development would cause a noticeable improvement (or deterioration) to the existing environment at a local scale;

- **Minor positive or negative effect** – where the Proposed Development would cause a small improvement (or deterioration) to the existing environment; and

- **Negligible** – no discernible improvement or deterioration to the existing environment as a result of the Proposed Development will occur.

4.6.15. Effects deemed to be significant for the purpose of assessment are those which are described as '**major**' and **'moderate/major'** when considered against Guidelines for Environmental Impact Assessment (2004): Institute of Environmental Management and Assessment (IEMA). In addition, **'moderate**' effects can also be deemed as significant Whether they do so shall be determined by a qualitative analysis of the specific impact to the environment that is identified. How significance has been determined will be detailed within each technical assessment of the ES as appropriate

4.6.16. The evaluation of the significance of an impact is important in determining the resources that should be applied in avoiding or mitigating an adverse impact or the actual value of a positive impact. Furthermore, the combined significance of the various mitigated impacts determines the overall environmental acceptability of a project.

4.6.17. The proposed outline methodology for assessing significance takes into consideration relevant guidance/regulations including;

- Guidelines for Environmental Impact Assessment (2004): Institute of Environmental Management and Assessment (IEMA);

- Special Report – The State of Environmental Impact Assessment in the UK – IEMA 2011 Institute of Environmental Management and Assessment (IEMA) (2017) - Delivering Proportionate EIA: A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice; and

- IEMA (2016) - Environmental Impact Assessment Guide to: Delivering Quality Development.

- CIEEM (Chartered Institute of Ecology and Environmental Management) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (IEEM, 2016).

4.7 CONSIDERATION OF ALTERNATIVES

4.7.1. The EIA Regulations require that the ES contains '…*a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studies by the applicant, which are relevant to the proposed project, the regulated activity and their specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects'* (Schedule 4 (2)).

4.7.2. Accordingly, the ES will contain a description of the reasons for the selection of the final design and location of the Proposed Development, taking into account environmental considerations.

4.8 ASSESSMENT OF POTENTIAL CUMULATIVE AND TRANSBOUNDARY IMPACTS

4.8.1. The EIA Regulations require the likely significant environmental effects of a development to be considered cumulatively and also in combination with effects to be experienced as consequence other approved or foreseeable projects to be considered.

4.8.2. Consideration will be given to the potential cumulative effects of the Proposed Development in combination with other committed developments in the locality.

4.8.3. PINS Advice Note 17 provides guidance on how to undertake a cumulative impact assessment (CIA) and outlines that the following types of projects should be considered:

- Tier One – permitted projects under construction; permitted projects but not yet implemented; submitted applications not yet determined.

- Tier Two – Projects on PINs Programme of Projects which have submitted a scoping report.

- Tier Three – Projects on PINs Programme of Projects which have not yet submitted a scoping report; development identified in Development Plans and emerging Development Plans; development identified within plans and programmes which are reasonably likely to be brought forward.

4.8.4. Cumulative impacts may result from the combined or incremental effects of future activities (i.e. those developments currently in planning and not included as part of the baseline). While a single activity may itself result in a non-significant impact, it may, when combined with other impacts to the same receptor group (significant or insignificant) that are occurring at the same time, result in a cumulative impact that is significant.

4.8.5. Consideration will be given to the identification of reasonably foreseeable cumulative impacts from the Proposed Development and other committed developments in the vicinity. Impacts can arise either from cumulative effects (the same effect from several sources) which will include synergistic effects (combined effects that lead to an increased effect greater than the individual effects), additive effects (where the magnitude of combined effects equal the sum of individual effects, or from in-combination effects (interaction or inter-relationship of different effects from different sources) or transboundary effects (where impacts are not limited to national jurisdictions).

4.8.6. No direct survey work to inform CIA is proposed. The technical assessments for each discipline will consider the potential for cumulative or in-combination effects (at receptor level) within the ES. Cumulative effects will be considered in terms of:

- Intra-project effects: The interaction and combination of environmental effects, and indirect effects of the Proposed Development affecting the same receptor, either within the Site or in the local area; and

- Inter-project effects: The interaction and combination of environmental effects of the Proposed Development with committed projects and activities affecting the same receptor. Committed development is defined as development for which planning consent has been granted or in some instances may include foreseeable development currently under planning determination.

4.8.7. Further information relating to the approach taken for CIA is presented in Chapter 17 and 32 of this Report.

4.8.8. In addition, the EIA Regulations require a description to be provided of any transboundary impacts that will be experienced as a consequence of the Proposed Development. For the avoidance of doubt, this assessment of transboundary effects will be of effects experienced in other EEA States as a consequence of the Proposed Development and will not consider any effects experienced in other EEA States as a consequence of the parts of the Project located within France in isolation. This assessment of transboundary effects will include any effects experienced in other EEA states that arise in combination with cumulative projects in France.

4.9 APPROACH TO MITIGATION MEASURES

4.9.1. Mitigation measures will be identified and incorporated into the design, as environmental assessments are undertaken, and any potentially higher magnitude impacts identified. In this way, the proposal presented within the final design for the Proposed Development will have incorporated mitigation measures directly into the design process, and the findings and conclusions of the environmental assessments will reflect the incorporation of those measures.

4.9.2. Most mitigation measures are considered likely to be embedded within the design rather than as 'add-on' measures to ameliorate significant environmental effects. The evolution of the design, therefore, will be reported clearly in the ES, including the rationale behind the preferred choice of project design.

4.9.3. All other measures proposed as mitigation for the project will be reported within the relevant section of the ES. The mechanism by which these measures will be carried through and implemented on site during installation and operation will also be made clear.

4.9.4. The proposed mitigation strategy comprises steps identified in Table 4.4.

Table 4.4 Mitigation strategy

Avoidance	Where viable, the Proposed Development will be redesigned to avoid impacts. This will also be considered during the assessment of alternative sites/routes.
Reduction	Reduction will be considered when all options for the avoidance of impacts have been exhausted or deemed impractical.
Compensation	Where the potential for avoiding and reducing impacts has been exhausted, consideration will be given to compensating for residual impacts to make the proposal more environmentally acceptable.
Remediation	Where adverse effects are unavoidable, consideration will be given to limiting the level of impact by undertaking remedial work.

5. SCOPING AND CONSULTATION HISTORY

5.1 FEBRUARY 2018 SCOPING

5.1.1. Prior to receipt of the Section 35 Direction from SoS, the Applicant's intention was to obtain consents and licences for the Proposed Development via the Town and Country Planning Act 1990 (TCPA) and MCAA 2009. This consenting strategy had been adopted by similar UK - Europe interconnector developments. However, during the development of the Project, it was concluded that the most appropriate consenting strategy for the Proposed Development would be to obtain a development consent from the SoS.

5.1.2. Prior to seeking a Direction for the Proposed Development to be treated as development for which development consent is required (see Appendix A), a formal request seeking an EIA Scoping Opinion for the onshore components of the Proposed Development from the relevant Local Planning Authorities was submitted in accordance with Regulation 15 of the TCPA (Environmental Impact Assessment) Regulations 2017. Similarly, a formal request for an EIA Scoping Opinion for the marine components of the Proposed Development from the MMO in accordance with Regulation 13 of the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) was submitted.

5.1.3. The Scoping Opinions from the LPAs' and the MMO were received in May and June 2018, respectively. The comments from these Scoping Opinions and how they have been addressed in this Report or will be addressed in other application documents, are summarised in Appendix E. This Report aims to consolidate the consultation responses received from the previous EIA scoping exercise and other consultation undertaken to date.

5.2 CONSULTATION UNDERTAKEN TO DATE

5.2.1. To date, the Applicant has consulted and continues to consult with stakeholders and communities who are likely to be affected by, or interested in, the Proposed Development. Stakeholders who have been consulted with to date include:

- Centre for Environment, Fisheries, and Aquaculture and Science (Cefas)
- Department for Business, Energy and Industrial Strategy (BEIS)
- EHDC;
- HCC;
- HBC;
- Historic England;
- Langstone Harbour Authority;

- Ministry of Defence (MoD);
- MMO Coastal Office;
- Natural England;
- Portsmouth City Council (PCC);
- Royal Yachting Association (RYA);
- South Down National Park Authority (SDNPA)
- The Crown Estate;
- The Environment Agency;
- The Joint Nature Conservation Committee (JNCC);
- The Maritime and Coastguard Agency (MCA);
- The National Federation of Fishermen's Organisations (NFFO)
- The Southern and Sussex IFCA;
- Trinity House; and
- Winchester City Council (WCC).

5.2.2. Informal public consultation events were held in January 2018 at the time and locations detailed in Table 5.1. These events were attended by the Applicant, WSP onshore planning, engineering and EIA team, Natural Power marine planning and EIA team, GVA land survey team and BECG.

5.2.3. The events provided the opportunity to present the evolving proposals for the Proposed Development, giving local residents the opportunity to ask questions and provide feedback. Feedback received at and following those exhibitions has been considered as part of the process of refining the proposals for the Proposed Development.

Table 5.1 Location of public consultation events

Location	Time and Date
Waterlooville Community Centre	24th January 2018, 14.00 – 20.00

Location	Time and Date
Milton Village Community Hall	26th January 2018, 14;00 – 20.00
Lovedean Village Hall	27th January 2018, 14:00 – 20.00

5.2.4. A second phase of public consultation with stakeholders and local communities is anticipated to be undertaken between January and February 2019 which will be in line with the statutory requirements of the PA 2008. Chapter 33 provides further information on future planned consultation for the DCO application.

PART 2: MARINE UK

6. PHYSICAL PROCESSES

6.1 SCOPING OPINION AND CONSULTATION

6.1.1. Consultation responses from Cefas and Natural England were incorporated into the previous scoping opinion issued by the MMO. Comments from the MMO Scoping Opinion relating to physical processes are summarised in Appendix E.

6.1.2. Any other additional consultation responses received to date that relate to physical processes for the Proposed Development are presented in Table E2 of Appendix E.

6.2 BASELINE

6.2.1. Where possible the marine cable corridor has been selected to avoid areas which are problematic for cable burial. This process comprises different stages of route development. Firstly, during the initial desk-based assessment and route planning, and secondly during the marine surveys. Following interpretation of the results of the surveys, the marine cable corridor can further be refined to select the optimum route. This will continue as an iterative process and will involve further surveys of the intertidal and marine environment. The marine surveys and investigations of the intertidal environment, undertaken in 2017 and 2018, will enable an understanding of the existing environment and further optimisation of the cable route.

6.2.2. To assess the baseline scenario, a wide variety of sources will be consulted; including site specific geophysical, geotechnical and benthic survey data, supported through inclusion of regional and site-specific information and data available from public sources and scientific literature.

Modelling

6.2.3. In addition to the site-specific datasets, and publicly available information and data, a numerical modelling approach will be adopted to provide an appreciation of the wider distribution and geospatial variation of tidal currents and water levels in the English Channel and along the length of the marine cable corridor.

6.2.4. A site-specific hydrodynamic (HD) model will be developed using the MIKE21 2D modelling package. In addition, a bespoke SWAN wave model[2]will be developed, with a high resolution regional nest, to produce wave data along the length of the marine cable corridor. Numerical modelling of waves in coastal areas is a useful means of understanding wave climatology and wave processes over broad areas and over longer periods (20 years).

6.2.5. Wave models typically use long-term historical wind datasets to simulate the formation of waves over a water body. They generate a spectrum of historic wave conditions, which are validated at certain times and points in space using

[2] SWAN is a third-generation wave model, developed at Delft University of Technology, which computes random, short-crested wind-generated waves in coastal regions and inland waters.

measured wave data. As the period of time over which *in situ* data are available is limited, and the wave climate can display a high degree of intra-annual variability, modelling studies enable short-term monitoring campaigns to be extended to the long term in order to derive wider data for sediment transport description and estimation of extreme metocean conditions. Spectral boundary conditions to the SWAN model originates from the European Centre for Medium-Range Weather Forecasts (ECMWF) The SWAN wave model accounts for the following physics:

- Wave propagation in time and space, shoaling, refraction due to current and depth, frequency shifting due to currents and non-stationary depth;
- Wave generation by wind;
- Three- and four-wave interactions;
- Whitecapping, bottom friction and depth-induced breaking;
- Wave-induced set-up;
- Transmission through and reflection (specular and diffuse) against obstacles; and
- Diffraction.

6.2.6. In total, hindcast data (between 1998 – 2017) will be extracted from the HD and SWAN models at 10 points along the marine cable corridor. These model points are broadly logarithmically spaced with increased data resolution at each cable landfall. Time-series of model data (over the twenty-year period) will be extracted for the following parameters:

- Significant wave height (H_s, m);
- Mean wave direction (M_{dir}, degrees from);
- Mean zero- crossing wave period (T_z, s);
- Mean energy wave period (T_e, s);
- Peak wave period (T_p, s);
- Wind speed @ 10mMSL (u_{10}, m/s);
- Wind direction @ 10mMSL (u_{10d}, degrees from); and
- Current speed (depth-average) (C_s, m/s)

- Current direction (depth-average) (C_d, degrees towards)

Bathymetry

6.2.7. The marine cable corridor runs through the eastern English Channel. The eastern half of the English Channel extends from a north-south line between the Isle of White and Cherbourg east to the Dover Strait. The seabed morphology is a very low angled planation surface with maximum depths of 60-70 m in the centre channel and which rises gently to the east at a depth of > 40 m and rises gently to the UK and French coasts (James et al., 2007). The principle features of this area are the St. Catherine's Deep, a 60 m deep linear channel located just south of the Isle of Wight and the Northern Palaeovalley which is an open channel system which runs across the seabed along much of the fringe of southern England. Both features are shown by the darker blue areas illustrated within Figure 6.1 (attached).

6.2.8. Water depths (in UK Waters) along the marine cable corridor from Eastney (the proposed UK landfall) to the EEZ median line, range between the shallower waters of the Solent (0-18 m) to water depths of 60-70 m. The deeper parts occur in the Northern Palaeovalley and briefly in mid channel at the UK/France EEZ. Throughout much of the marine cable corridor water depths range from 30 m to 65 m.

Shallow Geology and Sediment Transport

6.2.9. The solid geology that makes up this region is generally >35 Ma (million years; including Upper Jurassic strata of over 142 Ma) and is incised and overlain by unconsolidated Quaternary sediments <2.5 Ma, the majority of which are probably < 0.5 Ma (James *et al.,* 2007).

6.2.10. Holocene and modern seabed sediments overlay the Quaternary channel infill. These comprise sands, muds and gravels and a combination of these textures. The general distribution of seafloor sediments is shown in Figure 6.2 (attached) (sediment key is based on Folk, R.L. 1954. Journal of Geology, Vol. 62, p344-359).

6.2.11. For much of the marine cable corridor, the seafloor surficial sediments are dominated by gravels, gravelly sands and sands. Small pockets of finer grained sediments are recorded close to the coasts. However, sediment cover/thickness is known to be predominantly thin (<5 m) over most of this area of the Channel. There are known to be areas where exposed bedrock is anticipated at the seabed and therefore specialist burial equipment (or cable protection measures) may be required.

6.2.12. The factors that control the character of the seabed in this area are two-fold. Firstly, the nature and form of the substrate and secondly, the hydrodynamic processes (currents, waves). Gravel dominated sediments on the seabed have largely been derived from reworking of Quaternary deposits during the Holocene transgression and subsequently, sandy sediments have either been derived in a similar way and/or have been winnowed from the gravelly sediments by the

relatively strong tidal currents in the region. The long term dominant hydrodynamic force of tide in the area has transported fine sediment and sand to the east and north along the coastal margin.

6.2.13. Figure 6.3 (attached) (modified from James *et al.* 2007) shows a simplified map of the dominant sediment transport directions within the English Channel. Sediment transport is controlled largely by tidal currents and ocean swells. Swells usually predominate over tide related currents close to the shore, whilst tidal currents prevail over wave influence in deeper waters further off from the coast. For much of the proposed cable route length, residual (net) sediment transport is considered to be in a west to east direction.

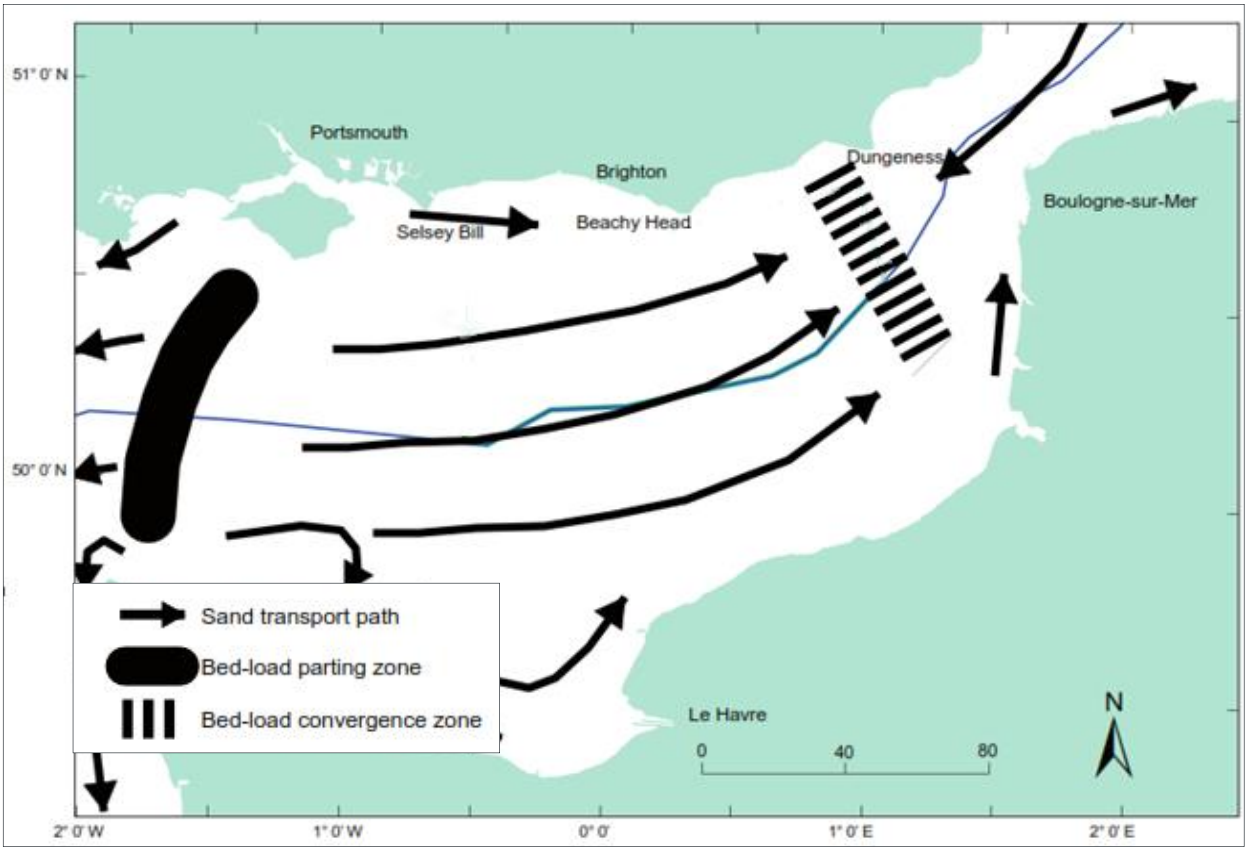


Figure 6.3 Sediment transport directions within the English Channel (modified from James et al. 2007)

Designated Sites

6.2.14. This area of the Channel also accommodates a number of Marine Conservation Zones (MCZ) (including Utopia, Offshore Overfalls, Offshore Brighton, Kingmere) and proposed MCZs Bembridge and Selsey Bill and the Hounds). These are illustrated on Figure 8.1(attached). The mixed sediments in the region and some of the geological features (e.g. English Outburst, High energy circalittoral rock, Northern Paleovalley) are protected features within these designated sites which, as habitats, can support a wide range of marina flora and fauna. Although the marine cable corridor does not overlap with any of the MCZs,

potential impacts on their geomorphological features and benthic communities will be assessed.

6.2.15. In addition, the Solent Maritime SAC is located in close proximity to the proposed landfall at Eastney; this site is designated in part, for its sediment habitats and the potential impacts of landfall in this location will be assessed.

Currents and Waves

6.2.16. Currents in the eastern English Channel are rectilinear. Tidal current magnitudes are at their strongest in the western English Channel and in the far eastern channel through the Strait of Dover. However, as the tidal wave progresses through the Channel during flooding, current velocities decrease throughout the central region building again towards the Strait of Dover. Tidal velocities in the eastern Channel have been recorded to reach speeds of up to1.2 m/s - 1.75 m/s (WSP, 2017; James *et al.* 2007*),* during Spring tides. Tides are recorded as being weaker closer to the coast in general, in the vicinity of the proposed cable landfall areas.

6.2.17. The marine region is subject to locally generated wind-induced waves and the eastern English Channel is also exposed to the west to swells generated in the Atlantic Ocean. Wave heights of 0.5-1.5 m are common in the area, but extreme 50-year return period significant wave heights of over 8 m have been predicted by models (Cotton *et al*, 1999; cited in James *et al.,* 2007). Although storm events may have a significant impact on movement of seabed sediments, it is considered that wave action is generally less important than tidal currents in the transport of sediments in this region.

Air Quality

6.2.18. Air quality along the cable corridor is good. Vessel exhaust emissions during marine cable installation will generally be distant from sensitive receptors and are not anticipated to result in significant effects. As such, an air quality assessment for the Proposed Development within the UK marine area is not considered a proportionate approach and is therefore proposed to be scoped out of the EIA.

6.3 POTENTIAL IMPACTS AND MITIGATION

6.3.1. The potential impacts of the construction, operational and decommissioning stages of the Proposed Development on the physical environment in UK waters may include:

- Construction, operation and decommissioning:
  - Physical disturbance to seabed geology;
  - Impacts to local sediment regimes;

- Impacts on air quality; and
- Impacts to coastal processes.

6.3.2. Potential impacts of the Proposed Development may include physical disturbance to seabed geology, impacts to local sediment regimes and coastal processes. These effects are expected to be limited to a narrow corridor and would arise mainly from installation activities, and maintenance operations during the operation stage, if necessary. Information on the effects on the physical environment that may have secondary effects on other environmental features will be fed in as appropriate to receptor specific assessments e.g. designated sites and features, and marine ecology. The marine surveys will help provide a detailed baseline of the physical characteristics of the intertidal and marine environment.

6.3.3. The decision on whether an impact should be further assessed within the EIA is based on whether potentially significant impacts may arise (Table 6.1).

Table 6.1 Potential impacts on the physical environment and approach to EIA

Potential impact	Proposed approach	Reason	Proposed mitigation
Construction, operation (and decommissioning)			
Physical disturbance to seabed geology and morphology.	Scope in	Potential direct effects during installation works on seabed geology and features.	Any required mitigation will be identified through the EIA process.
Impacts to local sediment regimes.	Scope in	Potential effects on sediment regimes within the vicinity of the Proposed Development.	Any required mitigation will be identified through the EIA process.
Impacts on air quality.	Scope out	Vessel exhaust emissions during cable installation will generally be distant from sensitive	

		receptors and are not anticipated to result in significant effects.	
Impacts to coastal processes.	Scope in	Potential effects on coastal processes within the vicinity of the Proposed Development.	Any required mitigation will be identified through the EIA process.

6.3.4. The presence of seabed features e.g. outcropping bedrock, sandwave and/or megaripple fields will be determined by the results of marine surveys. Results from the marine surveys will identify if it is likely that the cables will need to be laid around, through or over any of these features if present.

6.3.5. Whilst the results of the marine geophysical survey will be required to determine the burial requirements, preliminary information suggests that burial should be possible along the majority of the route. However, sediment is known to be thin (<5 m) within the English Channel. There are known to be areas where rock is anticipated at seabed and therefore specialist burial or trenching equipment may then be required.

6.3.6. Seabed conditions largely dictate the choice of cable installation method. Differing cable installation and protection methods have different potential impacts upon the environment, and a description of the different methods is provided in Chapter 2.

6.3.7. All of the cable burial methods and cable protection methodologies described in Chapter 2 are used worldwide and on different subsea cable systems. However, the suitability of the equipment needs to be assessed based on seabed conditions, nature of the environment, preferred burial methodology and potential for minimising impact.

6.3.8. In addition, non-burial protection measures may be required in specific sections along the marine cable route. Rock placement or concrete mattresses may be required where:

- Cables cannot be routed around rock that is too strong to trench; and
- Where trenching may not be feasible or where sediment is particularly mobile.

6.3.9. The potential effects of mattressing will be dependent upon the mattress size and coverage extent. The requirement for mattressing will be determined following interpretation of data from the marine surveys. It is considered that the height of protection above the seabed that would be required could result in a local elevation of the seabed profile. This will alter the bathymetry slightly (by approximately up to 1 m). The impact of a change of this magnitude on the physical processes will be assessed through an empirical evaluation which will consider the hydrodynamic regime, sediment transport processes and the surrounding seabed region.

6.3.10. Some sections of the marine cable may need to be laid through features such as sandwave and/or large ripples, if present. Where possible, these features will be avoided in order to preserve the cable burial depth, since free-spans or increased cable cover along the marine cable route may arise as a result of sediment mobility. However, if an alternate marine cable route cannot be found then seabed preparation including sandwave clearance may be required. The requirement for sandwave clearance will be determined following the interpretation of data from the marine surveys and the Cable Burial Risk Assessment (CBRA). The process of sandwave clearance will likely result in the requirement for sidecasting and/or deposit of dredged sediments. At present, it is proposed to relocate dredged material within the boundary of the marine cable corridor. The spatiotemporal distribution of disposed dredged sediments is a function of the following parameters:

- Sediment characteristics (Particle Size Distribution, bulk density, specific gravity and settling velocity);
- Water depth;
- Hydrodynamic and sediment transport regime; and
- Volume of dredge material and dredge programme (i.e. dredge hopper size).

6.3.11. To investigate potential impacts associated with dredge disposal operations a depositional modelling approach will be adopted. The modelling will be performed utilising a MIKE21 particle tracking module and the MIKE21 hydrodynamic model. At this stage, due to the uncertainty surrounding the volumes of material to be dredged a Rochdale envelope approach is proposed to simulate the disposal of the lowest potential volume of material, and the greatest potential volume of material, for the following model scenarios:

- Surface disposal of material (i.e. via the dredge hopper doors);
- Disposal from a fall pipe (5 m above the bed);

- A dredging programme based on the size of the dredge vessel hopper – Small dredge hopper (i.e. smaller volume and more frequent disposals along the route); and

- Amendment to dredge programme based on the size of the dredge vessel hopper– Large dredge hopper (i.e. larger volume and fewer disposals along the route).

6.3.12. A hypothesised dredge programme (cycle) will be developed. Each disposal event, within each of the model runs, will be individually parameterised using the site-specific geophysical, geotechnical and benthic sampling data. The model outputs would include the spatial and temporal extent of the dredge plume and the depositional thickness of the disposed sediment for the scenarios proposed. In addition, each model scenario will include the potential for tidally driven resuspension of the material once deposited on the seabed following disposal and model runs will continue until estimated background concentrations are achieved.

6.3.13. The presence of sandwaves indicates that the environment is dynamic and it is likely that the sandwaves will re-form over a relatively short period of time (weeks to months). The extent of any mobile seabed features will be established following interpretation of data from the marine surveys.

6.3.14. In addition to assessing the key environmental impacts of the Proposed Development, consideration will be given to the identification of potential cumulative impacts between the Proposed Development and other committed future developments in the vicinity. The likely schedules for the other developments will be taken into account, as both construction stage and long-term cumulative impacts will be considered. Chapter 17 provides further details on cumulative assessment.

6.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

6.4.1. Data for the Proposed Development will be derived from several sources, including the aforementioned geophysical, geotechnical, and benthic surveys. Seabed sediment particle size data will be obtained from the results of the geotechnical and benthic survey.

6.4.2. Features to be addressed in the baseline desk study include:

- Seabed sediment composition distribution, and variability in thickness;

- Shallow sub-seabed conditions;

- Sediment transport pathways;

- Existing coastline and shoreline dynamics, including long-term seabed and shoreline stability;

- Scour around adjacent cables and pipelines, and the potential for development of ‘free-spans’;
- Natural seabed obstructions and features;
- Man-made seabed obstructions and features (debris, wrecks, cables, pipelines, etc.);
- Bathymetric setting, including slopes at the landfalls;
- Oceanographic setting;
- Seasonal variations in climate and weather;
- Typical sea states;
- Seabed currents; and
- Wind and wave data.

6.4.3. Once the collection of baseline data is completed, and the results of the marine surveys have been analysed, the assessment of impacts of the worst-case scenario on the physical environment will be undertaken in full. It is considered that given the nature of the project and installation works, that a proportionate assessment be undertaken which can be based on the marine surveys already described and through the use of existing datasets. As such, the Applicant does not propose to deploy any current or wave equipment for data collection but is confident that a robust assessment can be made using the data from existing projects and resources.

7. MARINE WATER AND SEDIMENT QUALITY

7.1 SCOPING OPINION AND CONSULTATION

7.1.1. Consultation responses from the Environment Agency, Cefas and Natural England were incorporated into the MMO Scoping Opinion. Comments from the MMO Scoping Opinion relating to marine water and sediment quality are summarised in Table E1 of Appendix E.

7.1.2. Any other additional consultation responses received to date that relate to marine water and sediment quality assessment for the Proposed Development are also presented in Table E2 of Appendix E.

7.2 BASELINE

Water Bodies and Designated or Protected Areas

7.2.1. Water bodies designated under the WFD and other designated or protected areas (i.e. designated bathing waters, shellfish waters, nutrient sensitive areas and SACs / SPAs) within 2km of the Proposed Development will be identified in order to establish the current marine water quality baseline within the region of the Proposed Development. These sites will be identified using resources such as the Environmental Agency's Bathing Water Identification Map and Catchment Data Explorer, JNCC data and reports, and the MAGIC website. The current status of the relevant water bodies and designated or protected areas will be presented within the baseline of the ES chapter.

Contaminated Sediments

7.2.2. Despite the long history of port, heavy shipping, and military activity in the wider area, there are no dredge/munitions disposal sites in the vicinity of the marine cable corridor. Information on levels of contamination in the Solent is available from studies conducted for the IFA2 project and the Rampion Offshore Wind Farm. Both projects recorded instances of slight elevation in certain contaminants, however these records are situated at some distance from the proposed marine cable corridor and there were no instances of any contaminant exceeding Cefas Action Level 2[3].(see attached Figure 7.1).

7.2.3. Site specific information has also been collected along the marine cable corridor within the Solent, where there is considered to be the greatest risk of elevated levels of contamination as a result of the long history of shipping and port activity in the area. Contaminated sediment samples have been collected along the inshore UK section of the cable route as part of the benthic sampling campaign (now complete) (see attached Figure 7.1). All sampling stations are located within 4 km of the marine cable corridor, with all habitats and sediment types

[3] Cefas Action Levels were derived for the dredging industry. Sediment with levels greater than Action Level 1 required further consideration. Sediment with levels greater than Action Level 2 are considered to be unsuitable for disposal at sea and therefore likely to pose a greater environmental risk.

present in the inshore area sampled with suitable repetition (see Figure 7.1 attached).

7.2.4. Samples will be analysed to determine the presence of a range of contaminants which are potentially present in marine sediments (Table 7.1), in addition to their Particle Size Analysis (PSA). Levels of contamination will be assessed against the Cefas Action Levels. All contaminants will also be assessed against the OSPAR Environmental Assessment Criteria, which is of particular use where no Cefas guidelines exist for that determinant (i.e. PAH's). Table 7.1 provides the full suite of chemicals and heavy metals analysed.

7.2.5. Once analysed, these will provide a suitable evidence base to assess impacts from the resuspension of any contaminated sediments within the EIA.

Table 7.1 Full suite of chemicals and heavy metals analysed

Matrix	Determinant
Metals (Sieving <63µm)	As, Cd, Cr, Cu, Hg, Ni, Pb, Zn
Organotins	DBT and TBT
PAHs	PDTI2-6 ring aromatics + EPA 16
Hydrocarbon	Total content incl. saturates
PCBs	ICES 7 (28, 52, 101, 118, 138, 153, 180)

7.3 POTENTIAL IMPACTS AND MITIGATION

7.3.1. The following potential impacts on water and sediment quality during construction and decommissioning of the Proposed Development have been identified and scoped in for assessment:

7.3.2. Construction (and decommissioning):

- Temporary increase in suspended sediment concentrations; and
- Impacts from the resuspension of contaminated sediment.

7.3.3. Whilst some operation and maintenance (O&M) activities (e.g. repair and re-burial of sections of cable) may lead to similar impacts, these are considered

likely to be much smaller in scale than construction works, and therefore have been scoped out of further assessment.

7.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

7.4.1. The overall impact assessment methodology proposed for marine water and sediment quality will be largely based on that outlined by CIEEM for projects in marine and coastal environments (IEEM, 2010; CIEEM, 2018) which can be summarised as follows:

- Describing the baseline within the zone of influence;
- Identifying potential receptors within the zone of influence;
- Identifying activities associated with the project that may result in effects on these receptors during installation, operation and maintenance and decommissioning;
- Describing these activities in terms of whether the effect is likely to be positive or negative, along with its magnitude, extent, duration, reversibility, timing and frequency;
- Characterising the effect, including the likelihood of its occurrence;
- Assessing whether the likely (pre-mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made;
- Providing details of proposed mitigation (if applicable);
- Assessing whether the residual (with mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made; and
- Assessing cumulative effects (with mitigation where applicable).

WFD Assessment

7.4.2. In addition, a WFD assessment will be undertaken to assess the potential impacts of the Proposed Development on water and sediment quality. It is currently proposed that the WFD assessment will be presented as a technical appendix, and the results of the assessment will be presented within the marine water and sediment quality ES chapter.

7.4.3. The WFD establishes a framework for the protection of European waters, including inland surface waters, transitional waters, coastal waters and groundwater. The assessment will be undertaken in a three-stage approach:

- Stage 1 - WFD Screening will be undertaken to determine which activities associated with the Proposed Development are relevant to the WFD assessment;
- Stage 2 - WFD Scoping will be undertaken to identify all potential receptors and determine whether there the Proposed Development poses a risk to their status, or potential to achieve good status. Where a risk is identified to a receptor, it will be considered a sensitive receptor and scoped in to the impact assessment. Where no risk is identified, the receptor will be scoped out.
- Stage 3 - WFD impact assessment will be undertaken on sensitive receptors as identified during scoping to determine potential impacts of activities and identify measures to avoid or minimise impacts. A determination will be made whether activities may cause deterioration in the status of receptors or jeopardise their potential to reach good status.

7.4.4. Separate WFD assessments will be undertaken for terrestrial elements (surface waterbodies and ground water) and marine elements (coastal waterbodies). It will be agreed in advance of undertaking assessments which WFD assessment will address transitional waters (estuaries).

8. INTERTIDAL AND BENTHIC ECOLOGY

8.1 SCOPING OPINION AND CONSULTATION

8.1.1. Comments from the MMO Scoping Opinion relating to intertidal and benthic ecology are summarised in Table E1 of Appendix E.

8.1.2. Any other additional consultation responses received to date that relate to the intertidal and benthic ecology assessment for the Proposed Development are also presented in Table E2 of Appendix E.

8.2 BASELINE

8.2.1. The proposed Eastney landfall section of the marine cable corridor passes through one protected area designated for benthic habitats; the Solent Maritime SAC. It is also located approximately 0.1 km from the Chichester and Langstone Harbours Ramsar Site and Langstone Harbour SSSI (Table 8.1). Several other protected areas lie within 50 km of the marine cable corridor (Table 8.1 and Figures 8.1 and 8.2 attached). While not strictly designated for benthic habitats, the Eastney Beach Local Wildlife Site (LWS) is an important intertidal habitat for coastal vegetated shingle therefore is included in the table.

Table 8.1 Protected areas with benthic features in UK waters in the vicinity of the Proposed Development

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
Solent Maritime (SAC)	Qualifying features: estuaries; mudflats and sandflats (not submerged at low tide); sandbanks (slightly covered by seawater all the time); shifting dunes along the shoreline; coastal lagoons	Designated	0
Eastney Beach (LWS)	Coastal vegetated shingle	Designated	0
Chichester and Langstone Harbours	Intertidal mudflats; saltmarsh; sand; shingle	Designated	0.1

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
Wetland (Ramsar)	spits; sand dunes; Zostera spp.		
Langstone Harbour (SSSI)	Notified features: saline coastal lagoons; sheltered muddy shores (including estuarine muds); Zostera communities; invertebrate assemblage	Notified	0.1
Offshore Overfalls (MCZ)	Protected features: subtidal coarse sediment; subtidal mixed sediments; subtidal sand	Designated	1.15
Utopia (MCZ)	Protected features: moderate/high energy circalittoral rock; subtidal coarse/mixed sediment; subtidal sand; fragile sponge and anthozoan communities on subtidal rocky habitats	Designated	1.3
South Wight Maritime (SAC)	Qualifying features: reefs; submerged or partially submerged sea caves	Designated	3.3
Bembridge (pMCZ)	Features considered: subtidal mixed sediments; subtidal coarse sediments; subtidal sand; subtidal mud; sheltered muddy gravels; seagrass beds; native oyster (*Ostrea*	Proposed	3.8

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
	edulis); maerl beds; sea-pens and burrowing megafauna; peacock's tail seaweed; rossworm reefs		
Selsey Bill and the Hounds (pMCZ)	Features considered: subtidal mixed sediments; subtidal sand; high energy infralittoral rock; moderate energy infralittoral rock; moderate energy circalittoral rock; low energy infralittoral rock; tentacled lagoon worm (*Alkmaria romijni*); peat and clay exposures	Proposed	4.0
Chichester Harbour (SSSI)	Notified features: Zostera communities; invertebrate assemblage	Notified	4.5
Solent and Isle of Wight Lagoons (SAC)	Qualifying features: coastal lagoons	Designated	4.6
Portsmouth Harbour (SSSI)	Notified features: *Gammarus insensibilis*; *Nematostella vectensis*	Notified	4.9
Portsmouth Harbour Wetland of International Importance (Ramsar)	Intertidal mudflat areas with Zostera beds; saltmarsh; *Hydrobia ulvae*; Ulva spp.; *Gammarus insensibilis*; *Nematostella vectensis*	Designated	4.9

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
Ryde Sands and Wootton Creek (SSSI)	Notified features: moderately exposed sandy shores (with polychaetes and bivalves); sheltered muddy shores (including estuarine muds); Zostera communities	Notified	6.6
Solent and Southampton Water (Ramsar)	Saline lagoons; saltmarshes; estuaries; intertidal flats; shallow coastal waters; reedbeds; rocky boulder reef; rare plants and invertebrate assemblages	Listed	6.6
Gilkicker Lagoon (SSSI)	Notified features: *Gammarus insensibilis*, *Nematostella vectensis*	Notified	6.9
Brading Marshes to St. Helen's Ledges (SSSI)	Notified features: invertebrate assemblage; sheltered muddy shores (including estuarine muds); sheltered rocky shores	Notified	7.9
Whitecliff Bay and Bembridge Ledges (SSSI)	Notified features: moderately exposed rocky shores; moderately exposed sandy shores (with polychaetes and bivalves); reefs; Zostera communities	Notified	8.4

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
Offshore Brighton (MCZ)	Features protected: high energy circalittoral rock; subtidal coarse sediment; subtidal mixed sediments	Designated	8.5
Browndown (SSSI)	Notified features: lichens, invertebrate assemblage	Notified	9.2
Pagham Harbour (SSSI)	Notified features: invertebrate assemblage; *Nematostella vectensis*; saline coastal lagoons	Notified	9.5
Pagham Harbour (MCZ)	Features protected: Zostera beds,Defoin's lagoon snail (*Caecum armoricum*), lagoon sand shrimp (*Gammarus insensibilis*)	Designated	9.6
Kingmere (MCZ)	Features protected: moderate energy infralittoral rock and thin mixed sediment; subtidal chalk	Designated	10.8
King's Quay Shore (SSSI)	Sheltered muddy shores (including estuarine muds)	Notified	12.7
Medina Estuary (SSSI)	Notified features: sheltered muddy shores (including estuarine muds)	Notified	17.3

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
North Solent (SSSI)	Notified features: invertebrate assemblage; sheltered muddy shores (including estuarine muds); Zostera communities	Notified	18.8
Isle of Wight Downs (SAC)	Annex I habitats: vegetated sea cliffs of the Atlantic and Baltic Coasts	Designated	19.6
Yarmouth to Cowes (pMCZ)	Features considered: Bouldnor Cliff geological feature; estuarine rocky habitats; intertidal coarse sediment; intertidal under boulder communities; littoral chalk communities; low intertidal rock; moderate energy intertidal rock; subtidal coarse sediment; high energy circalittoral rock; high energy infralittoral rock; moderate energy circalittoral rock; moderate energy infralittoral rock; native oyster (*Ostrea edulis*); peat and clay exposures; sheltered muddy gravels; subtidal chalk; subtidal mixed sediments; subtidal mud	Proposed	19.9

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
Thorness Bay (SSSI)	Notified features: moderately exposed sandy shores (with polychaetes and bivalves)	Notified	21.9
Compton Chine to Steephill Cove (SSSI)	Notified features: invertebrate assemblage; moderately exposed rocky shores	Notified	24.2
Newtown Harbour (SSSI)	Notified features: invertebrate assemblage	Notified	24.5
Wight-Barfleur Reef (SAC)	Qualifying features: reefs	Designated	28.5
Hurst Castle and Lymington River Estuary (SSSI)	Notified features: sheltered muddy shores (including estuarine muds)	Notified	29.2
Adur estuary (SSSI)	Notified features: sheltered muddy shores (including estuarine muds)	Notified	30.1
Yar Estuary (SSSI)	Notified features: invertebrate assemblage; sheltered muddy shores (including estuarine muds)	Notified	33.5
Beachy Head West (MCZ)	Features protected: intertidal coarse sediment; subtidal mixed	Designated	34.5

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
	sediment; subtidal mud; subtidal sand; infralittoral muddy sand; infralittoral sandy mud; low energy infralittoral rock and thin sandy sediment blue mussel (*Mytilus edulis*) beds; subtidal chalk; littoral chalk communities; native oyster (*Ostrea edulis*); moderate energy circalittoral rock; high energy circalittoral rock		
The Needles (MCZ)	Features protected: moderate energy infralittoral rock; high energy infralittoral rock; moderate energy circalittoral rock; subtidal chalk; subtidal coarse sediment; subtidal mixed sediments; subtidal sand; subtidal mud; sheltered muddy gravels; seagrass beds; peacock's tail seaweed; native oyster (*Ostrea edulis*)	Designated	35.4
Brighton to Newhaven cliffs (SSSI)	Notified features: invertebrate assemblage; reefs	Notified	36.1

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
Seaford to Beachy Head (SSSI)	Notified features: invertebrate assemblage; reefs	Notified	40.1
Beachy Head East (Roral Sovereign Shoals) (pMCZ)	Features considered: littoral chalk communities; subtidal sand; subtidal coarse sediment; subtidal chalk; peat and clay exposures; ross worm reefs; high/moderate energy circalittoral rock	Proposed	44.5

Benthic Habitats (EUNIS)

8.2.2. The majority of the seabed that the Proposed Development passes through is predicted to be sediment according the European Marine Observation and Data Network (EMODnet) (EMODnet, 2018). Figure 8.3 (attached) illustrates this dataset in relation to the Proposed Development. There are two main seabed habitat types, classified as European Nature System (EUNIS) A5.14 (high energy shallow circalittoral coarse sediment) and A5.15 (moderate energy deep circalittoral coarse sediment). Other habitat types predicted to intersect with the Proposed Development are patches of A5.13 (high energy infralittoral coarse sediment), A5.23 or A5.24 (high energy infralittoral fine sand or infralittoral muddy sand), A5.25 or A5.26 (high energy shallow circalittoral sand or circalittoral muddy sand, A3.1 (high energy infralittoral rock or other hard substrata), A4.1 (high energy shallow circalittoral rock or other hard substrata), and A4.27 (faunal communities on deep moderate energy circalittoral rock) (Table 8.2).

8.2.3. Additional habitats types predicted adjacent (within 1 km) to the marine cable corridor include patches of A5.44 (high energy shallow circalittoral mixed sediment) and A5.45 (moderate energy deep circalittoral mixed sediment), approximately 35 km from the Eastney landfall. The habitats A4.12 (sponge communities on deep circalittoral rock), A5.33 (moderate energy infralittoral sandy mud to muddy sand) and A5.35 (low energy shallow circalittoral sandy mud to muddy sand) are also predicted within 5 km of the marine cable corridor.

Table 8.2 EUNIS habitat types located within the vicinity of the Proposed Development

EUNIS Code	Description	Overlap cable corridor?
A3.1	High energy infralittoral rock or other hard substrata	Yes
A4.1	High energy Atlantic and Mediterranean shallow circalittoral rock or other hard substrata	Yes
A4.12	Sponge communities on deep circalittoral rock),	No
A4.27	Faunal communities on deep moderate energy circalittoral rock	Yes
A5.13	High energy infralittoral coarse sediment	Yes
A5.14	High energy shallow circalittoral coarse sediment	Yes
A5.15	Moderate energy deep circalittoral coarse sediment	Yes
A5.23 or A5.24	High energy infralittoral fine sand or infralittoral muddy sand	Yes
A5.25 or A5.26	High energy shallow circalittoral sand or circalittoral muddy sand	Yes
A5.44	High energy shallow circalittoral mixed sediment	No

A5.33	Moderate energy infralittoral sandy mud to muddy sand	No
A5.35	Low energy shallow circalittoral sandy mud to muddy sand	No
A5.45	Moderate energy deep circalittoral mixed sediment	No

8.3 POTENTIAL IMPACTS AND MITIGATION

8.3.1. The following potential impacts on intertidal and benthic ecology during construction, operation and decommissioning of the Proposed Development have been identified:

- Construction (and decommissioning):
  - Seabed disturbance;
  - Deposition of sediment (smothering);
  - Temporary increase in suspended sediment concentrations;
  - Impacts from the resuspension of contaminated sediment;
  - Introduction of invasive non-native species (INNS);
- Operation:
  - Habitat loss;
  - Electro-magnetic field (EMF) emissions from HVDC cable;
  - Heat emissions from HVDC cable; and
  - Disturbance due to O&M activity.

8.3.2. The decision on whether an impact should be further assessed within the EIA is based on whether potentially significant impacts may arise (Table 8.3).

Table 8.3 Potential impacts on benthic environment and approach to EIA

Potential impact	Proposed approach	Reason	Proposed mitigation
Construction (and decommissioning)			
Seabed disturbance	Scope in	Activities undertaken will cause disturbance to the seabed, which can lead to the loss of biodiversity and habitat. Depending on the habitat type affected, potentially significant effects may arise if sensitive habitats are affected.	Any required mitigation will be identified through the EIA process.
Deposition of sediment	Scope in	Sediment will be displaced during construction. This will result in adjacent habitats which are otherwise unaffected by direct works becoming buried or smothered to a certain degree. Effects may be significant where sensitive habitats are present.	Any required mitigation will be identified through the EIA process.

Increase in suspended sediments	Scope in	Disturbance to the seabed will cause an increase in suspended sediments in the water column. Sediment suspension can impede the capacity for organisms to feed or respire, but also reduce light levels, which can affect photosynthetic organisms particularly in shallow water. Effects may be significant where sensitive habitats are present.	Any required mitigation will be identified through the EIA process.
Impacts from the resuspension of contaminated sediment	Scope in	Disturbance to the seabed may cause an increase in suspended sediments in the water column which may include an increase in contaminants.	Any required mitigation will be identified through the EIA process.
Introduction of invasive non-native species	Scope out	No significant effects predicted.	Follow industry best practice, including producing a biosecurity plan to manage risk.

Operation			
Habitat loss	Scope in	Any secondary cable protection used along the route will result in loss of habitats. Depending on the habitat type affected and its location, potentially significant effects may arise from habitat loss.	Any required mitigation will be identified through the EIA process.
Impacts from EMF emissions	Scope out	No significant effects predicted.	Shielding and burial of cable.
Impacts from heat emissions.	Scope out	No significant effects predicted.	Shielding and burial of cable.
Seabed disturbance due to O&M activity.	Scope in	Activities undertaken will cause disturbance to the seabed, which can lead to the loss of biodiversity and habitat. Depending on the habitat type affected, potentially significant effects may arise if sensitive habitats are affected.	Any required mitigation will be identified through the EIA process.

8.3.3. Where impacts are proposed to be scoped out, additional justification is provided in the following paragraphs.

Introduction of Invasive Non-Native Species

8.3.4. It is noted that several invasive non-native species (INNS) can already be found within the vicinity of the proposed works (Arenas *et al*., 2006; Minchin *et al.,* 2013). Introduction of any further species (or transport of species already present) as a result of the proposed works will be managed by following best industry practices (including provision of a biosecurity plan), and as such no impacts resulting from the introduction of INNS are predicted.

Electro-Magnetic Field and Emissions from HVDC Cable

8.3.5. Modern power cables are shielded to prevent electric field (E) emissions. As such, it is only magnetic (B), and associated induced electric (iE) fields which arise when B fields interact with a moving medium/object that require consideration.

8.3.6. Although there is some evidence that benthic species can detect EMF, there is no evidence that they are particularly sensitive to it, and no evidence that it leads to any effects on benthic species (Andrulewicz *et al*., 2003).

8.3.7. Modern cable design shields electrical field emissions. However magnetic fields will still exist outside of a shielded cable and these can induce electric fields in the water column within close proximity of the cable, although the strengths of these fields are generally below that of the background geomagnetic field. There are few studies that address electroreception specifically in invertebrates, however the studies that do exist conclude that invertebrates are not deemed to be particularly sensitive and no negative effects have been shown to date (Bergström *et al.,* 2014). Bochert and Zettler (2004) exposed invertebrate species to a magnetic field for several weeks, and recorded no significant differences in survival between experimental and control animals. It is therefore concluded that there is no potential for significant effects to arise from EMF on benthic receptors.

Heat Emissions from HVDC Cable

8.3.8. During the transport of energy along a cable, heat is emitted as a result of the resistance of the conductor material. The impact of heat on the environment is considered to be minimal for marine cables due to the burial depth and dissipation within the sediment. Any residual heat at the sediment surface will be subject to both tidal and current motion thus dissipating any residual heat.

8.3.9. In general, heat emissions from AC cables is greater than that for DC cables (OSPAR 2009), and Meiβner *et al.,* (2006) found that temperature of a subsea cable did not exceed 1.4^{o}C in 20 cm depth above the cable. With a burial depth of up to 4.9 m proposed for the marine cable, it is unlikely that any increase in temperature will be significant within the biologically inhabited sediments or adjacent water column. It is therefore concluded that there is no potential for significant effects to arise from heat on benthic receptors and the potential impact of heat on marine ecosystems will therefore not be considered further.

8.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

8.4.1. The impact assessment methodology proposed for benthic ecology will be that outlined by CIEEM for projects in marine and coastal environments (IEEM, 2010; CIEEM, 2018) which can be summarised as follows:

- Describing the baseline within the zone of influence;
- Identifying potential receptors within the zone of influence;
- Identifying activities associated with the project that may result in effects on these receptors during construction, operation and maintenance and decommissioning;
- Describing these activities in terms of whether the effect is likely to be positive or negative, along with its magnitude, extent, duration, reversibility, timing and frequency;
- Characterising the effect, including the likelihood of its occurrence;
- Assessing whether the likely (pre-mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made;
- Providing details of proposed mitigation (if applicable);
- Assessing whether the residual (with mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made; and
- Assessing cumulative effects (with mitigation where applicable).

8.4.2. As the significance of any impacts will be heavily influenced by the exact nature of the habitats present, a benthic survey campaign has been undertaken along the proposed marine cable corridor. The objective of the benthic survey was to collect data to allow the characterisation of the benthic (subtidal and intertidal) habitats and identify any protected species or habitats present.

8.4.3. The data was collected via Drop Down Video (DDV) and a benthic grab (grabs were only deployed in habitats identified as not sensitive by DDV) to obtain information on subtidal sediment and infaunal/epifaunal communities. The surveys were stratified so that sampling stations were placed in representative habitats along the entire of the route. Sampling stations were also located in potentially sensitive or protected habitats, such as potential Annex I habitats (e.g. sand banks or reef), or near designated sites such as SAC, or MCZ. Intertidal surveys have also been undertaken at the proposed landfall at Eastney.

8.4.4. The benthic data has been supplemented by geophysical data (collected in late 2017 - early 2018) which will be used to assist the designation of habitat types and map their extent.

8.4.5. In addition, an MCZ assessment will be undertaken. This will include screening each relevant site identified within Table 8.1 for connectivity and sensitivity for all proposed activities.

8.4.6. A Habitats Regulation Assessment (HRA) Report will also be undertaken and submitted with the application for the DCO. This report will provide the information to the competent authority as may reasonably be required for the purposes of assessing the implications for a site in view of its conservation objectives or to enable them to determine whether an appropriate assessment is required. This will include screening each relevant site identified within Table 8.1 for connectivity and sensitivity for all proposed activities.

8.4.7. Current Conservation Advice packages and Advice on Operations guidance will be used for the MCZ and HRA assessments where available and all sites where connectivity and sensitivity are demonstrated during screening will be taken forward for further assessment. These further assessments will evaluate the effects on the Conservation Objectives for the features within each site resulting from activities proposed for the Proposed Development.

9. FISH AND SHELLFISH

9.1 SCOPING OPINION AND CONSULTATION

9.1.1. Consultation responses from Cefas, Natural England, the Southern IFCA and the NFFO were incorporated into the MMO Scoping Opinion. Comments from the MMO scoping Opinion relating to fish and shellfish are summarised in Table E1 of Appendix E.

9.1.2. Any other additional consultation responses received to date that relate to the fish and shellfish assessment for the Proposed Development are also presented in Table E2 of Appendix E.

9.2 BASELINE

9.2.1. This section will provide a description of the fish and shellfish baseline conditions within the UK marine cable corridor.

9.2.2. The marine area of the Proposed Development supports a wide range of fish and shellfish species which are common throughout the English Channel, including:

- Marine fish;
- Shellfish;
- Elasmobranches; and
- Migratory species.

9.2.3. Areas surrounding the marine cable corridor supports both flat and round fish populations of commercial importance. These include species such as bass (*Dicentrarchus labrax*), lemon sole (*Microstomus kitt*), plaice (*Pleuronectes platessa*), cod (*Gadus morhua),* Dover sole (*Solea solea*), whiting (*Merlangius merlangus*), mackerel (*Scomber scombrus*), black bream (*Acanthopagrus butcheri*), grey gurnard (*Eutrigla gurnardu*) and tub gurnard (*Chelidonichthys lucerna*), (ICES, 2016). In addition, there are many fish of non-commercial importance, such as gobies (Gobiidae), dragonets (Callionymidae), rockling (Gadidae), pipefish (Syngnathidae) and sea horse (Hippocampus).

9.2.4. Shellfish species of commercial importance within the wider marine cable corridor include clams (Bivalvia), Manila clam (*Venerupis philippinarum*), whelks (*Buccinum undatum*), scallops (Pectinidae),) lobster (*Homarus gammarus*), cuttlefish (*Sepia officinalis*), squid (Teuthida), native oyster (*Ostrea edulis*), spider crab (Majoidea) and edible crabs (*Cancer pagurus*). Egg-bearing female shellfish such as crabs and lobster may also be present along the marine cable corridor.

9.2.5. The eastern English Channel supports a range of elasmobranch species. This includes nationally important populations of the undulate ray (*Raja undulata*) and the thornback ray (*Raja clavata*). Other commercially and non-commercially important elasmobranch species include lesser spotted dogfish (*Scyliorhinus canicula*) and smoothound (*Mustelus mustelus*).

9.2.6. The English Channel is also used by a range of migratory species which will pass through inshore waters to migrate or spawn in fresh water both as adults and juveniles. These are likely to comprise Atlantic salmon (*Salmo salar*), sea trout (*Salmo trutta*), European eel (*Anguilla anguilla*), sea lamprey (*Petromyzon marinus*), river lamprey (*Lampetra fluviatilis*) twaite shad (*Allosa fallax*), allis shad (*Allosa allosa*) and smelt (*Osmerus eperlanus*).

Spawning and Nursery Grounds

9.2.7. The marine cable corridor is a known spawning and nursery ground for a range of both pelagic and demersal fish species (Coull *et al.,* 1998; Ellis *et al.,* 2012).

9.2.8. Black bream are demersal spawners and are known to nest in areas around the south coast of the UK. There are extensive nesting grounds off the West Sussex coast to the Isle of Wight and Dorset (Collins and Mallinson, 2012). The eggs are laid in a nest excavated by the male as it creates a depression in a sandy gravel substrate. The nests are typically circular craters 1-2 m wide and 5-30 cm in depth. The nests are generally found in waters of about 10 m depth and appear as circular craters on the seabed.

9.2.9. Other fish species that are reported to use the area within the vicinity of the marine cable corridor to spawn include herring (*Clupea harengus*), sandeel (*Ammodytidae*), sole, horse mackerel (*Trachurus trachurus*), mackerel, cod, whiting, plaice and lemon sole (Coull *et al.,* 1998; Ellis *et al.,* 2012).

9.2.10. Areas around the marine cable corridor support a number of nursery areas for fish including, mackerel, whiting, lemon sole, plaice, undulate ray, tope shark (*Galeorhinus galeus*), thornback ray, sandeel, cod and sole (Coull *et al.,* 1998; Ellis *et al*., 2012).

Protected Areas and Species

9.2.11. There are a number of SACs in the vicinity of the marine cable corridor which list migratory fish as interest features. The River Itchen SAC is designated for Atlantic salmon, as is the River Avon SAC (see attached Figure 8.1) which also list sea lamprey. Although some distance from the marine cable corridor (229 km), Plymouth Sound and Estuaries SAC is designated for allis shad (a member of the herring family).

9.2.12. Within 64 km of the marine cable corridor there are 12 MCZs with proposed (pMCZ) and designated (MCZ) status which list fish and shellfish as features. The closest protected area is Bembridge pMCZ which lists short snouted seahorse (*Hippocampus hippocampus*) and native oyster (*Ostra edulis*) as features. Selsey Bill and the Hounds pMCZ is the second closest which also

lists short snouted seahorse. Kingmere Reef MCZ is the closest MCZ and lists black bream as an interest feature.

9.2.13. There are also a range of fish and shellfish species of conservation importance in the vicinity of the marine cable corridor which are protected under a range of legislation. This includes the Wildlife and Countryside Act, UK and Regional BAP and NERC Act (Table 9.1).

Table 9.1 Protected areas with fish and shellfish features in UK waters in the vicinity of the Proposed Development

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
Bembridge (pMCZ)	Feature species: Short-snouted seahorse and native oyster	Proposed	3.8
Selsey Bill and the Hounds (pMCZ)	Feature species: Short-snouted seahorse	Proposed	4.0
Kingmere Reef (MCZ)	Feature species: Black bream nesting site	Designated	10.8
Yarmouth to Cowes (pMCZ)	Feature species: Native oysters	Proposed	19.6
River Itchen (SAC)	Designed for: Atlantic salmon	Designated	27.5
Beachy Head West (MCZ)	Feature species: Blue mussel beds (*Mytilus edulis*); native oyster and short-snouted seahorse	Designated	34.5
The Needles (MCZ)	Feature species: Native oysters	Designated	35.4

Name	Criteria	Status	Approx. closest distance to the Proposed Development (km)
Beachy Head East (pMCZ)	Feature species: Short-snouted seahorse	Proposed	44.5
River Avon SAC	Designed for: Sea lamprey and Atlantic salmon	Designated	51.4
Southbourne Rough (pMCZ)	Feature species: Black bream nesting site	Proposed	55
Poole rocks (MCZ)	Feature species: Native oysters	Designated	59.1
Studland Bay (pMCZ)	Feature species: long snouted seahorse (*Hippocampus guttulatus*)	Proposed	63.7
Plymouth Sound and Estuaries SAC	Designated for: Allis shad	Designated	229

9.3 POTENTIAL IMPACTS AND MITIGATION

9.3.1. The potential impacts of the construction (and decommissioning) and operational stages of the Proposed Development on fish and shellfish in UK waters may include:

- Construction (and decommissioning):
  - Temporary habitat disturbance;
  - Temporary increase in suspended sediments; and
  - Noise and vibration.

- Operation:
  - Electro-magnetic field effects.
  - Habitat loss

9.3.2. The potential impacts on fish and shellfish from the Proposed Development and proposed mitigation are detailed in Table 9.2.

Table 9.2 Potential impacts on fish and shellfish and approach to EIA

Potential impact	Potential effect	Proposed approach	Reason	Proposed mitigation
Construction (and decommissioning)				
Temporary habitat disturbance	Direct damage/ disturbance to eggs, nests and shellfish from cable installation	Scope in	Cable laying activities require the construction of a trench causing disturbance to the seabed and any habitats which may be present. One potential impact of disturbance is the loss of habitat. This habitat loss can temporary or permanent	Any required mitigation will be identified through the EIA process.
Temporary increase in suspended sediments	Possible damage/ disturbance to eggs and nests from smothering and potential temporary migration barrier from	Scope in	Cable burial and associated works may cause an increase to suspended sediment concentrations. This may result in smothering or eggs and	Any required mitigation will be identified through the EIA process.

	suspended sediment		nests and temporary barrier to migration	
Noise and Vibration	Potential increased subsea acoustic noise installation equipment	Scope in	Increased survey noise from vessels may displace fish species	Any required mitigation will be identified through the EIA process.
Operation				
Electro-magnetic field effects	Possible behavioural effects from electromagnetic fields on electro sensitive fish species	Scope in	Elasmobranch may be affected by electromagnetic fields produced by the cable	Likely depth of sediment cover of 0.6 m in a cable trench depth > 0.9 m
Habitat Loss	Possible loss of habitat for sediment spawning fish species and seabed dwelling fish and shellfish species	Scope in	Any secondary cable protection used along the route will result in loss of habitats. Depending on the habitat type affected and its location, potentially significant effects may arise from habitat loss.	Any required mitigation will be identified through the EIA process.

9.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

9.4.1. The impact assessment methodology used for fish and shellfish will follow that recommended by CIEEM (Chartered Institute of Ecology and Environmental Management) for marine and coastal developments (IEEM, 2010; CIEEM, 2018). These guidelines set out the process for assessment through the following stages:

- Describing the baseline within the zone of influence;
- Identifying potential receptors within the zone of influence;
- Identifying activities associated with the project that may result in effects on these receptors during construction, operation, maintenance and decommissioning;
- Describing these activities in terms of whether the effect is likely to be positive or negative, along with its magnitude, extent, duration, reversibility, timing and frequency;
- Characterising the effect, including the likelihood of its occurrence;
- Assessing whether the likely (pre-mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made;
- Providing details of proposed mitigation (if applicable);
- Assessing whether the residual (with mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made; and
- Assessing cumulative effects (with mitigation where applicable).

9.4.2. Baseline conditions will be established by undertaking a desktop review of published information and through consultation with relevant stakeholders. No marine surveys are proposed. The data sources used to inform the baseline description and assessment will include (but will not be limited to) the following:

- International Council for the Exploration of the Seas (ICES)/MMO landing data;
- IFCA reports;

- Studies undertaken for other developments (e.g. Rampion Offshore Wind Farm, IFA2);
- Published data:
- Coull *et al.* (1998) and Ellis *et al.* (2012) for spawning and nursery maps;
- Environment Agency' Transitional and Coastal Waters (TraC) Fish Monitoring Programme;
- Cefas Young Fish Survey;
- The Fish Atlas of the Celtic Sea, North Sea and Baltic Sea (Heessen *et al.*, 2015);
- Solent Seabass Pre-Recruit Survey;
- North Sea IHLS data;
- MarineSpace *et al.* (2013a; 2013b) for assessments of the potential suitability of habitat for sandeel and Atlantic herring spawning;
- The East English Channel Herring Spawning assessment for The East Channel Association (RPS, 2013)

9.4.3. The most up to date information on aspects of fish and shellfish will be collated to determine the likely key species within the Proposed Development's marine cable corridor requiring assessment.

9.4.4. In addition, an MCZ assessment will be undertaken. This will include screening each relevant site identified within Table 9.1 for connectivity and sensitivity for all proposed activities.

9.4.5. A HRA Report will also be produced. This will include screening each relevant site identified within Table 9.1 for connectivity and sensitivity for all proposed activities.

9.4.6. Current Conservation Advice packages and Advice on Operations guidance will be used for the MCZ and HRA assessments where available and all sites where connectivity and sensitivity are demonstrated during screening will be taken forward for further assessment. These further assessments will evaluate the effects on the Conservation Objectives for the features within each site resulting from activities proposed for the Proposed Development.

10. MARINE MAMMALS AND BASKING SHARKS

10.1 SCOPING OPINION AND CONSULTATION

10.1.1. The consultation responses from Cefas, JNCC and Natural England were incorporated into the MMO Scoping Opinion. Comments from the MMO Scoping Opinion relating to marine mammals are summarised in Table E1 of Appendix E.

10.2 BASELINE

10.2.1. Information from the following sources has been used to identify the key marine mammal species which occur in the Channel (Table 10.1):

- SCANS III (Hammond *et al.,* 2017) - Block C covers the Channel;
- JNCC Atlas (Reid *et al.,* 2003);
- SMRU seal usage maps (Russell *et al.,* 2017); and
- Vincent *et al.,* (2017).

Table 10.1 Key marine mammal species which occur in the Channel

Common name	Latin name
Minke whale	*Balaenoptera acutorostrata*
Long-finned pilot whale	*Globicephala melas*
Bottlenose dolphin	*Tursiops truncatus*
Short-beaked common dolphin	*Delphinus delphis*
Harbour porpoise	*Phocoena phocoena*
Grey seal	*Halichoerus grypus*
Harbour seal (also known as common seal)	*Phoca vitulina*

10.2.2. The information presented in Table 10.1 will form the basis of the detailed baseline, along with information from other local studies (e.g. the Solent Seal Project (Solent Seal Project, 2018) and the CHARM III Project (CHARM, 2018) where it is publicly available and consultation with the relevant bodies (including the MMO, Joint Nature JNCC and Natural England). Reference populations will be as defined by the Inter-Agency Marine Mammal Working Group (IAMMWG) (IAMMWG, 2013[4]; IAMMWG, 2015[5]). No surveys are proposed.

10.2.3. Although any assessment will focus on the main species, any resulting mitigation is also considered to be appropriate for other, less commonly occurring, marine mammal species.

10.2.4. Although harbour seal is associated with the Solent Maritime SAC (shown in the attached Figure 8.1), it is not a qualifying feature. Therefore, this Natura 2000 site is not considered to be relevant for Habitats Regulations Assessment (for marine mammals). There are no designated sites which have marine mammals as a qualifying feature within likely foraging range of the Proposed Development therefore the potential for connectivity is considered to be negligible.

10.3 POTENTIAL IMPACTS AND MITIGATION

10.3.1. The following potential impacts on marine mammals and basking sharks during construction, operation and decommissioning of the Proposed Development have been identified:

- Construction (and decommissioning):
  - Collision with vessels;
  - Increased vessel noise;
  - Increased anthropogenic noise from geophysical survey and positioning equipment (used during construction and decommissioning) which emits sound; and
  - Increased anthropogenic noise from the following construction activities:
    - § Geotechnical investigations;
    - § HDD;
    - § Seabed preparation (which may include mass flow excavation, rock placement, boulder removal);

[4] This document will be used for seals.
[5] This document will be used for cetaceans.

- Route clearance; and
- Cable lay and burial (which may include ploughing and/or trenching).

- Operation:
  - Presence of EMF.

10.3.2. There are no other predicted potential impacts during operation of the Proposed Development except for a potential need to repair the cable as a result of a fault or physical damage. In such instances, the impact will be similar in nature to the installation of the cable.

10.3.3. Table 10.2 identifies the potential effects of the Proposed Development and proposes whether or not potential impacts can be scoped out of further assessment or not. It is proposed that 'Increased anthropogenic noise from geophysical survey and positioning equipment which emits sound' is taken forward for assessment (scoped in).

Table 10.2 Potential impacts on marine mammals and basking sharks and approach to EIA

Potential impact	Potential effect	Proposed approach	Reason	Proposed mitigation
Construction (and decommissioning)				
Collision with vessels	Lethal effects Physical injury (and subsequent risk of infection)	Scope out	Vessels will be following pre-defined linear routes when working. Working speeds will be low to moderate. It is considered that the additional, vessels associated with the Proposed Development will not significantly increase the amount of vessel traffic which uses the Channel, and therefore do not present a more significant risk of collision than animals experience on a daily basis.	None

Increased vessel noise	Behavioural response Masking Indirect effects due to potential impacts on prey	Scope out	Maximum impact ranges are likely to be very small even for large vessels (<1-22 m, Inchcape Offshore Ltd [ICOL] 2013). Sound from vessels associated with the Proposed Development is unlikely to significantly add to existing noise levels from vessels in the Channel.	None
Increased anthropogenic noise from geophysical survey and positioning equipment which emits sound e.g. sonars, sub-bottom profilers, USBL positioning systems and transponder beacons	Physical injury at very close range Auditory injury at close range Temporary behavioural response (if the sound emitted falls within the hearing range of marine mammals)	Scope in	Potential for physical and/or auditory injury.	Use of geophysical survey and positioning equipment which emits sound will be carried out in accordance with the relevant JNCC guidelines (JNCC, 2017). This will reduce the potential for harm to

				acceptable (not significant) levels.
Increased anthropogenic noise from geotechnical investigations, HDD, seabed preparation, route clearance, cable lay and burial	Auditory injury Temporary behavioural response	Scope out	Auditory injury: SEL modelling indicates that maximum impact ranges are likely to be < 1 m (Inch Cape Offshore Ltd [ICOL], 2013). Therefore, it is unlikely that marine mammals will receive a level of noise sufficient to induce auditory injury. Behavioural response: Noise modelling for these activities indicates that the maximum impact ranges are likely to be small (< 30 m for drilling, suction dredging and cable laying; ≤140 m for trenching; <100 m for rock placement (ICOL, 2013). Given the small maximum impact ranges, the relatively low densities of the species which are known to occur in The Channel, and the short duration of these	None

			activities (weeks or months), the potential for animals to come into contact with, and therefore have the potential to be impacted by sound from these installation-related activities, is considered to be very low. Furthermore, sound from these activities is unlikely to significantly add to existing noise levels in the Channel.	
Presence of EMF	Temporary behavioural response	Scope out	Although behavioural responses by electro-sensitive species such as basking sharks to the presence of EMF have been demonstrated, it is very unlikely that basking sharks will be impacted by the presence of EMF around the cable(s). This is because the potential zones of impact are likely to be very small (i.e. within a small number of	None

			metres from the cable's surface), the cable(s) will be buried or protected, and basking sharks are a pelagic species and therefore generally distant from the seabed where the cable(s) will be located. No evidence for electro-sensitivity in marine mammals has been reported (Normandeau *et al*., 2011). In terms of sensitivity to magnetic fields from buried cables, theoretical results suggest that any changes to swimming behaviour are likely to be corrected within a few metres and therefore have minimal effect (Normandeau *et al*., 2011). Therefore, it is proposed that the effects as a result of EMF are scoped out.	

10.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

10.4.1. A detailed baseline will be established by undertaking a desktop review of published information, other sources of publicly available information and through consultation with relevant stakeholder. It is considered, given the nature of the Proposed Development and the construction works, that a proportionate assessment be undertaken which can be based on the marine surveys already described and through the use of existing datasets. As such, it is not proposed to undertake any marine surveys for further data collection for marine mammals. A robust assessment can be made using the data from existing projects and resources.

10.4.2. The impact assessment methodology proposed for marine mammals will be that outlined by CIEEM for projects in marine and coastal environments (IEEM, 2010; CIEEM, 2018) which can be summarised as follows:

- Describing the baseline within the zone of influence;
- Identifying potential receptors within the zone of influence;
- Identifying activities associated with the project that may result in effects on these receptors during construction, operation and maintenance and decommissioning;
- Describing these activities in terms of whether the effect is likely to be positive or negative, along with its magnitude, extent, duration, reversibility, timing and frequency;
- Characterising the effect, including the likelihood of its occurrence;
- Assessing whether the likely (pre-mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made;
- Providing details of proposed mitigation (if applicable);
- Assessing whether the residual (with mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made; and
- Assessing cumulative effects (with mitigation where applicable) if required.

11. INTERTIDAL AND MARINE ORNITHOLOGY

11.1.1. This chapter covers UK ornithological interests present in the UK marine area. Accordingly, interests within the intertidal area and within the marine area are considered. Onshore ornithology (landward of the MHWS mark) is considered in Chapter 19 of this Report.

11.2 SCOPING OPINION AND CONSULTATION

11.2.1. Consultation responses from Natural England were largely incorporated into the MMO Scoping Opinion. MMO Scoping Opinion relating to intertidal and marine ornithology is summarised in Table E1 of Appendix E.

11.2.2. Any other additional consultation responses received to date that relate to marine water and sediment quality assessment for the Proposed Development are also presented in Table E2 of Appendix E.

11.3 BASELINE

MARINE ORNITHOLOGY

11.3.1. A detailed baseline will be established through a desktop review of published information and through consultation with relevant stakeholders.

11.3.2. The most up to date information on aspects of seabird and migratory species ecology (such as foraging ranges and behaviour) will be collated to determine the likely key species within the marine cable corridor requiring assessment.

UK Statutory Sites of International Importance

11.3.3. Breeding seabird populations in the UK and Channel Islands that could use the marine cable corridor within UK waters have been determined using an initial search area of 100 km. However, more distant sites may be considered if a clear ecological link between birds using the marine cable corridor and an internationally important SPA or Ramsar site can be established e.g. by foraging distance for designated species. Maximum foraging ranges have been used as a worst-case scenario, using the values published in Thaxter *et al.* (2012). The marine cable corridor within UK waters may also be used by breeding seabirds from SPA colonies in France. Whilst these colonies will be covered separately in the application submitted to the French authorities, potential transboundary effects of the Proposed Development on non-UK SPA/Ramsar sites will also be considered as part of the HRA process (see Chapter 17).

11.3.4. The UK SPAs designated for breeding seabirds within the search area are listed in Table 11.1 and illustrated in Figure 11.1 (attached). The marine cable corridor does not lie within the foraging range of any other UK designated seabird colonies, or any other UK SPA/Ramsar designated for inshore wintering waterfowl.

Table 11.1 UK SPAs and Ramsars designated for breeding seabirds and inshore wintering waterfowl

SPA/Ramsar	Approx. distance from Proposed Development (minimum) (km)	Species	Population (number of breeding pairs)*	Maximum foraging range	Proposed Development within maximum foraging range?
Chichester and Langstone Harbours	0.1	Little tern (*Sternula albifrons*)	49	11 km	Yes
		Common tern (*Sterna hirundo*)	126	30 km	Yes
		Sandwich tern (*Sterna sandvicensis*)	93	54 km	Yes
Portsmouth Harbour	4.9	Red-breasted merganser (*Mergus serrator*)	100 individuals	NA	Yes
	6.6	Little tern	49	11 km	Yes

SPA/Ramsar	Approx. distance from Proposed Development (minimum) (km)	Species	Population (number of breeding pairs)*	Maximum foraging range	Proposed Development within maximum foraging range?
Solent and Southampton Water		Sandwich tern	231	54 km	Yes
		Common tern (*Sterna hirundo*)	267	30 km	Yes
		Roseate tern** (*Sterna dougallii*)	2	30 km	Yes
		Mediterranean gull (*Larus melanocephalus*)	2	20 km	Yes
Pagham Harbour	9.5	Little tern	14	11 km	Yes
		Common tern	149	30 km	Yes
Poole Harbour* **	63	Common tern	178	30 km	No

SPA/Ramsar	Approx. distance from Proposed Development (minimum) (km)	Species	Population (number of breeding pairs)*	Maximum foraging range	Proposed Development within maximum foraging range?
		Sandwich tern	179	54 km	No
		Mediterranean gull	155	20 km	No
Dungeness, Romney Marsh and Rye Bay	76.6	Little tern	35	11 km	No
		Sandwich tern	350	54 km	No
		Common tern	273	30 km	No
		Mediterranean gull	56	20 km	No
Alderney West Coast and Burhou Islands	142.1	Gannet (*Morus bassanus*)	5,950	590 km	Yes
		European storm petrel	100	>65 km	Yes

SPA/Ramsar	Approx. distance from Proposed Development (minimum) (km)	Species	Population (number of breeding pairs)*	Maximum foraging range	Proposed Development within maximum foraging range?
		(*Hydrobates pelagicus*)			
		Cormorant (*Phalacrocorax carbo*)	1	35 km	No
		Shag (*Phalacrocorax aristotelis*)	44	17 km	No
		Kittiwake (*Rissa tridactyla*)	16	120 km	No
		Lesser black-backed gull (*Larus fuscus*)	273	181 km	Yes
		Herring gull (*Larus argentatus*)	105	98 km	No

SPA/Ramsar	Approx. distance from Proposed Development (minimum) (km)	Species	Population (number of breeding pairs)*	Maximum foraging range	Proposed Development within maximum foraging range?
		Great black-backed gull (*Larus marinus*)	32	98 km‡	No
		Guillemot (*Uria aalge*)	105	135 km	No
		Razorbill (*Alca torda*)	17	95 km	No
		Puffin (*Fratercula arctica*)	180	200 km	Yes

***Most recent five year mean count provided on the Natural England Designated Sites View website.**

****Roseate tern no longer breed in this SPA (Holling *et al*. 2015).**

***** Including the 2017 marine extension.**

‡ Great black-backed gull foraging range is not available from Thaxter *et al*. (2012). Therefore, foraging range is based on the maximum foraging range cited for herring gull. This was considered the most suitable model species as lesser black-backed gull is a long distant migrant (unlike great black-backed gull and herring gull).

11.3.5. In addition to the SPA/Ramsar sites outlined in Table 11.1, the Solent and Dorset Coast pSPA also overlaps with the marine cable corridor. This pSPA covers the marine foraging area of little terns, Sandwich terns and common terns breeding within four SPAs within the Greater Solent: Chichester & Langstone Harbours SPA, Solent & Southampton Water SPA, Pagham Harbour SPA and Poole Harbour SPA. Furthermore, it is proposed that the existing Dungeness, Romney Marsh and Rye Bay SPA be extended to include the marine foraging areas used by little terns, common terns and Sandwich terns breeding within the existing SPA. The Dungeness, Romney Marsh and Rye Bay SPA is located 76.6 km from the marine cable corridor and is therefore outwith the maximum foraging range of these designated features.

11.3.6. Based on the information provided in Table 11.1, there are six international statutory sites designated for ornithological features with potential connectivity to the marine cable corridor: Solent and Dorset Coast pSPA, Chichester & Langstone Harbours SPA/Ramsar, Portsmouth Harbour SPA/Ramsar, Solent & Southampton Water SPA/Ramsar, Pagham Harbour SPA/Ramsar and Alderney West Coast and Burhou Islands Ramsar. As such, a HRA Report will be produced alongside the Ecological Impact Assessment (EcIA) to determine the likelihood of any adverse effect on the integrity of the SPAs.

UK Statutory Sites of National Importance

11.3.7. SSSI within the UK and Channel Islands notified for breeding seabirds within the search area are listed in Table 11.2 and illustrated in Figure 11.2 (attached). The marine cable corridor does not lie within the foraging range of any other SSSIs notified seabird colonies, or any other SSSIs notified for inshore wintering waterfowl. The marine cable corridor within UK waters may also be used by breeding seabirds from nationally important colonies in France. These colonies will be covered in the French application submitted to the French authorities, but potential transboundary effects from the Proposed Development on French sites will be considered where necessary.

11.3.8. Whilst not a notified feature of this SSSI, Barne *et al.* (1998) identified Pagham Harbour as supporting a nationally important population (20-25 individuals) of wintering Slavonian grebe (*Podiceps auritus*). Chichester, Langstone and Poole Harbours were also identified as supporting nationally important populations of marine waterfowl, including Slavonian grebe, black-necked grebe (*Podiceps nigricollis*), red-breasted merganser (*Mergus serrator*) and cormorant (Barne *et al.* 1996).

Table 11.2 UK SSSIs designated for breeding seabirds and inshore wintering waterfowl

SSSI	Distance from Proposed Development (minimum) (km)	Species	Maximum foraging range	Proposed Development within maximum foraging range?
Langstone Harbour	0.1	Little tern	11 km	Yes
		Common tern	30 km	Yes
		Sandwich tern	54 km	Yes
		Red-breasted merganser	NA	Yes
Chichester Harbour	4.4	Little tern	11 km	Yes
		Common tern	30 km	Yes
		Sandwich tern	54 km	Yes
North Solent	18.7	Little tern	11 km	No

		Sandwich tern	54 km	Yes
		Common tern	30 km	Yes
		Black-headed gull (*Chroicocephalus ridibundus*)	40 km	Yes
Newtown Harbour	24.1	Little tern	11 km	No
		Sandwich tern	54 km	Yes
		Common tern	30 km	Yes
		Black-headed gull	40 km	Yes
Hurst Castle to Lymington River Estuary	29.2	Little tern	11 km	No
		Sandwich tern	54 km	Yes
		Common tern	30 km	Yes

		Black-headed gull	40 km	Yes
Brighton to Newhaven Cliffs	35.8	Kittiwake	120 km	Yes
		Fulmar (*Fulmarus glacialis*)	580 km	Yes
		Herring gull	92 km	Yes
Seaford to Beachy Head	40.7	Fulmar	580 km	Yes
Poole Harbour	63.8	Sandwich tern	54 km	No
		Common tern	30 km	No
		Black-headed gull	40 km	No
		Mediterranean gull	20 km	No
Rye Harbour	84.5	Little tern	11 km	No

		Common tern	30 km	No

11.3.9. MCZs were created under the MCAA 2009. Their purpose is to protect the full range of nationally important biodiversity in UK waters, as well as certain rare and threatened species and habitats. There are no recommended, proposed or designated MCZs within the search area with ornithological features. Therefore, an MCZ assessment for ornithology is proposed to be scoped out.

INTERTIDAL ORNITHOLOGY

11.3.10. Coastal areas including intertidal mudflats, marsh habitats and high tide roosts sites, which can be shingle, marsh or even inland fields, present important habitats for wintering bird assemblages.

11.3.11. A programme of intertidal baseline ornithology surveys, designed by WSP, was undertaken between October 2017 and March 2018 in order to assess the importance of the Eastney Beach landfall site.

11.3.12. Monthly site visits were undertaken covering a range of falling and rising tides throughout the wintering season. Each survey was a minimum of six hours in duration, extending from either high tide or low tide. Surveys utilised the BTO Wetland Bird Survey (WeBS) method to count birds within sections of the survey area visible from a number of Vantage Point (VP) locations. These VP locations were repeated in rotation for the duration of each survey. Bird and/or flock locations were mapped and activity recorded (e.g. foraging, loafing, roosting etc.). In addition, observed and potential disturbance events were recorded.

11.3.13. A total of 86 species were recorded on or over the landfall site during the wintering bird survey. Of these species, a high number are legally protected or species of conservation concern, including 11 Schedule 1 species, 11 Species of Principal Importance (SPI) under the NERC Act 2006, 12 Birds of Conservation Concern (BoCC) red list species and 30 BoCC amber list species.

11.3.14. These surveys, along with a desktop review of published information and consultation with relevant stakeholders, will be used to establish a detailed baseline.

UK Statutory Sites of International Importance

11.3.15. The following international and national designated sites discussed previously in relation to marine ornithology are also of relevance to intertidal ornithology:

- Chichester and Langstone Harbours SPA/Ramsar;
- Portsmouth Harbour SPA/Ramsar;
- Solent and Southampton Water SPA/Ramsar:
- Solent and Dorset Coast pSPA; and

- Langstone Harbour SSSI.

11.3.16. The Proposed Development passes through Chichester and Langstone Harbour SPA and Ramsar. This SPA is designated for the following wildfowl and wader species during the non-breeding season and on passage:

- Dark-bellied brent goose (*Branta bernicla bernicla*);
- Little egret (*Egretta garzetta*);
- Grey plover (*Pluvialis squatarola*);
- Ringed plover (*Charadrius hiaticula*);
- Black-tailed godwit (*Limosa limosa*);
- Bar-tailed godwit (*Limosa lapponica*);
- Dunlin (*Calidris alpina*);
- Redshank (*Tringa totanus*); and
- A wintering waterfowl assemblage of international importance.

11.3.17. More distant sites may be considered if a clear ecological link between birds using the cable corridor and an internationally important SPA and/or Ramsar site can be established e.g. by foraging distance for designated species. Further details are provided Chapter 19.

11.3.18. The Proposed Development passes through Chichester Harbour SSSI. The extensive intertidal mudflats provide feeding grounds for the following notified features during the non-breeding season:

- Dark-bellied brent goose;
- Shelduck (*Tadorna tadorna*);
- Teal (*Anas crecca*);
- Grey plover;
- Ringed plover;
- Curlew (*Numenius arquata*);
- Black-tailed godwit;

- Bar-tailed godwit;
- Sanderling (*Calidris alba*);
- Dunlin;
- Greenshank (*Tringa nebularia*); and
- Redshank.

11.3.19. As for statutory sites of international importance, more distant sites may be considered if a clear ecological link between birds using the cable corridor and a SSSI can be established. Further details are provided in Chapter 19.

11.4 POTENTIAL IMPACTS AND MITIGATION

MARINE ORNITHOLOGY

11.4.1. The potential impacts of the construction, operational and decommissioning stagtesof the marine cable corridor on marine ornithological interests in UK waters may include:

- Construction (and decommissioning):
  - Disturbance and displacement from installation plant and support vessels;
  - Indirect effects as a consequence of prey and/or habitat loss;
  - Exposure to surface hydrocarbons or chemicals due to accidental spills
  - Barrier effects; and
  - Collision risk.
- Operation:
  - Disturbance and displacement from installation plant and support vessels;
  - Indirect effects as a consequence of prey and/or habitat loss;
  - Exposure to surface hydrocarbons or chemicals due to accidental spills
  - Barrier effects; and
  - Collision risk.

11.4.2. Table 11.3 presents a summary of potential impacts on marine ornithology features during construction, operation (including maintenance) and decommissioning of the marine cable corridor.

Table 11.3 Potential impacts to marine ornithological receptors and approach to EIA

Potential impact	Proposed approach	Reason	Proposed mitigation
Construction, operation (and decommissioning)			
Disturbance and displacement from installation plant and support vessels	Scope in	Disturbance effects can manifest through the deterrence of birds from using suitable or preferred habitat. During installation, noise and visual disturbance has the potential to arise as a result of the presence of vessels and installation activity.	Any required mitigation will be identified through the EIA process.
Indirect effects as a consequence of prey disturbance and/or habitat loss	Scope in	Potential effects of installation on habitats, benthic organisms, fish and shellfish species. The physical presence of cable components during operation, in addition to ongoing maintenance activities may affect the	Any required mitigation will be identified through the EIA process.

		availability of prey species.	
Exposure to surface hydrocarbons or chemicals due to accidental spills	Scope out	Accidental release of hydrocarbon fuel from vessels by its nature is unplanned and an unexpected impact as a result of the project. However, pollution prevention measures will be detailed within the ES as part of the DCO application.	
Barrier effects	Scope out	Potential collision risk and barrier effects to seabirds are not relevant to subsea cables and are therefore scoped out.	
Collision risk	Scope out	Potential collision risk and barrier effects to seabirds are not relevant to subsea cables and are therefore scoped out.	

Construction

11.4.3. Habitat loss due to installation of infrastructure and changes to physical process may lead to changes in habitat available for birds and their prey species.

Potential effects of installation on habitats, benthic organisms and fish species are presented in Chapters 8 and 9 of this Report. The conclusions of the assessments of impacts on these receptors will be used to assess the potential (indirect) effects upon the foraging behaviour of bird species.

11.4.4. Disturbance effects can manifest through the deterrence of birds from using suitable or preferred habitat. During installation, both noise and visual disturbance has the potential to arise as a result of the presence of vessels and installation activity. Different species show differing sensitivities to disturbance. Assessment of disturbance sensitivity will be based upon: species abundance within the cable corridor, the estimated proportion of colony-population within the area, their estimated sensitivities to vessel presence (Garthe & Hüppop 2004; Furness & Wade 2012; Wade *et al*. 2016), whether their distribution over the wider area is localised or widespread, their reliance on specific habitat types and any published information on habituation.

11.4.5. Potential collision risk and barrier effects to seabirds are not relevant to subsea cables and are therefore scoped out.

Operation

11.4.6. The physical presence of cable components during operation, in addition to ongoing maintenance activities may affect the availability of prey species. Potential effects of operation and maintenance on habitats, benthic organisms and fish species are presented in Chapters 8 and 9 of this Report. Again, the conclusions of the assessments of impacts on these receptors will be used to assess the potential (indirect) effects upon the foraging behaviour of bird species.

11.4.7. Noise and visual disturbance during operation may be initiated by vessel presence and other maintenance activities to the cable components. Bird species density, distribution and behavioural data will be collated to inform likely population densities across the cable corridor in different seasons.

11.4.8. As for installation, potential collision risk and barrier effects to seabirds are not relevant to subsea cables and are therefore scoped out.

Decommissioning

11.4.9. Potential effects during decommissioning are expected to be similar (although likely lower) to those predicted for installation.

Potential Mitigation Measures

11.4.10. Potential mitigation measures will be considered and proposed where deemed relevant during impact assessment in order to reduce predicted effects on ornithological features. These may include:

- Micro-siting of the cable to avoid sensitive habitats; and

- Use of standard vessel routes and procedures.

INTERTIDAL ORNITHOLOGY

11.4.11. The potential impacts of the construction, operational and decommissioning stages of the Proposed Development on intertidal ornithological interests in UK waters may include:

- Construction (and decommissioning):
  - Disturbance and displacement from installation plant and support vessels;
  - Indirect effects as a consequence of prey and/or habitat loss;
  - Exposure to surface hydrocarbons or chemicals due to accidental spills;
  - Barrier effects; and
  - Collision risk.
- Operation
  - Disturbance and displacement from installation plant and support vessels;
  - Indirect effects as a consequence of prey and/or habitat loss;
  - Exposure to surface hydrocarbons or chemicals due to accidental spills
  - Barrier effects; and
  - Collision risk.

11.4.12. Table 11.3 can also be used to illustrate the potential impacts on both intertidal and marine ornithology and the proposed approach to EIA. Further detail on intertidal ornithology is provided in Chapter 19.

11.5 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

MARINE ORNITHOLOGY

11.5.1. It is considered that given the nature of the Proposed Development and installation works, that a proportionate assessment be undertaken which can be based on the marine surveys already described and through the use of existing datasets. As such, the Applicant does not propose to undertake any marine

surveys for further data collection or modelling for ornithology, but are confident that a robust assessment can be made using the data from existing projects and resources.

11.5.2. The data sources used to inform the baseline description and assessment will include (but will not be limited to) the following:

- Seabird 2000 national seabird census project (Mitchell *et al.* 2004);
- Alderney Renewable Energy Regional Environmental Assessment (ABPmer, 2014);
- JNCC European Seabirds at Sea (ESAS) Database (Stone *et al.* 1995);
- JNCC Reports No. 431 and No. 461 (Kober *et al*. 2010; Kober *et al*. 2012);
- Aerial surveys of water birds in UK inshore waters (Dean *et al.* 2003; DTI 2006; Söhle *et al*. 2006; Lewis *et al.* 2009);
- The Migration Atlas Movements of the Birds of Britain and Ireland (Wernham *et al*. 2002);
- Wetland Bird Survey (WeBS) peak count data for the Portsmouth region (Frost *et al.* 2018);
- JNCC Coastal Directories Project: Region 8 Sussex: Rye Bay to Chichester Harbour (Barne *et al.* 1998) and Region 9: Southern England: Hayling Island to Lyme Regis (Barne *et al.* 1996); and
- Websites e.g. Seabird Monitoring Programme (SMP), Natural England, JNCC.

INTERTIDAL ORNITHOLOGY

11.5.3. Whilst no marine bird surveys are proposed, a programme of intertidal baseline ornithology surveys, designed by WSP, was undertaken between October 2017 and March 2018 in order to assess the importance of the landfall site at Eastney.

11.5.4. WSP also designed a series of onshore ornithology surveys which were undertaken during winter 2017/18. Further details of these are provided in Chapter 19 of this Report.

ASSESSMENT METHODOLOGY

11.5.5. The impact assessment methodology used for marine and intertidal ornithology will follow that recommended by CIEEM for marine and coastal developments

(IEEM, 2010; CIEEM, 2018). These guidelines set out the process for assessment through the following stages:

- Describing the ornithological baseline within the zone of influence;
- Identifying potential ornithological receptors within the zone of influence;
- Identifying activities associated with the project that may result in effects on these ornithological receptors during installation, operation, maintenance and decommissioning;
- Describing these activities in terms of whether the effect is likely to be positive or negative, along with its magnitude, extent, duration, reversibility, timing and frequency;
- Characterising the effect, including the likelihood of its occurrence;
- Assessing whether the likely (pre-mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made;
- Providing details of proposed mitigation (if applicable);
- Assessing whether the residual (with mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made; and
- Assessing cumulative effects (with mitigation where applicable).

11.5.6. A HRA Report will also be undertaken. This will include screening each relevant site identified within Table 11.1 for connectivity and sensitivity for all proposed activities.

11.5.7. Current Conservation Advice packages and Advice on Operations guidance will be used for the HRA assessments where available and all sites where connectivity and sensitivity are demonstrated during screening will be taken forward for further assessment. These further assessments will evaluate the effects on the Conservation Objectives for the features within each site resulting from activities proposed for the Proposed Development.

12. COMMERCIAL FISHERIES

12.1 SCOPING OPINION AND CONSULTATION

12.1.1. The consultation responses from Cefas, the Southern IFCA and the NFFO were incorporated into the MMO Scoping Opinion. Comments from the MMO scoping Opinion relating to commercial fisheries are summarised in Table E1 of Appendix E.

12.1.2. Any other additional consultation responses received to date that relate to marine water and sediment quality assessment for the Proposed Development are also presented in Table E2 of Appendix E.

12.2 BASELINE

12.2.1. The English Channel in the area of the Proposed Development is used by a variety of commercial fishing vessels with a wide diversity of fishing gear types. Target species include both fish and shellfish, with strong seasonal and spatial sensitivities.

12.2.2. Within UK offshore waters, surveillance sightings have identified French, Belgian and UK vessels (ICES rectangle 29F0) with the majority being otter trawlers, beam trawlers and scallop dredgers (see attached Figure 12.1) (Brown & May Marine, 2017). UK inshore waters (30F0 and 30E9) are mostly used by UK registered vessels operating pots, gill nets and unspecified trawl gear although few vessels apply a single method (Brown & May Marine, 2017).

12.2.3. It should be noted that Figure 12.1 (attached) is used as an example of the methods and nationalities fishing within UK waters during the period 2011 - 2015. The most up to date data (2012 - 2016) will be used in the ES where separate sections will address nationalities and methods.

12.2.4. The Vessel Monitoring System (VMS) satellite data for vessels over 15 m in length indicates that scallop dredging records the highest levels of effort within the UK fleet with UK demersal trawlers and seine netters recording moderate levels of effort within the proposed marine cable corridor (Brown & May Marine, 2017). UK over 15 m potters show very little activity within the study area (Brown & May Marine, 2017).

12.2.5. VMS data is only representative of activity by the over 15 m fleet, as vessels less than 15 m are not tracked by VMS. A significant proportion of activity within the area is conducted by vessels smaller than 10 m (RSK Environment Ltd., 2010) which highlights the importance of consultation with local fisherman and both Southern and Sussex IFCAs to gain data and information on this fleet.

12.2.6. The average landings values of UK vessels highlight that the ICES rectangle 30E9 is the most profitable on the marine cable corridor with £6,171,633 recorded on average. This is across a range of gear types with nearly a third of values originating from the under 10 m potting fleet (Brown & May Marine, 2017). The main species targeted by potters in inshore areas are whelk, lobster and to

a lesser extent edible crab (Brown & May Marine, 2017). Whereas the offshore section (29E9 and 29F0) is dominated by mechanical dredging targeting scallops.

12.2.7. The annual landings data is used to highlight the values of each fishing method within a particular area and is illustrated in Figure 12.2 (attached). It should be noted that this figure is used as an example only and the most up to data (available at the time of writing) will be used in the ES.

12.3 POTENTIAL IMPACTS AND MITIGATION

12.3.1. The potential impacts of the construction, operational and decommissioning stages of the Proposed Development on commercial fisheries in UK waters may include:

- Construction (and decommissioning):
  - Temporary loss or restricted access to established fishing grounds;
  - Temporary displacement of fishing activity into other areas;
  - Interference to normal fishing activities;
  - Safety issues for fishing vessels;
  - Temporary increases in steaming times; and
  - Obstacles on the seabed after installation.
- Operation:
  - Temporary loss or restricted access to established fishing grounds;
  - Temporary displacement of fishing activity into other areas;
  - Interference to normal fishing activities;
  - Safety issues for fishing vessels;
  - Increased steaming times; and
  - Obstacles on the seabed after installation.

12.3.2. There is the potential for the construction and operation stages of the Proposed Development to have effects on commercially harvested fish and shellfish populations. This may result in behavioural changes or declines in abundance, which could indirectly affect the productivity of the fishery. While this is acknowledged in the commercial fish chapter of this document, the potential for

such effects will be assessed in the Fish and Shellfish chapter and any significant impacts discussed in the commercial fish chapter of the ES.

12.3.3. The potential impacts on commercial fish from the construction and decommissioning of the Proposed Development and proposed mitigation are detailed in Table 12.1.

Table 12.1 Potential impacts on commercial fisheries and approach to EIA

Potential impact	Potential effect	Proposed approach	Reason	Proposed mitigation
Construction (and decommissioning)				
Temporary loss or restricted access to established fishing grounds.	Loss of or restricted access to fishing grounds.	Scoped in	Temporary safety zones around installation activities, installed or partially installed unattended infrastructure, advisory exclusion zones along vulnerable exposed sections of cables are all required to ensure the safety of other sea users. This will result in temporary restriction of access to fishing grounds.	Establishment of a Fisheries Working Group with key fisheries stakeholders to provide a forum for ongoing engagement with the fishing industry. Production of a Construction Management Plan. Consideration of the use of local fishing vessels to enforce safety zones. A Fisheries Liaison Officer (FLO) will

				be appointed to disseminate survey, installation (and decommissioning) schedules and associated safety risks will be shared through notices to all potential stakeholders.
Temporary displacement of fishing activity into other areas	Increased competition for alternative fishing grounds. Potential conflict between competing vessels. Potential conflict between different fishing methods.	Scoped in	Temporary safety/exclusion zones around installation activities, installed or partially installed unattended infrastructure, advisory exclusion zones along vulnerable exposed sections of cables are all required to ensure the safety of other sea users. This will result in temporary restriction of access to fishing grounds, which will displace fishing activity into other areas.	Establishment of a Fisheries Working Group with key fisheries stakeholders to provide a forum for ongoing engagement with the fishing industry.

Interference to normal fishing activities	The propellers, rudders or towed survey equipment of survey and installation vessels have the potential to foul fishing buoys and lines.	Scoped in	Survey and installation vessels are required for surveying and installation/burial of the cable, which may cause interference to fishing activity.	Liaison with fishermen. Works vessels will fully comply with the International Regulations for Preventing Collisions at Sea (COLREGS).
Safety issues for fishing vessels	Collisions with installation vessels. Interaction with cables and infrastructure.	Scoped in	Unsafe areas such as installation activities will be made safe by using exclusion zones to prevent access and subsequent safety risks to fishing vessels.	Standard temporary exclusion zones around marine installation activities. Advisory exclusion zones around marine installation activities. Partially installed cable and associated infrastructure that is not fully installed would be marked, possibly guarded and advisory

				exclusion zones implemented. Liaison with fishermen.
Temporary increases in steaming times	Short term increases in steaming distances and times due to implementation of temporary safety zones and advisory exclusion zones.	Scoped in	Temporary safety/exclusion zones around installation activities, installed or partially installed unattended infrastructure and advisory exclusion zones along vulnerable exposed sections of cables are required to ensure safety to other sea users.	Safety and exclusion zones will be in place for a short duration and encompass a small area.
Obstacles on the seabed after installation.	Safety issue. Damage to or complete loss of fishing gear.	Scoped in	Obstacles on the seabed will arise as a result of cable installation activities.	Compliance to obligatory standards. Any significant risk to navigational safety will be identified and appropriate

				rectification measures undertaken before removal of safety zones.
Operation:				
Temporary loss or restricted access to established fishing grounds.	Loss or restricted access to fishing grounds. Increased competition for grounds outside the cable route due to displacement.	Scoped in	The cable will be buried in the seabed as part of the installation process. It is ultimately the choice of the vessel owner/skipper to choose to fish over the buried cable.	Likely target depth of lowering of 0.6 m in a target trench depth of 0.9 m. In areas of sediment where the cable cannot be buried the most appropriate cable protection will be used to minimise impacts to fisheries.
Temporary displacement of fishing activity into other areas.	Displacement due to cable protection. Concerns of fishing over subsea cables. Safety concerns.	Scoped in	Temporary safety zones in place around maintenance/repair vessels are required to ensure the safety of other sea users.	Discussions with relevant vessel owners to determine appropriate mitigation.

				Safety zones occurring as a result of maintenance activities would represent a very small proportion of total grounds available.
Interference to normal fishing activities.	Collison risk. Interactions with fishing gear.	Scoped in	Maintenance and operation vessels are required to ensure the ongoing operation of the cable.	Codes of conduct between works vessels and fishing vessels should be well established post installation Comply with international Regulations for preventing Collisions at Sea (COLREGS).
Safety issues for fishing vessels.	Interactions with cables and cable protection.	Scoped in	Obstacles on the seabed will arise as a result of cable installation activities.	Likely target depth of lowering of 0.6 m in a target trench depth of 0.9 m.

				Post installation surveys will be undertaken to assess seabed status. Temporary safety zones and advisory exclusion zones used.
Increase steaming times	Short term increases in steaming distances and times due to temporary safety zones.	Scoped in	Maintenance activities may be required, and temporary safety zones needed to ensure the safety of other sea users.	Temporary safety zones in place for a short duration and will encompass a small area.
Obstacles on the seabed after maintenance	Safety issue. Damage to or complete loss of fishing gear.	Scoped in	Obstacles on the seabed are likely to arise as a result of maintenance activities.	Compliance to obligatory standards. Post maintenance surveys Accidently dropped objects and/or debris will be removed.

12.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

12.4.1. The impact assessment methodology proposed for commercial fish will be that outlined by CIEEM for projects in marine and coastal environments (CIEEM, 2010, CIEEM, 2018) which can be summarised as follows:

- Describing the baseline within the zone of influence;
- Identifying potential receptors within the zone of influence;
- Identifying activities associated with the project that may result in effects on these receptors during installation, operation and maintenance and decommissioning;
- Describing these activities in terms of whether the effect is likely to be positive or negative, along with its magnitude, extent, duration, reversibility, timing and frequency;
- Characterising the effect, including the likelihood of its occurrence;
- Assessing whether the likely (pre-mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made;
- Providing details of proposed mitigation (if applicable);
- Assessing whether the residual (with mitigation) effects are ecologically significant and the geographical scale at which they are predicted to occur, including an indication of certainty in the predictions made, and
- Assessing cumulative effects (with mitigation where applicable).

12.4.2. In order to provide a robust fisheries baseline, data will be collected from a combination of data gathering from publicly available sources as well as consultation with fishermen. The baseline will be based on the last five years' worth of available fisheries data for the UK, French and any other nationality that may fish within the corridor, for all species and commercial fishing methods.

- Landings (tonnage and value);
- Sightings data; VMS data;
- Location of fishing activities; and

- Operating patterns and practices.

12.4.3. A more detailed description of the fishing activity occurring in the vicinity of the study area will be provided using the most up-to-date datasets available. The principal data and information sources to be used are summarised as follows:

- ICES;
- MMO - Fisheries Statistics Unit and Data & Communications Team;
- EU Fisheries Committee publications and data sets (Europa & Eurolex);
- Cefas Laboratory – Lowestoft;
- SeaFish;
- UK Oil & Gas;
- Publications from the SIH (Système d'Information Halieutique) for relevant ICES rectangles;
- Publications from the UMR AMURE (University of Brest);
- Publicly available data sets from the DIRM (Direction Interrégionale de la mer Manche Mer du Nord); and
- Non-UK fleet catch and effort data.

12.4.4. There is currently no single data set or model which can accurately quantify the precise levels or values of commercial fishing within discrete sea areas such as marine cable corridor. As such, data and information will be acquired from a number of sources. Data will be collected using the data sources described below:

- Fisheries Statistics - ICES statistical rectangles are currently the smallest spatial unit used for the collation of fisheries data by the EU and ICES. The following data from the years 2012 to 2016 will be presented and analysed by ICES rectangles, this includes information on the following:
  - Landings values;
  - Effort data (days fished per year);
  - Nationality;

- Weight of catch;
- Species caught;
- Methods used;
- Landing ports;
- Annual variations;
- Monthly variations (seasonality);
- Vessel category (under-10m, 10m to 15m, over-15m and non-UK); and
- Data will be collected for UK, French, Belgium, Dutch and Danish and German landing statistics.

- Satellite Tracking (VMS) - Satellite tracking data is for over-15 m UK registered vessels, obtained from the MMO, and will be assessed and GIS plotted for the years 2012 to 2016 by average annual value within the study areas. Vessels under-15m in length are not currently tracked. For the French activity in UK waters a data, request will be made to IFREMER (Institut français de recherche pour l'exploitation de la mer) in order to obtain more recent VMS data on a 5 years' time series (2011-2015) with a breakdown by gear type. For non-UK vessels, the desktop study will rely on the most relevant VMS data sets.

- Fisheries Surveillance - Fisheries over-flight and surface vessel surveillance sightings for the years 2011 to 2015 will be analysed by vessel nationality and gear type.

- Consultation with fishermen to establish fishing patterns of non-VMS fitted fleet. In the UK, fishing vessels under 15m are currently not fitted with VMS. As a consequence, consultation with relevant fishing interests will ensure coverage of the small-scale fleet fishing of the inshore section of the Proposed Development. For the French under 15m fleet, Brown and May will liaise with the CRPMEM (Comité Régional des Pêches Maritimes et des Elevages Marins de Bretagne) of Normandy to obtain the VALPENA (l'éVALuation des Pratiques de PEches au regard des Nouvelles Activités) data which provides a mapping of the fishing activity by French vessels regardless of their size.

13. SHIPPING AND NAVIGATION

13.1 SCOPING OPINION AND CONSULTATION

13.1.1. Consultation responses from the MCA, the RYA, Trinity House, The Langstone Harbour Board and the MoD were incorporated into the MMO Scoping Opinion. Comments from the MMO Scoping Opinion relating to shipping and navigation are summarised in Table E1 of Appendix E.

13.2 BASELINE

13.2.1. A preliminary baseline study for this Report has been provided by Anatec Ltd. It is important to note that this Report is focussed on the landfall and marine elements for the UK part of the Proposed Development only.

13.2.2. This topic in relation to French waters will be outlined in greater detail in the French application submitted separately to French authorities.

13.2.3. Data obtained for the UK waters is considered to provide ample coverage of the area to inform the shipping and navigation baseline at this current stage.

Navigational Features

13.2.4. This section identifies the key navigational features in the vicinity of the Proposed Development.

13.2.5. The Proposed Development crosses the English Channel. One section of the corridor crosses the entrance of the eastbound shipping lane of the west of the Dover Strait Traffic Separation Scheme (TSS) which is one of the busiest shipping lanes in the world.

13.2.6. There is a maintained depth channel (Nab Channel) located approximately 0.7 nm south of the cable corridor. The Nab Channel, associated with the eastern approach to Portsmouth and the Solent, is approximately 5 nm in length and is intended for deeply-laden inward-bound tankers, large container vessels and other vessels constrained by their draught. Accordingly, other vessels should keep clear of the Nab Channel and not impede the safety of deep-draught vessels navigating in the area.

13.2.7. There are numerous anchorages in close proximity to the cable corridor (none located inside), the largest of which is the Nab anchorage berths located approximately 4-5 nm to the south west of the Eastney landfall. This anchorage contains anchor berths and swinging circles. Mariners are advised that, in strong winds, the nature of the holding ground in the area of the Nab Anchorages is such that vessels may be liable to drag anchor.

13.2.8. The navigational features in UK waters are presented in Figure 13.1 (attached).

Automatic Identification System (AIS) Analysis

13.2.9. A total of two months AIS receiver data from 2016, one month in summer (July - August 2016) and one month in winter (December 2016), was analysed. In addition, one month of auxiliary satellite AIS data from 2015 (July - August 2015) has also been included in the analysis for validation. The combined data set was analysed for a study area, defined to encompass an area of 2.5 nm around the Proposed Development.

Commercial Shipping

13.2.10. An overview plot of the vessel tracks, colour-coded by vessel type, recorded within the study area for the three months of AIS data are provided in Figure 13.2.

13.2.11. Figure 13.3 shows the type distributions (excluding < 1% unspecified) for vessels passing within the study area during the 3-month study period.

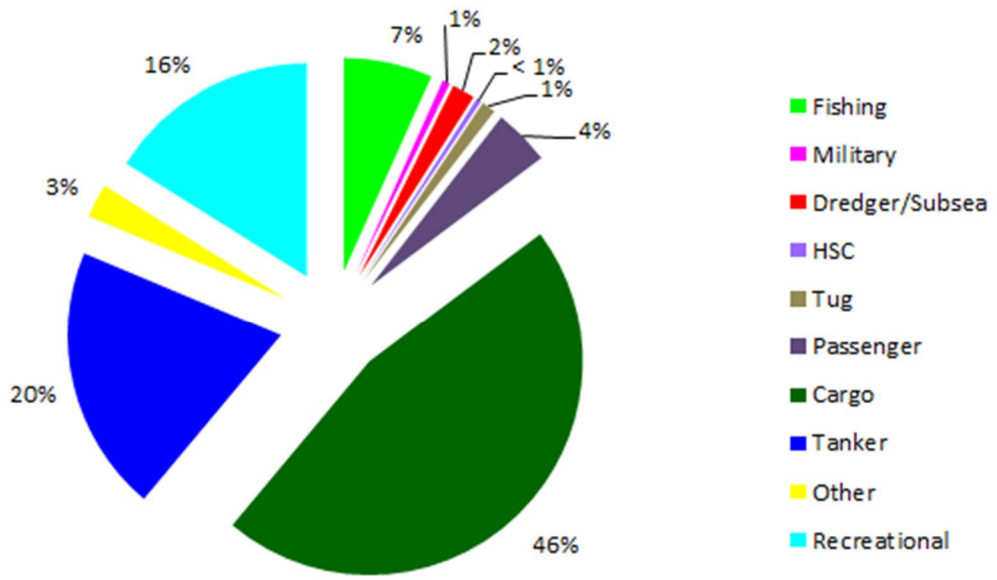


Figure 13.3 Vessel type distribution (excluding unspecified). Anatec 2017.

13.2.12. In summer 2015, there was an average of 304 unique vessels per day recorded within the study area and an average of 237 intersecting the cable corridor. During the one month of summer 2016 AIS data (July - August), there was an average of 265 unique vessels per day passing through the study area and an average of 214 intersecting the cable corridor. The most common vessel types in the two summer periods were cargo vessels (43%), tankers (20%) and recreational vessels (22%).

13.2.13. During the one month of winter AIS data (December 2016), there was an average of 242 unique vessels per day passing through the study area and an

average of 202 intersecting the cable corridor. The most common vessel types in winter were cargo vessels (55%), tankers (23%) and fishing vessels (11%).

13.2.14. The majority of vessels passing through the study area, during the combined study periods, were commercial vessels including cargo and tankers. The average length of vessels passing through the study area was 119m in the summer periods and 168 m in the winter period. For vessels intersecting the cable corridor only, the average recorded lengths were 129m in the summer periods and 147m in the winter period. Recreational vessels were found to operate closer to the coast, particularly during summer, whilst the majority of fishing vessels were found close to the Dover Strait TSS lanes in the winter period. Passenger cruise and ferry vessels were frequently recorded transiting to and from the Port of Portsmouth due to its international connections with Spain, France and the Channel Islands.

13.2.15. The highest areas of density were due to traffic utilising the lanes associated with the Dover Strait TSS. High density was also seen in UK coastal waters in summer, particularly due to recreational traffic and vessels entering / exiting ports such as Portsmouth and Southampton.

13.2.16. Ship density for the summer and winter periods are shown in Figure 13.4 to Figure 13.6 (attached). The vessel density values presented on the figures are based on the number of track intersects per cell of a 500m x 50 m grid.

Fishing Vessels

13.2.17. Based on the 3-months of AIS data, there are high levels of fishing within the study area. The AIS tracks recorded from fishing vessels during the combined three-month study periods are presented in Figure 13.7 (attached).

13.2.18. It should be noted that fishing vessels below 15m in length are not required to broadcast via AIS and thus may be under-represented in Figure 13.7 (attached). Therefore, additional satellite data VMS will be used in the Navigational Risk Assessment (NRA), to be undertaken as part of the EIA, to further validate the findings of the AIS data.

Anchoring Analysis

13.2.19. Vessels recorded at anchor within the study area, for the combined 3-month survey period, have been identified through the vessels' navigation status (transmitted via AIS). In addition to this, Anatec's Speed Analysis model was used to identify any anchored vessels transmitting a navigation status other than 'At Anchor' to account for inaccuracies. Figure 13.8 (attached) presents the vessels recorded at anchor in the study area for the 3-month study period, colour-coded by vessel type.

13.2.20. The majority of vessels deemed to be at anchor were found close to shore with the most significant activity occurring close to Langstone Harbour. Significant anchoring activity from dredgers was observed within the vicinity of the

Proposed Development, particularly close to the Eastney landfall site approximately 3-4nm off the UK coast.

13.3 POTENTIAL IMPACTS AND MITIGATION

13.3.1. Due to its location, it is not possible for the Proposed Development to avoid all active commercial navigation areas. Nevertheless, the route of the marine cable corridor has been selected with careful consideration given to constraints. Potential impacts to shipping and navigation have been mitigated through avoidance of the main navigational features in the area such as charted and known anchorages, maintained channel depths and prohibited regions. The following potential impacts have been identified and scoped in for assessment:

- Installation vessels causing deviation to established vessel routes and displacement of recreational activity;
- Increase in the risk of a vessel-to-vessel collision due to installation vessel activity;
- Risk of interaction with vessel anchors and displacement of anchoring activity;
- Displacement of fishing vessels into commercial shipping lanes;
- Displacement of third party marine activities;
- Reduction in under keel clearance resulting from laid cable and associated protection; and
- Interference with marine navigational equipment.

Vessel Route Deviation and Displacement of Recreational Activity

13.3.2. During the construction stage, regular traffic will be required to alter their planned route due to the presence of installation vessels. Installation vessels have limited manoeuvrability and will require a minimum passing distance in which no other vessel can enter to reduce the likelihood of incidents. Since this will cause disruption to shipping activity, to mitigate this potential impact, Notice to Mariners (NtM) will be issued on a frequent basis before and during the cable installation period. This will inform the nautical community of locations of proposed works which may require vessels to temporarily make slight diversions to avoid specific areas.

13.3.3. During normal operations, provided it is buried to an adequate depth, the Proposed Development should have no significant impact to shipping and navigation in the area. However, if maintenance works or a repair is required along the cable, vessels will be present to carry out relevant works. The length

of time in which these vessels will be required along the route will be dependent upon the location and amount of maintenance required and / or the complexity of the repair. During this time, vessels working on the cable will need to be avoided by vessels transiting through the area.

Increase Vessel-To-Vessel Collision Risk

13.3.4. The presence of installation and/or maintenance vessels may increase the risk of a vessel-to-vessel collision. This includes both a collision between a third-party vessel and a vessel associated with the laying of the cable, and a collision between two third party vessels resulting from route deviation. Standard mitigations including promulgation of information and minimum safe passing distances will be in place to mitigate this risk.

Risk of Interaction with Vessel Anchors and Displacement of Anchoring

13.3.5. The cable corridor has been selected to minimise the risk from dragged anchors by avoiding designated anchorage areas, however due to the high level of shipping which will cross over the cable route on a daily basis and the size of vessels that regularly visit the ports of Southampton and Portsmouth, an anchor dropped accidentally, in an emergency or negligently, may pose a risk to the cable.

13.3.6. A wider anchoring assessment within the proposed NRA will determine the extent and positions of anchoring activity near the cable, and the frequency of vessels passing over the cable that might present a risk of emergency anchoring.

13.3.7. Mitigation measures include marking of the cable on Admiralty Charts and suitable protection of the cable, such as burial or rock placement.

13.3.8. During the operational stage, interaction between anchors and cables will depend on the cable protection. Therefore, an assessment will need to be undertaken (at the appropriate stage), taking into account the seabed sediment characteristics and external risks to determine optimal burial depths and additional protection methods if deemed necessary.

Displacement of Fishing Activity and Gear Snagging

13.3.9. The baseline assessment showed that fishing activity does occur within the study area, however further data assessment will be required as part of the NRA. The vessel presence associated with the laying of the cable is likely to displace this fishing activity within the footprint of the works. Chapter 33 of this Report summarises how consultation is ongoing with the fishing industry and how the Applicant will implement the Proposed Development utilising installation methods to reduce conflict with the fishing industry wherever possible.

13.3.10. The baseline assessment identified both dredging and demersal trawling occurring within the study area, both of which have the potential for interaction with the cable. Due to the limited penetration of fishing gear (up to 30 cm), once the cable is appropriately buried and protection is implemented, interaction between fishing gear and the cable is considered unlikely assuming that the cable depth and protection is monitored and maintained.

13.3.11. The charted presence of the cable should dissuade fishing activity to some extent, however previous experience suggests some vessels may continue to fish over installed cables, and therefore, there is still a snagging risk during the operation and maintenance stage. Again, it is noted that penetration of fishing gear is limited (up to 30 cm), and that this will therefore not necessarily lead to interaction, assuming the cable is suitably monitored and maintained.

13.3.12. This risk of snagging will be mitigated by clear marking of the cable on Admiralty Charts and suitable burial and protection of the cable.

Removal in under Keel Clearance

13.3.13. The cable, and associated cable protection, may lead to a reduction in under keel clearance. It will be ensured that the relevant policy guidance is followed.

13.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

13.4.1. In order to inform the full impact assessment, a NRA will require to be carried out; this will include a baseline study which will summarise the available background navigation data and focus on any key shipping routes and / or anchoring areas and fishing activity in the vicinity of the cable corridor. Hazards will be identified and ranked and quantified where appropriate to inform the level of impact during both installation and operation, with appropriate mitigation measures identified.

13.4.2. The primary input to the NRA will be up-to-date marine traffic survey data. For the Proposed Development cable, this will cover 6 months of data taking into account seasonal variation. The data will cover two 3-month periods between December 2017 and February 2018 (winter period) and May and July 2018 (summer period).

13.4.3. AIS is required to be fitted aboard all vessels engaged on international voyages of 300 gross tonnage (GT) and upwards, cargo vessels of 500 GT and upwards not engaged on international voyages and passenger vessels (carrying 12 or more passengers) irrespective of size built on or after 1st July 2002. It is also mandatory for fishing vessels over 15 m to carry AIS. Vessels not required to carry AIS may still broadcast voluntarily via AIS Class A or B (a cost-efficient version for non-mandatory vessels) and would also be recorded and assessed as part of the NRA.

13.4.4. The assessment methodology used in the NRA will primarily be based on the following guidance:

- International Maritime Organisation (IMO) Guidelines for Formal Safety Assessment (FSA) - MSC/Circ. 1023 (IMO, 2002); and
- MCA MGN 543 (M+F) Offshore Renewable Energy Installations Guidance on UK Navigational Practice, Safety and Emergency Response Issues (MCA, 2016).

13.4.5. The NRA will present a baseline assessment, which would include marine traffic surveys, desk-based assessment and consultation to allow the identification of higher risk areas. This phase is then followed by the Formal Safety Assessment (FSA), in line with the IMO FSA Guidelines (IMO, 2002).

13.4.6. The results of the baseline assessment will be used to identify the potential impacts arising from the installation and operation of the cable relevant to shipping and navigation. The impact will be ranked in terms of frequency and severity of consequence. This process requires a degree of subjectivity and professional judgement; therefore, the assessment will incorporate the output of a hazard workshop involving national and local stakeholders relevant to shipping and navigation, and the lessons learnt from existing developments. Where applicable, quantitative risk assessment will be undertaken to inform the ranking process.

13.4.7. Additional data and information sources that will be reviewed include:

- Up to date hydrographic charts for the area;
- Maritime incident data in the area (10 years);
- RYA coastal atlas and reference materials such as sailing almanacs;
- Environmental statement studies for developments in close proximity;
- BEIS OESEA; and
- Fishing vessel activity data (AIS and VMS satellite data).

13.4.8. During the NRA, consultation with key navigational stakeholders in UK waters will be undertaken in order to obtain supplementary information. Parties consulted will include:

- MCA;
- MoD;
- Trinity House;

- Chamber of Shipping;
- Cruising Association;
- Dover Straits User Working Group
- Langstone Harbour
- RYA; and
- Relevant UK Port Authorities (ABP Southampton, Queens Harbour Master Portsmouth).

13.4.9. Consultation will be used to verify desk-based data sources and fill in any gaps in information. Consultation will also be required to verify that there are no conflicts between the Proposed Development and other marine users. The planned approach to the impact assessment and cumulative assessment work will also be agreed through consultation.

14. MARINE ARCHAEOLOGY

14.1 SCOPING OPINION AND CONSULTATION

14.1.1. Consultation responses from Historic England were incorporated into the MMO Scoping Opinion. Comments from the MMO Scoping Opinion relating to other marine users are summarised in Table E1 of Appendix E.

14.2 BASELINE

14.2.1. Archaeological and cultural heritage assets located within the UK section of the Proposed Development can be characterised as comprising four fundamental categories: seabed prehistory; maritime archaeology; aviation archaeology; intertidal heritage assets and marine installations. Other themes relevant to the archaeological baseline of the Proposed Development include the setting of known marine heritage assets and the historic seascape character of the area.

14.2.2. The baseline of known archaeological and cultural heritage assets within the proposed marine cable corridor refers to data obtained from the UK Hydrographic Office (UKHO) archives, which contains records relating to charted wrecks and other seabed obstructions that are considered navigational hazards. The National Heritage List for England maintained by Historic England comprises data of designated heritage assets including sites protected under the Protection of Military Remains Act 1986 and the Protection of Wrecks Act 1973. Data for the location of protected wreck sites have been downloaded from the National Heritage List for England (NHLE) webpage (Historic England, 2018).

14.2.3. The UKHO data covered the UK extent of the Proposed Development and is presented in Universal Transverse Mercator (UTM) Zone 30 North projected from a World Geodetic System (WGS) 1984 datum (see attached Figures 14.1 and 14.2).

14.2.4. This data collection has been completed in line with Chartered Institute for Archaeologists' (CIfA) *Standard and Guidance for Historic Environment Desk-Based Assessment* (CIfA 2017). This information has fed into the initial stages of the marine cable route selection and will be supplemented by a full desk-based assessment undertaken as part of the impact assessment process.

14.2.5. The following legislation applies to archaeological and cultural heritage located within both the UK EEZ and English Territorial Waters (up to 12 nm from the coast):

- Protection of Wrecks Act 1973: Section One and Two;
- Ancient Monuments and Archaeological Areas Act 1979 (as amended);

- Merchant Shipping Act 1995; and
- Protection of Military Remains Act 1986.

14.2.6. Due to the high level of mercantile activity in the English Channel region dating back as far as the Mesolithic (8500 - 4000 BC), many wrecks are located in the area, the highest concentrations are in the Solent and Approaches (see attached Figure 14.1) in terms of UK waters.

Protected Wrecks

14.2.7. There are no designated wrecks located within the UK element of the Proposed Development.

14.2.8. All wrecks protected by the legislation listed above are marked on appropriate UKHO Admiralty Charts. Interference or damage to these wrecks is considered a criminal offence. Although no protected wrecks are located within the marine cable corridor, there are four protected wrecks designated under Section 1 of the *Protection of Wrecks Act 1973* in the Solent and Approaches within approximately 6.5 km of the corridor (Figure 14.2). These consist of (UKHO wreck numbers in brackets):

- The *Mary Rose* (UKHO 19160), Henry VIII's flagship that sank in 1545. Whilst elements have been recovered from the site, including a large section of hull raised in 1982, the remainder of the wreck is a designated site within a 300m protected area;
- HMS *Invincible* (UKHO 19370), a British Third Rate ship of the line that sank in 1758. The site is located less than 2km to the south-west of the Proposed Development;
- HMS/m A1 (UKHO 20248), the first British designed and built submarine used by the Royal Navy that sank in 1911. The Statutory Instrument has defined a restricted area of 100m around the wreck site; and
- HMS *Hazardous* (UKHO 20224), a British Third Rate ship of the line that ran aground and sank in 1706.

UKHO Recorded Wrecks

14.2.9. Within the Proposed Development, the UKHO records eight wrecks or obstructions (Table 14.1). The locations of these records are presented in Figure 14.2 (attached) and a summary of these sites is presented below.

Table 14.1 Known marine archaeological assets

UKHO wreck category	Total
Dangerous wreck	5
Non-dangerous wreck	3
Total	**8**

14.2.10. The majority of the UKHO recorded wrecks are First World War casualties along with two unknown wrecks and one recent wreck from 1981. They comprise five steam ships, a barge, a trawler and a sailing vessel. Further details derived from their UKHO record and the published dive guide for Sussex are provided as follows:

- UKHO 20073 is the British steam ship *Corbet Woodall* sunk on 30 May 1917, weighing 917 gross tonnes. The vessel was mined whilst en route from South Shields to Poole. The remains of this vessel are classed as a dangerous wreck, now amended to 'dead';
- UKHO 20039 is classed as a dangerous wreck. *Lowmount* was a steam ship that sunk with masts visible after hitting a mine laid by UC-70 with the loss of five men on 7 May 1917;
- UKHO 20024 is classed as a dangerous wreck. The wreck is an unknown, well broken up steam ship with the bow facing west;
- UKHO 20019 is the non-dangerous wreck of the 2084-ton steam ship *Brigitta*, mined 4 December 1917;
- UKHO 20004 is classed as a dangerous wreck. The wreck is an unknown barge, approximately 60 m long that is intact, inverted and almost buried;
- UKHO 19982 is classed as a dangerous wreck. HMS *Sapper* was a requisitioned First World War coaster or trawler, and believed to have been sunk by a mine or torpedo with the loss of all crew in December 1917;
- UKHO 19952 is a non-dangerous wreck, possibly the *Vesuvio*. This 1391-ton steam ship was lost in April 1916. The wreck lies on its port side and is broken in three places; and

- UKHO 20656 is the non-dangerous wreck, *Tortona*. The sailing vessel sunk after striking a submerged object in October 1981.

14.3 POTENTIAL IMPACTS AND MITIGATION

14.3.1. The following potential impacts of the construction, operational and decommissioning stages of the Proposed Development on other maritime archaeology in UK waters have been identified and scoped in for assessment:

- Construction (and decommissioning):
  - Potential damage or destruction to known assets; and
  - Potential damage or destruction to unknown assets.
- Operation:
  - Potential damage or destruction to known assets; and
  - Potential damage or destruction to unknown assets.

14.3.2. Potential damage or destruction to known and unknown assets may occur through direct impacts and/or indirect impacts, which may occur during the construction, operation, maintenance and decommissioning stages of the project. Direct impacts include: seabed preparation; surveys and clearance of unexploded ordnance; cable burial and subsequent scour protection; and possible seabed contact by work vessels. Indirect impacts may be caused by sediment suspension and re-deposition, and scour associated with the direct impacts mentioned above.

14.3.3. Operational and maintenance effects will be limited to those arising from repair or replacement of cables or associated cable protection measures, or any monitoring that may be required.

14.3.4. Mitigation measures are necessary to reduce, remove or offset the impacts on heritage assets and should be presented in the form of a Written Scheme of Investigation (WSI) document. In order to mitigate against impact to unknown resources, further analysis of all available data sources relating to the terrestrial, intertidal and marine archaeology for the area will be undertaken during the detailed desk-based assessment and associated EIA in accordance with best practice guidance (Chartered Institute for Archaeologists, 2017). Avoidance is considered the primary option with regards to mitigating impacts upon known heritage assets, which can be achieved through the implementation of Archaeological Exclusion Zones and/or through the micro-siting of the cable route to avoid vulnerable heritage assets. In addition, any geophysical, geotechnical, ROV, and dive investigations associated with the project can be subject to archaeological review. Another form of mitigation for reducing the impact on unknown marine heritage is the implementation of a

protocol for reporting finds of archaeological interest, which aims to establish whether recovered material is of archaeological interest and will recommend appropriate mitigation where necessary.

14.3.5. In general, there is high potential for the presence of archaeological and cultural material that is currently uncharted or unrecorded, spanning from early prehistory to the present day. Material that could potentially be discovered could relate to prehistoric finds, sites or landscapes; maritime wreck sites and/or aviation crash sites along with associated debris; and marine installations.

14.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

14.4.1. Further analysis of all available data sources relating to the terrestrial, intertidal and marine archaeology for the area will be undertaken during the detailed desk-based assessment and associated EIA in accordance with best practice guidance (Chartered Institute for Archaeologists, 2017; COWRIE 2012).The data will be further reviewed alongside information generated by geophysical survey in order to further enhance and refine the Proposed Development's archaeology and cultural heritage baseline.

14.4.2. For geoarchaeological assets, an overview of existing core/geoarchaeological information available in the wider area will be undertaken and reported on within the ES. Subsequently, specialist archaeologists will input into the geotechnical survey campaign prior to mobilisation. All core logs from the geotechnical survey will be provided for assessment in accordance with best practice guidelines (COWRIE, 2012) and recommendations for further analysis will be made.

14.4.3. The overall baseline results of the detailed desk-based assessment and the assessment of the potential impacts will be summarised in the cultural heritage chapter of the ES.

14.4.4. Results from the geophysical and geotechnical surveys will be incorporated into a full desk-based assessment, which will be undertaken using data from the UKHO and the NHLE[6] together with the following sources:

- National Record of the Historic Environment data maintained by Historic England, comprising data for terrestrial and marine archaeological sites, find spots and archaeological events;
- Local data from Portsmouth Environment Record and Hampshire Archaeology and Historic Buildings Record comprising a database of all recorded terrestrial and marine archaeological

[6] Historic England's National Heritage List for England. Available at: https://www.historicengland.org.uk/listing/the-list/data-downloads/. Accessed October 2018.

sites, find spots, historic buildings and landscapes, parks and gardens, and industrial monuments;

- Receiver of Wreck droits data;
- Second World War records for Air/Sea Rescue missions;
- The Historic Seascape Characterisation reports for Solent and Isle of Wight (2007) and Hastings to Purbeck and Adjacent Waters (2011);
- Records of Protected and Controlled Sites under the Protection of Military Remains Act held by the MoD;
- Historic England's intertidal and coastal peat database;
- British Geological Society borehole records;
- Data generated from protocols for unexpected discoveries including the Offshore Renewables Protocol for Archaeological Discoveries (ORPAD), and the Marine Aggregate Industry (MAI) Protocol for Reporting Finds of Archaeological Interest;
- Find spots, sites and monuments recorded by CITiZAN, Portable Antiquities Scheme, Marine Antiquities Scheme and the South East Rapid Coastal Zone Assessment Survey (2013);
- Relevant mapping including Admiralty Charts, historic maps and Ordnance Survey; and
- Relevant documentary sources and grey literature held by Wessex Archaeology, and those available through the Archaeological Data Service and other websites.

15. LANDSCAPE AND SEASCAPE

15.1.1. Effects in the UK marine area will be limited to the installation of the Proposed Development where the use of heavy plant and installation vessels may be visible to shore based receptors. There may also be some visible ground disruption in the intertidal area.

15.1.2. These visual effects will be of a short duration through the construction stage with short term effects on the intertidal area. Accordingly, landscape and seascape assessment for the marine element of the Project (the Proposed Development) is proposed to be scoped out.

16. OTHER MARINE USERS

16.1 SCOPING OPINION AND CONSULTATION

16.1.1. Consultation responses from Maritime and Coastguard Agency, the RYA, Trinity House, The Langstone Harbour Board and the MoD were incorporated into the MMO Scoping Opinion. Comments from the MMO Scoping Opinion relating to other marine users are summarised in Table E1 of Appendix E.

16.2 BASELINE

16.2.1. The area has a range of other marine users, these include:

- Military;
  - The MoD has designated practice or exercise areas in the vicinity.
- Aggregates;
- Offshore Wind Farms;
  - Rampion Offshore Wind Farm is currently in the commissioning and testing phase and is expected to be fully operational by late 2018. Therefore, cumulative impacts would be limited to asset management activities.
  - The Marine Licence Application for Navitus Bay project has been refused, and the developer has chosen not to appeal the decision of the minister. The Applicant will monitor future developments of this project, and include cumulative impacts assessments where appropriate.
- Recreational Users; and
  - The Solent and the areas around Isle of Wight is also a popular recreational area with facilities for a range of water sport and angling activities.
- Other Infrastructure.
  - There are a number of existing cable routes which cross the Proposed Development.

16.2.2. There are a number of MoD practice and exercise areas (PEXA) in the vicinity of the Proposed Development which may be used for military exercises (see Figure 16.1 attached). One MoD area intersects the Proposed Development at a location approximately 8 nm south-east of the Eastney landfall option, and

another MoD area intersects the Proposed Development at a location approximately 7 nm south of Selsey Bill.

16.2.3. The eastern English Channel is nationally important for aggregate extraction although there are no known currently active aggregate dredging areas that intersect the Proposed Development, as illustrated in Figure 16.2 (attached). Consultations are also ongoing to ensure that the Proposed Development keeps potential sterilisation of other licenced only dredging areas to a minimum.

16.2.4. The area in and around the Solent and the Isle of Wight is popular for recreational purposes such as angling, sailing, racing and water skiing. Figure 16.3 (attached) illustrates the RYA UK Coastal Atlas of recreational boating data within proximity of the cable corridor.

16.2.5. As shown in Figure 16.4 (attached), the Rampion Wind Farm is the only wind farm in close proximity to the marine cable corridor. It is located approximately 5 nm east of the cable corridor in UK waters.

16.2.6. A crossing agreement will be made with operators of all existing active cables and pipelines which the route crosses. These agreements will provide protection to the continued operation of these facilities. Specific protection measures will be discussed in the relevant section of the ES.

16.3 POTENTIAL IMPACTS AND MITIGATION

16.3.1. The following potential impacts of the construction, operational and decommissioning stages of the Proposed Development on other marine users in UK waters have been identified and scoped in for assessment:

- Construction, operation (and decommissioning):
  - Vessel route deviation and displacement of recreational activity;
  - Increase in vessel to vessel collision risk;
  - Displacement of third party marine activities;
  - Reduction in under keel clearance resulting from laid cable and associated protection; and
  - Interference with marine navigational equipment.

16.3.2. The installation works are likely to incur the most impacts due to exclusion zones needed to ensure the safety of all marine users. This could disrupt some recreational activity; however this disruption will be of a short duration whilst the cable is being installed. Operational effects will be limited to those arising from repair or any monitoring that may be required.

Vessel Route Deviation and Displacement of Recreational Activity

16.3.3. During the construction stage, regular traffic will be required to alter the planned route of travel due to the presence of installation vessels. These installation vessels have limited manoeuvrability and will require a minimum passing distance in which no other vessel can enter to reduce the likelihood of incidents. Since this will cause disruption to shipping activity, to mitigate this potential impact, notice to mariners will be issued on a frequent basis before and during the cable installation period. This will inform the nautical community of locations of proposed works which may require vessels to temporarily make slight diversions to avoid specific areas.

16.3.4. During normal operations, provided it is buried to an adequate depth, the Proposed Development should have no significant impact to shipping and navigation in the area. However, if maintenance works or a repair is required along the cable, vessels will be present to carry out relevant works. The length of time in which these vessels will be required along the route will be dependent upon the location and amount of maintenance required and / or the complexity of the repair. During this time, vessels working on the cable will need to be avoided by vessels transiting through the area.

16.3.5. Recreational users are common in coastal waters, and therefore may be affected by the installation of the cable, particularly near landfall. However, during normal operational stage, it is unlikely that recreational users will be impacted with the exception of cases when repairs / maintenance works are required.

Increase in Vessel-to-Vessel Collision Risk

16.3.6. As previously mentioned in Chapter 13, the presence of installation and/or maintenance vessels may increase the risk of a vessel-to-vessel collision. This includes both a collision between a third-party vessel and a vessel associated with the laying of the cable, and a collision between two third party vessels resulting from route deviation. Standard mitigations including promulgation of information and minimum safe passing distances will be in place to mitigate this risk.

Displacement of Third Party Marine Activities

16.3.7. Within the English Channel, there are a large number of aggregate dredging areas (both active and licensed). Despite this, the Proposed Development does not intersect any identified dredging areas and thus has reduced any potential. There will be a requirement for an exclusion area for disposal and dredging in the vicinity of the cable throughout the operational lifetime. The Proposed Development lies within close proximity to MoD PEXA areas (with two areas intersecting the Proposed Development, see attached Figure 16.1) which have no current restrictions on the right to transit through them. Firing practice and exercises only take place when areas are considered to be clear of all shipping. However, potential impacts could include the disruption of

installation activities if the timing coincides with firing practices. This could also be applicable to repairs and / or maintenance works. These potential impacts will be mitigated by on-going consultation with the MoD to determine the frequency and nature of activities so as to avoid unnecessary disruptions.

Reduction in under Keel Clearance Resulting from Laid Cable and Associated Protection

16.3.8. The cable, and associated protection, may lead to a reduction in under keel clearance. It should be ensured that the relevant policy guidance is followed.

Interference with Marine Navigational Equipment

16.3.9. The electromagnetic field created by buried direct current cables has the potential to create interference on a vessel's magnetic compass, in particular on smaller recreational vessels, as such vessels may lack more sophisticated navigational equipment on-board.

16.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

16.4.1. Consultation with all relevant stakeholders has been and will continue to be undertaken and their feedback used to finalise the route so as to avoid conflicts wherever practicable.

16.4.2. The NRA will present a baseline assessment, which would include marine traffic surveys, desk-based assessment and consultation to allow the identification of higher risk areas.

16.4.3. The results of the baseline assessment will be used to identify the potential impacts arising from the installation and operation of the Proposed Development relevant to shipping and navigation and other marine users.

16.4.4. Additional data and information sources that will be reviewed include:

- Up to date hydrographic charts for the area;
- Maritime incident data in the area (10 years);
- RYA coastal atlas and reference materials such as sailing almanacs; and
- Environmental statement studies for developments in close proximity.

16.4.5. During the NRA, consultation with key navigational stakeholders in UK waters will be undertaken in order to obtain supplementary information. Parties relevant to other marine users consulted will include:

- MCA;
- MoD;
- Trinity House;
- Langstone Harbour;
- Chamber of Shipping;
- Cruising Association;
- Local angling groups and charter vessel operators;
- RYA; and
- Relevant UK Port Authorities (ABP Southampton, Queens Harbour Master Portsmouth).

16.4.6. Consultation will be used to verify desk-based data sources and fill in any gaps in information. Consultation will also be required to verify that there are no conflicts between the Proposed Development and other marine users. The planned approach to the impact assessment and cumulative assessment work will also be agreed through consultation.

17. MARINE CUMULATIVE AND TRANSBOUNDARY IMPACTS

17.1 CUMULATIVE IMPACTS

17.1.1. The need to consider cumulative impacts is set out in the EIA Directive and the requirements of the Directive implemented through the EIA Regulations.

17.1.2. In order to ensure that a meaningful assessment can be carried out with regards to the CIA, only projects which are reasonably well described and sufficiently advanced will be considered. However, where any such projects are identified and screened out, justification will be provided for doing so.

17.1.3. As advised by the PINs Advice Note 17, where projects under construction are expected to be completed before construction of the Proposed Development and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline.

17.1.4. Cumulative assessment will also be undertaken for the French EIA being submitted to French authorities. It is envisaged that French projects/plans for cumulative assessment will be identified by French authorities for the French EIA. Where relevant, these French projects/plans will also be included within the UK cumulative assessments.

17.1.5. Cumulative assessment will be taken in accordance with the guidance provided within the PINS Advice Note 17 and will be considered on a topic by topic basis (e.g. to establish Zones of Influence).

17.1.6. Appendix F of this Report provides a list of projects including other relevant preliminary information gathered to date, in order to identify projects/plans within the vicinity of the Proposed Development that may need to be considered as part of the process of cumulative assessment. The following sources of information have been used to produce the long list:

- PINs Programme of Projects
- MMO Public Register
- LPA Planning Registers
- Relevant Local Plans and Marine Plans

17.1.7. This list includes the following major developments in France that it are considered to potentially give rise to cumulative effects in combination with the Proposed Development:

- The French side of the Aquind Project – development of this element of the Project is running in tandem with the UK element.

- Fécamp Offshore Wind Farm – is a consented project that is yet to start construction (construction may commence in 2020) and is located a significant distance (>35 km) from the Proposed Development.

- Dieppe Le Tréport Offshore Wind Farm – the application for this has been submitted but is yet to be determined and is located a significant distance (> 55 km) from the Proposed Development.

17.2 TRANSBOUNDARY IMPACTS

17.2.1. Regulation 32 of the EIA Regulations identifies procedures to consider whether a development that might have a significant impact on the environment in another European Member State. Where possible transboundary effects may occur then these should be considered as part of the EIA process.

17.2.2. Further information on the roles and responsibilities of process, roles and responsibilities for transboundary screening are included in the PINs Advice Note 12.

17.2.3. In brief, the SoS (or PINSs on his behalf) must, following a person confirming they intend to submit an ES in respect of proposed development, determine whether or not they consider that the development is likely to have significant effects on another European Member State. This is commonly undertaken during pre-application i.e. at scoping stage, and applicants are advised that they can provide information to inform transboundary effects screening within a scoping request. Accordingly, this Report and the text below provides information about the Proposed Development to inform the transboundary screening process.

17.2.4. When providing the information, consideration has been had to the detail within the Transboundary Screening Proformas (PINS Advice Note 12).

The potential for transboundary effects will be considered more fully on a topic by topic basis within the ES. However, at this stage it is considered that the potential impacts of the Proposed Development in the UK marine area are unlikely to lead to any significant transboundary effects (which will be confirmed through the EIA process). At this stage of assessment, consideration of the following potential impacts has been undertaken and based on the reasons set out in Table 17.1 below.

Table 17.1 Marine Transboundary Impacts

Topic/s	Impacts	Potential Transboundary Effect
Benthic Ecology/Fish and Shellfish/Marine	· Potential increase in suspended sediment	Significant transboundary effects are not anticipated due to the following reasons;

Topic/s	Impacts	Potential Transboundary Effect
Water and Sediment Quality	· Sediment deposition/smothering · Habitat loss	There is expected to be limited spatial overlap of these potential impacts with Non-UK areas; These impacts are considered to be relevant to construction stage of the Proposed Development, and any similar potential impacts that may occur during operation (maintenance and repair only) or during decommissioning are considered to be of a lesser or similar magnitude and duration as those anticipated for the construction stage; and The duration of the impacts is considered to be relatively short term in nature, and any impacts would be temporary and reversible.
Commercial Fisheries	· Loss or restricted access to fishing grounds · Temporary displacement of fishing activity · Temporary increase in steaming times	· These impacts are considered to be of greatest magnitude during the construction stage of the Proposed Development due to potential displacement of fishing activity. It is known that non-UK vessels from some European states fish both within the 6-12 nm zone and from 12 nm to EEZ, hence these vessels may be impacted. However, the magnitude of the impacts is expected to be relatively small due to the restricted spatial area of the marine cable corridor and the short duration of the installation work (temporary rolling exclusion zones are proposed). Accordingly, significant transboundary effects are not anticipated.

Topic/s	Impacts	Potential Transboundary Effect
		· Impacts may also occur from the loss of fishing grounds i.e. at the cable crossing or where cable protection may have been installed. Such effects will be mitigated where possible and residual impacts are expected to be limited to a relatively small spatial extent. It is known that non-UK vessels from some European states fish both within the 6-12 nm zone and from 12 nm to EEZ, hence these vessels may be impacted. However, the magnitude of the impacts are relatively small and will be mitigated where possible. As such, residual impacts are expected to be limited due to the small spatial area of the marine cable corridor where non-burial protection is proposed. Accordingly, significant transboundary effects are not anticipated. Any similar potential impacts that may occur during operation (maintenance and repair only) or during decommissioning are considered to be of lesser magnitude and shorter duration as those anticipated for the construction stage. The duration of the impacts are considered to be short term in nature, and would be temporary. Accordingly, significant transboundary effects are not anticipated.
Marine Ornithology	Potential impacts to non-UK European and internationally designated sites. Possible sites include;	Qualifying features of these sites include breeding seabirds which range widely during foraging. Disturbance and displacement impacts from installation plant

Topic/s	Impacts	Potential Transboundary Effect
	· Alderney's West Coast and the Burhou Islands Ramsar; · Baie de Seine Occidentale SPA; and · Littoral seino-marin SPA.	and vessels are expected to be negligible due to the restricted spatial area of the marine cable corridor and the comparatively large extent of their foraging areas. Habitat loss impacts leading to changes in prey availability are also expected to be negligible. The duration of these impacts are considered to be short term in nature, and would be temporary. Collision risk and barrier effects are not relevant to subsea cables. Accordingly, significant transboundary effects are not anticipated.

PART 3: ONSHORE UK

18. LANDSCAPE AND VISUAL

18.1 SCOPING OPINION AND CONSULTATION

18.1.1. Comments from the LPA Scoping Opinions relating to landscape and visual are summarised in Table E3 and Table E4 of Appendix E.

18.2 BASELINE

PROPOSED CONVERTER STATION

Site Description

18.2.1. The existing Lovedean substation is located in a rural area on the northern fringes of Portsmouth, approximately 13.5km to the north of the city centre. It is surrounded by mixed agricultural fields with hedgerow boundaries and individual farm properties connected by narrow lanes. The settlements of Lovedean and Waterlooville lie approximately 1.5 km to the south east, Horndean to the east and Denmead approximately 1.5 km to the south west. A number of Public Rights of Way (PRoW) cross the area and link to surrounding villages.

18.2.2. Specific characteristics associated with the proposed converter station options are outlined below:

- Site Option A lies to the south of Lovedean substation within an arable field. Gradients slope gently north south from approximately 80m to 70m above Ordnance Datum (AOD). The south west corner of the site would lie to the north of a deciduous copse whilst the eastern edge of the site would run adjacent to Broadway Farm. An access road would connect the proposed converter station to Broadway Lane.

- Site Option B lies to the west of Lovedean substation and would span across a number of small fields divided by hedgerows and used for horse grazing and off road vehicles. Land falls from approximately 90m to 80m AOD. A new access route would connect the proposed substation with Broadway Lane to the east and either run to the north or south of the existing substation.

Designations

18.2.3. The SDNP boundary is, at its closest point, located approximately 200m to the north west of the proposed convertor station location (Option B). The SDNP boundary is located to the west, north and east of both proposed convertor station locations, and the existing Lovedean substation.

18.2.4. The SDNP has been given the status of an International Dark Skies Reserve.

18.2.5. The Hambledon Conservation Area lies within the SDNP approximately 2 km to the northwest of the substation while Catherington Conservation Area lies approximately 2.5 km to the north east.

18.2.6. A number of Listed Building, predominately Grade II, lie within Lovedean, Denmead, Hambledon and along the narrow lanes mainly to the east of the substation, with the closest being at Denmead Farm, off Edneys Lane.

18.2.7. The proposed converter substation is surrounded by pockets of woodland including Ancient Woodland.

Landscape Character

18.2.8. The National Character Area Profiles (NCAPs), as defined on the National Character Areas Map of England (Natural England) indicates that the proposed converter station land lies within National Character Area (NCA) 125, The South Downs. The NCA describes the landscape as one of contrasts, the downland creating a sense of openness whilst enclosure and remoteness is evident within woodlands and close to urban areas.

18.2.9. At a county level the proposed converter station options lie within Landscape Character Area (LCA) 7H South East Hampshire Downs (Hampshire County Integrated Character Assessment, 2012). The landscape is "a large scale downland" and predominate "landscape type, typical with expansive, rolling arable landscapes and extensive wooded visual horizons"

18.2.10. Site Option A lies within LCA 3F Downland Mosaic, East Hampshire Landscape Character Assessment, 2006 (EHLCA), whilst Site Option B falls LCA 17 Hambledon Down, Winchester Landscape Character Assessment, 2004 (WCCLCA). Although the options lie within different administrative areas, their key characteristics are similar. Characteristics of relevance to both preferred options and their immediate surroundings, and drawn from the above landscape character assessments, are outlined below:

- *"Undulating rolling landform….. The land gradually falls from the north-east to the Hambledon valley, but with a secondary ridge east/west of Hambledon. Scarps and dry valleys are common features" (WCCLCA);*
- *"A mixture of 18th and 19th century arable fields and early post medieval pasture fields, with pockets of older medieval assarts surrounded by woodland. This mosaic of habitats supports arable weeds and farmland birds." (EHLCA);*
- *"A variety of copses, shelter-belts and woodlands, many of which are ancient semi-natural woodland and designated as Sites of Importance for Nature Conservation." (WCCLCA);*

- "Medium to large irregular wavy fields formed through the enclosure of downland in medieval times, together with more regular fields created at the time of parliamentary enclosure". (WCCLCA);
- *"Varied degrees of visual enclosure, from the exposed downs to the more enclosed areas to the south of the character area, with a strong pattern of hedgerows, intermittent trees and woodland." (WCCLCA);*
- *"A strong pattern of woodland cover, many of which are of ancient origin and some of which are of national importance, and hedgerows providing enclosure which contrasts with the open farmland." (EHLCA);*
- *"Numerous long views from high points on the Downs." (WCCLCA);*
- *"A low density of dispersed settlement across the downland with a scattering of nucleated settlement in preferred lower lying areas. Distinctive churches are often landmarks." (EHLCA); and*
- *"Tranquil rural nature with no major routes which passing through the area (the main one being the B2150). Routes consist of an intricate network of ancient minor roads, lanes and drove roads. These are mainly straight and open across the downs and winding and narrow elsewhere." (WCCLCA).*

South Downs National Park

18.2.11. It should be noted that whilst the preferred options do not fall within SDNP, consideration needs to be given to one of the special qualities of the South Downs which is the "diverse, inspirational landscapes and breathtaking views". Further reference during the LVIA will be made to:

- the SDNP's recent studies on Viewshed Characterisation, Tranquillity;
- the SDNP's designation as a Dark Night Skies Reserve; and
- the South Downs Integrated Landscape Character Assessment, 2011.

Visual Amenity

18.2.12. Visual effects would be experienced by the people who live and work in the area, along with those enjoying recreational activities in this area or simply passing through. Whilst it is people who are the actual receptors of visual effects it is the places they may occupy, and from which the Proposed

Development may be seen, that are listed below and described as visual receptors.

18.2.13. The existing Lovedean substation is well screened by a belt of deciduous woodland which wraps around the substation to the north, south and east. Views from local roads in the short to middle distance are filtered by layers of intervening hedgerow and shelterbelt vegetation, and built form consisting of isolated farms and cottages. Notable in most views, and particularly from higher ground to the north, is the increasing concentration of pylons and associated transmission lines clustering towards the substation.

18.2.14. The two proposed locations for the convertor station do not fall within any key views identified in the Hambledon Character Appraisal and Management Strategy (2009) or the Catherington Conservation Area Character and Appraisal (2006).

18.2.15. It is anticipated that both proposed converter station options would be partially screened by vegetation in middle and long-distance views. In terms of short distance views, however, Site Option A would be noticeable from two PRoWs which run to the north and south of the site and link Denmead Farm to the west to Broadway Lane in the east. There are no PRoWs which run immediately adjacent to Site Option B.

Residential Receptors

18.2.16. Residents of individual properties close to the edge of both options, from higher ground as well as residents situated on the fringes of the larger settlements to the south, south east, may experience views of the proposed converter station.

18.2.17. Whilst the preferred options do not fall within any key views identified in the Hambledon Character Appraisal and Management Strategy (2009) or the Catherington Conservation Area Character and Appraisal (2006) it is likely that both options will be notable from specific viewpoints identified within the View Characterisation and Analysis SDNP (2015). Three specific viewpoints were discussed with the LPAs and SDNP, and are included within the 8 km Study Area. These included Old Winchester Hill approximately 8km to the northwest, Windmill Hill approximately 5km to the northeast and views from close to Fort Widley, Port Downs approximately 7km away. The first two lie within the SDNP.

- Individual farmsteads and cottages to the north of the substation;
- Properties off Broadway Lane to the east of the substation;
- Properties off Old Mill Lane / Edneys Lane / Denmead Lane / White Horse Lane / Rushmere Lane to the west of the substation;

- Properties off lanes which link Old Mill Lane with Broadway Lane to the south of the substation; and

- Properties on the fringes of Denmead, Anmore, Catherington and Horndean settlements.

Viewpoints from within the SDNP

18.2.18. It is likely that both convertor station options will be visible from specific viewpoints identified within the View Characterisation and Analysis SDNP (2015). Three specific viewpoints were discussed with the LPAs and SDNP, and are included within the 8 km Study Area. These include; Old Winchester Hill approximately 8km to the northwest, Windmill Hill approximately 5km to the northeast and views from close to Fort Widley, Port Downs approximately 7km away. The first two are located within the SDNP.

Recreational and Visitor Receptors:

- Users of the Monarch Way which runs to the north and east of the proposed convertor station locations;

- Users of the Wayfarer's Walk, a regionally promoted route which runs west of the proposed convertor station locations;

- Queen Elizabeth Community Forest and Park located north east of the proposed convertor station locations;

- Forest of Bere, located **km south west of the proposed convertor station locations;

- National Cycle Route 222, located approximately 2.5km south east of the proposed convertor station locations on the A3 Road in Waterlooville and Cowplain;

- Users of local PRoW including bridlepathss; and

- Users of open access land at Catherington Down.

Transport Receptors:

18.2.19. Users of the local road network.

CABLE ROUTE AND LANDFALL

Landscape Character

18.2.20. The preferred location for the TJB is at the landfall at Eastney, in a car park to the north of Eastney beach, and within Marine Character Area 5: The Solent, Seascape Assessment for the South Marine Plan Areas, 2014 which is described as a transition zone.

18.2.21. A number of heritage assets lie close to the proposed siting of the transmission bay including Fort Cumberland; a Scheduled Monument.

- Between Eastney and Lovedean the cable route will run through three NCA from Eastney landfall (land/sea transition joint bay) located within NCA 126: South Coast Plain, NCA 128 South Hampshire Lowlands to NCA 125 The South Downs.

- At a County and District level the cable route is likely to run through the following LCA's:

    - LCA 11 C Eastern Solent, LCA 8i Portdown Hill Open Downs, LCA 2f Forest of Bere East and LCA 7h South East Hampshire Downs (Hampshire County Integrated Character Assessment, 2012);

    - LCA 3f (East Hampshire Character Assessment, 2006);

    - LCA 17 Hambledon Downs and LCA 18 Forest of Bere (Winchester Landscape Character Assessment, 2004); and

    - The AC cable routes connecting the proposed converter station to Lovedean substation will either run through LCA 17 Hambledon Downs (Winchester Landscape Character Assessment, 2004) or 3f Downland Mosaic (East Hampshire Character Assessment, 2006).

VISUAL AMENITY

18.2.22. Visual effects associated with the laying of the cable and the TJB will be temporary and experienced by a variety of users including recreational users utilising public open space, PRoWs and public footpaths, local residents and road users including cycles and horse riders. The land will be reinstated following the installation of the cables and thus returned to its previous use. There will be no permanent visible sign of the works, save for manhole covers every approx. 6km along the cable route at a link box location, or a small cabinet above ground providing a link pillar.

18.2.23. There may be long term effects resulting from the loss of existing vegetation (hedgerows and hedgerow trees) where the new cable runs across for instance open fields, playfield fields / recreation / sports grounds, allotments and common land. The extent of any vegetation loss will be subject to the confirmation of the final route option and as part of construction and reinstatement work, mitigation measures will be introduced to protect existing vegetation, consider Horizontal Directional Drilling and ensure through reinstatement measures new planting appropriate to the locality is introduced.

18.3 SCOPE OF ASSESSMENT

18.3.1. Landscape and visual effects are separate, though interlinked, topic areas. Landscape effects can be defined as the changes in the fabric and quality of the landscape as a result of a development through:

- Direct effects upon specific landscape elements;
- Subtler effects upon the overall patterns of elements that give rise to landscape character and regional and local distinctiveness; and
- Effects upon special interests or values such as designated landscapes, built heritage assets and cultural associations.

18.3.2. Visual effects can be defined as changes to the visual amenity or quality of the view, particularly for people (visual receptors) for whom enjoyment of the view is a primary part of their activity, such as those engaging in outdoor recreation, or who will be exposed to the view for extensive periods, such as people in their homes. These would be defined as particularly sensitive receptors.

LIKELY SIGNIFICANT EFFECTS

18.3.3. Significant landscape and visual effects are predicted to occur as a result of the following impacts:

- Construction activities including cable route installations, temporary vehicular route for construction vehicles and temporary laydown area close to the proposed converter station;
- New structures associated with the proposed converter station and new access road, signage, fencing and landscaping including ground modelling to level the proposed converter station and utilise excess material;
- Changes to the local landscape character as a result of the proposed converter station and surroundings including the off road section of cable route (both from the converter station to the landfall and from the converter station to the substation), both during the construction and operational stages;

- Loss of features including characteristic vegetation such as Ancient Woodland, copses, hedgerows, hedgerow trees and individual trees;

- Changes impacting on the composition of key views including from surrounding residential, open access land, PROWs and highways; and

- The setting of built assets including Conservation Areas and Listed Buildings.

SIGNIFICANT AND INSIGNIFICANT

18.3.4. Table 18.1 outlines both significant and insignificant effects. Insignificant effects will not be considered further within the LVIA.

Table 18.1 Impacts to be scoped in and out of the LVIA

Impact	Scoping		Explanation
	In	Out	
Proposed Converter Station			
Landscape Character			
Effects on the landscape resource within 3km of the Site Boundary during construction and decommissioning.	P		Changes on the landscape resource and associated features within 3 km of the study area during construction and decommissioning. Works will include a new construction access route and laydown area as well as a change in land use and topography.
Effects on the landscape resource within 3km of the Site Boundary during operation.	P		Changes to landscape character within and surrounding the Study Area due to new built form and landscaping.

Impact	Scoping		Explanation
	In	Out	
Effects on landscape resource beyond 3 km during construction, operation and decommissioning.	P		Changes to landscape character and associated features further than 3 km from the Site boundary. Effects on character will be largely dependent on inter-visibility with the Proposed Development and perceptual appreciation of changes in the extent, size and scale of development in the landscape and its relationship to Lovedean substation.
Visual Amenity			
Effects on visual receptors within 3km of the Site boundary during construction, operation and decommissioning.	P		Changes in the visual amenity of visual receptors due to on site demolition, construction and decommissioning as a result of changes to landscape character.
Effects on visual receptors beyond 3 km of the site boundary.		P	Changes in the visual amenity of visual receptors will be limited due to the presence of existing built form and intervening vegetation.
Cable Route and Landfall			
Landscape / Seascape Character			

Impact	Scoping		Explanation
	In	Out	
Effects on landscape and seascape character and features associated with the landfall during construction, operation and decommissioning.		P	Whilst temporary effects will be generated associated with the landfall these will be short term and the scale of construction works will be minimal. Works will result in a below ground structure which will house the transition bay. Land will be reinstated following construction.
Effects on landscape character and features associated with the DC cable route during construction, operation and decommissioning.	P		Permanent landscape effects beyond the converter station and access road may be significant along the route where the route may cross fields, playgrounds, allotments and common land rather than utilise existing roads. Here there may be subject to determination of the preferred option and route option the permanent loss of landscape features which contribute to landscape character and screening.
Effects on landscape character and features associated with the AC cable route during construction,	P		Due to the width of the route required for the AC cables there is likely to be a permanent loss in landscape features

Impact	Scoping		Explanation
	In	Out	
operation and decommissioning.			which contribute to landscape character and screening.
Visual Amenity			
Effects on visual receptors within 100m buffer on either side of the cable route and landfall beyond 2 km of the proposed converter station during construction, decommissioning and operation.	P		Temporary short term significant effects could be generated during construction along the route and adjacent to the landfall. Whilst the land will be reinstated following the installation of the cables and returned to its previous use there may be subject to determination of the preferred option and route option the permanent loss of landscape features which contribute to landscape character and screening.
Effects on visual receptors within 100m buffer on either side of the cable route up to 2km of the proposed converter station.		P	Changes in the visual amenity of visual receptors due to land take and loss of vegetation. Extent of vegetation loss associated with hedgerows and hedgerow trees will be dependent on route option selected.

18.4 ASSESSMENT METHODOLOGY

18.4.1. The LVIA will address landscape and visual amenity issues relating to the Proposed Development and associated with the UK onshore elements of the Project during construction, operation and decommissioning. The assessment will be carried out in accordance with "The Guidelines for Landscape and Visual Assessment" (GLVIA) published by the Landscape Institute (LI) and IEMA (2013). In addition, guidance in "An Approach to Landscape Character Assessment", Natural England (2014) will also be reviewed. The methodology will be agreed with LPAs and SDNP as part of discussions prior to the submission of the PEIR and ES.

18.4.2. Reference will also be made to relevant local planning policy documents, and regional and local guidance including landscape character assessments as well as aerial photographs and OS data. Documents will include:

- Relevant NCAPs;
- Hampshire County Integrated Character Assessment, (2012);
- East Hampshire Character Assessment, (2006);
- Winchester Landscape Character Assessment, (2004);
- Havant Borough Landscape Character Assessment, (2007);
- South Downs Integrated Landscape Character Assessment (2011);
- Historic Evidence - maps, historic landscape characterisation (Hampshire Historic Landscape Characterisation, (2013);
- SDNP Viewshed Characterisation and Analysis (2015);
- SDNP Tranquillity Study (2017);
- SDNP Green Infrastructure Framework (2016);
- East Hampshire Green Infrastructure Study and Strategy, 2011, 2013 and updated Green Infrastructure Strategy due February 2019;
- The Green Infrastructure Study, WCC (2010);
- West Sussex Landscape Character Assessment, 2003;
- A Strategy for the West Sussex Landscape, October 2005;

- The Solent, Seascape Assessment for the South Marine Plan Areas, 2014; and

- PCC. Urban Characterisation Study, 2011.

18.4.3. The LVIA will consider both national regional and local landscape character, along with an assessment of specific local landscape features. As part of the baseline review, the LVIA will consider the SDNP's designation as an International Dark Night Skies Reserve, and the relationship between the site and the setting of the SDNP, both visually and with regard to landscape character

18.4.4. In terms of the assessment, the LVIA will consider the direct and indirect effects of the Proposed Scheme on the SDNP, as well as on landscape character and visual receptors, considering experiential and perceptual effects.

18.4.5. The LVIA will also consider cumulative effects of other similar developments, and in discussions with the LPAs and NE, the extent of the Cumulative Zone of Visual Influence will be determined, along with whether this needs to be refined beyond the 8km study area outlined below.

18.4.6. The LVIA will inform the design and siting of the converter station, and whilst the design should be landscape led, other factors will also need to be considered, such as local characteristics and distinctiveness of the area

18.4.7. The proposed converter station will be a dark site, with emergency lighting that would only be used in case of an emergency. As such, the impact of lighting during operation of the Proposed Development will not be considered further within the PEIR and ES. The LVIA will consider the visual impact of the Proposed Converter Station on the Dark Night Sky reserve and visual receptors.

18.5 EXTENT OF THE STUDY AREA

18.5.1. It was agreed amongst the LPAs and SDNP that an 8 km Study Area would be defined to inform the initial baseline review, identification of district / country level assessments and more long-distance views. This would then be narrowed to a 3km inner study area which would focus on local landscape character and views.

18.5.2. For the DC cable route, the study area has been assumed to be a working width of 20m with a 100m buffer along either side of the working widths.

PROPOSED VIEWPOINT SELECTION

18.5.3. A digital terrain model (generated from LiDAR data) and engineering drawings was used to produce a Zone of Theoretical Visibility (ZTV) for each of the preferred options based on a viewer's height of 1.6m and drawing on four

variations in point data ranging from the proposed converter hall at 22m to the transformers, switchyards, terminators and reactors at a maximum height of 12m. Changes in the layout's orientation were also tested to determine whether this had an effect on the extent of visibility.

18.5.4. An initial ZTV was prepared based on a proposed study area of 8km and then revised to 3 km. Representative viewpoints were agreed in consultation with LPAs based on publically accessible locations. Viewpoint photographs were taken during the winter demonstrating the worst case in terms of visibility and subject to discussion with LPAs further spring / summer photographs will be taken to inform the LVIA chapter of the ES.

18.5.5. Three specific viewpoints which fall within the 8km study area but outside the 3km zone have also been included in discussions with LPAs and SDNP. These include Old Winchester Downs, Windmill Hill and close to Fort Widley, Port Down.

18.5.6. High sensitivity receptors will include residents as well as users of public amenity areas and local footpaths.

18.5.7. Viewpoint locations, wirelines and photomontages have been agreed in discussion with the LPAs and SDNP. The viewpoints represent short, medium and long-range views and will be used to inform the level of effect arising from the introduction of the Proposed Development. Viewpoints agreed include viewpoints 1 to 17 and Viewpoints A to C. The latter will be subject to which option for the Proposed Converter Station is selected and the exact location will be determined and agreed with the LPAs.

18.5.8. It was agreed with the LPAs that the following visualisations would be prepared: Three wirelines from:

- Viewpoint 9 Anmore Dell;
- Viewpoint 11 From the edge of Denmead and Little Denmead Farm; and
- Viewpoint 17 Old Winchester Down.

18.5.9. Three fully rendered photomontages would also be prepared and LPAs have agreed that these will provisionally be from:

- Viewpoint A Lane connecting Old Mill Lane with Broadway Lane;
- Viewpoint B Old Mill Lane; and
- Viewpoint C Old Mill Lane.

18.5.10. The methodology for the photography will be in accordance with Landscape Institute Advice Note 01/11 (2011); "Photography and Photomontage in Landscape and Visual Impact Assessment". It should be noted that revised emerging guidelines on Photography and Photomontage in LVIA, by the Landscape Institute (1 June 2018) are due to be issued imminently, and have yet to be adopted by the Landscape Institute. Therefore, in the interim period, we propose to present a set of field verified viewpoints as part of the LVIA, compliant with the methodology of the 2011 guidelines which is the current industry standard.

LANDSCAPE CHARACTER ASSESSMENT

18.5.11. The landscape character resource will be characterised through a review of relevant NCAP, Hampshire County Integrated Character Assessment, 2012, East Hampshire Character Assessment, 2006, Winchester Landscape Character Assessment, 2004 and Havant Borough Landscape Character Assessment, 2007 as well as the West Sussex Landscape Character Assessment, 2003 and Portsmouth City Council. Urban Characterisation Study, 2011.

18.5.12. The assessment will be undertaken in parallel and informed by a combination of desk study appraisal and site visits. Where appropriate this will be supplemented by further information gathered from site visits.

DETERMINING THE SIGNIFICANCE OF EFFECTS

18.5.13. The significance of effect is determined by combining the assessed sensitivity of the landscape or visual receptor with the anticipated scale, duration and incongruity of impacts from the Proposed Development.

18.5.14. Effects will be assessed for:

- Construction stage;
- Operational stage 1 (or year 1 when changes are most obvious);
- Operational stage 15 years after commencement of operations when any mitigation would be considered to have matured to maximum effectiveness; and
- Decommissioning of the site.

MITIGATION

18.5.15. Through an iterative design process and close consultation internally with the design team (and externally with the LPAs) measures will be considered to reduce landscape and visual and ecological effects and create positive new habitats. A set of principles, which have been agreed within the LPAs and

SDNP, will be used to inform the micro-siting of each preferred option, influence the scheme design and purpose of the assessment. Principles will:

- Consider the different effects of all elements of the development: proposed converter station, access track and cable connections;
- Integrate the development and associated infrastructure into the surrounding topography;
- Seek to cut the proposed converter station construction platform into the gentle hill slope where possible, to reduce the ridge level of the building;
- Work with the shape of the land and making positive use of material arising from the works to create new screening landform and reduce the apparent height of the building;
- Minimise the loss of existing vegetation of ecological value (particularly long established hedgerows and veteran trees);
- Introduce new planting which is sympathetic to the surrounding landscape character and, in consultation with the ecology team, reflective of native species;
- Consider the soil types, seeding mixes and management regimes to create species-rich meadows and glades within areas of new screen planting;
- Consider the potential for introducing offsite planting in discussion with adjacent landowners to reduce effects of middle and long distance views; and
- Consider height, mass, colour, texture and nature of materials for the buildings and associated infrastructure which is sensitive to the immediate surroundings.

PROPOSED VIEWPOINT LIST

18.5.16. The scope of the LVIA will encompass an assessment of those receptors listed in under Baseline Conditions, combined with further information emerging from the consultation process, and this formal request for a Scoping Opinion.

18.5.17. In particular consultees are encouraged to suggest other landscape or visual receptors and viewpoint assessment locations that should be considered in the assessment and to provide further information on other built development which may be included or excluded from the assessment.

18.5.18. The total number of viewpoints which will be illustrated in the assessment will be approximately 17 No. viewpoints and 3 No local viewpoints. These will be used as illustrative material to support the visual assessment, which will include ZVI maps and viewpoint photographs. These will all produced in accordance with industry standard guidance (Landscape Institute, 2011).

19. ECOLOGY (WITH ARBORICULTURE)

19.1 SCOPING OPINION AND CONSULTATION

19.1.1. Comments from the LPA Scoping Opinion relating to ecology and arboriculture are summarised in Table E3 and Table E4 of Appendix E.

19.2 BASELINE

This chapter uses information obtained from the following sources:

- Freely downloadable datasets from Natural England for statutory designated sites and important habitats;
- Ecological records from Hampshire Biodiversity Information Centre (HBIC);
- Ordnance Survey (OS) Master Map, aerial photography and Lidar data, National Tree Map and habitat classification; and
- Data collected during site surveys conducted by experienced ecologists.

19.2.1. The scoping boundary includes the footprint of the Proposed Development, including any land required temporarily during the construction stage, prior to deviations being considered. The ecological zone of influence of the Proposed Development will depend on the type of works (temporary construction for ducting and cable laying or permanent works relating to the proposed converter station) and the receptors that are encountered.

Study areas extended beyond the Proposed Development boundaries as follows:

- 10km for Natura 2000 sites, which include SAC, Special Protection Area (SPA) and internationally designated Wetlands of International Importance (Ramsar sites);
- 2km for nationally designated sites, which include SSSI and Local Nature Reserves (LNR);
- 1km for non-statutory sites designated for nature conservation value;

- 1km for information regarding Habitats of Principal Importance (HPI)[7] and woodland listed on the Ancient Woodland Inventory[8]; and

- 1km for records of legally protected and notable species.

19.2.2. The current species and non-statutory site information purchased from HBIC, is for the red line boundary (RLB) when the route was under consideration without additional deviations. Data will be purchased from HBIC for the RLB as it is at the time when the EIA is carried out to ensure this is accurately relates to the RLB for the Proposed Development.

19.2.3. A Preliminary Ecological Appraisal (PEA) has been undertaken to inform this Report. A detailed habitat survey was undertaken for areas within the indicative site boundary and broad habitat mapping and identification of water bodies (for great crested newts) was undertaken for areas up to 250m from the Proposed Development. The updated RLB will be assessed to identify any further water bodies within 250m. Impacts on other protected species will also be considered, with the revised red line.

19.2.4. Detailed habitat survey work used the Phase 1 Habitat Survey methodology (JNCC 2010), extended to identify the potential of habitats to support protected and notable species, was undertaken on the 16th and 17th April 2017 and updated to respond to design changes on the 26th and 27th April, 9th August and 15th August 2018.

19.2.5. The PEA provides a preliminary evaluation of all ecological features within the study area, taking into account guidance issued by the CIEEM (2018b). In evaluating the relative importance of ecological features for scoping, the following factors were considered; nature conservation designations, species/habitat rarity, naturalness, fragility, connectivity to other habitats and relevant nature conservation aims and objectives for a given area as contained under the NERC and local biodiversity action plans and planning policies.

19.2.6. The following section presents a provisional ecological baseline, informed by the PEA and species-specific surveys undertaken during 2017 and 2018. These surveys are ongoing and the baseline will be updated with their results as they are completed. A summary of the results of these surveys are included in this section.

[7] Mapped locations of HPI are usually not available, but HPI aligns in the most part with UKBAP habitats. Inventories of UKBAP habitat have been prepared by a variety of organisations and at a national (Natural England priority habitat inventory) and local scale (e.g. by local records centres). In some instances, these are primarily based on aerial photograph analysis rather than field survey.

[8] The ancient woodland inventory in England lists areas over two hectares in size which have been continuously wooded since at least 1600.

PROPOSED CONVERTER STATION

Designated Sites

19.2.7. Although internationally designated sites (i.e. Natura 2000 sites) are found within 10km of the two proposed options for the location of the proposed converter station, those associated with the coastline to the south are not considered to be relevant to the baseline conditions at the potential converter station sites. Such sites are a long distance from the potential locations for the converter station and located behind numerous barriers which cut off effect pathways. These sites are considered relevant to the cable route and landfall sites, and have been described in the baseline sections below.

19.2.8. There is one internationally designated site within the 10km study area and two nationally designated sites within the 2km study area. They are described in Table 19.1 and Table 19.2 below. In addition, four non-statutory designated sites are found within the 1km study area, and are described in Table 19.3.

Table 19.1 Internationally designated sites (Natura 2000 sites) (converter station)

Site Name	Size (ha) / Distance (m)	Description
Butser Hill SAC	239.9 / 5,690	Butser Hill is situated on the east Hampshire chalk which forms part of the South Downs. Much of the site consists of sheep's-fescue – meadow oat-grass (Festuca ovina – Helictotrichon pratense) grassland, and has a range of slope gradients and aspects which influences vegetation composition. A particular feature is its lower plant assemblage; it has a rich lichen flora and also supports the distinctive association of leafy liverworts and mosses on north-facing chalk slopes. This association is very rare in the UK and Butser Hill supports the largest known example. The site exhibits various transitions between semi-natural dry grassland, chalk heath, mixed scrub and yew Taxus baccata woods.

Table 19.2 Nationally designated sites (converter station)

Site Name	Size (ha) / Distance (m)	Description
Catherington Down SSSI / LNR	12.8 / 845.3	Catherington Down is an area of chalk grassland and narrow fringing woodland belts on predominantly west-facing downland slopes near the southern extent of the main Upper Chalk outcrop in Hampshire. About one-third of the area has rather less steep slopes, deeper soils and a turf dominated by coarse grasses. Development of scrub and incipient woodland is more apparent here. A belt of oak *Quercus robur* woodland forms the lower, woodland boundary, whilst part of the high, eastern edge is covered by a strip of oak standards over old hazel *Corylus avellana*. This latter woodland is separately fenced and has a typical spring woodland flora which includes, locally associated with hazel, toothwort *Lathraea squamaria.*
Yeoll's Copse LNR	5.5 / 193.1	A woodland site with old coppiced sessile oak and wild service trees. Notable species include common cow wheat and butchers broom.

Table 19.3 Non-statutory designated sites (converter station)

Site Name	Designation	Size (ha)	Distance (m)
Crabdens Copse	SINC	1.3	140
James' Copse and Outlier	SINC	5.69	830
James' Copse Paddock	SINC	1.42	650
Crabdens Row	SINC	0.93	520

Habitats

19.2.9. The proposed converter station locations are located within agricultural land on the edge the village of Lovedean, Hampshire. The area is mainly composed of arable land with hedgerows and small pockets of woodland, and residential development to the south-east. Habitats present are described in **Error! Reference source not found.**

Table 19.4 Proposed converter station habitat descriptions

Habitat Type	Description
Semi natural broadleaved woodland **(A1.1.1)**	Parcels of semi natural broadleaved woodland are present to the east and south of the proposed converter station. Dominant species include ash *Fraxinus excelsior*, hazel *Corylus avellana*, elder *Sambucus nigra* and beech *Fagus sylvatica*. A dense cover of ivy Hedera sp. was also recorded on the ground and on some trees, particularly on the embankments adjacent to the proposed converter station to the south. In the woodland to the west, the ground flora comprised wood anemone *Anemone nemorosa*, ramsons *Allium ursinum* and bluebell *Hyacinthoides non-scripta*.
Plantation woodland (**A1.1.2)**	A stand of plantation woodland, comprised predominantly mature and semi mature sycamore *Acer pseudoplantanus* is present to the eastern extent of the proposed converter station. A second parcel of this habitat was recorded to the west. Trees in this parcel had been recently planted
Poor semi-improved neutral grassland **(B1.6)**	Poor semi improved neutral grassland was recorded in three fields to the west and south of the proposed converter station. Species present include red fescue *Festuca rubra*, Yorkshire fog *Holcus lanatus* perennial rye grass *Lolium perenne*, cock's foot *Dactylis glomerata*, and white clover *Trifolium repens*. Sward height was approximately 30cm.
Improved grassland **(B4)**	Improved grassland was present in fields to the west of the proposed converter station. Horses were noted to be grazing in one field to the south. Dominant species are perennial rye grass, dock and sorrel *Rumex acetosa*. Sward height was approximately 20cm.
Tall ruderal **(C3.1)**	Tall ruderal vegetation is present in a number of locations, particularly along field boundaries. Species present include nettle *Urtica dioica* dock *Rumex obtusifolius* and bramble Rubus sp.
Arable **(J1)**	Arable fields were noted to the north and south of the proposed converter station. The fields to the north were ploughed; to the south recently planted crops were present.
Species-poor hedgerow **(J2.2)**	A number of hedgerows were present at the site, particularly marking field boundaries to the west. Dominant species include blackthorn *Prunus spinosa*, hawthorn *Crataegus rhipidophylla*, bramble and hazel. Hedges to the north appeared recently managed.

Habitat Type	Description
Hedgerow with trees **(J2.3)**	Hedgerows with trees were present to the north of the sites. Dominant species include oak *Quercus robur*, ash, elder, hawthorn, blackthorn and sycamore.

Protected and Notable Species

19.2.10. The potential for the land on which the Proposed Development is proposed to support legally protected and notable species has been assessed using the results of the desk study, and observations made during site survey within the proposed converter station location.

19.2.11. The following species may occur within the survey area:

- Bats;
- Badger;
- Dormouse;
- Breeding Birds;
- Wintering and Passage Birds;
- Reptiles;
- Great Crested Newt; and
- Invertebrates.

Bats

19.2.12. The desk study did not return records of bats within the vicinity of the proposed converter station.

19.2.13. Habitats in the survey area, including buildings and trees (both those occurring individually and within woodland or hedgerows), have the potential to support roosting bats. Ancient woodland surrounding the Lovedean substation and associated hedgerows are suitable to support roosting, foraging and commuting bat species, including Bechstein's bat *Myotis bechsteinii*, which are known to be found in Hampshire. The vast majority of Bechstein's bat records are associated with the Forest of Bere, a large area of ancient woodland and a Forestry Commission site 3km southeast of Lovedean. There are also records immediately east of the Forest of Bere towards the A3 motorway.

19.2.14. Walked transects and monitoring using static automated detectors were carried out around the proposed converter station from April – October 2017, with at least 9 species recorded: *Myotis* species, *Plecotus* species, barbastelle bat, noctule, serotine, Leisler's bat, common pipistrelle, soprano pipistrelle; and Nathusius' pipistrelle.

19.2.15. Emergence and return to roost surveys were undertaken but no bat roosts were identified.

Badger

19.2.16. No records of badger *Meles meles* were returned from the desk study within the vicinity of the proposed converter station. Habitats including semi-natural woodland and hedgerows are suitable for supporting foraging and sheltering badger.

19.2.17. Badger surveys were undertaken around the proposed converter station in 2017. Badger activity, including main and annex setts, latrines and paths were recorded in proximity to the proposed converter station.

Hazel Dormouse

19.2.18. One record of hazel dormouse *Muscardinus avellanarius* was returned within the vicinity of the proposed converter station, from Stoneacre Copse in 2011. Habitats including semi-natural woodland and hedgerows are suitable for supporting foraging and sheltering habitat for hazel dormice.

19.2.19. Hazel dormouse surveys were undertaken around the proposed converter station at Lovedean in 2017. Further surveys are currently being undertaken to the west and south of the proposed substation in 2018. All surveys have currently returned a negative result.

Other mammals

19.2.20. The desk study did not return any records of other notable mammal species. Habitats around the converter station, including areas of woodland, hedgerow, semi-improved grassland and arable land offer suitable foraging and sheltering habitat for these species.

Breeding Birds

19.2.21. The desk study returned records of peregrine *Falco peregrinus* and house sparrow *Passer domesticus* to the south-west of the converter station. Habitats in the vicinity of the converter station, including woodland, scrub and hedgerows are likely to support a range of breeding birds.

19.2.22. Breeding bird surveys were undertaken around the proposed converter station during 2018. Notable species recorded included skylark *Alauda arvensis*, song thrush *Turdus philomelos*, house sparrow, linnet *Carduelis cannabina*,

bullfinch *Pyrrhula pyrrhula*, swallow *Hirundo rustica* and dunnock *Prunella modularis*.

Wintering and Passage Birds

19.2.23. The desk study returned one record of brambling *Fringilla montifringilla* to the south of the converter station. Arable fields and grasslands surrounding the converter station have the potential to support other overwintering birds such as redwing *Turdus iliacus* and fieldfare *Turdus pilaris*.

19.2.24. Wintering bird surveys have not been undertaken and are not planned around the proposed converter station locations.

Reptiles

19.2.25. The desk study did not return any records of reptiles within the vicinity of the converter station. Habitats including grassland fields, woodland, hedgerows and logs piles and debris offer suitable hibernacula and foraging opportunities for the four common reptile species.

19.2.26. Reptile surveys have not been undertaken and are not planned around the proposed converter station locations.

Great Crested Newt

19.2.27. The desk study returned no records of great crested newt *Triturus cristatus* within the vicinity of the converter station.

19.2.28. No water bodies (ponds) were identified within 250m of the converter station locations.

Other Amphibians

19.2.29. The desk study did not return records of other amphibians in the vicinity of the converter station option locations. Terrestrial habitats could support these species, but there were not any water bodies identified.

Invertebrates

19.2.30. The desk study did not return invertebrate records from around the proposed converter station. Habitats within the survey area, including woodland, scrub and semi-improved grassland are likely to support invertebrates.

19.2.31. Invertebrate surveys have not been undertaken and are not planned around the proposed converter station locations.

Arboriculture

19.2.32. The results of a desk study indicate that there are no Tree Preservation Orders or Conservation Areas within the study area nor are there any recordings of ancient or veteran trees. Ancient semi-natural woodland was found within the study area consisting of Crabdens Row to the north-east of the electricity substation and Crabdens Copse to the south-west. The locations of which are shown on Figure 19.1 (attached).

19.2.33. The desk study also indicates that the study area is within the OS 10 km grid reference SU61. This grid reference includes recorded incidences of Chalara Ash Dieback first confirmed in 2014. The disease was also recorded to the north (OS reference SU62), south (OS reference SU60), east (OS reference SU71) and west (OS reference SU51) of the study area in 2014.

19.2.34. The arboricultural resource within the study area includes a total of 47 trees, 18 groups of trees, eight woodlands and 10 hedges. A breakdown of these features based upon their quality category is included in Table 19.5.

Table 19.5 Arboricultural resource and associated BS 5837 Category

Category	Tree	Group	Woodland	Hedge	Total
A	36	3	5	0	**44**
B	9	8	3	0	**20**
C	2	7	0	10	**19**
Total	**47**	**18**	**8**	**10**	**83**

CABLE ROUTE AND LANDFALL

Designated Sites

19.2.35. The desk study identified 10 European or internationally designated sites within 10km of the study area and 11 nationally designated sites within 2km. A description of designated sites is provided in Table 19.6 and Table 19.7.

Table 19.6 European or internationally designated sites (cable route and landfall)

Site Name	Size (ha) / Distance (m)	Description
Solent and Isle of Wight Lagoons SAC	38.1 / 6,580	The SAC encompasses a series of Coastal lagoons, including percolation, isolated and sluiced lagoons, and includes marshes in the Keyhaven – Pennington area, at Farlington Marshes in Chichester Harbour, behind the sea-wall at Bembridge Harbour and at Gilkicker, near Gosport. The lagoons show a range of salinities and substrates, ranging from soft mud to muddy sand with a high proportion of shingle, which support a diverse fauna.
Solent Maritime SAC	11,243.8 / Adjacent	The SAC comprises a number of different estuary ecosystems on the south coast of England. Its qualifying features are three Habitats Directive Annexe 1 habitats which are primary reasons for selection (estuaries, *Spartina* swards, Atlantic salt meadows), and another seven Annexe 1 habitats which are present but not a primary reason for the site's selection.
South Wight Maritime SAC	19,866.2 / 8,178	The South Wight Maritime SAC encompasses a range of reef types on the coast of the Isle of Wight. The site includes some of the most important subtidal chalk reefs in Britain, supporting a diverse range of species in the subtidal and intertidal. Faces and crevices on the limestone reefs and areas of large boulders provide a range of habitats for a number of marine species. Exposed bedrock is extensively bored by bivalves and sponges adding to habitat diversity. A number of nationally scarce seaweed biotopes are also present within the site, and rare fish species are often present in summer months.
Butser Hill SAC	239.9 / 5,690	Butser Hill is situated on the east Hampshire chalk which forms part of the South Downs. Much of the site consists of sheep's-fescue – meadow oat-grass (Festuca ovina – Helictotrichon pratense) grassland, and has a range of slope gradients and aspects which influences vegetation composition. A particular feature is its lower plant assemblage; it has a rich lichen flora and also supports the distinctive association of

Site Name	Size (ha) / Distance (m)	Description
		leafy liverworts and mosses on north-facing chalk slopes. This association is very rare in the UK and Butser Hill supports the largest known example. The site exhibits various transitions between semi-natural dry grassland, chalk heath, mixed scrub and yew Taxus baccata woods.
Portsmouth Harbour SPA/Ramsar	1,249.6 / 2,120	Portsmouth Harbour SPA, together with the adjacent Chichester and Langstone Harbours SPA, forms one of the most important sheltered intertidal areas on the south coast of England. It is composed of extensive intertidal mudflats and sandflats with seagrass beds, saltmarsh, shallow coastal waters, coastal lagoons and coastal grazing marsh. The estuarine sediments and areas of saltmarsh support rich populations of intertidal invertebrates, which provide an important food source for wintering birds, and also shelter roosting flocks, in particular black-tailed godwit *Limosa limosa*, dark-bellied Brent goose *Branta bernicla bernicla*, dunlin *Calidris alpine* and red-breasted merganser *Mergus serrator*.
Chichester and Langstone Harbours SPA/Ramsar	5,811.0 / Adjacent	This site encompasses a wide area including two harbours located on the south coast of England in Hampshire and West Sussex. They are large, sheltered estuarine basins comprising extensive areas of sand and mudflat exposed at low tide. The mudflats are rich in invertebrates and also support extensive beds of algae, particularly *Enteromorpha* species, and eelgrass *Zostera* spp. The site is of particular value for water birds, especially in migration periods and winter. It also supports important colonies of breeding terns.
Solent and Southampton Water SPA/Ramsar	5,402.0 / 7,083	The site comprises a series of estuaries and harbours with extensive mud-flats and saltmarshes together with adjacent coastal habitats including saline lagoons, shingle beaches, reedbeds, damp woodland and grazing marsh. The mud-flats support beds of *Enteromorpha* spp. and *Zostera* spp. and have a rich invertebrate fauna that forms the food resource for the estuarine birds. In summer, the

Site Name	Size (ha) / Distance (m)	Description
		site is of importance for breeding seabirds, including gulls and four species of terns. In winter, it holds a large and diverse assemblage of waterbirds, including geese, ducks and waders. Dark-bellied Brent goose *Branta b. bernicla* also feed in surrounding areas of agricultural land outside the SPA.
Solent and Dorset Coast pSPA	87,531.7 / Adjacent	The proposal for Solent and Dorset Coast is to create a new SPA for internationally important populations of: • Common tern; • Sandwich tern; and • Little tern. This area is particularly important to these birds as much of the sea around their breeding colonies is the ideal habitat for plunge diving for food.

Table 19.7 Nationally designated sites (converter station)

Site Name	Size (ha) / Distance (m)	Description
Langstone Harbour SSSI	2,085.7 / Adjacent	Langstone Harbour is a tidal basin which at high water resembles an almost land-locked lake. The harbour includes one of the largest areas of mixed saltmarsh on the south coast, and extensive cord-grass *Spartina anglica* marsh in an advanced state of degeneration, is among the twenty most important intertidal areas in Britain as a summer and autumn assembly ground for waders during the moult (when they require abundant high protein food) and as a post-moult wintering ground.

Site Name	Size (ha) / Distance (m)	Description
Portsdown SSSI	69.2 / 423.8	Portsdown is an isolated east-west chalk hillside with a long south-facing escarpment. On the lower south-facing slopes raised beaches mark former sea levels and former wave erosion has removed Tertiary deposits and some of the chalk, leaving very steep slopes. Despite the absence of grazing and extensive disturbance, these slopes still support a rich chalk grassland flora and have a diverse insect fauna.
Sinah Common SSSI	243.0 / 884.3	The site comprises a complex of maritime habitats which extend for over 2km eastwards from the south-western extremity of Hayling Island, Hampshire. Gunner Point at the western end contains the most extensive sand dunes and vegetated shingle beach in Hampshire. It supports shingle beach vegetation and grassland, dune heath, dune grassland, saltmarsh and open water communities. To the east of Gunner Point there is an extensive area of fragmented dune grassland and shingle.
Catherington Down SSSI / LNR	12.8 / 845.3	Catherington Down is an area of chalk grassland and narrow fringing woodland belts on predominantly west-facing downland slopes near the southern extent of the main Upper Chalk outcrop in Hampshire. About one-third of the area has rather less steep slopes, deeper soils and a turf dominated by coarse grasses. Development of scrub and incipient woodland is more apparent here. A belt of oak *Quercus robur* woodland forms the lower, woodland boundary, whilst part of the high, eastern edge is covered by a strip of oak standards over old hazel *Corylus avellana*. This latter woodland is separately fenced and has a typical spring woodland flora which includes, locally associated with hazel, toothwort *Lathraea squamaria.*
Catherington Lith LNR	9.22 / 1,820.1	The site comprises woodland and remnants of chalk grassland, supporting a diverse range of bird and plant species. There are islands of scrub within the open habitats.

Site Name	Size (ha) / Distance (m)	Description
Farlington Marshes LNR	119.7 / 482.6	The site comprises flower-rich grazing marsh on the northern shore of Langstone Harbour between Portsmouth and Havant. Farlington is important for the bird populations that it supports, as well as being of importance to wild flowers and butterflies. It is managed by the Hampshire and Isle of Wight Wildlife Trust.
Hazleton Common LNR	17.5 / 1,158.0	A mosaic of heathland, grassland, hedgerow and scrub habitats of importance to wildflowers, birds and reptiles.
The Kench, Hayling Island LNR	6.0 / 1,264.7	A small area of inter-tidal mud and saltmarsh within Langstone Harbour. This shallow tidal inlet alongside Ferry Road on Hayling Island is used by birds as a feeding area while the tide is out and when it is high the shingle ridge between the inlet and the main harbour is used as a roost by waders.
Yeoll's Copse LNR	5.5 / 193.1	A woodland site with old coppiced sessile oak and wild service trees. Notable species include common cow wheat and butchers broom.
Dell Piece West LNR	4.1 / 1,078.6	The site comprises woodland, unimproved grassland, damp marshy ground and a large shallow pond that provides habitat for a rich variety of wildlife that includes various butterflies, dragonflies and reptiles.

19.2.36. The desk study identified 43 non-statutory nature conservation sites within 1km of the study area, being SINCs or Road Verges of Ecological Importance (RVEI). A summary of these sites is presented in Table 19.8.

Table 19.8 Non-statutory designated sites (cable route and landfall)

Site Name	Designation	Size (ha)	Distance (m)
Newlands Row and Plant Row	SINC	5.35	239.3
Crabdens Copse	SINC	1.3	243.7
James' Copse and Outlier	SINC	5.69	185.2
Milton Common	SINC	46.13	Adjacent

Site Name	Designation	Size (ha)	Distance (m)
Land West of Fort Cumberland	SINC	7.58	Adjacent
Newlands Farm Meadow	SINC	3.74	271.4
James' Copse Paddock	SINC	1.42	265.4
Great Salterns	SINC	17.76	275.8
Great Salterns Lake	SINC	5.1	Adjacent
Hilsea Lines	SINC	18.05	Adjacent
Longwood (Idlewood)	SINC	1.15	151
Stakes Coppice Remnant 1	SINC	0.46	454.8
Adjacent to Farlington Playing Fields	SINC	6.59	411.5
Marrelsmoor Row	SINC	0.69	271.3
London Road Fen	SINC	1.91	Adjacent
Purbrook Heath	SINC	3.4	466.4
Land to the north of Portsdown Hill Road	SINC	8.49	87.9
Park Wood, Havant	SINC	2.59	385.9
Crabdens Row	SINC	0.93	293.7
Meadow west of Farlington Avenue	SINC	1.54	Adjacent
Fort Purbrook Paddock 2 (Havant)	SINC	0.85	468.6
Fort Purbrook	SINC	5.53	191.8
Rabbit Copse, Horndean	SINC	1.93	435.6
Melville Road verge	SINC, RVEI	0.04	Adjacent
Land to the South of Portsdown Hill Road	SINC	0.81	Adjacent
Wecock Wood	SINC	1.69	117.1
Fort Purbrook Paddock 1 (Havant)	SINC	2.77	354.6
Fort Cumberland	SINC	9.51	Adjacent
Kings Pond Meadow	SINC	2.69	Adjacent
Anmore Dell Meadow	SINC	1.61	308.6
Wecock Common	SINC	5.54	54.2
Alsfordmoor Coppice	SINC	5.66	479.2
Yoells Copse	SINC	5.4	92.2
Piper's Hill Wood	SINC	1.96	215.2

Site Name	Designation	Size (ha)	Distance (m)
Portsmouth Golf Course West	SINC	2.01	182.6
Field to West of Gillman Road	SINC	2.66	161.7
Golf Course North of Burrfields Road	SINC	28.13	Adjacent
East and West of Gillman Road	SINC	11.25	122.2
Farlington Avenue	SINC, RVEI	0.15	Adjacent
Baffins Pond	SINC	2.12	433.6
Farlington Marshes	SINC	122.52	475.9
Eastney Beach	SINC	18.47	Adjacent
Marrelsmoor Coppice	SINC	3.05	84.8
B2177 Portsdown Hill Road	RVEI	0.60	422.8

The Solent Waders and Brent Goose Strategy Sites

19.2.37. The Solent Waders and Brent Goose Strategy (SWBGS) is a conservation partnership, aiming to conserve the internationally important Brent Goose and wading bird populations within and around the SPAs and Ramsar wetlands of the Solent coast. The SWBGS provides a framework for identifying sites lying outside the physical boundaries of SPA/Ramsar sites but which are, or may be, used by bird species associated with the European sites. These sites are termed as Functionally Linked Land (Natural England, 2016) and are considered functionally linked to the designated sites. There are an extensive number of Brent Goose strategy sites around Portsmouth and near Drayton and Farlington.

19.2.38. 72.79ha of woodland listed on the National Inventory of Woodland and Trees is present within 1km of the study area. This comprises 35.62ha of Ancient and Semi-Natural Woodland within Alsfordmoor Coppice, Crabdens Copse, Crabdens Row, Long Wood, Purbrook Park Wood, Rabbit Copse, Stoneacre Copse, Yoells Copse and other unnamed patches of woodland, and 37.17ha of Ancient Replanted Woodland within James's Copse and The Queens Enclosure.

19.2.39. 13 types of Priority Habitat can be found within 1km of the study area, covering 1,392 ha of the landscape. Habitat types cover those associated with coastline (grazing marsh, sand dunes, mudflats), woodland and calcareous hillsides amongst others.

Habitats

19.2.40. The landfall is located at Eastney beach, comprising intertidal mud and sand, a sand/shingle beach with concrete erosion protection and a mosaic of habitats resulting from derelict developments on the landward side; disused buildings, scrub, rough grassland and bare ground. There is a caravan park to the west of the landfall site and Fort Cumberland to the east. The proposed landfall area is adjacent to Eastney Beach Site of Importance for Nature Conservation (SINC), Fort Cumberland SINC and Land West of Fort Cumberland SINC, comprising semi-improved grassland, coastal heathland, shingle and scrub habitats.

19.2.41. Habitat types associated with the landfall site and cable route are described in Table 19.9 and Table 19.10 respectively.

Table 19.9 Landfall habitat descriptions (Portsmouth)

Habitat Type	Description
Scrub **(A2)**	Scattered scrub was recorded both around Fraser Range and within Land West of Fort Cumberland SINC, which are present in the adjacent areas surrounding the landfall. Common scrub species recorded include bramble *Rubus fruticosis* agg. and gorse *Ulex europaeus.*
Semi-improved grassland **(B2.2)**	The main areas of semi-improved, low nutrient grassland within the landfall area was recorded within Land West of Fort Cumberland SINC, with species including yellow rattle *Rhinanthus minor,* viper's bugloss *Echium vulgare,* kidney vetch *Anthyllis vulneraria* and bird's foot trefoil *Lotus corniculatus*. The SINC is also noted for the presence of dittander *Lepidium latifolium*, County scarce sea radish *Raphanus raphanistrum maritimus* and, of National Interest, autumn lady's-tresses *Spiranthes spiralis*.
Intertidal – shingles/cobbles (H1.2)	The beach at the landfall is generally comprises a long, wide and continuous shingle beach with associated promenade and parking, and landward development including barracks, a caravan park and disused military ranges. Colonising vegetation such as sea kale *Crambe maritima* and sea beet *Beta vulgaris* and fennel *Foeniculum vulgare* were recorded. Nationally scarce Nottingham catchfly is known to be present on more stable parts of the beach near the caravan park; however was not recorded during the survey. Coastal vegetated shingle habitats qualify as a Habitat of Principal Importance.
Amenity grassland **(J1.2)**	The majority of amenity grassland present within the landfall site was recorded at Southsea Leisure Park, interspersed between static caravan plots.

Habitat Type	Description
Built-up areas **(J3)**	The landfall and cable route passes through built up environs of a former military range, Fraser Range. This derelict nautical gunnery comprised a series of flat roofed structures and hardstanding, with scattered scrub and grassland colonising in dilapidated surfaces.
Hard standing	The majority of hard standing is present in Frasers Range. The cable route then follows the access track, which joins Fort Cumberland Road at the bareground carpark of Land West of Fort Cumberland SINC. At this point, the cable route passes the northern end of Melville Road, where the Road Verge is designated as a SINC for the presence of the County Scarce sea radish.

Table 19.10 Cable route habitat descriptions

Habitat Type	Description
Scattered trees (A3.1)	Scattered trees were recorded along the entire proposed cable route. Whilst the route is generally confined to the path of existing infrastructure, tree-lined roads were mainly noted at Bransbury Park, Milton Park, Milton Cemetery, Milton Common (SINC), Southsea Golf Course (SINC), Interchange Park ad Airport Industrial Estate, Walton Road Industrial Estate, Mountbatten Business Park, Residential roads at Drayton, roads adjacent to Meadow west of Farlington Avenue (SINC) and tree lined roads at Widley.
Semi-improved grassland (B2.2)	Grassland fields were noted in association with the western sub-option, where the route leaves the B2150. Access to these fields was not possible at the time of survey; however, Priority Habitat records suggests that fields in this locality are lowland meadows with an affinity to MG5.
Running water (G2)	The western sub-option crosses, what appears to be running water, as the route diverts off Hambledon Road. This watercourse was not accessed at the time of survey as permission was not granted. From Ordnance Survey, the watercourse resembles an agricultural drain.
Intertidal mud/sand (H1.1)	Main areas of intertidal habitats that interface the Proposed Development are located within the Solent Maritime SAC, Chichester and Langstone Harbours Ramsar Site and Langstone Harbours SSSI. Although the route does not intersect this habitat, the cables follow the A2030 Eastern

Habitat Type	Description
	Road, which runs parallel to the intertidal habitats before crossing the harbour on an existing road bridge before joining the A27 Havant Bypass. Mudflats are exposed at low tide and are generally rich in invertebrates and may support important plant communities and bird assemblages.
Arable (J1.1)	The western sub-option of the cable route crosses intensively farmed arable fields before reaching the proposed converter station location at Lovedean. Arable fields, at the time of survey, had recently been ploughed and drilled.
Hedges (J2)	The proposed cable route crosses a series of hedges which were not accessed for survey due to permissions. These are located on the western sub-option where the cable cuts across semi-improved
Built-up Areas	The proposed cable route is almost entirely urban with exception of the western sub-option, which leads the final leg of the route through an agricultural landscape before connecting with the proposed converter station at Lovedean. The Cable route follows built up, urban areas around Portsmouth, including Eastney, Milton, Ancorage Park, Drayton, Purbrook and Waterlooville.
Hard standing	The majority of the route is within hard standing areas of existing highways, including the A288, A2030, Farlington Avenue, B2177, A3, B2150, Milton Road, Lovedean Lane and Day Lane.

Protected and Notable Species

19.2.42. The potential for the land on which Proposed Development is to be located to support legally protected species and notable species has been assessed using the results of the desk study and observations made during the site survey of habitats within and immediately surrounding Eastney Beach landfall site, the proposed high voltage cable route and the proposed converter station location.

19.2.43. The following species may occur within the survey area:

- Bats;
- Badger;
- Otter;

- Water vole;
- Dormouse;
- Breeding Birds;
- Wintering and Passage Birds;
- Reptiles;
- Great Crested Newt; and
- Invertebrates.

Bats

19.2.44. The desk study returned records of six bat species within the study area, which comprised 97 individual bat records. This included records for serotine *Eptesicus serotinus*, brown long-eared *Plecotus auritus*, noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and whiskered bat *Myotis mystacinus*.

19.2.45. Habitats along the route, including buildings and trees (both scattered and those occurring within woodland and hedgerows), have the potential to support roosting bats.

19.2.46. No bat surveys have been undertaken along the cable route. Trees within Denmead Meadows have been identified as having bat roost potential. If the cable route takes this route, further surveys may be necessary in 2019.

Badger

19.2.47. Four records of badger Meles meles were returned from the desk study with the most recent one recorded in 2009. These records are near to Purbrook and the north-west of Waterlooville. Habitats along the route, including semi-natural woodland, dense scrub, hedgerow and the golf course are suitable for supporting foraging and sheltering badger. No badger surveys have been undertaken and are not planned around the landfall and cable route.

Otter

19.2.48. No records of otter *Lutra lutra* were returned from the desk study. However, suitable habitat for this species, including foraging, commuting, and sheltering habitat, is present along the route, particularly within the coastal area along the A2030 and the Farlington Marshes, which are unlikely to be affected by the Proposed Development.

Water vole

19.2.49. There were five records of water vole *Arvicola amphibius* recorded within the study area. The most recent record was reported in 2012. The survey area crosses an unnamed watercourse north of the B2150. The survey area is also bordered by Farlington marshes where the five records were reported; however, the cable route is understood to be drilled through this section.

Hazel Dormouse

19.2.50. There are 11 records of hazel dormouse *Muscardinus avellanarius* recorded along the route, the most recent record was returned from 2012. Habitats within the survey area, including the hedgerows, small and larger areas of woodland east of the A3 London road and north-west of Waterlooville, offer suitable foraging and sheltering habitat for dormice. Scrub habitats connected to these areas are also likely to offer suitable habitat for this species.

19.2.51. Hazel dormouse surveys are being undertaken in 2018 to the south of the converter station where hedgerows could be affected. Further surveys could be necessary in 2019 at Denmead Meadows or between the meadows and converter station, depending on the route of the cable and how much hedgerow is due to be removed.

Other mammals

19.2.52. The desk study returned records of other notable mammal species, including hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, and common seal *Phoca vitulnia*. Habitats within the survey area, including areas of woodland, hedgerow, semi-improved grassland, arable land, and coastal area offer suitable foraging and sheltering habitat for these species.

Breeding Birds

19.2.53. The desk study returned 147 species of bird within the study area. Eighty-eight of these species are listed under Schedule 1 of the Wildlife and Countryside Act 1981, including amongst others: little ringed plover *Charadrius dubius*, osprey *Pandion haliaetus*, common crossbill *Loxia curvirostra*, Dartford warbler *Sylvia undata*, firecrest *Regulus ignicapilla*, kingfisher *Alcedo atthis*, hobby *Falco subbuteo*, barn owl *Tyto alba*, red kite *Milvus milvus*, bittern *Botaurus stellaris*, woodlark *Lullula arborea*. Thirteen of the 147 species are listed as Priority Speciesin accordance with Section 41 of the NERC and five of which are listed under Schedule1 of the Wildlife and Countryside Act 1981 (as amended). Records of tawny owl *Strix aluco*, barn owl, kestrel *Falco tinnunculus* and little owl *Athene noctua* were found in areas around the landfall and Fort Cumberland.

19.2.54. Habitats within the survey area, including woodland, scrub, hedgerow and coastal habitats are likely to support a range of breeding birds, including those listed on Schedule 1 of the WCA and Priority Species. In addition, the

residential areas which support buildings and gardens are likely to support breeding birds which have become habituated to the shelter and foraging opportunities provided by suburban environments.

19.2.55. Breeding bird surveys were undertaken around Fort Cumberland SINC and Eastney Beach, during 2018. Black redstart *Phoenicurus ochruros* was confirmed as breeding at Fraser Range. Species recorded during surveys included linnet, house sparrow, black-headed gull *Chroicocephalus ridibundis*, common gull *Larus canus,* common sandpiper *Actitis hypoleucos*, curlew *Numenius arquata*, herring gull *Larus argentatus*, swallow and swift.

Wintering and Passage Birds

19.2.56. Coastal areas including intertidal mudflats, marsh habitats and high tide roosts sites, which can be shingle, marsh or even inland fields, present important habitats for wintering bird assemblages associated with the neighbouring SPA and Ramsar sites. These species include species such as black-tailed godwit, dark-bellied Brent goose, dunlin, red-breasted merganser, oyster catcher *Haematopus ostralegus*, redshank *Tringa totanus* and curlew *Numenius arquata*.

19.2.57. Six wintering bird survey visits were completed between October 2017 and March 2018. These included vantage point surveys and walked transects to include some Brent Goose Strategy Sites. A total of 86 species were recorded on or over the Site during the wintering bird survey. Of these species, a high number are legally protected or species of conservation concern, including 11 Schedule 1 species, 11 Species of Principal Importance (SPI) under the NERC, 12 Birds of Conservation Concern (BoCC) red list species and 30 BoCC amber list species.

Reptiles

19.2.58. The desk study returned records of two reptile species within the study area: common lizard *Zootoca vivipara* (nine records) and slow-worm *Anguis fragilis* (eight records). Habitats within the survey area, including tussock grassland and scattered scrubs in the Southsea beach, woodland and dense scrub west of the junction of the A3 with the B2177, the golf course north-east of the junction offer suitable habitat for common species of reptiles. Grassland fields and associated margins northeast of the B2150 present habitats suitable to support reptile species.

Great Crested Newt

19.2.59. The desk study returned four records of great crested newt *Triturus cristatus* within the study area; the most recent record is from 2015 in the Purbrook area.

19.2.60. Water bodies (ponds) were identified within 250m of the Proposed Development. These were subject to Habitat Suitability Index study, and six were tested for eDNA during 2017 and 2018, with five returned positive and

one negative. The three lakes on Milton Common and Great Salterns Lake were not tested due to the perimeter not being considered safe to access and them likely being saline, due to coastal location. King's Pond at Denmead was desiccated when visited in 2018, with other water bodies identified scoped out.

Other Amphibians

19.2.61. The desk study returned three records of common toad *Bufo bufo*. This species is listed as Priority Species in accordance with Section 41 of the NERC. Habitats within the survey area, including woodland, scrub, semi-improved grassland and coastal habitats are likely to support common toads.

Invertebrates

19.2.62. The desk study returned a large number of invertebrate records, including records of species which are listed on Section 41 of the NERC. Habitats within the survey area, including woodland, scrub, semi-improved grassland and inter-tidal habitats, are likely to support invertebrates, including notable species such as stag beetle *Lucanus cervus.*

19.3 SCOPE OF ASSESSMENT

PROPOSED CONVERTER STATION

Designated Sites

19.3.1. Based on the proposed converter station option locations, it is understood that the following SINCs are likely to be affected by the Proposed Development through disturbance, hydrological change, pollution effects or direct land-take:

- Crabdens Copse and Crabdens Row SINC: The proposed converter station and associated works have potential to be located in close proximity to these sites, which surround the National Grid Substation.

19.3.2. These SINCs partly overlap with areas of Ancient Woodland, which are within proximity to the proposed converter station: Stoneacre Copse, Crabdens Copse and Crabdens Row. Current Natural England guidelines are that a buffer of at least 15m should be retained (depending on the size of the development).

Habitats

19.3.3. Habitats identified as HPI in accordance with Section 41 of the NERC have been identified in proximity to the proposed converter station. Under Section 40 of this legislation, every public body (including planning authorities) must, 'in exercising its functions, have regard so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'.

19.3.4. Lowland Mixed Deciduous Woodland habitats surround the existing National Grid Sub-station. The proposed converter station site should seek to avoid these habitats and retain a c.15-30m buffer from the boundary of any development.

Bats

19.3.5. Construction activities, if undertaken at night, may affect bats foraging and commuting within and adjacent to the survey area. This is most likely within the vicinity of hedgerows, areas of woodland adjacent to the scheme.

19.3.6. Where the proposed converter station will be constructed, hedgerows, scrub and woodland might be damaged or removed for the purpose of the works. These may support suitable habitats for foraging and commuting bats, which would result in potential disturbance, fragmentation and severance effects.

19.3.7. There are a number of trees within the Proposed Development which may be damaged or require removal during construction. These trees may be suitable for supporting roosting bats.

19.3.8. Bat activity surveys have been undertaken to identify commuting routes and foraging areas where hedgerows, scrub and woodlands may be damaged or removed during the construction of the proposed converter station, within the proposed permanent work areas.

19.3.9. A survey to identify Potential Roost Features (PRFs) has been undertaken for trees which may be removed, damaged or disturbed during construction of the Proposed Development. Emergence and return to roost surveys have been undertaken for trees possibly affected within the footprint of Option B. When the route and converter station are confirmed, further assessment and surveys will be carried out as necessary.

Badger

19.3.10. Where the proposed converter station will be constructed, suitable habitats for badger setts may be affected. The presence of workers and work activity may also discourage badger from moving through the area, particularly if works are undertaken at night.

19.3.11. A badger survey has been undertaken in these areas and based on the results of this survey, appropriate mitigation for badger will be designed.

Hazel Dormouse

19.3.12. The hedgerow, woodland, and scrub habitat within proximity to the proposed converter station may support hazel dormice. Land-take and vegetation removal north of the scheme required to facilitate the construction may affect these habitats and dormice if supported within them. Surveys to confirm presence or likely absence of dormice in areas where hedgerows, scrub or

woodland will be affected or severed were undertaken in 2017, with further surveys currently underway. Based on the results of this survey, appropriate mitigation for dormouse will be designed and the need for any licensing will be identified.

Breeding and Wintering Birds

19.3.13. Habitats surrounding the proposed converter station may support breeding birds, including areas of woodland, scrub and hedgerow. Breeding birds may be affected by vegetation removal during construction, if undertaken during the bird breeding season (generally between March and July).

19.3.14. Breeding bird surveys have been undertaken around the proposed converter station and suitable mitigation will be designed.

Reptiles

19.3.15. Where the Proposed Development affects areas of rough grassland and edge habitats suitable to support reptile species, controls to safeguard the species are likely to result in a temporary displacement effect.

19.4 SCOPE OF ASSESSMENT

CABLE ROUTE AND LANDFALL

Designated Sites

19.4.1. The Habitats Regulations provide strict protection to sites of European and/or international importance. This includes requiring projects or plans to be screened for likely significant effects upon SPA, SAC and candidate SACs (cSACs). Guidance also requires potential SPAs (pSPAs) and Ramsar sites are subject to the same assessment. Therefore, due to the presence of Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar and Solent and Dorset Coast SPA, an HRA Report will be undertaken and submitted with the application for the DCO to provide the information required to provide the competent authority with such information as may reasonably be required 'for the purposes of the assessment of the implications on for a site in view of its conservation objectives or to enable them to determine whether an appropriate assessment is required..

19.4.2. The HRA will be prepared with due consideration given to the information provided in PINS advice note ten on 'Habitat Regulations Assessment relevant to nationally significant infrastructure projects' version 8 published November 2017 (PINS, 2017b). The advice note sets out the approach that should be taken to HRA in applications for NSIPs.

19.4.3. The Solent Waders and Brent Goose Strategy and designated sites will be considered as part of the HRA. This is due to '*any impact on a wader roost or Brent Goose feeding site outside of the SPA/Ramsar site boundaries may be*

considered to have an effect on the international site itself. Where impacts cannot be avoided or satisfactorily reduced/mitigated, the competent authority will need to ascertain that the plan or project will not have a negative impact on the designated populations, which would constitute an adverse effect on the integrity of the international site.'(Natural England, 2014)

19.4.4. Based on the current design and indicative areas required for construction, it is understood that the following SINCs are likely to be affected by the Proposed Development through disturbance, hydrological change, pollution effects or direct land-take:

- Eastney Beach SINC: the cable route will make landfall through this site;
- Land West of Fort Cumberland SINC: Transition Joint Bay is currently located within this area;
- Melville Road Verge SINC and Road Verge of Ecological Importance (RVEI): Cable route following Fort Cumberland Road is connected to Melville Road to the south;
- Milton Common SINC: There are currently three possible proposed cable routes through this SINC;
- Great Salterns Lake SINC, Golf Course North of Burrfields Road SINC, Hilsea Lines SINC: One possible cable route runs immediately adjacent to these sites along Eastern Road;
- Farlington Avenue SINC and RVEI, Meadow West of Farlington Avenue SINC: The cable route is located immediately adjacent to these sites on Farlington Avenue;
- London Road Fen SINC: A small section of the SINC is located immediately adjacent to London Road, along which the cable route is located;
- Kings Pond Meadow SINC: Where the cable route diverts off Hambledon and intersects fields before crossing this site east of Denmead. The current status of the other meadows within this block is unknown and could be affected by the cable route; and

19.4.5. SINCs are generally designated and managed by the County Councils on behalf of a Biodiversity Partnerships including The Wildlife Trusts. Botanical surveys of the SINCs potentially affected have been carried out in 2017 and 2018. This study has enabled the conservation value to each site to be assessed, so that appropriate mitigation can be designed once a route is confirmed. The study has included:

- Habitat types affected and their conservation status;
- Species likely to be affected and their conservation status;
- Ecological connectivity and landscape context of the site; and
- Mitigation strategy and recommendations.

19.4.6. Milton Common SINC, has the greatest potential for impact, as there are currently three options which would involve trenching through the site. The citation for Milton Common lists:

- Grasslands which have become impoverished through inappropriate management but which retain sufficient elements of relic unimproved grassland to enable recovery;
- Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands;
- Fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions;
- Sites which support one or more notable species. Notable species incudes: Yellow Vetchling *Lathyrus aphaca*; Toothed Medick *Medicago polymorpha*; Slender Hair's Ear *Bupleurum tenuissimum* and Purple Small-Reed *Calamagrostis canescens*; and
- Sites of nature conservation interest which occur in areas otherwise deficient in such interest, and/or are known to be of particularly high value to local communities e.g. community wildlife sites.

19.4.7. Any works carried out on Milton Common would be temporary and localised and turf would be lifted and replaced as appropriate.

19.4.8. Surveys have been undertaken of the meadows at Denmead including Kings Pond Meadow SINC during August 2018. The southern fields had been cut and baled, the northern fields had been heavily horse grazed. Further surveys are planned for May 2019, to inform assessment of this area.

19.4.9. No negative effects are envisaged on all other designated sites identified in the study area.

Habitats

19.4.10. Habitats identified as HPI in accordance with Section 41 of the NERC have been identified within the study area. Under Section 40 of this legislation, every

public body (including planning authorities) must, *'in exercising its functions, have regard so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'.*

19.4.11. The landfall may directly affect areas of Coastal Vegetated Shingle HPI. Coastal vegetated shingle habitats are extremely fragile and excavation and construction access is likely to degrade the site through loss of vegetation and incorrect reinstatement and management, resulting in lack of regeneration. The impacts on this habitat resulting from the landfall will need to be further investigated once construction measures are known and the precise location is identified. Any landfall design should avoid/minimise direct effects on this habitat and any work in this area should be carried out under an appropriate method statement, which should be informed by a detailed survey of the area.

19.4.12. One of the options for the Cable Route directly affects areas of lowland meadow, north of the B2150. Part of this habitat is also a SINC (Kings Pond Meadow SINC), with the status of the remaining area, currently unknown.

Brent Goose Strategy Sites

19.4.13. Current options for the cable route include Brent Goose Strategy Sites, including Bransbury Park, the University Playing Fields and Farlington Playing Fields. The works would involve trenching or be the start and end locations for HDD. The works in these locations are planned to be undertaken during summer months, ensuring that that there would be no impact on the over wintering Brent goose population.

Allotments

19.4.14. The Allotments to the south of Milton Common and the University playing fields are currently being considered for a possible route for the cable. This location is thought to be of little ecological interest, with the potential for common reptiles to be present in small numbers.

Bats

19.4.15. A survey to identify PRFs has been undertaken for trees which may be removed, damaged or disturbed during construction of the Proposed Development at the meadows of Denmead. Further assessment and surveys will be carried out as necessary, when the cable route is confirmed.

Badger

19.4.16. Where works are focused within the existing highway areas, it is not likely that badger setts will be found or disturbed. No signs of badger were found at the meadows at Denmead or other areas along the proposed route. Further surveys will be undertaken as necessary, when the cable route is confirmed.

Otter

19.4.17. Otter may be present within the vicinity of the coastal area along the A2030 and the Farlington marshes. Works within the vicinity of these areas could disturb otters if a holt is present within the near vicinity of works. The presence of workers and work activity may also discourage otter from moving through the area, particularly if works are undertaken at night. It is however understood that the cable route will avoid any effects to these habitats through directional drilling. Should the route deviate from these proposals, otter surveys may be required.

Water vole

19.4.18. Water vole may be present within the vicinity of the unnamed watercourse north of the B2150 crossed by the scheme, and the vicinity of the Farlington marshes. Works within the vicinity of the Farlington marshes will be on roads and is not likely to disturb water vole and /or damage their burrows. However, where works cross the unnamed watercourse, water voles could be disturbed and displaced if burrows are present within the near vicinity of works.

Hazel dormouse

19.4.19. The hedgerows at the meadows at Denmead may support hazel dormice. The proposed route and vegetation removal has not yet been confirmed in this area. Further surveys will be undertaken as necessary with appropriate mitigation for hazel dormouse designed and the need for any licensing will be identified.

Breeding Birds

19.4.20. A large proportion of the cable route may support breeding birds, including areas of woodland, scrub, hedgerow, coastal areas and residential areas. Breeding birds may be affected by vegetation removal during construction, if undertaken during the bird breeding season (generally between March and July).

19.4.21. Construction adjacent to intertidal areas and surrounding SPA and Ramsar sites may give rise to disturbance effects on nesting birds such as common tern, little tern, Mediterranean gull, roseate tern and sandwich tern.

19.4.22. To assess the likelihood of disturbance, resulting from construction, of nesting bird species associated with European designated sites, screening for HRA will be undertaken.

Wintering and Passage Birds

19.4.23. During the non-breeding season, the main impacts of construction is disturbance to birds resulting in the interruption of foraging and, to a lesser extent, roosting. The extent to which disturbance affects the actual distribution

of birds within a site will vary according to the species involved, the availability of other resources and the birds. There are a number of SPA and Ramsar sites adjacent to the Proposed Development where their qualifying features comprise the assemblage of wading and wintering birds present. Furthermore, a number of suitable fields exist across the proposed cable route suitable to support roosting, loafing and foraging during high-tide.

19.4.24. Winter bird surveys were undertaken in 2017-2018 to include the landfall, the cable route where SPA, Ramsar sites and intertidal habitats are in close proximity, and identify potential high-tide roosting areas in close proximity to the scheme where disturbance during construction may arise.

Reptiles

19.4.25. Habitats along the cable route, including tussock grassland and scattered scrubs, woodland and dense scrub offer suitable habitat for common species of reptiles.

19.4.26. Where the Proposed Development affects areas of rough grassland and edge habitats suitable to support reptile species, controls to safeguard the species are likely to result in a temporary displacement effect.

Great crested newt

19.4.27. Great crested newts may be present within suitable terrestrial habitat within 250m of a breeding pond. For all parts of the Proposed Development where an offence is likely, a Habitat Suitability Index Survey and eDNA survey for associated ponds within 250m have been undertaken and will be further assessed as part of the EIA.

Invertebrates

19.4.28. Notable terrestrial invertebrate species are likely to occur in HPI areas whilst notable macroinvertebrate species are likely to be present in intertidal habitats. Given the temporary nature of construction at the landfall and cable route, it is unlikely that the conservation status of invertebrate species will be affected. Furthermore, it is understood that that the cable route is largely to remain within the existing road, thereby avoiding impacts on SPIs and notable invertebrate species. Where this is not the case, further survey work may be required to inform an appropriate mitigation strategy.

Arboriculture

19.4.29. The assessment will provide details of a desk based study highlighting any statutory and non-statutory considerations in relation to trees within the study areas and to provide a plan showing their locations. This plan will also show trees as recorded during a tree survey which in the case of the proposed converter station has been carried out in accordance with BS 5837. The remainder of the cable route and landfall will be the subject of a desk based

assessment and site constraints survey which will be undertaken in September and October 2017.

19.4.30. The study area is defined as all land up to 15m beyond the site boundary. This has been identified as the maximum area within which trees may be directly influenced by the Proposed Development and accounts for the Root Protection Area (RPA) associated with any trees located outside of the site.

19.5 ASSESSMENT METHODOLOGY

19.5.1. Survey methodologies have been carried out and will continue to be in accordance with current good practice guidelines as detailed by CIEEM (2018a).

19.5.2. Screening for HRA will be carried out to identify potential Likely Significant Effects on European Sites. The Stage 1 Screening Assessment will be undertaken in accordance with the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Natura 2000 sites include SPAs and SACs as well as cSACs, pSACs and Sites of Community Importance (SCIs) which have been adopted by the EC, but not yet formally designated by the government of Member State. In the UK it is a matter of policy that Ramsar sites are also considered by an assessment when a plan/project could result in likely significant effects upon a site.

19.5.3. The HRA will be prepared with due consideration given to the information provided in the PINS advice note ten on 'Habitat Regulations Assessment relevant to nationally significant infrastructure projects' (PINS, 2017b). The advice note sets out the approach that should be taken to HRA in applications for NSIPs.

19.5.4. The methodology for the Ecological Impact Assessment will follow guidance issued by the CIEEM (2018b).

19.5.5. The assessment for potential effects will fulfil the following stages as necessary in respect of the Proposed Development:

- Determine the importance of ecological features affected, through survey and/or research;
- Assess impacts potentially affecting important features;
- Characterise the impacts by describing their extent, magnitude, duration, reversibility, timing and frequency;
- Identify cumulative impacts;
- Identify significant effects of impacts in the absence of any mitigation;

- Incorporate measures to avoid and mitigate (reduce) these impacts;
- Assess the significance of any residual effects after mitigation;
- Identify appropriate compensation measures to offset significant residual effects; and
- Identify opportunities for ecological enhancement.

19.5.6. An arboriculture desk studies will be undertaken to identify the presence or otherwise of any statutory controls or other designations which may have relevance to trees within the study area. The following information sources will be used:

- East Hampshire District Council;
- Portsmouth City Council;
- Forestry Commission – Chalara (*Hymenoscyphus fraxineus*);
- Natural England Magic Maps; and
- Woodland Trust – Ancient Tree Hunt Interactive Map.

19.5.7. There are further arboricultural surveys to be undertaken. Where not already undertaken, the tree survey will be carried out in accordance with BS 5837 and categorised in accordance with BS 5837.

19.5.8. Hedges will be recorded where they formed distinct visual features.

19.5.9. In all instances the trees will be inspected using the Visual Tree Assessment methodology as purported by Mattheck and Breoler (Mattheck & Breloer, 2006). The tree survey will be carried out from ground level only. No tissue samples will be taken and in all instances no internal investigation of the subject trees are undertaken. Tree heights will be estimated to the nearest 1 with their canopies estimated and average spread recorded.

19.5.10. Stem diameters are measured in accordance with Annex C of BS 5837. Root Protection Areas are calculated as an area equivalent to a circle with a radius 12 times the stem diameter.

19.5.11. To allow the assessment of trees on site to be completed in a practicable way and to best reflect the tree population on site, where trees form groups either aerodynamically, through mutual support or by forming a screen or other such feature they are recorded as such.

20. SOILS AND LAND USE

20.1 SCOPING OPINION AND CONSULTATION

20.1.1. Comments from the LPA Scoping Opinion relating to soils and land use are summarised in Table E3 and Table E4 of Appendix E

20.2 BASELINE

PROPOSED CONVERTER STATION

20.2.1. The key feature of national policies regarding the use of agricultural land is the importance of safeguarding finite natural resources in the long-term national interest. For this reason, policies governing development within the countryside give a certain level of protection to 'best and most versatile (BMV) agricultural land'. This is land defined as Grades 1, 2 and 3a in the Agricultural Land Classification (ALC) system. Agricultural land affected by the Proposed Development is confined to the site of the proposed converter station. Provisional ALC mapping published at an original scale of One Inch to One Mile (1:63,360) shows the agricultural land affected by the scheme to be of undifferentiated Grade 3 quality.

20.2.2. Topography at the locations of Site Option A has a gentle downward slope from north to south, from around 80m to 70m AOD. Site Option B occupies a gentle to moderate slope, with altitude falling from around 90m to 80m AOD.

20.2.3. Published soil association mapping shows the Carstens association to be mapped at the proposed converter station site. These soils are characterised by fine silty over clayey, clayey or fine silty soils, which are often very flinty. Although clayey in subsoil horizons they are rarely waterlogged and often of WC I.

20.2.4. Detailed ALC data available in the vicinity of the proposed converter station sites within the same mapped soil type shows agricultural land quality to vary from Subgrade 3a to Grade 4.

20.2.5. There are three farm holdings close to the proposed converter station sites. Millfield Farm is located to the west, Little Denmead Farm to the south and Broadway Farm House and Barns to the east.

20.2.6. Site Option A sites the proposed converter station approximately 450m to the south of the current National Grid substation, within a large arable field.

20.2.7. Site Option B sites the proposed converter station approximately 103m to the west of the substation site, within some permanent pasture fields, and could potentially remove approximately 110m of hedgerow.

CABLE ROUTE AND LANDFALL

20.2.8. The proposed landfall would not involve the loss of any agricultural land or resources. The cable route mainly follows existing highways and would not involve the loss of agricultural resources, following the A288, A2030, B2177 and A3 towards the proposed converter station and substation at Lovedean.

20.2.9. Most of the cable route would be on non-agricultural land, with the section between Horndean to the proposed converter station at Lovedean shown as undifferentiated Grade 3 land on the Provisional ALC map.

20.3 SCOPE OF ASSESSMENT

20.3.1. Impacts on agricultural land quality, soil resources and local farm businesses could occur during the construction stage of the Proposed Development.

20.3.2. The proposed scope of the assessment will include the establishment of baseline conditions for each receptor, the impact of the Proposed Development on the receptor and the potential resultant effect.

20.3.3. Receptors taken into consideration during the construction stage of the Proposed Development will include BMV agricultural land, soil resources and farm holdings. Potential impacts of the Proposed Development may include the loss of BMV agricultural land; the loss of, or damage to, the soil resources and the impact on the viability of the farm holdings.

20.4 ASSESSMENT METHODOLOGY

20.4.1. There is an established methodology for classifying the quality of agricultural land within England and Wales. The methodology is contained within guidance issued by the former Ministry for Agriculture, Fisheries and Food (MAFF) in 1988. All agricultural land in England and Wales is graded from 1 to 5, dependent on the extent to which physical or chemical characteristics of the soil impose long-term limitations on the agricultural use of the land.

20.4.2. Grade 1 land is considered excellent quality agricultural land with either no, or very minor limitations on its agricultural use. Grade 5 is considered to be very poor quality land, with severe limitations due to adverse soil, relief, climate or a combination of these factors. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land).

20.4.3. There is no existing detailed ALC survey data available for the agricultural land affected by the Proposed Development. A detailed ALC survey will be required in order to establish baseline conditions. An ALC survey will involve an interpretation of published geographical, topographical, soil and agro-climatic information in light of the ALC guidelines. This will be followed by a site survey examining soil profiles using hand-held augers and spades. Soil samples may be taken for laboratory analysis. The soil characteristics will then be described

and analysed in accordance with the MAFF guidelines to determine the agricultural land quality.

20.4.4. Information on the existing agricultural use and circumstances of the sites will be obtained primarily from the existing occupiers and owners. The information collected will include a description of the size, location and use of farm holdings. Also included will be the existing scale and nature of agricultural and non-agricultural enterprises based on farm holdings and their associated capital and labour inputs. By doing this an assessment can be made of potential impacts on farm viability and other farm businesses affected by the Proposed Development.

METHODOLOGY FOR DETERMINING SIGNIFICANCE

20.4.5. The significance of the effect of the Proposed Development on agricultural resources will be determined by combining the sensitivity of the receptor with the magnitude of the impact arising from the Proposed Development.

20.4.6. The sensitivity of agricultural land will be determined according to its quality within the ALC system. Grade 1 land is considered the most sensitive to change and Grade 5 land the least sensitive.

20.4.7. Sensitivity of the soil will be determined according to its texture and its propensity to damage from compaction and smearing. Heavy clay soils are the most sensitive to movement and handling, with light, sandy soils being the least sensitive.

20.4.8. The sensitivity of the farm holding will be determined according to the type and scale of the enterprise. Those enterprises that rely directly on key, fixed infrastructure or frequent movements between land and buildings, for example dairy farms, are the most sensitive to change and severance during the construction of the Proposed Development. Small farm holdings are also highly sensitive to change.

20.4.9. The magnitude of impact on agricultural land and soil resources will reflect the scale of the Proposed Development, and will have regard to existing consultation procedures with Natural England for the development of agricultural land. The magnitude of impact on the farm holding will primarily be reflected in the area of land that is not available to the farm during the construction of the Proposed Development and the degree of severance caused.

MITIGATION MEASURES

20.4.10. The ES will act to identify mitigation measures to conserve and reuse the soil resource on site in a sustainable manner; and any necessary measures to reduce any adverse impacts on farm holdings associated with the Proposed Development.

20.4.11. There is no universally applicable measure to mitigate against the direct loss of agricultural land as a result of development. However, effects on soil resources can be mitigated by implementing a soil resources plan, indicating the soil types affected; the most appropriate re-use strategy for the different types of soils and any proposed methods for the handling, storage and replacing of soils on site.

20.4.12. The aim of a soil resources plan is to re-use as much of the surplus soil on-site in a sustainable manner in a use appropriate to the soil's quality. This will be done in accordance with Defra's Construction Code of Practice for the Sustainable Use of Soils (Defra, 2011).

21. GROUND CONDITIONS

21.1 SCOPING OPINION AND CONSULTATION

21.1.1. Comments from the LPA Scoping Opinion relating to ground conditions are summarised in Table E3 and E4 in Appendix E.

21.2 BASELINE

21.2.1. The method for determining the baseline conditions will involve a review of publicly and commercially available and data from Envirocheck Reports, the Environment Agency, the British Geological Survey (BGS), Historic England, Natural England, and The Coal Authority.

21.2.2. The 'study area' will comprise the maximum physical extent of the cable route plus a buffer zone of 250m. This distance is referenced in best practice documents and is considered typical at the hazard identification stage of site assessment. This Report refers to the cable route, proposed converter station and the landfall site as the 'study area'. Specific differences between the proposed converter station location options are noted where applicable.

PROPOSED CONVERTER STATION SITE

Ground Conditions

Made Ground

21.2.3. BGS mapping indicates no areas of made ground in the study area for the proposed converter station, though it would be anticipated that areas of Made Ground could be present around the Lovedean substation, existing highways and disused pits.

Superficial Deposits

21.2.4. BGS 1:50,000 mapping indicates bedrock to be close to or at surface with some localised head deposits.

Bedrock

21.2.5. The study areas are within the 'Hampshire Basin' geological region.

21.2.6. BGS 1:50,000 mapping indicates bedrock to be close to or at surface with some localised Head Deposits.

Groundwater

21.2.7. The study area is underlain by a Principal Aquifer as designated by the Environment Agency and located within a Zone 1 Source Protection Zone (SPZ) for groundwater protection.

21.2.8. Historical chalk groundwater level data from the local area around the proposed converter stations sites appear to be at significant depth below ground level. This may be because groundwater levels may be supressed as a result of the cumulative drawdown effects of groundwater abstractions that define the local source protection zones.

Surface Water

21.2.9. No surface water features are located within the study area.

CABLE ROUTE AND LANDFALL

Ground Conditions

Made Ground

21.2.10. BGS mapping indicates a number of areas of made ground within the study area associated with infilled land with unknown fill, historical landfills accepting a variety of commercial and household waste.

21.2.11. There is the potential for made ground and worked ground to be present associated with all current and historical developments and the existing highway network including embankments and cuttings.

Superficial Deposits

21.2.12. BGS 1:50,000 scale mapping indicates superficial deposits to be present across the study area of the route predominantly in the southern half of the route. These include a mixture of Raised Marine Deposits, Beach and Tidal Flat Deposits, Storm Beach Deposits, River Terrace Deposits and Head Deposits and along the route.

Bedrock

21.2.13. BGS 1:50,000 scale mapping indicates that the study area is primarily underlain by a mixture of Bracklesham Group and Barton Group (Wittering Formation and Earnley Formation), Thames Group (London Clay, Bognor Sand Member, Portsmouth Sand Member and Whitecliff Sand Member), Lambeth Group and White Chalk Subgroup (Portsdown Chalk, Culver Chalk, Newhaven Chalk and Lewes Nodular Chalk).

Groundwater

21.2.14. The proposed route is directly underlain by Principal Aquifers, Secondary A Aquifers and unproductive soils/rocks as designated by the Environment Agency. The Principal Aquifer is generally found in the middle of the route and the very northern section although this is likely to underlie the Secondary A Aquifers. The northern area of the route is located within Source Protection Zones I and II for groundwater source protection relating to Lovedean pumping station Potable Water Supply.

21.2.15. Superficial deposits along the proposed route are classified as Secondary A Aquifers or Secondary (Undifferentiated) Aquifers.

Surface Water

21.2.16. The cable route crosses a number of 'main rivers' as well as a number of unnamed surface water receptors.

21.2.17. 'Main rivers' are usually larger rivers and streams for which the Environment Agency has powers to carry out maintenance, improvement or construction work to manage flood risk.

Designated Sites

21.2.18. The route does not traverse any designated site of geological importance.

POTENTIAL SOURCES OF CONTAMINATION

21.2.19. From a review of available data a number of potential contamination sources have been noted within the study area of the route and the proposed converter station location options. Across the study areas there is a mixture of urban (residential, commercial and industrial) and agricultural land. The potential sources of contamination which have been noted include current and historical landfills, infilled pits with unknown fill, active fuel filling stations, electrical substations, and a number of industrial areas. A detailed review of potential sources of contamination will be completed in the preliminary risk assessment.

21.3 SCOPE OF ASSESSMENT

21.3.1. The ground conditions assessment will cover the environmental topic areas of land contamination, mineral resources and sites of geological interest.

21.3.2. In this context, "land contamination" includes both soil and water contamination, i.e. releases to ground and surface water bodies. Wider issues of groundwater and surface water resources are contained within Chapter 22 of this Report.

21.3.3. The land quality section will interact with a number of other chapters within the ES including:

- Ecology (Chapter 19);
- Soils and Land Use (Chapter 20);
- Carbon and Climate Change (related to waste) (Chapter 30); and
- Water Resources and Flood Risk (Chapter 22).

LAND CONTAMINATION

21.3.4. Land and groundwater may have become contaminated through previous industrial or agricultural practices. Such land or groundwater could adversely affect people and the wider environment; including effects on groundwater quality, surface water quality and ecology.

21.3.5. The ES will assess the likelihood of existing contamination being encountered during the construction process, such that it could cause significant environmental harm or adverse health effects if not addressed adequately at the construction and/or operational stages.

21.3.6. There is an identified potential for contaminant linkages to exist within the study area relating to potentially contaminative current and historical land use and sensitive human health, controlled waters and built environment receptors. It is therefore recommended that a desk-based assessment is undertaken in accordance with Model Procedures for the Management of Land Contamination: Contaminated Land Report 11 (Environment Agency, 2004). The assessment should include a Preliminary Risk Assessment (PRA) and development of a preliminary conceptual site model and should seek to identify potentially significant effects and constraints relating to soil, geology, construction waste and land contamination.

21.3.7. Further assessment involving an intrusive ground investigation may be required if, after the completion of a PRA, a low confidence or high uncertainty remains with respect to the likelihood or significance of effects or constraints.

WASTE AND MATERIAL RESOURCES

21.3.8. Remediation of contamination can lead to a requirement for treatment and/or disposal of contaminated materials. Issues of onsite treatment and re-use of contaminated materials will be dealt with in the land quality assessment along with issues related to the disposal of contaminated soils off site.

GEOLOGICAL AND MINERAL FEATURES

21.3.9. Along the cable route of the Proposed Development there may also be areas of land that have special geological significance, either from a scientific, or mineral resources point of view, such as:

- Geological SSSI;
- Local Geological Sites (LGS);
- Regionally Important Geological Sites (RIGS); and

21.3.10. Currently permitted and proposed future mineral and resource extraction areas, which may be compromised or sterilised by the construction and operation of the proposed scheme.

OTHER POTENTIAL ISSUES

21.3.11. The proposed excavation invert depth for housing the converter station may be founded within putty chalk which would likely be of a low permeability. The proposed excavation (approximately 4-6ha) is expected to remain open for construction works for up to two years. The potential therefore exists that during the wetter period of the year, which is generally considered to be the winter months, sustained periods of rainfall and increased stormwater runoff will occur that could inundate the converter station excavation. The potential for this 'what-if scenario' will be considered as part of general engineering risk appreciation, buildability and environmental impact considerations. In broad terms the potential construction risks are:

- The excavation 'fills' or partially fills with water which would provide a challenge as to how to reduce the head of water within the excavation e.g. pumping out the water and the potential avenues for treating and discharging the water, which could be limited; and
- The resulting saturated putty chalk could be a challenge with respect to the design and construction of the platform formation level.

21.3.12. The potential operational risks of the converter station include the possibility that groundwater levels from the chalk beneath the converter station rebound in future years. This could for example have an effect on the skin friction of the piles used as load-bearing structures for the converter platform but will be considered as part of the 'what-if' engineering scenarios.

ASSESSMENT METHODOLOGY

21.3.13. A PRA will be undertaken to establish baseline conditions within the study area. This will comprise a desk-based review of all relevant information including historical mapping, any available ground investigation reports and a walkover survey to inspect the study area and obtain recent photography.

21.3.14. The information from the PRA will be used to assess the impacts associated with contaminated land by developing a conceptual site model (CSM). The

CSM will assess contamination linkages by determining all possible source, pathways and receptor within the study area.

21.3.15. The semi quantitative assessment within this topic area considers land quality from the perspective of land contamination. It excludes soils quality from an agricultural or forestry perspective. Such an assessment will be found in Chapter 20 (soils and land use) of this Report. Land contamination has the potential to affect groundwater resources. Wider issues of groundwater and surface water resources are contained within Section 12 (water resources and flood risk) of this Report. Land contamination has the potential to affect ecological resources. Other ecological issues are addressed in Chapter 19 of this Report.

SIGNIFICANCE CRITERIA

21.3.16. The likelihood must be demonstrated that there is an identifiable source of contamination (be it an onsite or offsite source), sensitive receptors and a viable pathway through which the former may affect the latter.

21.3.17. The sensitivity of potential receptors can be described qualitatively according to the categories shown in Table 21.1

Table 21.1 Criteria for assessing receptor sensitivity (based on the Design Manual for Roads and Bridges (DMRB), (Highways England, 2008))

Receptor Sensitivity/ Value of Resource	Receptor/Recourse[9]
High	Residential areas, schools and playing fields Surface water bodies of high quality and/or Principal aquifers Nationally designated areas e.g. SSSI Major strategic mineral resource areas Strategic underground storage space
Moderate	Retail and business parks (public and work places)

[9] Resource applies to both minerals and geological sites and is defined as a “mineral body including aggregates, salt, coal and other hydrocarbons and a site of local geological interest”

Receptor Sensitivity/ Value of Resource	Receptor/Recourse[9]
	Allotments and market gardens Surface water bodies of moderate quality, and/or Secondary A Aquifers Regionally designated areas e.g. local nature reserves or LGS Regionally or locally important mineral resource areas (MPA or MSA)
Low	Commercial or industrial development Mineral Areas of Search/ Consultation Areas (MCA) Secondary B and undifferentiated aquifers

21.3.18. Construction and/or maintenance workers are not included in the list of receptors, as it will be a fundamental requirement that any construction/maintenance workers on the Proposed Development are adequately protected from the effects of any contamination via project specific health and safety plans and procedures which will be put in place prior to the construction stage.

21.3.19. The magnitude of the effects of contaminated land is assessed by comparing the difference in risk of each contaminant linkage at baseline to those at construction and at post construction stages. This provides a way of assessing both the adverse and beneficial effects during construction and the post construction period.

21.3.20. The magnitude of potential proposed scheme impacts regarding land quality issues will be assessed using a four-point scale as shown in Table 21.2.

Table 21.2 Impacts magnitude criteria (based on DMRB (Highways England, 2008))

Impact Magnitude	Criteria	Examples
High	Results in loss of attribute and/or likely to cause exceedance of statutory objectives and/or breach of legislation	Likely significant human health impact[10],, contamination of a Principal aquifer, or loss or isolation of strategic mineral resource
Moderate	Results in impact on integrity of attribute/or loss of part of attribute, and/or possibly cause exceedance of statutory objectives and/or breach of legislation	Reduction in the value of a feature, moderate human health impact, loss or isolation of regional/local mineral resource
Low	Results in minor impacts on attribute	Measurable change in attribute, but of limited size/proportion
Negligible	Results in no change or impact on attribute	No significant loss in quality of feature/attribute

21.3.21. The assessment of significance is based on the magnitude of the impact and the importance or sensitivity of the receptors. Appropriate mitigation measures will be recommended in order to reduce/control any significant adverse effects on sensitive receptors.

21.3.22. Effects have the potential to be adverse, beneficial or neutral.

21.3.23. The significance of the effect will be affected by:

- The value of the resource;

[10] Defined in Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012) Section 4.1

- The sensitivity of the receptor;
- The strength and length of the pathway; and
- The size of the area affected.

21.3.24. Adverse and beneficial effects are further classified as being minor, moderate or major in significance, with only moderate or major significant effects being reported.

21.3.25. Table 21.3 summarises the criteria for assessing effect significance.

Table 21.3 Significance of effects criteria

Significance	Description
Major adverse	Considerable detrimental effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability/legislation/policy standards
Moderate adverse	Limited detrimental effect (by extent, duration or magnitude) that may be considered significant
Minor adverse	Slight, very short or highly localised detrimental effect
Neutral	No appreciable effect
Minor beneficial	Minor reduction in risk (slight, short or highly localised effect)
Moderate beneficial	Moderate reduction in risk
Major beneficial	Major reduction in risk

CONSTRUCTION EFFECTS

21.3.26. The impact of existing land contamination will predominantly occur during the construction stage. A fundamental requirement of the Proposed Development will be to carry out sufficient mitigation or remediation of contamination such that, following construction, there are no continuing significant adverse effects from the contamination during the operational stage of the Proposed Development.

OPERATIONAL EFFECTS

21.3.27. The major operational sources of contamination will be reviewed and appropriate mitigation measures proposed.

22. WATER RESOURCES AND FLOOD RISK

22.1 SCOPING OPINION AND CONSULTATION

22.1.1. Comments from the LPA Scoping Opinion relating to water resources and flood risk are summarised in Table E3 and Table E4 of Appendix E.

22.2 BASELINE

22.2.1. The study area will encompass surface water and groundwater features up to a minimum of 0.5km from the Proposed Development.

22.2.2. Information to inform the baseline conditions has been obtained through a review of:

- OS mapping;
- Online MAGIC mapping;
- Environment Agency's flood map for planning, surface water, groundwater and water abstractions;
- BGS online mapping; and
- The Groundwater Management Plan (GWMP) for Hampshire (dated October 2003).

22.2.3. The assessment will be undertaken following the principles of the DMRB Volume 11, Section 3, Part 10 (HD 45/09) and the TAG Unit A3 Environmental Impact Appraisal – Impacts on the Water Environment as those provide a good basis for assessing effects of developments on the water environment.

PROPOSED CONVERTER STATION

Surface Water Features

22.2.4. Review of OS mapping indicates that there are no surface water features located within 0.5km of the proposed converter station option sites. The nearest surface water feature is a pond located approximately 1.2km to the south east of the proposed converter station.

22.2.5. Review of the Environment Agency's water abstractions map indicates that there are no surface water abstraction licences located within the study area.

Groundwater Features

22.2.6. Review of the BGS mapping indicates that the proposed converter station sites are underlain by bedrock geology of the Tarrant Chalk Member comprising chalk.

22.2.7. Review of the Environment Agency's groundwater map indicates that the bedrock geology is classified as Principal Aquifer, described as layers of rock or drift deposits that have a high intergranular and/or fracture permeability. As a result, they usually provide a high level of water storage and may support water supply and/or river base flow on a strategic scale.

22.2.8. Review of BGS mapping indicates that superficial deposits located within the study area are clay, silt, sand and gravel.

22.2.9. Review of the Environment Agency's groundwater map indicates that the proposed converter station sites are located within an Inner Zone (Zone 1) groundwater SPZ. Inner Zone (Zone 1) is defined as the 50 day travel time from any point below the water table to the source; this zone has a minimum radius of 50m. SPZs are typically used to protect abstractions for public water supply. Certain land uses will be restricted in order to protect groundwater quality within the area.

22.2.10. Review of the Environment Agency's water abstractions map indicates that there is one groundwater abstraction licence, located approximately 550m to the east of the proposed converter station sites. The licence is for public water supply for Portsmouth Water Ltd with a maximum daily abstraction above 2,500m^3.

22.2.11. Review of BGS online data suggests that historic groundwater levels within the Tarrant Chalk Member are at significant depth. It is unknown at this stage the degree to which local groundwater levels could be supressed as a result of the cumulative drawdown impacts of groundwater abstraction supply wells that are in operation and define the source protections zones. The potential for groundwater level rebound if the supply wells were to cease operation is unknown at this stage.

22.2.12. In addition, a review of BGS online borehole records in the vicinity of the converter sites describes the Tarrant Chalk Member as soft white chalk with relatively widely spaced but large flint seams. There is a potential therefore that weathered chalk may be present in the form of what is often described as putty chalk within the excavation depth for the converter station.

Flooding

22.2.13. Review of the Environment Agency's Flood Map for Planning (Rivers and Sea) indicates that the proposed converter station sites arelocated in the low risk Flood Zone 1, where the risk of flooding from fluvial sources is less than 1 in 1000 (0.1%) in any year.

22.2.14. Review of the Environment Agency's Flood Risk from Surface Water map indicates that there is a very low risk of flooding from surface water sources at the proposed converter station sties. The map identifies a natural overland flow path which flows along the western edge of the existing substation, and in a south-western direction through Stoneacre Copse and onwards towards Denmead Farm. This is likely to be due to a local depression in topography where surface water can accumulate during or following heavy rainfall events.

22.2.15. The GWMP for Hampshire (HCC, 2013) identifies areas that are susceptible to groundwater flood emergence. The map provided in the report indicates that the proposed converter station sites are at a very low risk.

22.2.16. The Lead Local Flood Authority (LLFA), in this case HCC, and the Environment Agency will be consulted during the production of the PEIR and ES to identify any historic flood events within the study area.

CABLE ROUTE AND LANDFALL

22.2.17. For the purpose of this assessment the cable route has been divided into a northern section (Horndean to Purbrook) and a southern section (Farlington to the southern end of Portsea Island).

Surface Water Features

Northern Section

22.2.18. Review of OS mapping indicates that the cable route cross or are located within 0.5km of approximately four watercourses or land drains (focusing on the larger watercourses), and eight ponds in the northern section of the study area. This will be further refined in the EIA following consultation with the Environment Agency and LLFA.

22.2.19. Four of the watercourses identified within 0.5km of the proposed cable route are classified as main river and therefore under the jurisdiction of the Environment Agency. All of the other watercourses are classified as ordinary watercourses under the jurisdiction of HCC as LLFA. All of the surface water the features have no known designations, and the use quality and ecological value of these features is currently unclear. This will be further assessed in the ES.

22.2.20. Ecological and chemical quality of a number of the watercourses and tributaries within the study area is assessed by the Environment Agency in accordance with WFD objectives. The watercourses located near to Purbrook, Waterlooville and Lovedean are located within the Powell Trib catchment area. These watercourses have an overall score of 'Moderate', with a 'Moderate' ecological status and 'Good' chemical status.

22.2.21. Review of the Environment Agency's water abstractions map indicates that there is one medium sized abstraction licence from tidal water sources located

within the study area. The licence is used for industrial, commercial and public services.

Southern Section

22.2.22. Review of OS mapping indicates that the proposed cable route cross or are located within 0.5km of approximately six watercourses or land drains (this stage of assessment has focused on the larger watercourses), and nine ponds in the southern section of the study area. This will be further refined in the ES following consultation with the Environment Agency and LLFA.

22.2.23. Two of the watercourses identified within 0.5km of the proposed cable route are classified as main river and therefore under the jurisdiction of the EA. All of the other watercourses are classified as ordinary watercourses under the jurisdiction of HCC as LLFA. With the exception of the Broom Channel which discharges into the Langstone Channel, the features have no known designations, and the use quality and ecological value of these features is currently unclear. This will be further assessed in the ES.

22.2.24. Ecological and chemical quality of the Broom Channel, located to the south of Farlington Marshes, is assessed by the Environment Agency in accordance with WFD objectives. The Broom Channel is located within the Langstone Harbour catchment area. The overall status of the waterbody is 'Moderate', with a 'Moderate' ecological status and 'Good' chemical status.

22.2.25. The Broom Channel forms part of the Chichester and Langstone Harbours Ramsar Site, Langstone Harbour SSSI, Solent Maritime SAC and Chichester and Langstone Harbours SPA. The Langstone Harbour SSSI has been divided into 14 units by Natural England. Unit 3 'Langstone Harbour West' is located within the study area. Natural England undertook an assessment of this area in 2010, which determined this unit to be 'Unfavourable – Recovering'.

Entire Cable Route

22.2.26. All watercourses in the study area of the cable route drain to either the Langstone Harbour or the Portsmouth Harbour areas. The watercourses are part of the South East River Basin District.

22.2.27. Review of the Environment Agency's water abstractions map indicates that there are no surface water abstractions licences located within the study area.

GROUNDWATER FEATURES

Northern Section

22.2.28. Review of the BGS mapping indicates that the cable route is underlain by the following bedrock geology in the northern section of the study area, in horizontal seams from approximately north to south:

- Tarrant Chalk Member comprising chalk;
- Lambeth Group comprising clay, silt and sand;
- London Clay Formation comprising clay, silt and sand;
- Bognor Sand Member comprising sand;
- Wittering Formation comprising sand;
- Wittering Formation comprising sand, silt and clay; and
- Portsdown Chalk Formation comprising chalk.

22.2.29. Review of the Environment Agency's groundwater map indicates that the bedrock geology in the northern section of the cable route, located close to the proposed converter station and to the areas surrounding Farlington, Drayton and Anchorage Park, are classified as Principal Aquifer, described as layers of rock or drift deposits that have a high intergranular and/or fracture permeability. As a result, they usually provide a high level of water storage and may support water supply and/or river base flow on a strategic scale.

22.2.30. Review of BGS mapping indicates that superficial deposits within the study area are mostly clay, silt, sand and gravel in the northern section of the cable route.

22.2.31. Review of the Environment Agency's groundwater map indicates that the northern section of the proposed cable route is located within an Inner Zone (Zone 1) groundwater SPZ. Inner Zone (Zone 1) is defined in the proposed converter station site section above. The area below the Inner Zone (Zone 1), extending south to Purbrook, is located within an Inner Zone – Subsurface activity only SPZ. Inner Zone – Subsurface activity only extends the Zone 1 where the aquifer is confined and may be impacted by deep drilling activities.

22.2.32. The Environment Agency's groundwater map also indicates that the area immediately south of the Inner Zone (Zone 1) SPZ is located within an Outer Zone (Zone 2) SPZ. Outer Zone (Zone 2) is defined by a 400 day travel time from a point below the water table. This zone has a minimum radius of 250 or 500 metres around the source, depending on the size of the abstraction. Further consultation with the EA will be undertaken as part of the EIA.

22.2.33. Review of the Environment Agency's water abstractions map indicates that there is one groundwater abstraction licence located within the study area.

Southern Section

22.2.34. Review of the BGS mapping indicates that the cable route is underlain by the following bedrock geology in the southern section of the study area, in horizontal seams from approximately north to south:

- Spetisbury Chalk Member comprising chalk;
- Newhaven Chalk Formation comprising chalk;
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culvert Chalk Formation and Portsdown Chalk Formation (undifferentiated) comprising chalk;
- Lambeth Group comprising clay, silt and sand;
- London Clay Formation comprising clay, silt and sand;
- Bognor Sand Member comprising sand;
- Portsmouth Sand Member and Whitecliff Sand Member (Undifferentiated) comprising sand; and
- Wittering Formation comprising sand, silt and clay.

22.2.35. Review of BGS mapping indicates that to the south of the cable route the majority of superficial deposits are river terrace deposits consisting of sand, silt and clay. There are also areas of raised marine deposits consisting of sand and gravel and areas of tidal flat deposits consisting of clay, silt, sand and gravel.

22.2.36. Review of the Environment Agency's groundwater map indicates that the majority of the superficial deposits in the southern section of the study area are classified as Secondary A Aquifer. A section of the southern area is, and areas in the northern part of the study area are classified as Secondary (Undifferentiated) Aquifer.

Entire Cable Route

22.2.37. Review of the Environment Agency's groundwater map indicates that bedrock geology in areas located throughout the study area is classified as Secondary A Aquifer, described as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Flooding

Northern Section

22.2.38. Review of the Environment Agency's Flood Map for Planning (Rivers and Sea) indicates that the majority of the northern section of the cable route is located in the low risk Flood Zone 1, where the risk of flooding from fluvial sources is less than 1 in 1000 (0.1%) in any year. However, there are also sections located in the medium risk Flood Zone 2, where the risk of flooding from fluvial flooding is between 1 in 1000 (0.1%) and 1 in 100 (1%) in any year, and the high risk Flood Zone 3, where there is a greater than a 1 in 100 (1%) risk of fluvial flooding in any year. The identified fluvial flood risk is associated with the upper reaches and tributaries of the Wallington River.

22.2.39. The GWMP for Hampshire (HCC, 2013) identifies areas that are susceptible to groundwater flood emergence. The map provided in the report indicates that areas of the northern section of the cable route have up to a 50% susceptibility to groundwater flood emergence.

Southern Section

22.2.40. The Environment Agency's Flood Map for Planning (Rivers and Sea) indicates that the majority of the southern section of the cable route near to Anchorage Park, Farlington and the eastern side of Portsea Island is located in the high risk Flood Zone 3, with some areas located in the medium risk Flood Zone 2. Current assessment indicates that flooding is tidally dominated, however that may also be a fluvial flood risk contribution, this will be determined as part of the EIA.

22.2.41. The GWMP for Hampshire (HCC, 2013) identified the southern section of the proposed cable route is at a very low risk of susceptibility to groundwater flood emergence.

Entire Cable Route

22.2.42. Review of the Environment Agency's Flood Risk from Surface Water map indicates that sections of the cable route are at risk of flooding from surface water sources. In addition to overland flow routes, the Flood Risk from Surface Water map also indicates fluvial flood risk from watercourses with a catchment of less than c. 3km^2 that are too small to be mapped on the Environment Agency's Flood Map for Planning.

22.2.43. LLFA, in this case HCC, and the Environment Agency will be consulted during the EIA to identify any historic flood events within the study area.

22.3 SCOPE OF ASSESSMENT

22.3.1. The aspects of the water environment that will be considered within this section include the ecological, chemical and hydromorphological quality of surface

water features, flood risk, unsaturated zone and groundwater flow characteristics and groundwater quality in so far that groundwater may be affected by surface-borne pollutants.

22.3.2. Potential impacts to groundwater associated with impacts to groundwater quantity, groundwater flows and the release of contaminants contained in the ground will be assessed in the Ground Conditions chapter. Similarly, impacts on sensitive and/or important aquatic species and habitats, will be assessed in the Ecology chapter.

22.3.3. The study area will encompass surface water features up to a minimum of 0.5km from the Proposed Development. This distance is considered appropriate for the assessment of direct effects (i.e. associated with overland migration of pollutants directly to a surface features, pollutants conveyed in drainage systems, and works within the river channel). Features that are in hydraulic connectivity with the study area will also be considered, including surface water abstractions and downstream watercourses. Based on the professional judgement of the assessor and current knowledge of the area, features located up to a distance of approximately 1km from the Proposed Development will be considered. This distance is considered appropriate for the assessment of indirect effects, although if sensitive features located further than 1km from the Proposed Development are identified to be at risk, these features will also be considered within the assessment.

22.3.4. The study area will encompass groundwater features within approximately 0.5km of the Proposed Development and groundwater abstractions up to a minimum of 1km from the Proposed Development. This distance is considered appropriate for the assessment of surface-borne pollutants migrating to groundwater features.

22.4 ASSESSMENT METHODOLOGY

22.4.1. The assessment will be undertaken following the principles of the DMRB Volume 11, Section3, Part 10 (HD 45/09) and the TAG Unit A3 Environmental Impact Appraisal – Impacts on the Water Environment as those provide a good basis for assessing effects of schemes and developments on the water environment. The DMRB promotes the following approach:

- Estimation of the important of the attribute;
- Estimation of the magnitude of the impacts; and
- Assessment of the significance of the impact based on the importance of the attribute and magnitude of the impact.
- In summary, our proposed methodology is as follows:

- Review of international, national and local legislation, policies and guidelines in relation to water resources, water quality and flood risk. This shall include a review of the requirements of the WFD;
- Establish baseline conditions within the study area through review of desk based sources of information, literature review, site walkover and consultation with relevant authorities;
- Assessment of potential effects, development of mitigation and assessment of residual effects;
- Assessment of any impact to flood defences, most likely from within the tidal area (landfall);
- Consultation with the Environment Agency regarding identified flood risks and the potential effects to the main rivers associated with the cable route and landfall;
- Consultation with HCC regarding the potential effects to ordinary watercourses and the proposed management of surface water runoff; and
- Identify any opportunities for enhancement of water quality and water management.

22.4.2. In accordance with the principles of the DMRB, the assessment will consider the potential effects of surface water runoff and groundwater features, and impacts to flooding. In addition to the core aspects promoted within DMRB, the assessment of impacts to the water environment will also consider potential impacts to the hydromorphological quality of surface water features. This is likely to be associated with the timing and seasonality of the works. It is proposed that this assessment is qualitative and informed by desk based study, site walkover and consultation with the Ecology team. Consultation with the Environment Agency and LLFA will determine the most appropriate method associated with watercourse crossings.

22.4.3. A standalone Flood Risk Assessment (FRA) will be undertaken in accordance with NPPF to assess the potential implications of the Proposed Development on flood risk to people and property elsewhere, as well as assess the potential risk of flooding to the Proposed Development. It is proposed that the following aspects will be considered:

- Potential impacts to flood flow conveyance in watercourses crossed by the scheme for both temporary diversions and permanent amendments to water features;

- Potential impacts to the scheme from all sources of flooding, including fluvial, tidal, surface water, groundwater, drainage systems and artificial sources;

- Potential impacts of the scheme to people and property elsewhere; and

- Potential impacts to surface water flooding associated with a loss of permeable area within the proposed converter station site associated with the proposed surface water drainage system.

22.4.4. The FRA will consider the potential impact of climate change in accordance with current policy; expected increases in river flows, sea levels and rainfall wil therefore be taken into account e.g. sea level rise for the East of England of 1.21m to 2115 and an increase in rainfall intensity of 20% to 40%.

22.4.5. It is considered unlikely that hydraulic modelling, to inform the assessment of flood risk to the Proposed Development or elsewhere as a result of the scheme, will be required given the nature of the Proposed Development.

22.4.6. It is not proposed to undertake water quality sampling to inform the assessment of the impacts of the scheme on the quality of the water features nearby.

22.4.7. Separate WFD assessments will be undertaken for terrestrial elements (surface waterbodies and ground water) and marine elements (coastal waterbodies). It will be agreed in advance of undertaking assessments which WFD assessment will address transitional waters (estuaries).

23. HERITAGE AND ARCHAEOLOGY

23.1 SCOPING OPINION AND CONSULTATION

23.1.1. Comments from the LPA Scoping Opinions relating to heritage and archaeology are summarised in Table E3 and E4 of Appendix E.

23.2 BASELINE

PROPOSED CONVERTER STATION

Designated Heritage Assets

23.2.1. The proposed converter station will be located on land which does not contain any designated heritage assets, such as scheduled monuments or listed buildings.

23.2.2. A study area of 2km from the proposed converter station will be assessed for possible setting impacts, although the designated assets within this area will be filtered depending on a zone of ZTV prepared as part of the EIA. The 2km area defined for this Report contains 21 Grade II Listed buildings, 1 Grade II* Listed building and one conservation area (see Figure 23.1 attached). There are no world heritage sites, scheduled monuments or registered parks and gardens. The closest listed building is the Grade II listed 'Denmead Farmhouse', approximately 750m to the west of the proposed converter station.

Historic Environment Potential

23.2.3. The potential for possible, previously unrecorded archaeological remains, along with above ground remains such as earthworks and undesignated build heritage, will be considered in the EIA following the collation and review of a broad range of data sources (see below). This will assess the likely potential, nature, extent, survival and significance of any remains present, and will consider factors which may have compromised survival.

23.2.4. The Site is underlain by varying geology. To the north of Portsea Island, the cable route and the proposed converter station are underlain by Head Deposits and Chalk. The geology and the access to Portsmouth Bay and the coast suggest that the proposed converter station lies within an area that was conducive to early settlement and farming.

CABLE ROUTE AND LANDFALL

Designated Heritage Assets

23.2.5. The eastern edge of the landfall boundary falls within the constraint area of a Scheduled Monument. This is the late 19th century Fort Cumberland, an

angled bastioned fort on the south-west of Portsea Island. The scheduled constraint area encompasses the above-ground star-shaped fort itself (which is also a Grade II* listed building) and its immediate surroundings. Archaeological investigations at the fort in the past have recorded below ground evidence of the glacis (artificial slope), along with ramparts and ditches belonging to earlier phases of the fort.

23.2.6. The landfall boundary contains one listed building. In addition to Fort Cumberland, there are Second World War defences, in the form of anti-tank concrete blocks at Eastney beach (Grade II).

23.2.7. The cable route does not contain any nationally designated heritage assets. Within a 1km study corridor centred on the cable route (500m on either side of the route line) there are six scheduled monuments and 47 listed buildings (see attached Figures 23.2, 23.3 and 23.4). The scheduled monuments include the forts and perimeter defences at Eastney, Fort Cumberland, Eastney Sewage pumping station, Hillsea Lines, Fort Widley in Wymering and Fort Purbrook in Farlington. Four of the buildings are Grade II* listed (Fort Cumberland structures, Fort Widley and two at Fort Purbrook in Farlington). The cable route crosses the Eastney Barracks Conservation Area, as designated by Portsmouth City Council.

23.2.8. Note that in terms of possible setting impacts, these have been scoped out along the cable route and at landfall, as the cable would be laid entirely below ground. At the landfall no above ground structures are proposed.

23.2.9. HCC has mapped Archaeological Alert Areas within Portsmouth based on known sites of archaeological interest. The red alert areas (highest sensitivity) are based on scheduled monuments. The cable route intersects a number of 'yellow' alert areas, which refer to 'locally important monuments of known extent'. Whilst these do not present a planning constraint as such, they are used internally by HCC to flag sites for development control purposes. The 'alert' areas beyond Portsmouth Borough were not available for consultation for this Report; only those within Portsmouth Borough (the southern section of the cable route) have been considered in this Report. The cable route intersects the following 'yellow' areas:

- Eastney Point;
- Eastney Farm (Possible medieval manor and homestead);
- Portsmouth/Arundal Canal (Post-medieval Canal - subsequently infilled);
- Extent of Milton Manor;
- Salterns (or saltings; area of coastal intertidal mudflats used in the production of salt, shown on historic mapping); and

- Hilsea Lines (mid-19th century military inland defences).

Historic Environment Potential

23.2.10. The potential for possible, previously unrecorded archaeological remains, along with above ground remains such as earthworks and undesignated build heritage, will be considered in the ES following the collation and review of a broad range of data sources (see below). This will assess the likely potential, nature, extent, survival and significance of any remains present, and will consider factors which may have compromised survival.

23.2.11. The Proposed Development is underlain by varying geology. Much of the cable route is underlain by Head Deposits and Chalk. The southern part of the cable route comprises Sand and Gravels, London Clay, Alluvium and Brickearth. The coastal areas on higher ground (on gravel terraces) may have attracted prehistoric activity, especially the natural promontory at Eastney point. On the basis of the geology and the nearby watercourses and access to Portsmouth Bay and coast, it is likely that the cable route crossed a landscape conducive to early settlement and farming.

23.3 SCOPE OF ASSESSMENT

23.3.1. In terms of heritage and archaeology, the ES will comprise above ground and buried heritage assets, including archaeological and paleoenvironmental remains, buildings, structures, monuments and landscapes of heritage interest, within or immediately around the cable route including the landfall site, and the proposed converter station. This includes any temporary construction compounds and access roads. The setting of statutorily designated heritage assets in the vicinity of the proposed converter station, for example views to and from Listed Buildings will form part of the assessment. The specialist assessment would conform entirely to standards set by the Chartered Institute for Archaeologists (CIfA 2014a, 2014b) and other professional guidance (EH 2015).

LIKELY SIGNIFICANT EFFECTS

23.3.2. The likely significant environmental effects of the construction stage which will be considered in the EIA are as follows:

- Partial or complete loss to buried heritage assets, if present, where ground disturbance is proposed. This might include excavation of the cable trench, topsoil removal within the cable trench 'working width' and for temporary access roads and construction compounds. For the proposed converter station it may also include landscaping, earthworks, planting and building construction;

- Removal of sections of Historic Hedgerows. This assessment will be carried out in close liaison with the Ecology team, to avoid double counting of effects; and

- Temporary impacts on the setting of nearby designated heritage assets at the proposed converter station.

23.3.3. The likely significant environmental effects of the operational stage which will be considered in the ES are as follows:

- Permanent changes to the setting of above ground designated assets within the vicinity of the proposed converter station, due to the presence of permanent above ground structures. This will include consideration of cumulative effects (i.e. the impact of the Proposed Development with other Proposed Developments in the study area).

23.3.4. In terms of considering the setting of designated above ground heritage assets, the scope will include those assets that may be subject to a 'significant' change to their setting in accordance with the stepped approach set out in Historic England guidance on setting (Step 1). This takes into account: the nature and scale of Proposed Development; the fact that the greater the distance a heritage asset is from the Proposed Development, the more diminished the visual effects are likely to be; the location and position of intervening development, infrastructure, vegetation and landscape features; and the location and direction of key views likely to contribute meaningfully to a particular asset's significance. A ZTV will guide the selection of designated assets potentially affected and considered for assessment. There will also be some consideration of the heritage value (if any) of the exiting landscape.

INSIGNIFICANT EFFECTS

- Operational impacts to buried archaeological remains will not be considered on the basis that there would be no further ground disturbance following completion of the construction stage and no additional archaeological impact;

- The possible impact on the setting of above ground designated heritage assets will not be considered along the cable route and at the landfall on the basis that the works comprise only below ground disturbance. Consequently there would be no effects to the setting of heritage assets. This includes temporary construction stage impacts as these are unlikely to be significant considering the short duration of the construction stage; and

- Cumulative effects in relation to the cable route and landfall. Cumulative effects are 'elevated' effects which occur where the

combined effect of the Proposed Development with other Proposed Developments in the vicinity, on a discrete and significant shared asset/resource, is more severe than that reported along the cable route. This is on the basis that for intangible and deeply buried heritage assets it is not feasible to quantify accurately the nature of the resource across the whole study corridor, which would enable the identification of a cumulative impact and potential elevated effect, along with the localised nature of the impact proposed.

23.4 ASSESSMENT METHODOLOGY

23.4.1. The ES will consider both the cable route and the proposed converter station, to allow an integrated and holistic approach to the historic environment, as is best practice. It will set out the planning framework in respect of buried heritage assets (archaeological remains) and above ground heritage assets (structural remains of historic interest including the listed buildings, conservation area, and the scheduled monument) and their setting.

23.4.2. It can be difficult to predict accurately the presence and likely significance of buried assets that are not visible, and consequently the impact upon them, based primarily on desk based sources. The principal source of information is the Berkshire Historic Environmental Record (HER). The information provides an initial indication of assets present rather than a definitive list of all potential archaeological assets because the full extent of a buried heritage resource cannot be known prior to site-specific archaeological field investigation. Typically, appropriate standard archaeological evaluation techniques are utilised to reduce the uncertainties inherent in any desk-based assessment, as part of an overall mitigation strategy.

23.4.3. The assessment methodology would entail a standard process for EIA, and follows the process similar to that outlined in the DMRB (Highways England, 2008).

23.4.4. The heritage and archaeology assessment in the ES would be supported by a fully illustrated Historic Environment Desk Based Assessment (HEDBA). This would put the Proposed Development into its full archaeological and historical context by compiling a detailed baseline through a broad and standard range of data sources, as set out in Table 23.1.

Table 23.1 Data sources

Source	Data	Comment
Historic England	National Heritage List (NHL) with information on statutorily designated heritage assets	Statutory designations (scheduled monuments; statutorily listed buildings; registered parks and gardens; historic battlefields) can provide a significant constraint to development.
Portsmouth City Council	Portsmouth Historic Environment Record (HER)	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources
HCC	Hampshire Historic Environment Record (HER)	Primary repository of archaeological information. Includes information from past investigations, local knowledge, find spots, and documentary and cartographic sources
HCC	Archaeological Alert Areas	Areas marked out as having potential archaeological interest, managed by the LPA to flag potential sites.
Local Planning Authority	Archaeological priority area	Area of interest identified by the local authority. There is likely to be a requirement for archaeological investigation (initially a desk-based assessment) as part of any planning application.
Local Planning Authority	Conservation area	An area of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance.

Source	Data	Comment
BGS	Solid and drift geology digital map; online BGS geological borehole record data.	Subsurface deposition, including buried geology and topography, can provide an indication of potential for early human settlement, and potential depth of archaeological remains.
Landmark Envirocheck	Ordnance Survey maps from the 1st edition (1860–70s) to present day	Provides a good indication of past land use and impacts which may have compromised archaeological survival. Provides an indication of the possible date of any buildings on the Site.
Portsmouth Local Studies or Hampshire County Archives	Historic maps (eg Tithe, enclosure, estate), published journals and local history	Baseline information on the historic environment (historic mapping, references)
Historic England	Portsmouth Harbour Hinterland Project; Gosport Historic Characterisation Study; National Record for the Historic Environment (NRHE), via Pastscape website.	This recent study may hold information on specific heritage assets within the Site.
Historic England Archive, Swindon	Vertical and specialist (oblique) aerial photographs; the National Mapping Programme data (where available)	Cropmarks formed by moisture variations due to subsurface features can indicate the presence of archaeological remains. Aerial photographs can also sometimes provide information on ground disturbance.
Portable Antiquities	Online data on chance finds.	Where this information has not been incorporated into the HER, it will be reviewed in order to inform the baseline.

Source	Data	Comment
Scheme (PAS)		
WSP Environment Teams	Ecology (Historic Hedgerows and Ancient Woodland); Landscape and Visual (ZTV); Ground Investigation	There will be close liaison with other teams working on the Project to ensure a joined-up approach which shares information.
Client team	Existing site survey, geotechnical data	Assists in the appraisal of the likely nature and depth of archaeological remains and the extent of truncation.
Client team	Proposed Development drawings.	Assists in the assessment of the extent of the proposed impact upon known or possible archaeological remains.

STUDY AREA

23.4.5. In order to determine the full historic environmental potential of the site, a study area of 500m from the cable route would be examined as part of the EIA. If there are a large amount of results from the HER, i.e. enough to characterise the historic environment potential, this could be reduced to 250m. The size of the study area is based on professional judgement and has been selected in order to provide an understanding of the historic environment potential within the area, possible impacts on known and previously unrecorded archaeological remains, and inform mitigation.

23.4.6. For the assessment of impacts to the setting of designated heritage assets in the vicinity of the proposed converter station, a larger study area of 2km would be applied with assets within that study area filtered to a ZTV produced for the Proposed Development.

SITE INSPECTION

23.4.7. A site walkover inspection would be carried out at selected accessible locations along the cable route in order to determine the topography of the site and existing land use, and to provide further information on areas of possible past ground disturbance and general historic environment potential. A broader area around the proposed converter station would be inspected in order to assess possible setting impacts.

SITE-BASED INVESTIGATION AND MITIGATION

23.4.8. The mitigation strategy would depend on the results of the EIA. Considering the nature of the cable route and the localised impact proposed (i.e. within the cable trench and working width), differing levels of targeted archaeological watching brief are a likely recommendation.

23.4.9. Where particularly sensitive assets have been identified, or where the impact is more extensive (e.g. topsoil removal with construction compounds and for the proposed converter station), suitable mitigation will be applied in discussion with the LPAs.

23.4.10. In terms of the proposed converter station and possible setting impacts, mitigation normally takes the form of design mitigation (modification of location, materials, massing, screening) in consultation with the engineers, architects, the LPA Conservation Officer, and Historic England (where appropriate).

24. TRAFFIC AND TRANSPORT

24.1 SCOPING OPINION AND CONSULTATION

24.1.1. Comments from the LPA Scoping Opinion relating to traffic and transport are summarised in Table E3 and E4 of Appendix E.

24.2 BASELINE

PROPOSED CONVERTER STATION

24.2.1. The road network in the vicinity of the proposed converter station comprises mainly rural lanes handling low volumes of traffic. Site access is anticipated be from Broadway Lane, which is the existing access route to Lovedean substation.

Access to the Site

24.2.2. The key strategic route serving the area is the A3 (M) which connects London to Portsmouth. The closest access point from the A3 (M) (Junction 2) to the site is via:

- B2149 > A3 Portsmouth Road > Lovedean Lane > Day Lane > Broadway Lane.

24.2.3. This route is near the Milton Parade local shops at the junction of Milton Road / Lovedean Lane; and also lies within close proximity to Woodcroft Primary School. This route is marked as Route 1 in **Inset 5.1** below.

24.2.4. An alternative route exists via:

- Lovedean Lane > Downhouse Road > South Lane > Charlton Lane > A3.

24.2.5. This route follows a path on the outskirts of Clanfield and local shops on South Lane, via Clanfield Junior School, several local parks and a local football club. This is marked as Route 2 in Figure 24.1.

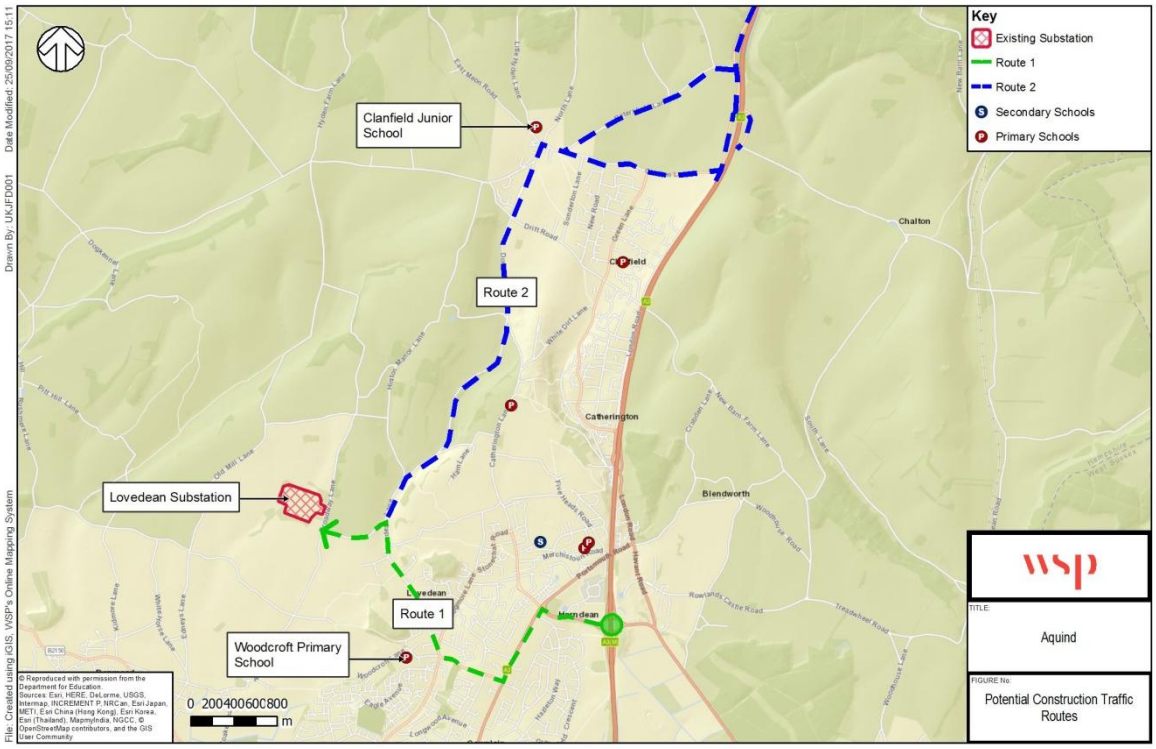


Figure 24.1 Potential traffic routes to the proposed converter station

CABLE ROUTE AND LANDFALL

24.2.6. Where possible, the cable route will be located within public highway network, making use of either the carriageway or footway / verges. The cable route and construction traffic access, running from the proposed converter station to landfall, includes the following main roads and streets:

- Anmore Road;
- Mill Road / Martin Avenue;
- B2155 Hambeldon Road;
- A3 Maurepas Way;
- A3 London Road;
- B2177 Portsdown Hill Road;
- Farlington Avenue;
- A2030 Eastern Road to the A27;

- Sywell Crescent / Anchorage Road;
- A2030 Eastern Road to Milton Common

24.2.7. From Milton Common, there are two possible route options towards landfall (see Table 24.1).

Table 24.1 Roads along the two cable route options in the Milton – Eastney areafrom the Eastern Road junction near Moorings Way

Option 1	Option 2
• Moorings Way; • Furze Lane; • Locksway Road; • Ironbridge Road / Kingsley Road or through the allotments; • Bransbury Park; • Bransbury Road; • Henderson Road / Halliday Crescent; and • Fort Cumberland Road / Melville Road.	• A2030 Eastern Road; • A2030 Velder Avenue; • A288 Milton Road; • A288 Eastney Road • Bransbury Road; • Henderson Road / Halliday Crescent; and. • Fort Cumberland Road / Melville Road

24.3 SCOPE OF ASSESSMENT

SENSITIVE RECEPTORS

24.3.1. The following sensitive receptors have been identified and will be considered within the ES:

Proposed Converter Station

- Motorised users of local roads, including vehicle drivers and public transport users; and

- Non-motorised users of local roads and PRoW, including pedestrians, cyclists and equestrians. Potential area which would be affected by construction traffic on the road network and in particular at the following junctions:
    - A3 London Road / Petersfield Lane / Chalton Lane junction interchange;
    - A3(M) / B2149 junction interchange (Junction 2);
    - B2149 / Lakesmere Road
    - B2149 / A3 Portsmouth Road / Catherington Lane;
    - Lovedean Lane / Milton Road / Woodcroft Lane (Milton Parade); and
    - Chalton Lane / E Meon Road (Clanfield Village).

Proposed Cable Route and Landfall

- Motorised users of local roads that form part of the cable route, including vehicle drivers and public transport users; and
- Non-motorised users of local roads that form part of the cable route and nearby PRoW, including pedestrians, cyclists and equestrians.

LIKELY SIGNIFICANT EFFECTS

24.3.2. Table 24.2 summarises the predicted effects of the construction of the proposed converter station which will be assessed in the ES.

Table 24.2 Likely significant effects of the converter station

Effect	Receptor	Development Stage
Nuisance and disruption, fear and intimidation, pedestrian and cyclist amenity impact to users of the local road network caused by construction traffic (including	Users of the local road network including vehicles, pedestrians, equestrians and cyclists.	Construction

heavy goods vehicles (HGVs)).		
Fear and intimidation, increased traffic delay, severance and road safety impacts on residents as a result of construction stage traffic (consisting of HGVs, Abnormal Loads, cars and LGVs) travelling to and from the Site.	Residents within the local area that live alongside construction traffic routes.	Construction

24.3.3. Table 24.3 summarises the predicted effects of the construction of the cable route and landfall which will be assessed in the ES.

Table 24.3 Likely significant effects of the cable route and landfall

Effect	Receptor	Development Stage
Fear and intimidation, increased traffic delay, severance, pedestrian and cyclist amenity and road safety impacts effect of road closures and traffic diversions during cable route construction.	Users of the local road network including vehicle, pedestrians, equestrians and cyclists.	Construction

24.4 ASSESSMENT METHODOLOGY

24.4.1. An overview of the methodology that will be used for the EIA presented below:

- Desk-study to identify the existing local and strategic road network and PRoW routes within the vicinity of the Proposed Development;

- Overall nuisance and disruption caused by construction traffic and construction activities on motorised and non-motorised users will be considered from information provided within a Transport Statement (document is dependent on size of development and scoping with the Local Authority). This will specifically consider the increases of traffic on the network study area during the construction stage and associated changes to motorised and non-motorised users in terms of severance, delay, safety, fear and driver stress; and

- The assessment will be in line with the principles outlined in:

    - DMRB Volume 11 Section 3 Part 8 and Part 9;

    - Guidelines for the Environmental Assessment of Road Traffic (IEMA, 2004);

    - Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993); and

    - Planning for the Future: a guide to working with Highways England on planning matters (Highways England, 2015).

24.4.2. Further detail regarding the assessment methodology is presented below. The EIA methodology will be subject to the agreement of the highway authorities impacted by the Proposed Development.

ASSESSMENT METHODOLOGY - HIGHWAYS NETWORK

24.4.3. This will include an assessment of the local traffic impacts of the Proposed Development. This is likely to consider the peak traffic movements anticipated during the construction stage; taking account of the proposed programme of works, the size of the anticipated peak workforce, the proposed working hours and peak HGV movements expected to be generated by the works.

24.4.4. Traffic may also be affected by traffic management along the cable route. Traffic management may include temporary lane or road closures which would require suitable diversions to be implemented. Consideration will be given to impacts on traffic movements and non-motorised users as a result of the proposed traffic management strategy

24.4.5. It is likely that the assessment will consider two peak network hours, in the morning and evening, taking account of the existing network conditions and the timing of anticipated construction traffic movements. Traffic surveys will inform the local network peak periods.

24.4.6. The assessment will focus on the local road network, which will provide access to the proposed converter station, the existing Lovedean substation, and the roads that form part of the cable route.

24.4.7. The potential network which would be affected by the Proposed Development includes the sensitive receptors listed in Section 24.3.

24.4.8. Further discussions are required with HCC, PCC, and Highways England to confirm the required scope of the Traffic and Transport assessment.

24.4.9. Traffic generation will be estimated based on the contractor's requirements for each area of work and labour types. The number of trip movements will be broken down whether they are linked to the construction of the proposed converter station or installation of the cable.

24.4.10. In terms of traffic distribution, the following methodology is proposed to assess the distribution of light and heavy goods vehicles and worker trips:

- Construction traffic will follow designated routes to the proposed converter station and cable sections. These routes are to be agreed with the local highway authorities; and
- Light vehicles, relating to staff will be distributed using a gravity model based on population centres.

24.4.11. The construction phasing will be confirmed within the ES although at this stage it is envisaged that the construction period of the proposed converter station will commence in 2021 and be completed in 2022.

ASSESSMENT METHODOLOGY - ROAD SAFETY

24.4.12. An analysis of Personal Injury Accident (PIA) data for the past five years will be conducted on the roads and streets along the proposed electric cable route and on the potential access routes to the proposed converter station. This analysis will identify clusters of accidents within the study area and an assessment of the impact of the Proposed Development on existing accident rates.

24.4.13. The exact extent of the network to be analysed will be confirmed with the local highway authorities.

ASSESSMENT METHODOLOGY - PUBLIC TRANSPORT NETWORK

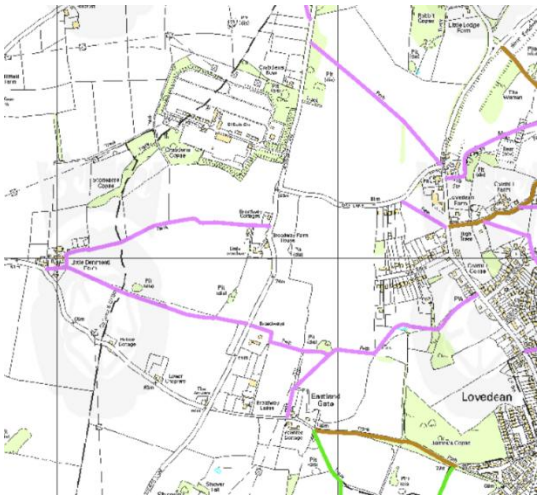
24.4.14. An audit of the existing public transport network in the study area will be undertaken. The impact of the Proposed Development and potential for workers to use public transport will be assessed. Any diversions or disruption caused by the cable route will also be assessed.

PEDESTRIAN AND CYCLE NETWORK

24.4.15. This will provide an assessment of the impacts of the Proposed Development on the pedestrian and cycle network. This will include impact on PRoW, walking, cycling infrastructure as well as equestrians' routes. Example sources of information are presented in Figure 24.2**.**

Portsmouth Cycle Map

Havant Borough Cycle Map



PRoW Map – Centred around Lovedean Substation

Figure 24.2 Non-Motorised users map (cycle map / PRoW Map)

MITIGATION

24.4.16. The Traffic and Transport ES chapter will provide details of proposed mitigation where appropriate. This is likely to include the following:

- Traffic Management Strategy – developed through analysis of impacts, construction and access requirements or diversionary impacts. This could potentially include improvements to the network to allow construction traffic to access the proposed converter station if required; and

- A Construction Traffic Management Plan (CTMP) – is likely to be required to mitigate the impact of the construction stage and associated traffic.

24.4.17. Further discussions regarding mitigation proposals will be required in order to ensure that they are acceptable solutions to the local highway authority or Highways England.

25. AIR QUALITY

25.1 SCOPING OPINION AND CONSULTATION

25.1.1. Comments from the LPA Scoping Opinions relating to air quality are summarised in Table E3 and E4 in Appendix E.

25.2 BASELINE

PROPOSED CONVERTER STATION

25.2.1. The proposed converter station will be located in a rural environment where air quality is mainly influenced by traffic emissions from small local roads. There are no significant industrial pollution sources in the surrounding area that influence air quality. The proposed converter station will lie between WCC and EHDC administrative areas (WCC, 2018 and EHDC, 2018). According to both council's latest Air Quality Annual Status Reports , air quality in the vicinity of the location of the proposed converter station meets all the relevant UK Air Quality Strategy (AQS) objectives.

CABLE ROUTE AND LANDFALL

25.2.2. The cable route runs through a number of Local Authorities. For the majority of the cable route, pollution concentrations meet all air quality objectives. However, part of the route goes through an Air Quality Management Area (AQMA) declared by PCC due to exceedances of the annual mean nitrogen dioxide (NO_2) objective. This AQMA covers a section of road stretching from Milton Road to Eastern Road.

25.2.3. Based on the above, air pollutant concentrations in the vicinity of the proposed converter station and for the majority of the cable route meet all the relevant air quality objectives. Annual mean NO_2 concentrations are in exceedance of the UK AQS objective for the section of the route going through the PCC AQMA. Detailed background air quality concentrations will be extracted from the latest Local Authority air quality reports and national maps provided by Defra (Defra, 2018a) . The available local and background air quality data are considered appropriate for use in this assessment. No site specific air quality monitoring will be undertaken to inform the EIA.

25.3 POTENTIAL IMPACTS

INSIGNIFICANT EFFECTS

25.3.1. The operation of the proposed converter station and cable route will not generate any emissions to air when in use. Operational activities will be limited to occasional vehicle trips (e.g. for routine maintenance). However, the number of trips generated is not expected to be above the indicative threshold presented in Environmental Protection UK (EPUK) / Institute of Air Quality

Management (IAQM) Guidance (EPUK and IAQM, 2016). An assessment of potential impacts on local air quality from operational traffic emissions has therefore been scoped out of the EIA.

25.3.2. A quantitative assessment of potential impacts to local air quality from construction traffic exhaust gas emissions has also been scoped out as the additional traffic generated is not expected to be above the indicative threshold presented in EPUK/IAQM guidance document either inside or outside AQMAs.

SENSITIVE RECEPTORS

25.3.3. For the construction stage, the assessment will consider human receptors within 350m from site boundary and 50m from construction routes, and ecological receptors within 50m from site boundary and 50m construction routes. This is in accordance with the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2016).

LIKELY SIGNIFICANT EFFECTS

- The following potential impacts are likely to be associated with the construction stage of the Proposed Development:
- Potential impact on human and ecological receptors from dust and Particulate Matter (PM) generated during the site preparation and construction stage;
- Potential impact on human and ecological receptors due to changes in local pollutant concentrations (NO_2, PM_{10} and $PM_{2.5}$) due to exhaust emissions from construction vehicles and plant; and
- Potential impact on human and ecological receptors due to changes in local pollutant concentrations (NO2, PM10 and PM2.5) due to exhaust emissions from road vehicles delayed due to construction works and road closures.

25.3.4. As detailed above, no operational impacts on air quality are anticipated.

25.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

25.4.1. The approach to the assessment of air quality will be agreed with all the relevant Local Authorities. Based on the likely environmental effects detailed above, the scope of the assessment will include the following:

- A qualitative assessment of the impacts of dust and particulate matter generated during the construction stage of the Proposed Development will be undertaken following the IAQM Guidance (IAQM, 2016);

- A qualitative assessment of the effects of exhaust emissions from construction traffic and plant on local air quality at nearby sensitive receptors; and

- A qualitative assessment of the effects of exhaust emissions from road traffic congestion on local air quality at nearby sensitive receptors due to construction works and road closures.

25.4.2. The IAQM Guidance (IAQM, 2016) provides distance-based criteria for qualitatively assessing dust / particulate matter impacts from construction activities and impacts from mobile plant emissions. The Guidance recommends that the potential for dust emissions from four different types of construction activities are assessed: Demolition, Earthworks, Construction and Trackout (the movement of dust/mud offsite on haulage vehicles wheels and bodies onto the public road network where it may be re-suspended by other vehicles).

25.4.3. The qualitative assessment of effects from construction traffic and plant will be undertaken based on professional judgement and information on the number and type of construction traffic and plant, the proximity of sensitive receptors, the construction routes; the duration of the construction stage and the nature of the construction activities.

25.4.4. The qualitative assessment of effects from road traffic congestion will be undertaken based on and information on traffic flows on the local road network and professional judgement.

25.4.5. The assessment of impacts during the construction stage will be based on information available at the time and assumptions will be made if necessary, based on the duration and number of equipment used, and professional judgement.

CONSULTATION

25.4.6. Consultation with the Environment Health Officers (EHO) of the relevant Local Authorities will undertaken to confirm the scope and approach to the air quality assessment in the PEIR and ES.

26. NOISE AND VIBRATION

26.1 SCOPING OPINION AND CONSULTATION

26.1.1. Comments from the LPA Scoping Opinions relating to noise and vibration are summarised in Table E3 and Table E4 in Appendix E.

26.2 BASELINE

PROPOSED CONVERTER STATION

26.2.1. A baseline noise survey has been undertaken at locations representative of the closest residential receptors to the proposed converter station site locations. Additional measurements have been undertaken close to the existing Lovedean substation.

26.2.2. A combination of attended and unattended noise measurements were undertaken between Wednesday 28th June and Thursday 6th July 2017.

26.2.3. Given the rural location of the proposed converter station, the noise climate at the closest residential receptors is generally low, with few dominant noise sources in the area. The substation noise levels are dominant when close to its boundary.

26.2.4. The noise survey data will be provided in the noise and vibration assessment within the PEIR and ES.

CABLE ROUTE AND LANDFALL

26.2.5. A baseline noise survey will be undertaken along the cable route at the earliest opportunity. This survey will comprise both attended and unattended measurements at up to ten locations.

26.2.6. The survey methodology and locations will be agreed with the local planning authorities prior to undertaking the measurements.

26.2.7. A meeting will be organised in due course with the relevant LPA to discuss the noise assessment methodology and scope in more detail.

26.3 POTENTIAL IMPACTS AND MITIGATION

26.3.1. The following potential impacts are likely to be associated with the construction stage of the Proposed Development

- Construction:
  - Noise and vibration effects for both the proposed converter station and cable route associated with construction activities.

- Operation:
    - Noise from the proposed converter station during operation.

26.3.2. Operational noise along the cable route is expected to be negligible and has been scoped out of the EIA.

26.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

26.4.1. The exact scope of the noise and vibration assessment will be discussed and agreed during consultation with the EHO at EHDC and WCC. Notwithstanding this, the scope of works is likely to comprise:

- A baseline noise survey over a period of at least three days close to the proposed converter station and at selected locations along the cable route;
- An assessment of construction stage noise and vibration effects in accordance with BS 5228: 2009+A1:2014 for both the proposed converter station and the cable route;
- An assessment of converter station noise in accordance with BS 4142: 2014 and other criteria, the detail of which are to be agreed with the local planning authorities;
- The significance of effects identified will be assessed using criteria derived from relevant British Standards and guidance documents. The approach and terminology set out in Chapter 4 will be followed to assess the significance of effects whereby the magnitude of change in noise levels and the sensitivity of the receptor will be considered; and
- Where necessary, mitigation measures will be specified to minimise any noise and vibration effects.

ASSESSMENT METHODOLOGY

26.4.2. Initial consultation with both EHDC and WCC Environmental Health Departments to discuss the baseline noise surveys and assessment methodologies has been undertaken.

26.4.3. It was established that, whilst an assessment in accordance with BS 4142 should be undertaken, a more in-depth assessment considering octave band noise levels should also be undertaken. Both LPAs have stated that the overall aspiration is for there to be no increase to existing ambient noise levels as a result of the proposed converter station.

26.4.4. The noise and vibration assessment will include the following:

- A robust baseline noise survey data set will be obtained which will be used for the following:
    - To derive appropriate noise limits for the construction stage at the closest proposed receptors to the proposed converter station and the cabling route in accordance with BS 5228 and any relevant criteria stipulated by the local planning authorities, and;
    - To derive appropriate noise criteria for the proposed converter station in accordance with BS 4142.
- The construction noise predictions will be undertaken and assessed in line with the methodologies in BS 5228 2009+A1:2014;
- The converter station noise assessment will be undertaken in two stages:
    - An assessment will be undertaken in accordance with BS 4142: 2014 to provide an initial indication of noise levels from the proposed converter station; and
    - An assessment will be undertaken considering the proposed converter station noise levels in octave bands and compared against existing noise levels to determine any increase. The methodology for this assessment will be determine during further consultation with the local planning authorities.

26.4.5. Where necessary and feasible, we will recommend noise mitigation measures to reduce construction and converter station noise levels.

27. SOCIO-ECONOMICS

27.1 SCOPING OPINION AND CONSULTATION

27.1.1. Comments from the LPA Scoping Opinions relating to socio-economics are summarised in Table E3 and E4 in Appendix E.

27.2 BASELINE

PROPOSED CONVERTER STATION

27.2.1. The proposed converter station will be located within either WCC or EHDC. The closest settlement is Lovedean (part of the wider urban area of Waterlooville) to the south and east of the proposed converter station. There are wider scattered farmsteads and hamlets to the north and west.

27.2.2. The estimated resident population of Winchester is 122,000 and 118,000 in East Hampshire as of 2016. The proportion of individuals aged 16-64 who are economically active is 79.3% in Winchester, which is similar to the proportion in East Hampshire (79.5%). These are lower than the regional average (81.0%), though higher than the average across Great Britain (77.8%).

27.2.3. The job density levels (i.e. the ratio of total jobs to the population aged 16-64 in 2015) in Winchester is 1.29 whereas in East Hampshire it is 0.84. The level in Winchester is higher than the averages across the South East Region (0.86) and Great Britain (0.83), whereas the level in East Hampshire is lower. This indicates a greater availability of employment opportunities within Winchester and a lower availability across East Hampshire.

27.2.4. In Winchester and East Hampshire, Services is the largest employment sector, accounting for 90.1% and 83.8% of the employee jobs respectively (as of 2015). However, in East Hampshire there are a greater proportion of jobs in the Manufacturing sector at 9.3%, compared within in 5% in Winchester, 6.2% across the South East Region and 8.3% across Great Britain.

27.2.5. The educational profile of Winchester indicates that 50.6% of the resident population aged 16-64 have achieved a qualification equivalent or higher than National Vocational Qualification (NVQ) Level 4. Within East Hampshire, the proportion of the resident population aged 16-64 is 43.8%. Both of these local authorities are higher than the the regional (41.4%) and national (38.2%) averages (NOMIS, 2018).

27.2.6. The 2011 Census suggests that the health of the population within Portsmouth is generally good with 47.7% of the resident population within Portsmouth considering themselves to be in ‘very good health’ and 34.8 % to be in ‘good health’, which compares national figures of 47.2% and 34.2% respectively (Neighbourhood Statistics, 2011).

27.2.7. There are no formal public open spaces within or adjacent to the proposed converter station site locations.

CABLE ROUTE AND LANDFALL

27.2.8. The cable route and landfall potentially crosses PCC, HDC, WCC and EHDC. The cable route runs through a mixture of rural and urban areas, including number of settlements such as Denmead, Anmore, Waterlooville, Purbrook, Widley, Farlington and Portsmouth.

27.2.9. The estimated resident population of Portsmouth was 214,800, Havant was 123,600, Winchester was 122,000 and 118,000 in East Hampshire as of 2016. The proportion of individuals aged 16-64 who are economically active is 79.3% in Winchester, which is similar to the proportion in East Hampshire (79.5%). However, the proportion in Portsmouth (76.3%) and Havant (59.2%) is lower. These are lower than the regional average (80.8%) (April 2016 – March 2017).

27.2.10. The job density levels (i.e. the ratio of total jobs to the population aged 16-64 in 2015) in Winchester is 1.29 which is higher than Portsmouth (0.85), East Hampshire (0.84) and Havant (0.69). The level in Winchester is higher than the averages across the south-east region (0.86) and Great Britain (0.83). This indicates a greater availability of employment opportunities within Winchester compared with the other local authorities and the regional and national averages. In Portsmouth, Havant, Winchester and East Hampshire, Services is the largest employment sector.

27.2.11. The educational profile of Winchester indicates that 50.6% of the resident population aged 16-64 have achieved a qualification equivalent or higher than National Vocational Qualification (NVQ) Level 4. Within East Hampshire, the proportion of the resident population aged 16-64 is 43.8%. Both of these local authorities are higher than the the regional (41.4%) and national (38.2%) averages (NOMIS, 2018). Conversley, the proportion of the population within Portsmouth is 34.7% and in Havant is 37%, both of which are lower than the regional and national averages.

27.2.12. The 2011 Census suggests that the health of the population within the local authorities is mixed compared with national figures of 47.2% and 34.2% respectively (Neighbourhood Statistics, 2011. Within Portsmouth, 47.7% of the resident population within Portsmouth considering themselves to be in ‘very good health’ and 34.8 % to be in ‘good health’. However, within Havant, 44.3% of the resident population considered themsleves to be in ‘very good health’ and 35.9% considered themsleves to be in ‘good health’. For Winchester, 53.2% considered themsleves to be in ‘very good health’ with 32.8% considered to be in ‘good health’. For East Hampshire, 50.5% classified themsleves as in ‘very good health’, with 34.7% in ‘good health’.

27.2.13. There are formal and informal recreational / public open spaces within the vicinity of the cable route and landfall, including Zetland Field, Farlington Playing Fields, Farlington Marshes, Great Salterns Recreation Ground, Milton

Common, Milton Cemetery, Milton Park, Bransbury Park and Eastney Esplanade.

27.3 POTENTIAL IMPACTS AND MITIGATION

INSIGNIFICANT EFFECTS

27.3.1. There are no private assets within the Proposed Development (e.g. residential properties, commercial / industrial properties) aside from agricultural land. As such, effects related to private or community assets will not be considered further within the socio-economics ES.

27.3.2. The site security arrangements for the Proposed Development during the construction stage will be in line with the requirements set out in the Construction (Design and Management) Regulations 2015 and appropriate levels of security (e.g. Close-Circuit Television (CCTV)) alongside design measures (e.g. appropriate fencing) will be provided during operation. Therefore, there is unlikely to be significant effects in relation to crime and this will not be considered further within the ES.

27.3.3. Community severance is defined 'as the separation of residents from facilities and services they use within their community'. In accordance with DMRB guidance, community facilities are taken to include doctor's surgeries and hospitals, aged persons homes, primary and secondary schools, dentists, churches, parish halls, recreational areas and leisure facilities, libraries and railway and bus stations. These facilities are concentrated within the urban area around the Proposed Development and, therefore, is unlikely to cause a significant separation of residents from community facilities. In addition, the disruption associated with the construction of the cable and landfall is temporary and short-term in nature. Therefore, effects in relation to community severance will not be considered within the ES.

27.3.4. During operation, the additional direct, indirect and induced employment opportunities associated with the Proposed Development are considered to be minimal. As such, effects in relation to employment during operation will not be considered further within the ES.

LIKELY SIGNIFICANT EFFECTS

27.3.5. The likely significant environmental effects of the construction stage which will be considered in the EIA are as follows:

- Generation of direct, indirect and induced employment opportunities during the construction stage;
- Changes in local service demands (education and healthcare), accomodation and community facilities due to an increase in population from construction workers;

- Changes in community severance and accessibility to private and community resources;
- Disruption to local businesses (shops and other services);
- Disruption and changes in amenity value for users of recreational / open space.

27.3.6. The likely significant environmental effects of the operational stage which will be considered in the EIA are as follows:

- Disruption and changes in amenity value for users of recreational / open space, PRoWS and non-designated public routes.

27.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

GENERATION OF DIRECT, INDIRECT AND INDUCED EMPLOYMENT OPPORTUNITIES DURING THE CONSTRUCTION STAGE

27.4.1. All analysis and assessment will use secondary data from NOMIS, which is publicly available via the Office of National Statistics (ONS). The assessment of direct, indirect and induced employment opportunities during the construction stage will be qualitative. Further information on the economy and employment will be identified through a desktop study of key sources, including relevant reports from the local authorities and HCC.

27.4.2. The estimated construction workforce per annum will be derived from the total estimated cost of the construction of the Proposed Development against the average output for construction workers per annum in the industry. The total jobs generated will be evaluated within the context of existing workforce and jobs available in the industry to determine the magnitude of change.

27.4.3. At this stage, it is not possible to isolate the industry sector where the indirect and induced jobs may be generated (i.e. where impact may occur within the local economy). Therefore, these figures will be evaluated against the total number of employees in all industry sectors to determine the magnitude of change.

CHANGES IN LOCAL SERVICE DEMANDS (EDUCATION AND HEALTHCARE), ACCOMMODATION AND COMMUNITY FACILITIES DUE TO AN INCREASE IN POPULATION FROM CONSTRUCTION WORKERS

27.4.4. It is assumed that the majority of operatives during the construction stage will be drawn from across the UK and internationally due to the specialised nature of the works. Given the potential significant increase in workers relocating to

the area (albeit on a temporary basis), a qualitative assessment will be undertaken for the changes in demands on local services (education and healthcare), accommodation and community facilities associated with this influx.

27.4.5. This assessment will take into consideration the current capacity of local services, accommodation and community facilities and identify any predicted increase in demands upon these resources. Further information on the capacity of local services, accommodation and community facilities will be identified through a desktop study of key sources, including relevant reports from the local authorities and HCC

DISRUPTION AND CHANGES IN AMENITY VALUE FOR USERS OF RECREATIONAL / OPEN SPACE

27.4.6. The assessment of disruption and changes in amenity value will be undertaken in accordance with the relevant sections of DMRB Volume 11, Section 3 including Part 8: 'Pedestrians, Cyclists, Equestrians and Community Effects' for both the construction and operation stages of the Proposed Development.

27.4.7. Baseline information will be identified through a desktop study of key sources, including relevant reports from the local authorities and HCC.

27.4.8. Part 8 of the DMRB defines amenity value as the relative 'pleasantness' of an experience. Changes to amenity value is concerned with changes in the degree and duration of a receptor's exposure to traffic - fear/safety, noise, dirt and air quality - and the effects of the Proposed Development itself. Air quality and Noise and Vibration will be considered elsewhere within the ES and will therefore not be assessed as part of the Socio-economics ES chapter. The Socio-economics assessment will focus on changes to fear / perception of safety, journey delay and visual intrusion associated with the Proposed Development.

27.4.9. The factors which will also be taken into account include:

- Distance between the receptor and construction activity associated with the Proposed Development;
- The presence of any barriers between users of the community resources and plant and traffic associated with the construction activities of the Proposed Development; and
- Likely increase in times for accessing the resources.

The qualitative assessment of disruption and change in amenity value for users of community open space will consider all resources within 500m of the Proposed Development.

28. HUMAN HEALTH

28.1 SCOPING OPINION AND CONSULTATION

28.1.1. There were no comments received from the LPA Scoping Opinions relating to human health.

28.2 BASELINE

PROFILE OF LOCAL POPULATION HEALTH AND WELLBEING, ECONOMY AND NOISE

28.2.1. Office of National Statistics local profile data (Public Health England, 2018a) for the wider study area was analysed to determine how the area performs across a number of indicators which are related to potential health impacts of the proposed converter station, cable route and landfall. These were:

- Population Age Profile;
- Indices of Multiple Deprivation;
- Life Expectancy;
- Mortality from Causes Considered preventable;
- Mortality from Cancer considered preventable;
- Rate of Noise Complaints about noise; and
- Employment rate.

28.2.2. The above data was used to provide a profile of the study area population and health baseline.

Age Distribution

28.2.3. Age profile for East Hampshire, Winchester and Havant indicate that population of these study areas are older than both the regional and national profile, with lower representation of age groups between 20 to 39 years (Figure 28.1, Figure 28.2 and Figure 28.3). The age profile for Portsmouth indicates that population of this study area is younger than both the regional and national profiles, with higher representation of age groups between 15 to 34 (Figure 28.4).

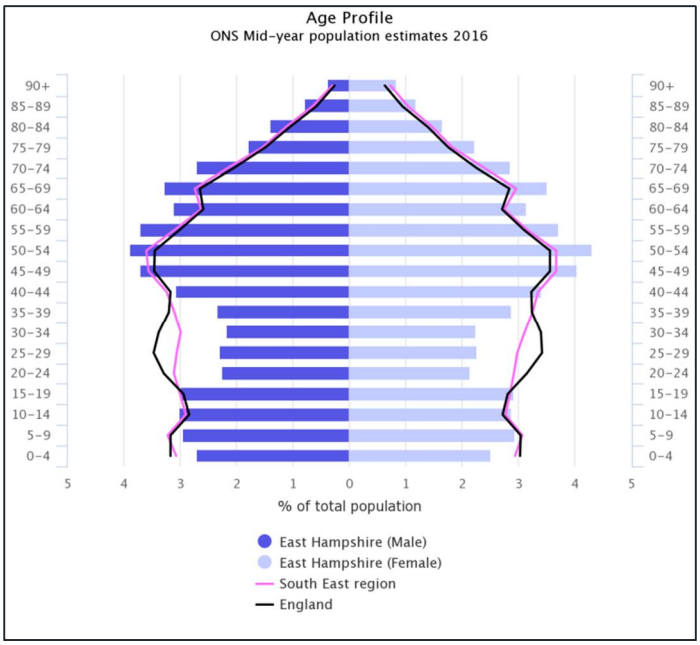


Figure 28.1 Age population profile for East Hampshire

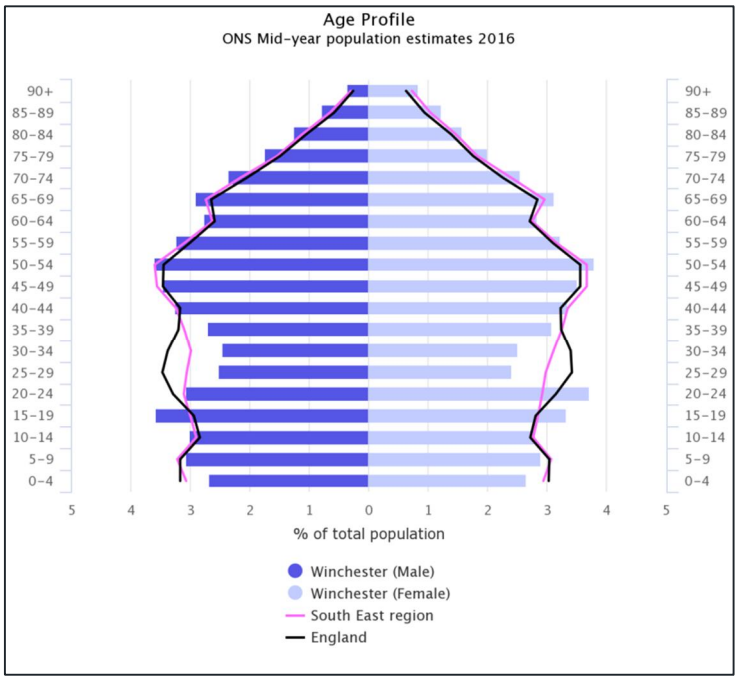


Figure 28.2 Age population profile for Winchester

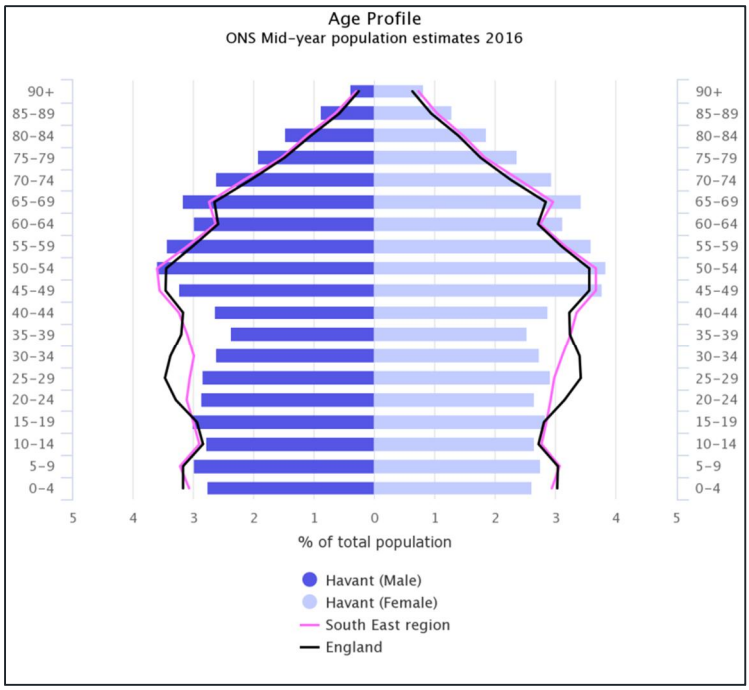


Figure 28.3 Age population profile for Havant

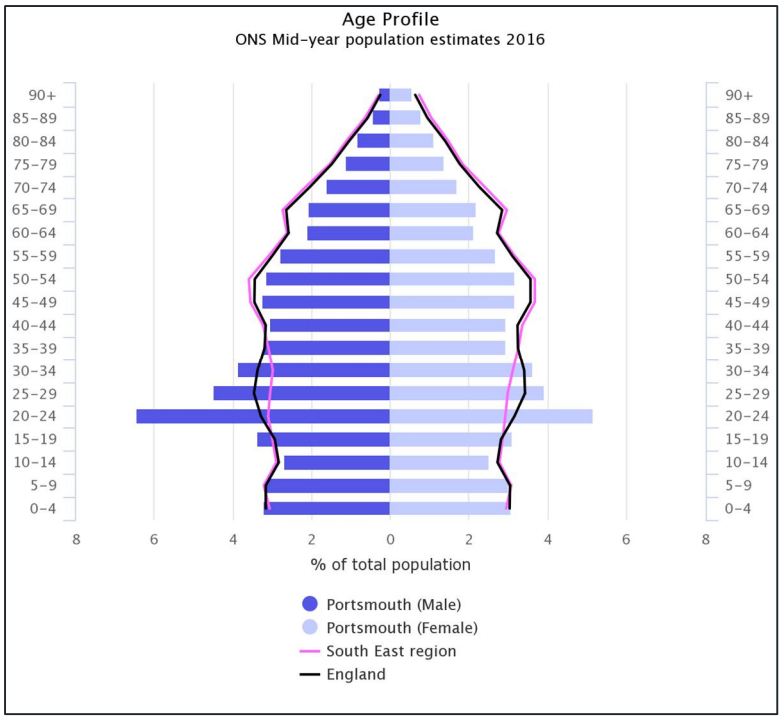


Figure 28.4 Age population for Portsmouth

Health and Wellbeing Profile

28.2.4. PHE Health Profile data (PHE, 2018b) was evaluated to determine the health status of the population within the two study areas for the proposed converter station and the cable route and landfall.

Index of Multiple Deprivation Score (IMD, 2015)[11]

28.2.5. Deprivation covers a broad range of issues and refers to unmet needs caused by a lack of resources of all kinds, not just financial. The English Indices of Deprivation attempt to measure a broader concept of multiple deprivation, made up of several distinct dimensions, or domains, of deprivation (DCLG, 2015).

28.2.6. In terms of overall deprivation, three of the study area districts were less deprived than the national average, with Winchester and Havant both significantly less deprived than the national average, falling within the best percentile (75th percentile – best) (Table 28.1). Portsmouth, however was considered to be more deprived than the England average.

Table 28.1 Study area indices of multiple deprivation

Area	Indices of Multiple Deprivation (IMD, 2015)
England	21.8
South East Region	-
Winchester	8.8
Portsmouth	27.1
Havant	21.2
East Hampshire	8.6

Health and Well-Being

28.2.7. Life expectancy across all local authorities within the study areas indicate that on average populations live longer in these areas than the England average. However, the life expectancy in Portsmouth was observed to be significantly lower than the England average, with the male population having al lower life

[11] The English Indices of Deprivation 2015 use 37 separate indicators, organised across seven distinct domains of deprivation which can be combined, using appropriate weights, to calculate the Index of Multiple Deprivation 2015 (IMD 2015). This is an overall measure of multiple deprivation experienced by people living in an area.

expectancy of 1.6 years than the national average and female population of Portsmouth having an average life expectancy of 0.8 years than the national average (Table 28.2)

Table 28.2 Life expectancy at birth (PHE, 2018b)

Area	Life Expectancy at Birth	
	Male	Female
England	79.5	83.1
South East Region	80.6	84.0
Winchester	82.0	84.0
Portsmouth	77.9	82.3
Havant	80.3	83.4
East Hampshire	81.6	84.4

28.2.8. Mortality from causes considered preventable across all local authorities within the study areas implies that on average the residents of Portsmouth are less healthy than the population within other parts of the study areas, and less healthy than the average south east local authority or the average England local authority (Table 28.3)

Table 28.3 Mortality from causes considered preventable

Area	Mortality from Causes Considered preventable (per 100,000 population)
England	184.5
South East Region	161.2
Winchester	135.5

Area	Mortality from Causes Considered preventable (per 100,000 population)
Portsmouth	231.1
Havant	181.7
East Hampshire	133.8

28.2.9. Mortality from cancers considered preventable across all local authorities within the study areas implies that on average preventable cancer is responsible for a greater proportion of deaths amongst residents of Portsmouth than the population within other parts of the study areas. Residents in the two local authorities likely to be affected by the installation of the proposed converter station, Winchester and East Hampshire, experience very low mortality rates from cancers considered preventable (Table 28.4)

Table 28.4 Under 75 mortality from cancer considered preventable

Area	Mortality from Causes Considered preventable (per 100,000 population)
England	184.5
South East Region	161.2
Winchester	135.5
Portsmouth	231.1
Havant	181.7
East Hampshire	133.8

Noise Complaints

28.2.10. Impacts of noise upon the populations across the study area can be seen to be low in all local authority areas with the exception to Portsmouth, where 10.4

complaints are received per year per 1,000 population (Table 28.5). This implies that the noise threshold in Portsmouth may be high, though tolerance to cumulative noise may be low. Low incidence of noise complaints in parts of the study area may account for a low noise baseline, which could result in a low tolerance of incidence noise or noise nuisance.

Table 28.5 Rate of noise complaints about noise (NHS, 2012)

Area	Rate of Noise Complaints about noise (per 1,000)
England	7.5
South East Region	5.9
Winchester	4.1
Portsmouth	6.6
Havant	3.4
East Hampshire	5.3

Employment and Economy

28.2.11. Levels of employment across the study areas can be seen to be above national average in all local authorities apart from Portsmouth, though below the regional average in all local authorities. The employment rate in Portsmouth is 2.5% below the national average and 5.8% below the regional average (Table 28.6).

Table 28.6 Employment rate for those between 16 to 64 years of age (%)

Area	Employment rate for those between 16 to 64 years of age (%) (2016-2017)
England	74.4
South East Region	77.7

Area	Employment rate for those between 16 to 64 years of age (%) (2016-2017)
Winchester	75.8
Portsmouth	71.9
Havant	75.6
East Hampshire	79.3

28.3 POTENTIAL IMPACTS

LIKELY SIGNIFICANT EFFECTS OF THE PROPOSED CONVERTER STATION

28.3.1. Potential beneficial health impacts of the proposed converter station are likely to be associated with benefits to the economy and increased economic activity brought about by the construction of the proposed converter station.

28.3.2. Potential adverse health impacts of the proposed converter station are likely to be associated with indirect impacts upon health brought about by a reduction in amenity from a reduction in landscape quality and fear of health impacts from the risk to health from Electric and Magnetic Fields. Additionally, a probable adverse impact on health could occur from noise during construction of the proposed converter station, particularly with regards to the relatively rural, tranquil location proposed site location.

LIKELY SIGNIFICANT EFFECTS OF THE CABLE ROUTE AND LANDFALL

28.3.3. Potential beneficial health impacts of the cable route and landfall are likely to be associated with benefits to the economy and increased economic activity brought about by the construction of the cable route and landfall.

28.3.4. Potential adverse health impacts of the cable route and landfall are likely to be associated with indirect impacts upon health brought about by increased congestion during the cable laying works. Additionally, a probable adverse impact on health could occur from noise during construction of the cable route and landfall, particularly where the cable route is positioned close to sensitive noise receptors. Construction may also result in the loss of public open spare and allotments. This may have a temporary adverse health impact.

28.3.5. Table 28.7 includes all of the potential health determinants and those proposed (shaded) to be included in this health assessment.

Table 28.7 Health determinants screened out (clear) and screened in (ticked) of the health assessment

Health Determinant	Proposed Converter Station		Cable Route and Landfall	
	Likelihood of Health Effect Occurrence	Impacts of health effects upon Study Area Population	Likelihood of Health Effect Occurrence	Impacts of health effects upon Study Area Population
Air quality				
Noise	P	P		
Collisions				
Social isolation				
Climate change				
Surface access			P	P
Apprenticeships	P	P	P	P
Business Activity	P	P	P	P
Exercise and physical activity				
Illicit Drug Use				

Health Determinant	Proposed Converter Station		Cable Route and Landfall	
Smoking habit				
Landscape and Townscape	P	P	P	P
Access to Nature				
Water Quality				
Land Use	P	P		
Natural Habitats	P	P	P	P
Soil/ Land Contamination	P	P	P	P
Hazards				
Public Transport			P	P
Wealth Distribution				
Community Participation				
Crime/ Antisocial behaviour				

Health Determinant	Proposed Converter Station		Cable Route and Landfall	
Housing				
Personal safety	P	P	P	P
Income				
Access to Services, facilities, and amenities	P	P	P	P
Access to Greenspace/ Bluespace	P	P	P	P
Access to Health care				
Childhood Development				
Level of Income				

28.4 SCOPE OF ASSESSMENT AND FURTHER INFORMATION

28.4.1. The following key tasks are proposed for the assessment of human health for the Proposed Development:

- Conduct an outline screening exercise on the likely health impacts from the Proposed Development upon the study area population, identify potential health impacts and scope out unlikely health impacts for the proposed converter station, the cable route and landfall;
- Determine the type and depth of health assessment required;
- Confirm the study areas for the assessment of health for the proposed converter station, the cable route and landfall;

- Identify relevant scientific evidence from past Health Impact Assessments and other literature;
- Assess the potential health and wellbeing impacts of the Proposed Development, and the nature and likelihood of such impacts; and
- Develop recommendations for minimising potential negative, and maximising potential positive, health and wellbeing impacts.

28.4.2. Human health is assessed using a systematic analysis of the potential direct and indirect health impacts of a Proposed Development. The purpose of a health assessment is to adapt to mitigate negative impacts and reduce health inequalities through recommending opportunities, and where appropriate, enhance a scheme's positive health impacts.

SCREENING

28.4.3. All of the potential health determinants associated with large-scale engineering projects were initially taken into considered and either screened in or out according to likelihood and the potential impact upon the study area and population and vulnerable groups. As an outcome, it is proposed that the following key determinants of health should be assessed for both the proposed converter station and the cable route and landfall installation (Table 28.8).

Table 28.8 Proposed health determinates for this study

Health Determinant	Proposed Converter Station	Cable Route and Landfall
Noise	P	
Surface access		P
Apprenticeships	P	P
Business Activity	P	P
Job Creation/ Availability of employment opportunities / Quality of	P	P

Health Determinant	Proposed Converter Station	Cable Route and Landfall
employment opportunities		
Landscape and Townscape	P	P
Land Use	P	P
Natural Habitats	P	P
Soil/ Land Contamination	P	P
Public Transport		P
Personal safety	P	P
Access to Services, facilities, and amenities	P	P
Access to Greenspace/ Bluespace	P	P

HEALTH ASSESSMENT

28.4.4. A desk-based assessment of the direct and indirect effects which are likely to be experienced by those communities that the Proposed Development is based in will be undertaken. The geographic scope of this Health Assessment are the Local Authority areas of Winchester and East Hampshire for the proposed converter station assessment (Figure 28.5) and Local Authority areas of Winchester and East Hampshire, Havant and Portsmouth City for the cable route and landfall assessment (Figure 28.6).

Figure 28.5 Proposed converter station site health study area

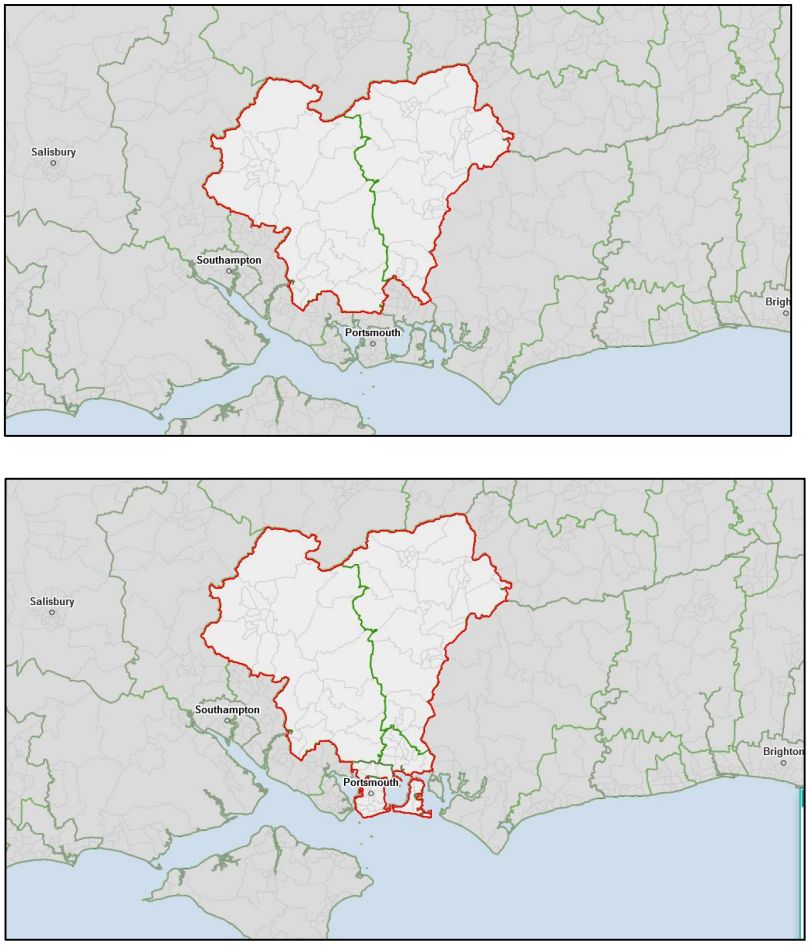


Figure 28.6 Cable route and landfall health study area

28.4.5. The proposed population to be assessed within this assessment is:

- Proposed converter station: Residents within Winchester and East Hampshire; and
- Cable route and landfall: Residents within Portsmouth, Havant, Winchester and East Hampshire.

28.4.6. It is proposed that health impacts should be assessed upon the following vulnerable groups:

- Older people;
- People with existing health conditions;
- Unemployed and low income groups; and
- Socially excluded or isolated groups.

EVIDENCE

28.4.7. It is proposed that evidence should be utilised from the following sources:

- Joint Health and Wellbeing Strategy: Working better together to improve health and wellbeing in Portsmouth 2014 - 2017 City Centre and Etruria Road Corridor Area Action Plan HIA (PCC, 2014);
- Hampshire's Joint Health and Wellbeing Strategy; and
- Hampshire Joint Strategic Needs Assessment (HCC, 2017).

PROPOSED APPRAISAL OF IMPACTS

28.4.8. Health impacts of the Proposed Development will be assessed against each of the determinants of health, looking first at the baseline conditions of the determinant category within the study area, evidence of how each determinant effects health and then the effect that the Proposed Development has on the health of the target population (short-term, temporary and permanent) via the determinant category.

28.4.9. A seven point assessment scale that classifies the significance of the identified impacts (Table 28.9) is used to categorise the effects for the assessment. This approach has been adapted from that used by the Institute of Occupational Medicine (IOM), for the North Staffordshire 'Streetcar' Bus Rapid Transport Scheme Health Impact Assessment, IOM, 2009. Significance incorporates the intensity of the impact and its potential duration, shown in Table 28.9 below.

Table 28.9 Assessment scale and definition of significance

Significance of Impact	Definition	Intensity [+/-]	Duration (SML) / (TIP)
Major Adverse	Health effects are major negative if they lead directly to deaths, acute or chronic diseases or mental ill health. They can affect either or both physical and mental health either directly or through the wider determinants of health and wellbeing. These effects can be important local, district, regional and national considerations. Mitigation measures and detailed design work can reduce the level of negative effect though residual effects are likely to remain.	The exposures tend to be of high intensity. Over a large geographical area or affect a large number of people or impact vulnerable groups. (- - - / + + +)	Long term duration (L) Intermittent (I) Temporary (T) or Permanent (P) in nature
Major beneficial	Health effects are categorised as a major positive if they prevent deaths/prolong lives, reduce/prevent the occurrence of acute or chronic diseases or significantly enhance mental wellbeing would be a major positive.		
Moderate Adverse	Health effects are categorised as a moderate negative if the effects are long term nuisance impacts, e.g. odours	The exposures tend to be of moderate intensity and/or over a relatively localised area and/or likely to affect a moderate-	Medium term duration (M) Intermittent (I) Temporary (T) or

Significance of Impact	Definition	Intensity [+/-]	Duration (SML) / (TIP)
	and noise, or may lead to exacerbations of existing illness. The negative impacts may be nuisance/quality of life impacts which may affect physical and mental health either directly or through the wider determinants of health. The cumulative effect of a set of moderate effects can lead to a major effect. These effects can be important local, district and regional considerations. Mitigation measures and detailed design work can reduce and in some/many cases remove the negative and enhance the positive effects though residual effects are likely to remain	large number of people e.g. between 100-500 and/or sensitive groups (- - / + +)	permanent (P) in nature.
Moderate Beneficial	Health effects are categorised as a moderate positive if they enhance mental wellbeing significantly and/or reduce exacerbations to existing illness and reduce the occurrence of acute or chronic diseases.		

Significance of Impact	Definition	Intensity [+/-]	Duration (SML) / (TIP)
Minor Adverse	Health effects are categorised as minor positive or negative, if they are generally lower level quality of life or wellbeing impacts. Increases or reductions in noise, odour, visual amenity, etc are examples of such effects. These effects can be important local considerations. Mitigation measures and detailed design work can reduce the negative and enhance the positive effects such that there are only some residual effects remaining.	The exposures tend to be of low intensity and/or over a small area and/or affect a small number of people e.g. less than 100 (- / +)	Short term duration (S) Intermittent (I) Temporary (T) or permanent (P) in nature.
Minor Beneficial			
Neutral/No	No health effect or effects within the bounds of normal/accepted variation.	N/A	N/A

29. WASTE AND MATERIAL RESOURCES

29.1 SCOPING OPINION AND CONSULTATION

29.1.1. Comments from the LPA Scoping Opinions relating to socio-economics are summarised in Table E3 and E4 in Appendix E.

29.2 BASELINE

29.2.1. The following sections describe the regional (and in the case of materials, national) baseline conditions for the three elements considered in this chapter: materials, arisings and waste. The analysis has been provided for the south east of England – the region in which all of the works for the Proposed Development will be conducted.

PROPOSED CONVERTER STATION

29.2.2. The proposed converter station will be established adjacent to the Lovedean substation. The typical layout for a converter station of this nature will comprise a footprint (including grounds and security fencing) of approximately 4-6ha. No further details on the volume or type of materials required for construction are available at this stage.

29.2.3. Site Option A for the proposed converter station is located entirely within arable farmland, the current site for which is devoid of both trees and hedgerows. Site Option B is also located on a Greenfield site (again, arable farmland) but will require the removal of trees and hedgerows if taken forward.

29.2.4. For both proposed converter station options, a temporary laydown area (4-5 ha) would be required during construction, but would be reinstated following demobilisation. An additional laydown area will also be required for the temporary storage of cables.

29.2.5. Landscaping will be required around the perimeter of the chosen site to integrate the proposed converter station into the surrounding environment. Grading of the land will also be necessary to level the construction platform. The materials generated from this will depend on the excavation depth and footprint of the proposed converter station.

29.2.6. A new access road will be established from the existing road network via Broadway Lane to service construction vehicles; the new road will be retained in operation to give staff access to the Site.

CABLE ROUTE AND LANDFALL

Converter Station to Landfall

29.2.7. Between the UK landfall and the proposed converter station, four HVDC cables and fibre optic cables are to be installed mainly along local roads, where there

is enough space available for excavation, installation, stockpiles and access/egress of the equipment, service cars and construction plant. The materials generated will depend on the cross section of the trenches required for burying the cables.

29.2.8. Where HDD is used to run cables past larger constraints (railways, crossing of main roads and water ways), temporary construction areas (approximately 50 x 50m) and JBs,(approximately 15m x 5m) will also be required. These will require the additional consumption of materials, and will generate arisings that may need to be disposed of as waste.

29.2.9. Typical materials required for laying the HVDC cabling will include wiring, cross-linked XLPE insulation, concrete protection slabs, a range of backfill materials including cement-bound sand (subject to design confirmation) at the level of the cables. No details on the precise volumes or specifications of these materials is currently available.

400kV AC

29.2.10. 400kV AC cables will be laid between the proposed converter station and Lovedean substation, across agricultural land. The excavation volumes will depend on the cross section of the trenches.

29.2.11. Typical materials required for laying the 400kV AC cabling will be similar to that required for laying HVDC cables. No details on the precise volumes or specifications of these materials is currently available.

MATERIALS

29.2.12. For the cable route, it is expected that the current consumption of materials would be limited to that which is required for the maintenance and operation of the existing highway network. Materials would likely include specialist components (e.g. light bulbs, signage steelwork for replacement barriers) as well as some bulk material (asphalt for minor re-surfacing) for routine works and repairs of the highway and ancillary infrastructure.

Availability of Construction Material in the South East and UK

29.2.13. Table 29.1 provides a summary of the availability of the main construction materials in south east England and the UK, as required to deliver a typical cabling project.

Table 29.1 Materials availability in the south east of England and the UK

Material type	Availability (2015 unless otherwise stated)	
	South East	UK

Material type	Availability (2015 unless otherwise stated)	
Asphalt *	3.6Mt	26.3Mt
Concrete blocks #	541,000m3 (2014)	5.4Mm3 (2014)
Copper ^	(no data)	22,800t (2014)
Permitted crushed rock *	1.0Mt	99.3Mt
Polyethylene	(no data)	(no data)
Primary aggregate *	13.3Mt	183Mt
Ready-mix concrete +	0.6Mm3	25.2Mm3
Recycled and secondary aggregate *	3.7Mt (2013, consumption)	63Mt
Sand and gravel +	18.8Mt	52.5Mt
Steel +	(no data)	7.6Mt (2016)
Sources: Defra (2016), South East Aggregates Working Party (2013), BGS (2014), Mineral Products Association (2016), World Steel Organisation (2017), BGS (2016). **# *stocks* + *production* * *sales* ^ *consumption***		

ARISINGS

29.2.14. It is anticipated that arisings within the boundary of the Proposed Development are negligible.

29.2.15. The Proposed Development will generate arisings that, subject to condition and structural integrity, have the potential to be diverted from landfill.

29.2.16. The regional context for an environmental assessment of arisings is provided below.

Transfer, treatment and metal recycling in England and the south east

29.2.17. Environment Agency data (Environment Agency, 2015a) (Table 29.2) indicates that within England, the recovery rate for non-hazardous construction and demolition arisings has remained above 90% since 2010. This exceeds the EU target of 70%, which the UK must meet by 2020 (Defra, 2018b).

29.2.18. No regional data for construction, demolition and excavation (CDE) production or recovery rates are currently available for south east England.

Table 29.2 Non-hazardous construction and demolition arisings recovery in England

Year	Generation (Mt)	Recovery (Mt)	Recovery rate (%)
2010	43.9	39.7	90.5%
2011	44.1	39.9	90.6%
2012	45.3	41.3	91.1%
2013	46.3	42.1	91.1%
2014	49.1	44.9	91.4%

29.2.19. Figure 29.1 shows that rates of material recovery within south east England have risen steadily over the past 15 years. Metal recycling shows a consistent, and relatively flat profile. Transfer data are, however, more variable, and no clear profile is discernible. Data provided include all waste types in the south east and hence will include, but are not specific to, CDE arisings.

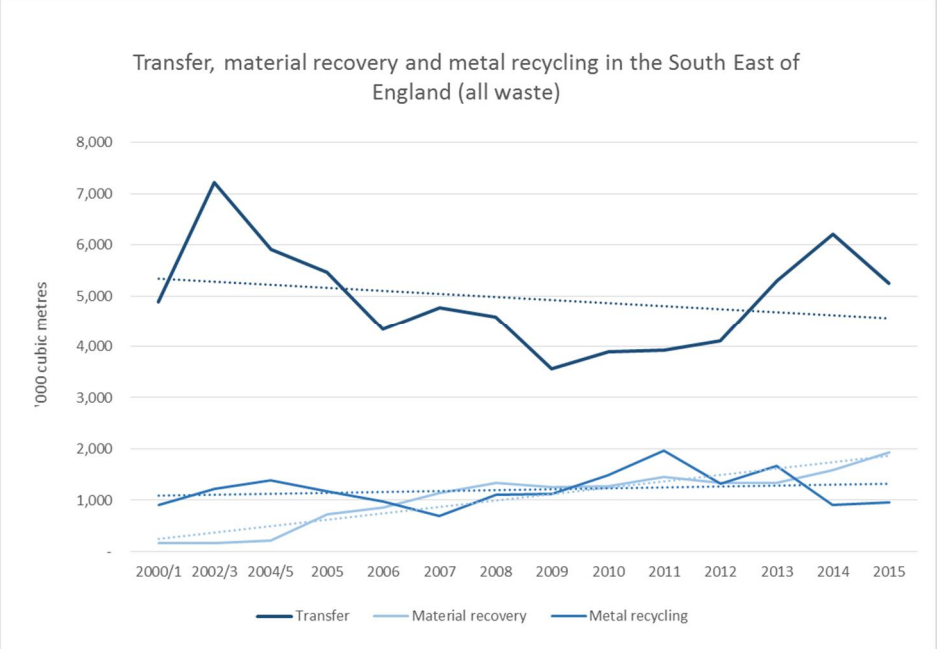


Figure 29.1 Transfer, material recovery and metal recycling in south east England

29.2.20. Whilst trends for transfer, recovery and metal recycling in the south east display different characteristics, data indicates that there is likely to be regional infrastructure and capacity for the sustainable management of CDE arisings from the Proposed Development. Non-hazardous construction and demolition recovery trends across England (Table 29.2) demonstrate further capacity in this context.

WASTE

29.2.21. It is anticipated that waste generated and disposed of within the boundary of the Proposed Development are negligible.

29.2.22. During construction the generation of volumes of arisings that may need to be disposed of as waste is significantly more likely, and has the potential to adversely impact on landfill capacity.

29.2.23. The regional context for an environmental assessment of waste is now provided.

Remaining landfill capacity in the south east

29.2.24. At the end of 2015, 91 landfill sites in the south east were recorded as having 75.2Mt of remaining capacity (Table 29.3).

Table 29.3 Remaining landfill capacity, south east England (Environment Agency, 2015b)

Landfill type	Remaining capacity m^3 (2015)
Hazardous (merchant and restricted)	630,000
Inert	26,530,707
Non-hazardous (including stable hazardous waste cells)	48,037,155

29.2.25. Figure 29.2 shows the remaining landfill capacity in the south east of England, and uses simple forecasting to indicate how this trend will continue in the absence of future recovery provision to the first full year of operation.

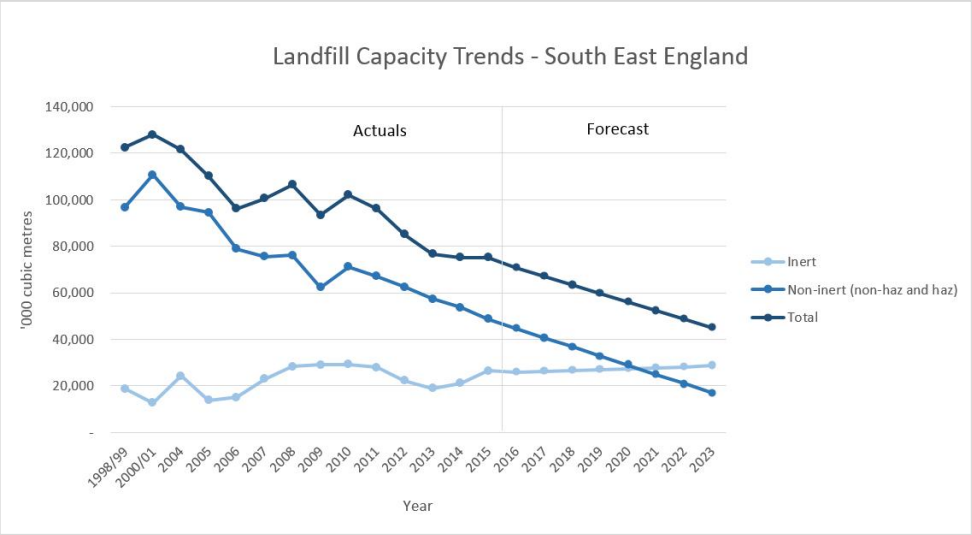


Figure 29.2 Landfill capacity trends in the south east of England

29.3 SCOPE OF ASSESSMENT

29.3.1. The scope of the assessment of materials will include:

- The consumption of materials and products (from primary, recycled or secondary, and renewable sources, and including materials

offering sustainability benefits), as well as the generation and use of arisings recovered from the Proposed Development; and

- The production and disposal of waste to landfill.

29.3.2. The assessment of materials will specifically exclude (scoped out):

- Lifecycle assessment (including embodied carbon and water) of materials and arisings, and waste. The effort and resources required to undertake a full lifecycle assessment of these elements are deemed disproportionate to the benefit they would offer the assessment of significance of effect; and

29.3.3. Materials consumption, and arisings and waste production beyond the first full year of operation have been scoped out, as their impacts and associated effects have been deemed to be not significant.

LIKELY SIGNIFICANT EFFECTS

29.3.4. The impacts of the Proposed Development from materials and arisings, and waste generation and disposal, are likely to occur on-site, off-site within the UK and, potentially, internationally.

29.3.5. It is expected that most direct and indirect impacts will occur during construction and the first full year of operation. Impacts arising further into the operational lifecycle of the proposed converter station and cable route are expected to be negligible, and hence have been scoped out of this chapter. Likely impacts are set out in Table 29.4.

Table 29.4 Impacts of consuming materials and disposing of waste, and from diverting arisings from landfill

Element	Direct adverse impacts	Indirect adverse impacts
Materials	Consumption of natural and non-renewable resources	• Release of greenhouse gas emissions; • Water consumption and scarcity; and

Element	Direct adverse impacts	Indirect adverse impacts
		• Environmental degradation and pollution. nuisance to communities (visual, noise, health)
Waste	Generation and disposal of waste	• Release of greenhouse gas emissions; • Environmental degradation and pollution; and • Nuisance to communities (visual, noise, health).
Arisings	Reduction in the consumption of natural and non-renewable resources	• Reduction in greenhouse gas emissions; • Reduced water consumption; • Environmental preservation; and • Reduced nuisance to communities.

29.4 ASSESSMENT METHODOLOGY

29.4.1. The following methodology will be used to assess the effects of the consumption of materials (including the production and use of arisings), and the generation and disposal of waste associated with the Proposed Development.

29.4.2. The methodology is based on guidance set out in Interim Advice Note (IAN) 153/11 Environmental Assessment of Material Resources which represents current best practice. With a primary focus on reducing the impacts of materials and waste from construction activities in the highways sector, it is the professional judgement of the author of this chapter that IAN 153/11 is appropriate for use on the cable routing elements of the Proposed Development. The general ethic and principles of the guidance are also applicable to the proposed converter station development, as well.

29.4.3. In accordance with the scale and nature of the Proposed Development, a detailed assessment of materials is proposed.

29.4.4. The assessment will take into account the impacts of the Proposed Development during construction, and for the first full year of operation.

MATERIALS

29.4.5. An assessment of the effects of consuming materials required during construction plus the first full year of operation will be undertaken by considering the origins and sources of materials, including their general availability (production, stock, sales) and the proportion of re-used or recycled materials they contain.

29.4.6. The assessment will take into account the relative volume of materials that need to be consumed, understanding that – typically – the larger a development footprint and associated groundworks, the greater the requirement to consume materials.

29.4.7. In general, it is expected that the consumption of natural and non-renewable resources will result in adverse effects.

ARISINGS

29.4.8. Arisings (from CDE activities) will be evaluated to determine the volume of excavations that can be retained for re-use or recycling i.e. diverted from landfill.

29.4.9. The assessment will take into account the nature of impacts (adverse/beneficial, permanent/temporary, direct/indirect) from arisings, and use professional judgement to determine the significance of effect.

29.4.10. In general, it is expected that the re-use and recycling of arisings will result in beneficial impacts.

LANDFILL CAPACITY

29.4.11. An assessment of the remaining landfill capacity in south east England (including the London area) will be used to determine the impacts and effects of waste generated during construction and the first full year of operation, for the Proposed Development.

29.4.12. The assessment shall consider the volume of waste generated and the potential impacts and effects of each on remaining landfill capacity. The assessment will be completed for inert, non-hazardous and hazardous waste types.

29.4.13. The assessment will consider the nature of impacts (adverse/beneficial, permanent/temporary, direct/indirect) from waste generated and disposed of, and use professional judgement to determine the significance of effect.

29.4.14. In general, it is expected that the generation of waste and its disposal to landfill, will result in adverse impacts.

29.4.15. UK landfill operators can claim commercial confidentiality for their data at time of submission; data for sites with a commercial confidentiality in place are unavailable for the analyses presented in this chapter.

DATA REQUIREMENTS

29.4.16. Table 29.5 provides an indication of the types of data and information that, where available, will be analysed during the environmental assessment of the Proposed Development.

Table 29.5 Information and data requirements for waste and materials assessment

Element	Information and data required
Materials	• The type and volume of materials to be consumed (a Bill of Quantities); • Details of on-site storage and stockpiling arrangements, and any supporting logistical details;

Element	Information and data required
	• The type and volume of materials that will be recovered from off-site sources for use on the Proposed Development; • Information on any materials that will comprise entirely (or incorporate) secondary or recycled content; • The source and origin of materials to be consumed; and • Information on any known sustainability credentials of materials to be consumed
CDE arisings	• the type and volume of CDE (including remediation) arisings to be generated • an On-site Recovery Index, which describes the percentage of demolition, remediation and earthwork arisings that will be diverted from landfill, and reused, recycled or stockpiled for high value future use either on-site or in other applications e.g. on other projects. • any physical, chemical or other processing, and storage requirements that needs to be deployed to ensure arisings are used their highest value • details of on-site storage and stockpiling arrangements, and any supporting logistical details • the capacity of identified materials treatment or recycling facilities able receive the type and volume of arisings forecast, where they cannot be re-used on or off site

Element	Information and data required
	• the cut and fill balance (including a description of whether this comprises net loss, balanced, net gain) Defra has confirmed that no CDE data are published at the regional level, and only national (England) data are accessible through the publically available Waste Data Interrogator Database (as held and operated by the Environment Agency). Defra quoted that: "*The methodology used to generate these figures is complex, in order to take into account the inherent double-counting and data gaps that are present within waste system data, and it would not be feasible to reproduce these on a regional basis*." Until such a time that CDE generation and recovery rates by region are available, transfer (non-civic), recovery and metal recycling data (available through the Waste Data Interrogator Database) will be used as the closest possible proxy.
Waste to landfill	• The type and volume of CDE and operational waste to be sent to landfill; • The % of all CDE and operational waste to be sent to landfill by type; and • The capacity of identified landfill sites to receive the type and volume of waste forecast

ASSESSING THE SIGNIFICANCE OF EFFECTS

29.4.17. In order to assign a significance of effect category to assessed materials, arisings and waste, the information in Table 2.4 from the DMRB (Highways England, 2008) will be applied.

29.4.18. The descriptions provided in Table 29.6 will be used to define the significance of effect from each element (materials, arisings, waste) assessed.

Table 29.6 Definitions for significance of effect

Significance category	Description of effect
Very large	Potential for extremely detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.
Large	Potential for considerable detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.
Moderate	Potential for noticeable detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.
Slight	Potential for limited or barely perceptible detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.
Neutral	No detrimental or beneficial effects in relation to construction materials, arisings or landfill capacity within the region.

DESIGN, MITIGATION, ENHANCEMENT AND MONITORING MEASURES

29.4.19. To date, specific design measures identified that will mitigate adverse impacts from materials consumption and the generation and disposal of waste, and that will maximise benefits derived from arising re-use / recycling, include:

- Ground and local environment inspections and surveys will be carried out to determine the nature of the ground, to identify its potential to be diverted from landfill;

- Where possible, the use of HDD or other trenchless techniques to minimise the need to generate open trenches;
- Spoil and rubbish segregation and containment on temporary laydown areas;
- A drive to balance cut and fill at the proposed converter station site. For example, materials excavated on higher parts of the site will be used to fill lower levels in order to minimise exportation. The option to increase the excavated material cut from the site to decrease the overall visual impact of the building will also be investigated;
- Both onshore and marine cables are designed not to require any maintenance;
- The proposed converter station will (at end of life) be decommissioned in accordance with the current waste disposal regulations;
- At the end of the marine cable's 40 year design, the options for decommissioning will be evaluated. In some instances, the least environmentally impacting option may be to leave the cable in-situ. The final decommissioning plan is still to be determined, and may depend on requirements and the marine environment at the time; and
- When decommissioning onshore cables, every effort will be made to re-use and recycle as much material as possible.

29.4.20. It would be expected that monitoring measures to be adopted across the Proposed Development would include – as a minimum – the implementation of a CEMP, Materials Management Plan (MMP) and Site Waste Management Plan (SWMP). Associated data, information and reports will be used to evidence monitoring undertaken.

30. CARBON AND CLIMATE CHANGE

30.1 SCOPING OPINION AND CONSULTATION

30.1.1. There were no comments received from the LPA Scoping Opinion relating to carbon and climate change.

30.2 BASELINE

GREENHOUSE GAS EMISSIONS ASSESSMENT

30.2.1. The greenhouse gas (GHG) assessment includes any increase or decrease in emissions as a result of the Proposed Development but there is no geographical restriction in terms of where those emissions occur. For example, construction emissions occur in the area of the Proposed Development footprint but are also related to the transport of materials to and from the site, their manufacturing and disposal. Operational emissions include those from the generation of electricity which is consumed or lost from the Proposed Development infrastructure, and emissions and energy consumption associated with maintenance activities.

30.2.2. In the current and future baseline scenario (without the Proposed Development), GHG emissions occur constantly and widely as a result of human and natural activity including energy consumption (fuel, power), industrial processes, land use and land use change in the area of the Proposed Development and beyond. The GHG assessment for the Proposed Development will only consider where it results in additional or avoided emissions in comparison to the baseline scenario.

30.2.3. The Proposed Development will provide for the transfer of electricity between France and the UK, according to the relative supply/demand in the respective countries. The current (2017) GHG emissions intensity of grid electricity in the UK (predominantly generated from fossil-fuel sources) is approximately 0.3kgCO2e per kWh. However, as UK electricity generation is decarbonised, the intensity is projected to continue decreasing over the lifetime of the Project (2022-2062) stabilising around 0.03 kgCO2e per kWh, as shown in Figure 31.1 (attached).

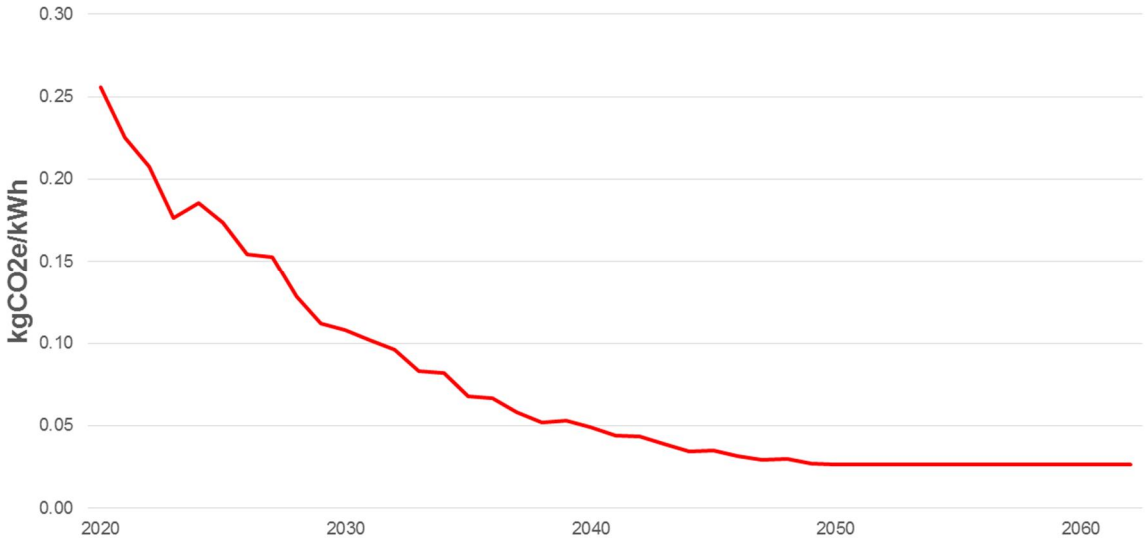


Figure 30.1 GHG emissions intensity of UK grid average electricity (BEIS)

30.2.4. In France, the GHG emissions intensity of grid electricity is much lower as a result of the high proportion of nuclear and renewable power generation (BEIS, 2017). In 2013, the emissions intensity was approximately 0.06 kgCO2e per kWh with future projections for the year 2030 of between 0.02 and 0.06 kgCO2e per kWh (RTE, 2014).

30.2.5. Electricity transferred from France is therefore projected to be of much lower emissions intensity than the UK until at least 2037, but this is likely to continue throughout the lifespan of the Proposed Development.

CLIMATE RESILIENCE ASSESSMENT

30.2.6. The study area for the climate resilience assessment comprises the footprint of the Proposed Development.

30.2.7. The baseline for the climate resilience assessment comprises the recent historical climate conditions (1961 to 1990) as well as the future projections for key climate parameters. All figures are taken from the UKCP09 projections which cover the whole of the UK. Future projections are provided for the 2020s (2010-2039; corresponding to the construction period) as well as the 2040s (2030-2059) and 2060s (2050-2079) during the Proposed Development's operational design life.

30.2.8. UKCP09 has been used to identify climate projections using the high emissions scenario and the central estimate (50% probability), in common with other major infrastructure developers and operators.

30.2.9. Table 30.1 and Table 30.2 show the absolute and projected changes in temperatures over the Proposed Development's design life (40 years). For all time periods, temperatures during both winter and summer are expected to increase. The warmest day in summer is projected to increase by almost 1.3°C

between 2010 – 2039, and by 2.5°C towards the Proposed Development's end of life.

30.2.10. All the environmental assessment topics for this Proposed Development will take into account the potential for in-combination impacts and effects in relation to these climate change projections.

Table 30.1 Absolute temperature

Period	Summer – Mean Daily Temperature (°C)	Winter - Mean daily temperature (°C)	Summer - Mean daily maximum temperature (°C)	Winter - Mean daily minimum temperature (°C)
2010 - 2039	17.5 °C	6.0 °C	22.3 °C	3.3 °C
2030 - 2059	18.3 °C	6.5 °C	23.3 °C	3.9 °C
2050 - 2079	19.1 °C	7.2 °C	24.4 °C	4.6 °C

Table 30.2 Projected change in temperature

Period	Summer - Mean daily temperature (°C)	Winter - Mean daily temperature (°C)	Summer - Mean daily maximum temperature (°C)	Winter - Mean daily minimum temperature (°C)	Summer - Warmest Day (°C)	Summer - Warmest Night (°C)
2010 - 2039	+ 1.6 °C	+ 1.4 °C	+ 2.0 °C	+ 1.5 °C	+ 1.3 °C	+ 1.2 °C
2030 - 2059	+ 2.4 °C	+ 2.0 °C	+ 3.0 °C	+ 2.1 °C	+ 2.2 °C	+ 2.1 °C
2050 - 2079	+ 3.2 °C	+ 2.6 °C	+ 4.0 °C	+ 2.8 °C	+ 2.5 °C	+ 2.7 °C

30.2.11. Table 30.3 and Table 30.4 show the absolute and projected changes in precipitation over the Proposed Development's design life. During winter, precipitation is projected to increase across all time periods. This may have the potential to lead to more extreme rainfall events, as increases range from +7% up to 2039 and +19% towards the end of the century.

30.2.12. In summer, average precipitation is projected to decrease by up to 10% towards 2039, and by 28% towards the end of the century.

Table 30.3 Absolute precipitation

Period	Summer – Average Precipitation (mm/day)	Winter – Average Precipitation (mm/day)
2010 – 2039	1.5	2.7
2030 – 2059	1.4	2.9
2050 – 2079	1.2	3.0

Table 30.4 Projected change in precipitation

Period	Summer - Average Precipitation (%)	Winter - Average Precipitation (%)	Summer - Wettest Day (%)	Winter - Wettest Day (%)
2010 – 2039	-10.4	+ 7.3	-0.7	+ 8.0
2030 – 2059	-16.4	+ 13.2	-5.3	+ 13.3
2050 – 2079	-27.5	+ 18.6	-10.4	+ 17.2

30.3 SCOPE OF ASSESSMENT

GHG ASSESSMENT

30.3.1. The approach to GHG assessment is based upon IEMA's EIA guide 'Assessing GHG emissions and evaluating their significance' (IEMA, 2017).

30.3.2. Table 30.5 provides detail of the relevant types/sources of emissions at each stage of the lifecycle of the Proposed Development and a decision on whether

this stage will be scoped in or out for environmental assessment. This decision is taken on the basis of the likely magnitude of GHG emissions (or avoided emissions) in comparison to the baseline scenario with no Proposed Development.

Table 30.5 Proposed scope of the GHG assessment

Lifecycle stage and emissions activity	Scope in/out	Reasoning
Construction		
Product stage; including raw material supply, transport and manufacture	In	Emissions 'embodied in' construction materials typically form the greatest proportion of a Proposed Development's construction emissions. The Proposed Development will involve large quantities of steel and concrete for the proposed converter station structure and infrastructure, as well as metal in the terrestrial cable itself.
Construction process stage; including transport to/from works site and construction/installation processes.	In	Emissions from the construction process can be considerable especially in schemes involving large quantities of earth excavation, on-site movement and removal of arising. There is the potential for large amounts of earth movement for the proposed converter station and cable trenching.
Land use, land use change and forestry (LULUCF).	Out	None of the proposed locations for the proposed converter station contain significant woodland vegetation. The cable route will largely be within the footprint of roads and it is assumed that any agricultural land will be re-instated.
Operation		

Lifecycle stage and emissions activity	Scope in/out	Reasoning
Operation and maintenance	In	Power will be consumed at the proposed converter station throughout its design life for operation, lighting and cooling. Insulants/cooling gasses (potent GHGs) may be used and leak from the proposed converter station. Electricity transmissions losses (consumption) will occur at the proposed converter station/cables.
Repair and refurbishment	In	It is anticipated that the control system and converter technology will be replaced after 15-20 years, with the remainder of the infrastructure expected to last the duration of the 40 year design life.
Decommissioning		
Deconstruction	Out	Decommissioning will result in emissions from the process of deconstruction and removing the proposed converter station infrastructure and the underground terrestrial cables (if removed). In contrast, this process will result in material which may be recycled thereby offering emissions savings for the next product system. These two aspects will balance each other to an extent and, combined with the uncertainty around future decommissioning processes over 40 years into the future, it is therefore not appropriate to assess this lifecycle stage.

Lifecycle stage and emissions activity	Scope in/out	Reasoning
Transportation of waste arisings		
Waste processing for recovery		
Disposal		
Beyond System Boundary		
Emissions or avoided emissions which are a result of the Proposed Development but are not related to its construction, operation or end of life.	In	A net reduction in emissions may be demonstrated as a result of the transfer of electricity predominantly from France (relatively low electricity generation emissions-intensity).

30.3.3. Since there is only limited information regarding the magnitude of emissions activity at this stage of the assessment, a conservative approach has been taken to scoping.

Likely Significant Effects

30.3.4. The impacts of GHGs relate to their contribution to global warming and climate change. These impacts are global and cumulative in nature, with every tonne of GHGs contributing to impacts upon natural and human systems.

30.3.5. GHGs are natural and man-made gases occurring in the atmosphere which absorb and emit infrared radiation thereby maintaining the Sun's energy within the Earth's atmosphere. There is an overwhelming scientific consensus that the major increase in the concentration of GHGs from man-made sources is contributing to global warming and climate change.

30.3.6. The seven main GHGs, as defined by the Kyoto Protocol, are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride. In combination, these GHG emissions are commonly expressed in terms of carbon dioxide equivalents (CO_2e) according to their relative global warming potential. For this reason, the shorthand 'carbon' is sometimes used to refer to GHGs.

CLIMATE RESILIENCE

30.3.7. The approach to assessment of climate resilience is based upon IEMA's EIA guide to Climate change resilience and adaptation as well as the experience of the Project team on other major infrastructure projects.

30.3.8. Climate resilience with respect to the risk of flooding is considered as part of the separate chapter on the water resources and flood risk (see Chapter 22) and is not assessed here.

Likely Significant Effects

30.3.9. The impacts in relation to climate resilience relate to how the changing climate may affect the Proposed Development itself in terms of the construction and operation of the infrastructure, its ability to function and the end-users.

30.3.10. The potential impacts of climate change on the Proposed Development are diverse and may include the receptors and aspects set out in Table 30.6.

Table 30.6 Potential impacts relating to climate resilience

Receptor	Aspects
Geotechnics	Erosion
	Stability of earthworks and compaction
	Earthworks construction across existing landslip
	Increased scour and erosion of earthworks
	Stability of slopes, change in water levels/pore pressure
Structures	Thermal actions (loads) applied to superstructure
	Wind actions (loads) applied to superstructure
	Increased thermal range giving rise to increased earth pressures
	Earth pressures used in design affected by change in ground water level
	Foundation settlement affected by change in ground water level
	Design for increased scour risk for foundations
	Design of structure drainage

Receptor	Aspects
	Use of temperature sensitive components or materials in construction or rehabilitation (e.g. epoxies used in fibre reinforced plastic (FRP) strengthening)
	Design, management and maintenance of expansion joints
	Climatic constraints on construction and maintenance activities
	Optimum timing of maintenance interventions, in response to changes in deterioration rates
Operations	Cooling capacity of plant in proposed converter station
Soft estate	Landscape, ecology

30.3.11. Including these elements within the assessment represents a comprehensive and good practice approach to assessing the significance of impacts and effects arising from climate change on the Proposed Development. It also creates an environment in which opportunities to identify and implement enhancements are encouraged alongside the reduction of adverse effects.

30.3.12. The effects of climate change during the decommissioning of the Proposed Development have been excluded due to uncertainty of requirements and processes at the Proposed Development's end of life.

30.4 ASSESSMENT METHODOLOGY

GHG Assessment

30.4.1. For each of the lifecycle stages which have been scoped in for assessment (see above), the detailed assessment will include the following:

- Collection of data/information on the scale of GHG-emitting activities for the Proposed Development, as well as for the baseline scenario if this is required to show the relative effect. In each case this will cover the trend for the whole study period; and
- Calculation of the GHG emissions using a standard emissions calculation methodology applying a suitable emissions factor.

30.4.2. GHG emissions calculations will be completed using a recognised carbon calculation tool for infrastructure schemes (e.g. Highways England, the Environment Agency, the Rail Safety and Standards Board) supplemented by a bespoke emission calculation model where necessary. GHG emissions will be calculated for each lifecycle stage and reported as tonnes of carbon dioxide equivalents (tCO2e).

Benchmarking

30.4.3. The total magnitude of GHG emissions (or avoided emissions) occurring during each of the five year carbon budget periods (agreed by the government) will also be reported.

30.4.4. The emissions will be compared to the overall carbon budget for that period (see Table 30.7) and expressed in percentage terms.

Table 30.7 UK Government Carbon budgets (Committee on Climate Change, 2017)

Carbon budget period	UK carbon budget
Third: 2018-2022	2,544 MtCO2e
Fourth: 2023-2027	1,950 MtCO2e
Fifth: 2028-2032	1,725 MtCO2e

30.4.5. GHG emissions result in the same global climate change effects wherever and whenever they occur and therefore the sensitivity of different human and natural receptors is not considered. There are currently no agreed thresholds for what level of GHG emissions is considered significant in an EIA context.

30.4.6. The GHG assessment will identify a range of potential opportunities for reduction of the magnitude of emissions, focussing on key lifecycle stages.

CLIMATE RESILIENCE

30.4.7. Historical and projected (baseline) climate data for the location of the Proposed Development will be used to identify climatic trends which may impact upon the Proposed Development. Having identified the climate change impacts, the effects (hazards/opportunities) of those impacts shall be assessed. The likelihood of the impact occurring shall be assessed using the criteria in Table 30.8.

Table 30.8 Qualitative measure of likelihood

Likelihood of impact	Description
Frequent	Will occur / recur regularly and/or often
Likely	Will occur / recur on occasion, a persistent issue
Occasional	Will probably occur
Remote	Will occur / recur occasionally
Unlikely	Not expected to occur / recur
Rare	Would only occur / recur in very extreme circumstances

30.4.8. The consequence of the impact will be assessed using the criteria in Table 30.9.

Table 30.9 Qualitative measure of consequence

Consequence of impact	Description
Extreme	Operation of the Proposed Development is disrupted resulting in outage >1week. Severe impact to operation of the site with damage, disruption or closure. Very large numbers of receptors and users affected with severe disruption to the site activities. Severe damage to property and built environment in affected area requiring large capital expenditure.
Major	Operation of the Proposed Development is disrupted resulting in outage between 4 – 7 days. Impact to operation with damage or disruption to the site. Large number of receptors and users in affected area

Consequence of impact	Description
	impacted. Disruption to site activities with health and safety risk
Moderate	Operation of the Proposed Development is disrupted between 1 – 3 days. Damage or disruption confined to a specific location of the Site
Minor	Operation of the Proposed Development is disrupted resulting in outage <1day. Minor, localised, impact to operation of the Site with damage or disruption
None	Impacts give rise to no or negligible effects on identified receptors.
Minor positive	Impacts give rise to small, typically localised, beneficial effects on identified receptors.
Moderate positive	Impacts give rise to larger and/or profound beneficial effects on identified receptors, typically impacts are local.
Major positive	Impacts give rise to particularly large and/or profound beneficial effects on identified receptors. Potential reductions to construction time and costs. Potential improvement to scheme operations.
Extreme positive	Impacts give rise to extremely large and/or profound beneficial effects on identified receptors. Potential substantial reductions to construction time and costs. Potential substantial improvement to scheme operations.

30.4.9. The likelihood and consequence of each impact, be it positive or negative, is combined to give the risk of each effect occurring as shown in Table 30.10.

Table 30.10 Climate risk assessment matrix

		Likelihood					
		Rare	**Unlikely**	**Remote**	**Occassional**	**Likely**	**Frequent**
Consequence	**Extreme**	Medium	Medium	High	High	High	High
	Major	Low	Medium	Medium	High	High	High
	Moderate	Low	Low	Medium	Medium	High	High
	Minor	Low	Low	Low	Low	Medium	Medium
	None	Low	Low	Low	Low	Low	Low

30.4.10. The climate resilience assessment will identify a range of potential opportunities for reduction of the risks identified.

31. ELECTRIC-MAGNETIC FIELDS

31.1 SCOPING OPINION AND CONSULTATION

31.1.1. Comments from the LPA Scoping Opinion relating to electric and magnetic fields are summarised in Table E3 and E4 in Appendix E.

31.2 BASELINE

INTRODUCTION TO ELECTRIC AND MAGNETIC FIELDS

31.2.1. EMF and the associated electromagnetic forces, are a fundamental part of the physical world. Their sources are electric charges (source of the electric field) and the movement of those charges (source of the magnetic field). Electromagnetic forces are partly responsible for the cohesion of material substances and they mediate all the processes of chemistry, including those of life itself. EMFs occur naturally within the body in association with nerve and muscle activity. People are also exposed to the natural magnetic field of the Earth (to which a magnetic compass responds) and natural electric fields in the atmosphere.

31.2.2. It has become common practice to report magnetic fields in units of microtesla (µT) or nanotesla (nT). One nanotesla is one thousandth of a microtesla. Microtesla is used throughout this chapter.

31.2.3. Electric-field strengths are measured in volts per metre (V/m) or kilovolts per metre (kV/m). One kilovolt per metre is one thousand volts per metre. Atmospheric static or “dc” electric fields at ground level are normally between 10 – 130 V/m in fine weather and may rise to many thousands of volts per metre during thunderstorms.

31.2.4. The direction of the Earth’s magnetic field is normally constant, varying in size only slowly over time, and is referred to as a static or “DC” field. The Earth’s magnetic field is approximately 50 µT in the UK. Other fields that alternate in their intensity more frequently over time are referred to as alternating or “AC” fields.

31.2.5. All wiring, equipment, and other conductors connected to the electric power system are sources of EMFs. In the UK and Europe the fundamental power frequency of ac systems is 50 Hertz (Hz) corresponding to the extremely low frequency (ELF) range. DC equipment produces static fields which do not vary with a fixed frequency.

31.2.6. Fields due to electrical equipment add to (or modulate) the Earth's steady natural fields. The strength (or amplitude) of the electric-field modulation depends on the voltage of the transmission equipment. As the voltage level supplied to power conductors is regulated, the electric field remains more or less constant as long as the equipment is energised. Conversely, the strength of the magnetic-field modulation depends on the current (often referred to as

the load) carried by the equipment, which varies according to the demand for power at any given time.

EMF EXPOSURE GUIDELINES

31.2.7. In the UK, there are presently no statutory regulations to limit public exposure to power-frequency electric or magnetic fields. However, in 2004 the National Radiological Protection Board (NRPB) provided advice to Government (NRPB, 2004), recommending the adoption in the UK of public exposure guidelines published in 1998 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) (ICNIRP, 1998) in terms of the 1999 EU Recommendation (Official Journal of the European Communities (OJEC), 1999).

31.2.8. The guidelines are designed to set conservative exposure levels for the general public to 50 Hz electric and magnetic fields, and they are endorsed by the UK's Health Protection Agency, the World Health Organisation and the UK Government. A summary of the ICNIRP Guidelines is provided in Table 31.1.

31.2.9. In 2010, ICNIRP produced new guidelines (ICNIRP, 2010), but these do not automatically take effect in the UK. The UK policy for public exposure remains based on 1998 ICNIRP until the UK Government decides otherwise.

Table 31.1 Summary of the public exposure 50 Hz UK guidelines based on 1998 ICNIRP

Basic Restriction			
1	ICNIRP Basic Restriction mA/m^2 Induced current density in central nervous system	$2mA/m^2$ for the general public	
Practical Exposure Measures			
		50 HZ Electric Fields	**50 Hz Magnetic Fields**
2	Field Strengths corresponding to the Basic Restriction	9,000 V/m	360 µT
3	ICNIRP Reference Level Field Strengths, below which no further action is	5,000 V/m	100 µT

	necessary, and above which further investigation may be warranted		

31.2.10. Table 31.1 contains two types of guidelines from ICNIRP. The first type, “Basic Restriction”, the EU recommends (OJEC, 1999) as the maximum current density to be induced in the central nervous system of an individual “when the time of exposure is significant”.

31.2.11. Current density, however, is a quantity that cannot realistically be measured in people. Public Health England (formerly Health Protection Agency) therefore also provided a second, more practical guideline – ‘’Field Strengths’’. Type 2 Field Strength (see Table 31.1) gives Field Strengths that are measurable practically and that are considered to correspond with the Basic Restriction.

31.2.12. ICNIRP Reference Level Field Strengths (see Table 31.1) are yet more conservative values that would, under all normal circumstances, be expected to induce current densities significantly less than the Basic Restriction. Research by Dimbylow (Dimbylow, 2005) indicates that the Field Strengths quoted as corresponding to the Basic Restriction act as good, if slightly conservative, equivalents to the 1998 ICNIRP Basic Restriction for the general public, and for this reason the Basic Restriction values in Table 31.1 are generally considered more relevant to electrical equipment than the Reference Levels.

31.2.13. A UK voluntary Code of Practice (Department of Energy and Climate Change (DECC), 2012) describes how compliance with the exposure limits is demonstrated including details of acceptable calculations and the conditions that compliance is assessed for.

STATIC ELECTRIC AND MAGNETIC FIELD EXPOSURE GUIDELINES

31.2.14. The UK Government’s policy with regard to static fields is based upon the EU Recommendation (OJEC, 1999) and NRPB’s advice (NRPB, 2004). A limit of 40 millitesla (40,000 µT) is defined for the continuous exposure of members of the general public. Although the public exposure limit for static magnetic fields was increased to 400 mT in the 2010 ICNIRP Guidelines (ICNIRP, 2010), UK guideline limits remain at the lower value in accordance with the EU Recommendation (OJEC, 1999)

31.2.15. The EU Recommendation (OJEC, 1999) does not contain any limits for static electric fields. Instead, there is a statement:

31.2.16. *“No E-field value is provided for frequencies <1Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.”*

31.2.17. No limits for static electric fields are given in the NRPB's 2004 advice either, but it states:

31.2.18. *"Where direct perception of static electric fields causes annoyance, or indirect effects of electrostatic discharge cause pain, it is important to reduce the possibility of occurrence of these effects. The threshold for perception of static electric fields is around 20 kV/m, and sensations become annoying above about 25 kV/m."*

31.3 ASSESSMENT METHODOLOGY

31.3.1. The assessment of electric and magnetic fields will be based upon the UK voluntary Code of Practice (DECC, 2012) which specifies that compliance should be specifically demonstrated for cables above 132 kV and substations containing air-cored reactors.

31.3.2. The Proposed Development uses both AC and DC technologies, so both AC and static electric and magnetic fields will be produced and are to be considered within the EMP assessment. High-voltage electrical equipment can create, or channel, electromagnetic emissions over a wide range of frequencies; however, only 50 Hz and static electromagnetic fields should be considered.

31.3.3. Electric and magnetic field strengths shall be calculated using standard equations based on fundamental properties, with consideration of conditions outlined in the Code of Practice (DECC, 2012). Accordingly, the calculation of EMF shall always be referenced to a height of 1m above ground level. The acceptability of the prospective field strengths shall be judged by comparing the results of the calculations with the appropriate ICNIRP Guidelines.

31.3.4. The topic of EMF will be assessed within individual technical assessments in relation to the specific receptors and the identified effects within the ES and PEIR.

32. ONSHORE CUMULATIVE EFFECTS

32.1.1. The need to consider cumulative impacts is set out in the EIA Directive and the requirements of the Directive implemented through the EIA Regulations.

32.1.2. In order to ensure that a meaningful assessment can be carried out with regards to the CIA, only projects which are reasonably well described and sufficiently advanced will be considered. However, where any such projects are identified and screened out, justification will be provided for doing so.

32.1.3. As advised by the PINs advice note 17 (PINS, 2015), where projects under construction are expected to be completed before construction of the Proposed Development and the effects of those projects are fully determined, effects arising from them should be considered as part of the baseline.

32.1.4. PINS (2015) advises that the following stages are followed for CIA:

- Establish a zone of influence fo the Proposed Development and identify a list of 'other developments';
- Identifity shortlist of 'other developments';
- Information gathering; and
- Assessment.

32.1.5. The projects which are to be considered in cumulation with the Proposed Development as part of the EIA are those located within a 1km radius of the Proposed Development that have the benefit of planning permission, or are reasonably foreseeable (i.e. resolution to grant) and are similar in terms of use, scale and nature. The schemes which meet these criteria are set out in Table 32.1 to Table 32.4 and their locations are shown on Figure 32.1 (attached).

32.1.6. Cumulative effects will be identified and assessed through a desk based study using professional expertise to make a judgement as to the likely significance of changes in baseline conditions in the area surrounding the Site arising from the completion of the Proposed Development together with relevant committed developments. A quantitative assessment approach will be adopted where appropriate and possible, and where data is available. Consideration will be given to the timing and spatial influence of the Proposed Development and the identified committed developments.

32.1.7. The result of the cumulative effects will be provided in the ES which will summarise the interactions between effects (as assessed in the individual chapters for each topic) and will describe the findings of the assessment of cumulative effects arising from the combination of the development together with relevant committed developments in the locality.

32.1.8. It would be appreciated if the LPAs could please confirm within their formal EIA Scoping Opinion the committed or permitted schemes that they believe should be included as part of any cumulative assessment.

32.1.9. The key potential cumulative effects for consideration in the ES are expected to include the following:

- Road traffic generation during construction and operation; and
- Effect on landscape character, including built heritage assets and their setting and visual amenity.

32.1.10. The assessment of interaction between effects that may occur between different environmental components (such as air, noise and road traffic) will be inherent within the EIA process and will be presented in the ES chapter specific to each topic, with cross references made between topics where appropriate.

32.1.11. The traffic assessment and traffic data utilised for the assessment will include the predicted future traffic generation on the local highway network (including relevant committed developments within the local area).

No transboundary impacts are anticipated for the onshore elements of the Proposed Development. Transboundary impacts in relation to the marine elements of the Proposed Development are discussed in Chapter 17.

Table 32.1 Proposed committed developments within EHDC boundary

Development Address	Planning Application Reference	Description	Approximate distance from site	Local planning Authority	Status as of October 2018
Land south of Lovedean Electricity Sub Station, Broadway Lane, Lovedean, Waterlooville	57524/001	Installation of two energy storage systems and associated infrastructure with a total capacity of 49.95MW.	To the immediate south of Lovedean substation.	East Hampshire District Council	Permission granted on 17.04.2018
Land rear of 185-189A Lovedean Lane	54596/001	Outline application with some matters reserved for 40 residential dwellings (mix of 1, 2, 3 and 4 bed) with associated amenity space and road network with access from Lovedean Lane via existing access.	1.1km to the south east of the proposed converter station	East Hampshire District Council	Outline permission granted on 15.09.2014.
Land Rear of 179-189A Lovedean Lane, Horndean, Waterlooville	54596/002	Reserved matters pursuant to 54596/001 for dwellings and discharge of condition 7 of 54596/001 as revised by plans and details received 3 March 2016.	1.1km to the south east of the proposed converter station	East Hampshire District Council	Reserved matters granted on 29.04.2016
Development Land East of Horndean, Rowlands Castle	55562/001	Outline planning application with all matters reserved (except for access to the highway network and associated off-site highway improvements) for the demolition	35km east of the proposed converter station	East Hampshire District Council	Outline permission granted on 05.02.2016

Development Address	Planning Application Reference	Description	Approximate distance from site	Local planning Authority	Status as of October 2018
Road, Horndean, Waterlooville		of existing buildings and the development of a maximum of 700 dwellings, approximately 1.7 Ha of employment land, a Local Centre (including local retail, a primary school and community facilities), a Care Village, playing pitches, a cricket pavilion (including associated access and parking), allotments (including associated building and car parking), acoustic bunds and ecological buffers together with internal access network (including footpaths and cycleways), drainage works, associated landscaping and open space (including play areas).			

Table 32.2 **Proposed committed developments within Havant Borough Councils boundary**

Development Address	Planning Application Reference	Description	Approximate distance from site	Local planning Authority	Status as of October 2018
Former Purbrook Park Playing Fields, Stakes Road, Waterlooville	APP/12/00205	Construction of 76No. dwellings consisting of 3No. 2 bed, 38No. 3 bed, 23No. 4 bed houses and 12No. 2 bed flats with associated parking, landscaping including open space and play area, and pumping station. New vehicular access to Stakes Road and new pedestrian access to Stakes Hill Road.	0.52km to the east of thTabe cable route	Havant Borough Council	Permission granted on 03.08.2012
Purbrook Park School, Park Avenue, Waterlooville, PO7 5DS	APP/14/00687	Construction of new two storey school building (Block A), two storey school building to courtyard (Block B), refurbishment to Block D, raised covered walkways, new pedestrian access to main entrance and new Block A, altered and additional car parking, landscaping and other works. Demolition of two storey Caretakers house (approved 16/10/2014). Request to Discharge Conditions 3 and 4 (09.03.2016). Request to Discharge Conditions 2 and 16 (26.8.16).	0.54km to the east of the cable route	Havant Borough Council	Under construction

Grainger Development Site Land West of, London Road, Waterlooville	APP/10/00828	Outline application for the development of approx 2,550 no. dwellings including the construction of a new access from Ladybridge Roundabout, Milk Lane and completion of Maurepas Way access, a local centre (comprising retail, community building, land for health care, land for elderly care) public house, land for 2 primary schools, land for a nursery, land for employment uses, associated amenity space along with substantial green infrastructure, SuDS, land for allotments, main pumping station, land for cemetery, restoration of River Wallington, together with landscape structure planting (Matters for Approval Access only). Full planning application for the development of Phase 1 comprising 194 no. dwellings, internal roads, garages, driveways, pathways, boundary treatment, substation, pedestrian/cycle ways, including to Maurepas Way, associated parking spaces, flood attenuation ponds, temporary play provision, associated amenity space and hard and soft landscape works. Full planning for engineering operations associated with infrastructure requirements and service provision for the detailed Phase 1 application, the temporary	0.26 km to the west of the cable route	Havant Borough Council and Winchester City Council	Permission granted on 18.04.2012

		closure of Havant Footpath No 11 and Southwick and Widley Footpath No 30, with suitable alternative route provided (approved 18/04/2012). Request to Discharge Conditions 6(ii) (a, (d, (e, (f, (i, l, 11 and 18 (09/12/2016). Request to discharge condition No.6 (11) (o) (18.04.17). Request to Discharge Condition 6 (ii) o) (23.05.17).			

Table 32.3 Proposed committed developments within Winchester City Councils boundary

Development Address	Planning Application Reference	Description	Approximate distance from site	Local planning Authority	Status as of October 2018
Grainger Development Site Land West of, London Road, Waterlooville	APP/10/00828	Outline application for the development of approx 2,550 no. dwellings including the construction of a new access from Ladybridge Roundabout, Milk Lane and completion of Maurepas Way access, a local centre (comprising retail, community building, land for health care, land for elderly care) public house, land for 2 primary schools, land for a nursery, land for employment uses, associated amenity space along with substantial green infrastructure, SuDS, land for allotments, main pumping station, land for cemetery, restoration of River Wallington, together with landscape structure planting (Matters for Approval Access only). Full planning application for the development of Phase 1 comprising 194 no. dwellings, internal roads, garages, driveways, pathways, boundary treatment, substation, pedestrian/cycle ways, including to Maurepas Way, associated parking	0.26 km to the west of the cable route	Havant Borough Council and Winchester City Council	Permission granted on 18.04.2012

		spaces, flood attenuation ponds, temporary play provision, associated amenity space and hard and soft landscape works. Full planning for engineering operations associated with infrastructure requirements and service provision for the detailed Phase 1 application, the temporary closure of Havant Footpath No 11 and Southwick and Widley Footpath No 30, with suitable alternative route provided (approved 18/04/2012). Request to Discharge Conditions 6(ii) (a, (d, (e, (f, (i, l, 11 and 18 (09/12/2016). Request to discharge condition No.6 (11) (o) (18.04.17). Request to Discharge Condition 6 (ii) o) (23.05.17).			
Land At Old Park Farm Wimpey Site Part Of West Of Waterlooville MDA Hambledon Road Denmead Hampshire	13/02843/FUL	(AMENDED PLANS) Residential development comprising 103 no. dwellings with associated on-site infrastructure.	0.3km to the west of the cable route	Winchester City Council	Permission granted on 31.07.2015

Table 32.4 Proposed committed developments within PCC boundary

Development Address	Planning Application Reference	Description	Approximate distance from site	Local planning Authority	Status as of October 2018
Coastline Between Ports Creek Railway Bridge And Kendall's Wharf Portsmouth PO3 5LY	14/01387/FUL	Construction of new coastal defences consisting of raised earth embankments with rock armour on the seaward side, together with wave walls to abut the A2030 Eastern Road bridge to tie into the new embankments (along the alignment of the existing coastal defences), and associated landscaped works including a shared footpath constructed along the full length of the new embankment.	0.15km to the east of the cable route	Portsmouth City Council	Under construction
Coastal Defences Fort Cumberland Fort Cumberland Road Southsea PO4 9LJ	16/00255/FUL	Replacement of existing coastal sea defences with a rock revetment.	0.2 km to the east of the landfall	Portsmouth City Council	Under construction
West Wing St. Marys Hospital Milton Road	11/00250/OUT	Construction of 2- and 3- storey buildings comprising 191 dwellings and a 2-storey 60 bed care home with associated estate roads/parking areas/open space	0.29km to the west of the cable route	Portsmouth City Council	Conditional outline permission granted 29.03.2012

Portsmouth PO3 6AD		and landscaping after demolition of existing buildings [Outline with all matters reserved].			
Tesco Fratton Way Southsea PO4 8FA	14/00128/FUL	Construction of a Retail Store (Use Class A1) of up to 10,475sqm GEA, Petrol Filling Station (Sui Generis) with an associated kiosk up to 86sqm GEA, canopy and jet wash, new access/egress arrangements, car parking including replacement Stadium car parking, service yard, highway and footpath works, landscaping, and other associated works (after demolition of existing structures).	0.5km to the west of the cable route	Portsmouth City Council	Conditional permission granted on 19.09.2014
Former Kingston Prison Milton Road Portsmouth PO3 6AS	16/00085/FUL	Redevelopment of former prison comprising: part demolition and conversion of listed buildings to provide 73 dwellings and commercial unit (within Class A1 or Class A3); demolition of non-listed structures; construction of five blocks of between three and seven stories to provide 157 dwellings; part demolition of listed prison wall and formation of new vehicular accesses to Milton Road and St Marys Road; and provision of car parking and associated landscaping and other works.	0.67km to the west of the cable route	Portsmouth City Council	Conditional permission granted on 02.02.2017

Voyager Park Portfield Road Portsmouth PO3 5FJ	11/00822/VOC	Application to renew planning permission A*36229/AH to extend period of implementation for the development of site for offices/ industrial/ warehousing/ distribution (Classes B1,B2 and B8).	0.96km to the west of the cable route	Portsmouth City Council	Conditional outline permission granted on 24.11.2011

PART 4: CONSULTATION

33. CONSULTATION

33.1.1. To date, the Applicant has consulted and continues to consult with stakeholders and communities who are likely to be affected by, or interested in, the Proposed Development. As outlined in Chapter 5, consultation with the MMO and the relevant Local Planning Authorities as part of the previous Scoping exercise has also been undertaken.

33.1.2. Further consultation will be carried out in accordance with the statutory consultation requirements provided for in the PA 2008. These include consultation with statutory or prescribed bodies (under Section 42), local communities (under Section 47) and more widely via publicising the proposed application (under Section 48).

33.1.3. Under Section 47 of the PA 2008, the Applicant is required to agree a Statement of Community Consultation (SOCC) with the relevant Local Planning Authorities. The SOCC will set out how the Applicant proposes to consult the local community on the Proposed Development and will thereafter be required to carry out consultation in accordance with the SOCC.

33.1.4. Formal consultation with the local communities are planned to commence in January 2019. During this period, it is intended that the following consultation methods will be adopted:

- **Public exhibitions** public exhibitions will be held at local venues in areas affected by the Proposed Development. The public will be informed of the exhibitions through a number of methods, including: direct communications for those living in the Primary Consultation Zone (PCZ), notices in the local press as well as relevant port and harbour locations and social media advertising. Details of the public exhibitions will also be listed on the project website at www.aquindconsultation.co.uk. At the public exhibitions, copies of the SOCC, PEIR and NTS will be available to view, together with other information and documents. Members of the Project team will be in attendance to answer questions. Feedback forms will be available for attendees to complete.

- **Fisheries consultations:** local fishermen will be invited to meetings focussed solely on fisheries.

- **Deposit locations:** The SOCC and the relevant consultation documentation will be made available online at **www.aquindconsultation.co.uk** and in hard copy (free of charge) at deposit locations listed in the local area, to be agreed with the respective relevant local planning authorities. Consultation packs will also be available at these deposit locations, in order to enable consultation responses to be made by the public at that location.

- **Feedback:** feedback forms and freepost envelopes will be available at all public exhibitions. Written comments can also be made online at www.aquindconsultation.co.uk, via email to aquindconsultation@becg.com and via freepost 'AQUIND CONSULTATION'.

- **Community newsletter:** at the start of the consultation and at the point at which the Applicant submits the DCO application, a community update newsletter will be produced, providing details on the proposals and reporting on the outcome of the consultation process respectively. These will be distributed to residents and community groups, to users registering for further communications on our website and also to parish councils and communities that wish to receive them. Copies will be made available on our website and hard copies will be provided (at no charge) on request.

- **Media**: the consultation will be advertised in appropriate local press publications. Press releases will also be sent to identified media outlets during the pre-application process, containing details of the consultation, public exhibitions and how the local community can participate.

- **Social media:** the public exhibitions will be advertised on Facebook through a series of adverts targeted at within the area affected by the Proposed Development.

- **Council and community briefings:** local councils and community groups located in areas potentially affected by the proposal will be offered briefings. When invited, and where it is possible to do so, the project team will attend meetings of local community groups affected by the proposal.

33.1.5. Following the conclusion of the formal consultation period. A consultation report will be produced in accordance with the requirements of Section 37(7) of the PA 2008.

PART 5: SUMMARY AND CONCLUSIONS

34. SUMMARY AND CONCLUSIONS

34.1 SUMMARY

34.1.1. This Reprort identifies what is currently known and understood by the AQUIND Project Team with respect to the Proposed Development. Where receptor specialists consider that additional knowledge of the baseline conditions is required to inform a robust environmental impact assessment process, the Report outlines what studies, surveys and consultations have been undertaken already and what are proposed to extend the team's knowledge.

34.1.2. The team of specialists will then take the outcomes of this data gathering exercise, apply the assessment methodologies described in each section, and undertake a receptor specific environmental impact assessment on the potential effects predicted to arise from the Proposed Development.

34.1.3. Should unacceptable significant effects be identified, mitigation measures will be sought and incorporated into the design of the Proposed Development where appropriate and practicable. The ES will then be compiled in order to be submitted as supporting information to the DCO application for the Proposed Development.

34.1.4. Tables C1 and C2 in Appendix C presents a summary of the potential environmental effects arising from the Proposed Development that have been identified to be assessed further and proposes the work that will be carried out to establish the magnitude of the impacts and significance of effects to be assigned.

34.1.5. Consultations with relevant authorities, organisations and stakeholders will continue to be undertaken throughout the assessment and project design process.

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FIGURES

N

Eastney

Inshore Traffic Zone

Rampion Wind Farm
Under construction
(2016-2018)

TSS IN THE STRAIT OF DOVER AND ADJACENT WATERS

Dredging Area

Dredging Areas

Anchoring, Dredging and Pr

UNITED KINGDOM
FRANCE

Military Wk
(see Note)

R C I S E A R E A

0 5 10 15 20 km

AQUIND Interconnector

- Landfall location
- Marine Cable Corridor
- 12 NM Limit
- Exclusive Economic Zone (EEZ) boundary

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

REV	DATE	BY	DESCRIPTION	CHK	APP
03	19/10/2018	LG	FINAL ISSUE	SL	RH
02	01/10/2018	LG	SECOND ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	SL	RH
01	18/06/2018	LG	FIRST DRAFT	SL	RH

DRAWING STATUS: FINAL

natural power
The Natural Power Consultants Limited, The Green House Forrest Estate, Dalry, Castle Douglas, DG7 3XS, UK
Tel: +44 (0)1644 430008 www.naturalpower.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Figure 1.1: Marine Cable Corridor - UK Marine Area

SCALE AT A3	CHECKED	APPROVED
1:320,000	SL	RH

PROJECT NO	DESIGNED	DRAWN	DATE
EN020022	LG	LG	19/10/2018

DRAWING NO: GB201394_M_041_A REV NO: 03

N

Land Potentially Affected by the Proposed Development
Existing Substation Boundary
Proposed Convertor Station Boundary
Option A
Option B

0 2 4 8 Km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Infrastucture Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(i)

REV	DATE	BY	DESCRIPTION	CHK	APP
		XX			
		XX			
		XX			
1	18/10/2018	AS	FINAL	CF	US
1	08/10/2018	JT	FIRST DRAFT	CF	US

DRAWING STATUS: FINAL

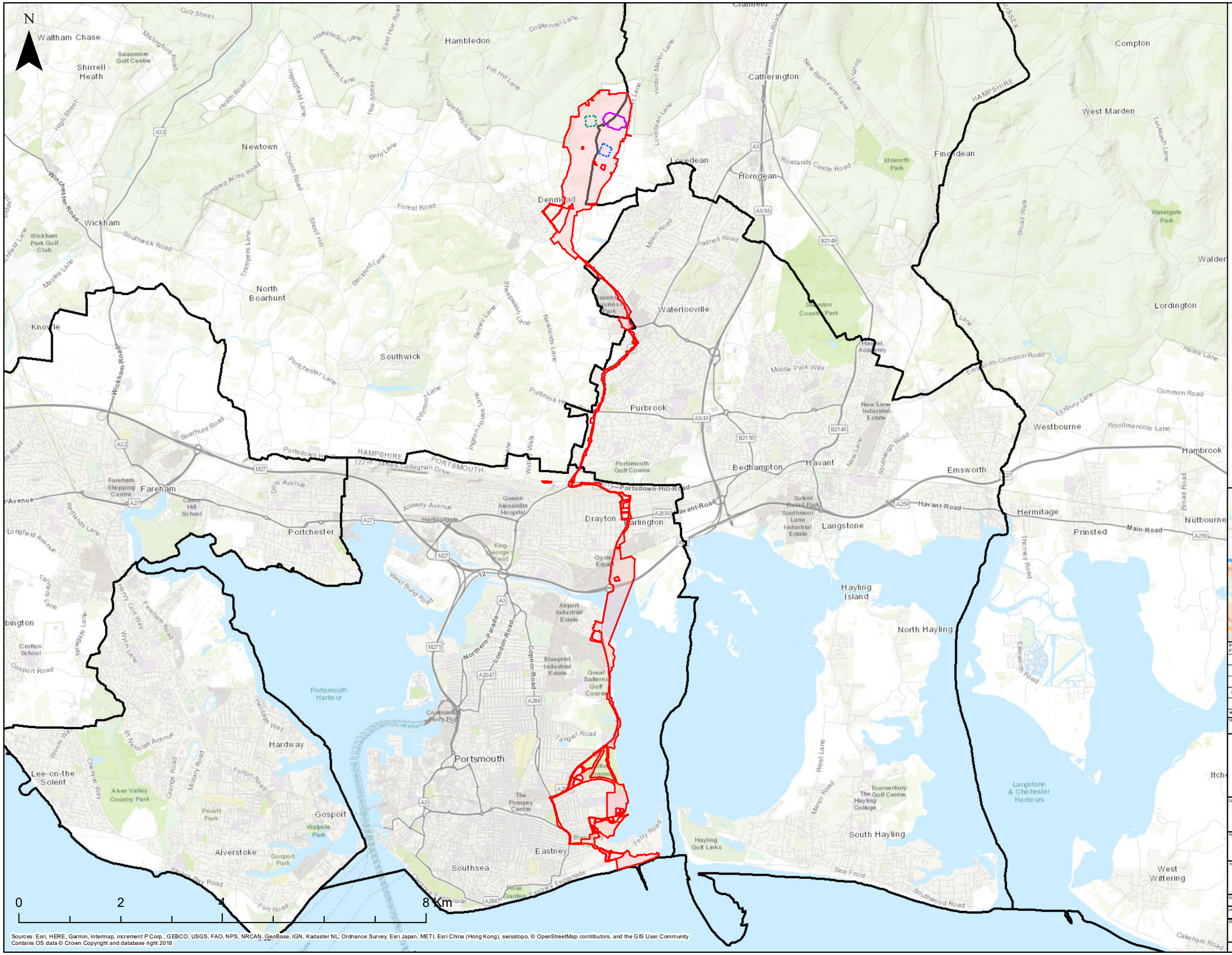
WSP House, 70 Chancery Lane, London, WC2A 1AF, UK.
T+ 44 (0) 020 7314 5000
wsp.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Onshore Scoping Red Line Boundary

SCALE AT A3	CHECKED:	APPROVED:
1:65,000	CF	US
PROJECT NO: EN20022	DESIGNED: WSP	DRAWN: AS	DATE: 18/10/2018
DRAWING NO: EN020022-SR-1.3		REV NO: 1



Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(i)

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			XX		
			XX		
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1	08/10/2018	JT	FIRST DRAFT	XX	XX

DRAWING STATUS: FINAL

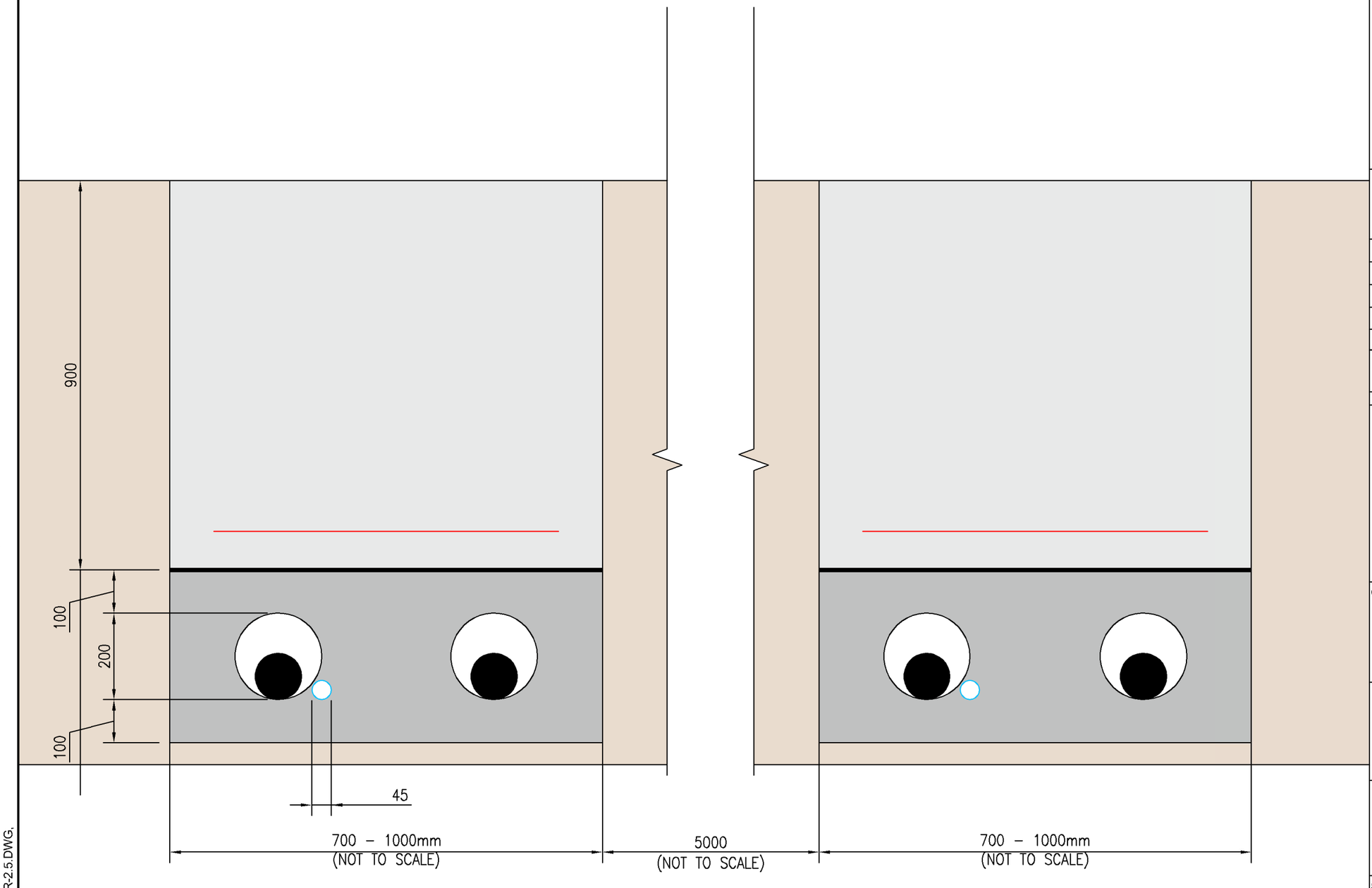
WSP House, 70 Chancery Lane, London, WC2A 1AF, UK,
T+ 44 (0) 020 7314 5000
wsp.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Local Authority Boundaries

SCALE AT A3	CHECKED	APPROVED
1:65,000	CF	US
PROJECT NO. EN20022	DESIGNED: WSP	DRAWN: AS
DATE: 24/10/2018		
DRAWING NO. EN020022-SR-1.4		REV NO. 1



200 0 200 400 600 800 1000mm

ORIGINAL SCALE 1:10

LEGEND

- Cement Bound Sand
- DC Cable Duct
- DC Cable
- Fibre Optic Cable Duct
- Protection Slab
- Native Soil Backfill
- Warning Tape
- Below Ground

Infrastructure Planning (Applications: Prescribed Forms & Procedure) Regulations 2009 - Regulation 5(2)(i)

REV	DATE	BY	DESCRIPTION	CHK	APP
1	25/10/2018	JPW	FIRST ISSUE	KH	NC

DRAWING STATUS: FIRST ISSUE

wsp

2 London Square, Cross Roads, Guildford, Surrey, GU1 1UN, UK
T+ 44 (0) 1483 528 400, F+ 44 (0) 1483 528 989
wsp.com

CLIENT: AQUIND

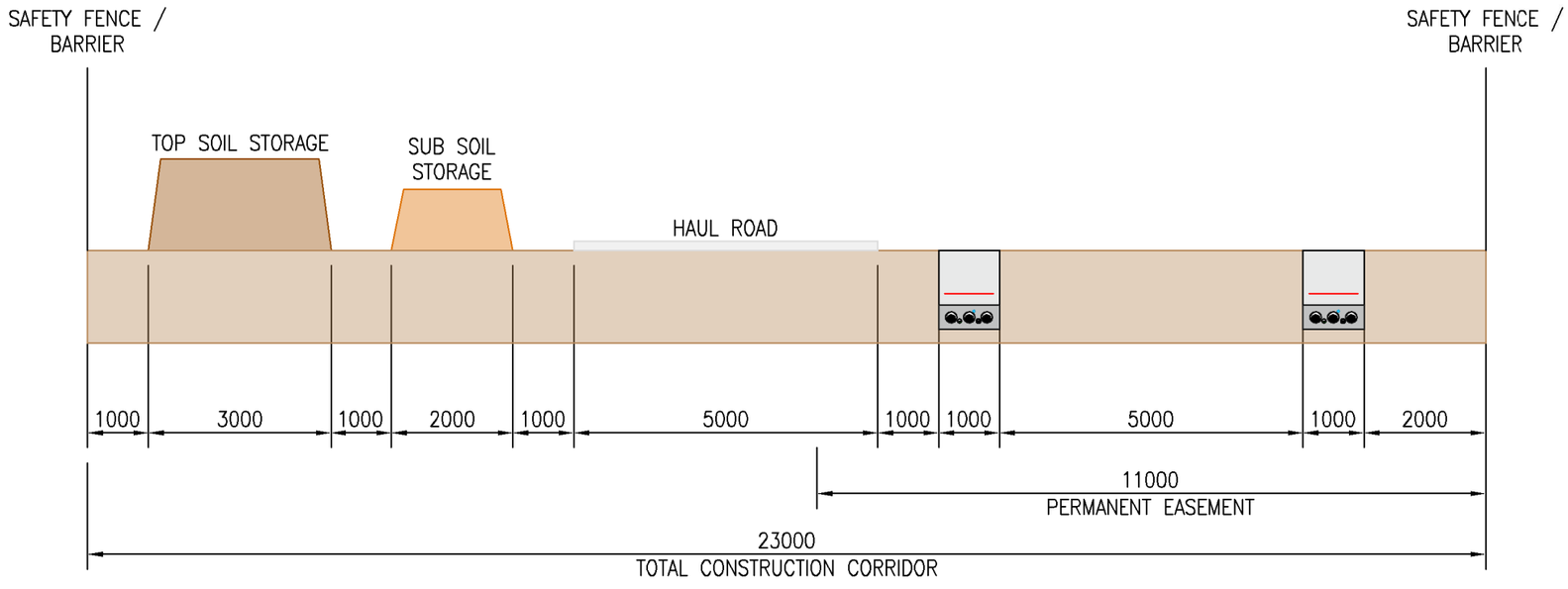
PROJECT: AQUIND Interconnector

TITLE: Typical cross-section of DC cable installation along roads

SCALE AT A3:	CHECKED:		APPROVED:
1:10	KH		NC
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	KH	JPW	25/10/2018

DRAWING NO:	REV:
EN020022-SR-2.5	1

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES



2 0 2 4 6 8 10m

ORIGINAL SCALE 1:100

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES
2. FOR MORE INFORMATION ON TRENCH PARAMETERS, SEE "62100616-UK-AC_TRENCH-0001"

Infrastructure Planning (Applications: Prescribed Forms & Procedure) Regulations 2009 - Regulation 5(2)(i)

REV	DATE	BY	DESCRIPTION	CHK	APP
1	25/10/2018	JPW	FIRST ISSUE	KH	NC

DRAWING STATUS: FIRST ISSUE

wsp
2 London Square, Cross Roads, Guildford, Surrey, GU1 1UN, UK
T+ 44 (0) 1483 528 400, F+ 44 (0) 1483 528 989
wsp.com

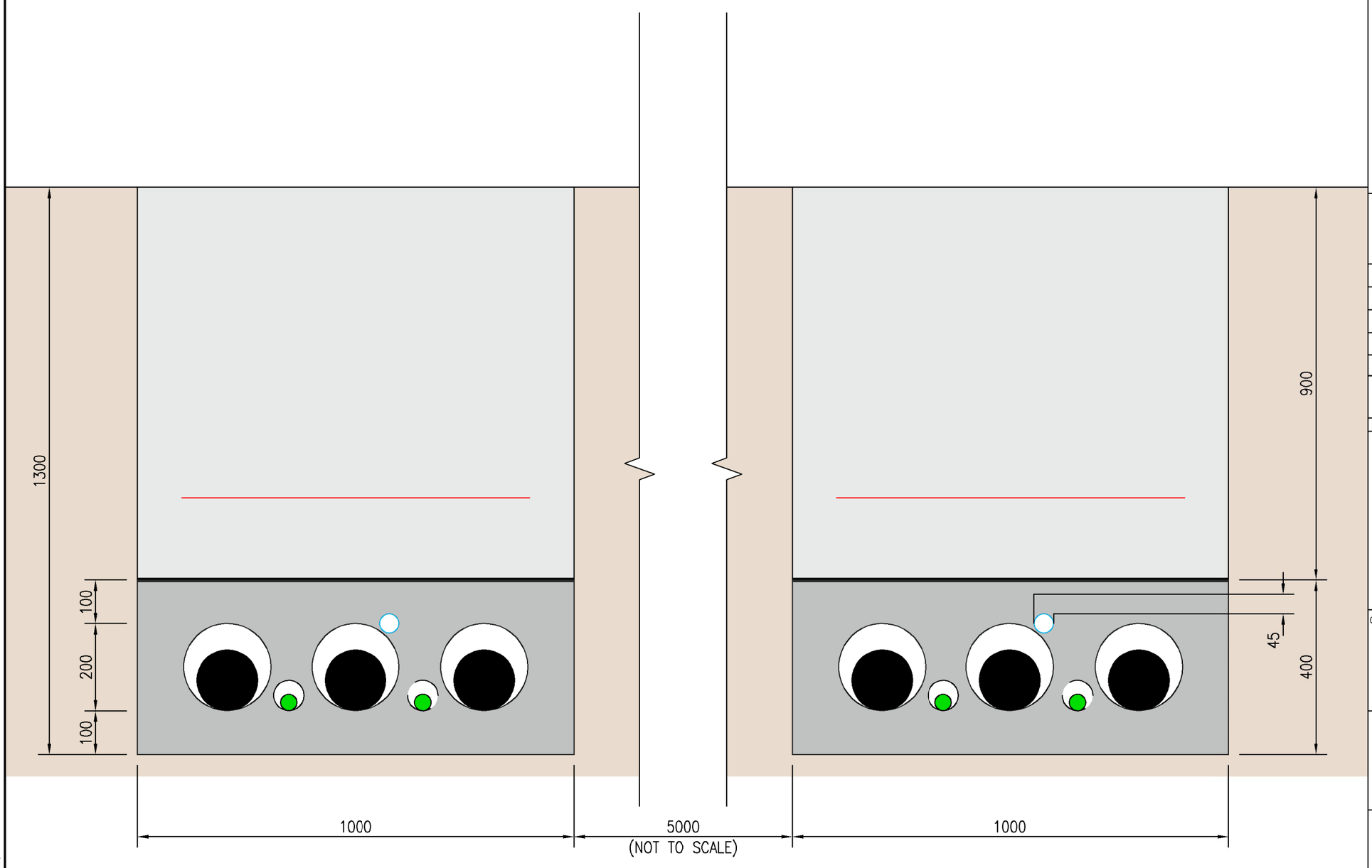
CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Typical cross-section of AC cable installation in fields

SCALE AT A3:	CHECKED:		APPROVED:
1:100	KH		NC
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	KH	JPW	25/10/2019

DRAWING NO: EN020022-SR-2.6 REV: 1



200 0 200 400 600 800 1000mm

ORIGINAL SCALE 1:10

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES

LEGEND

- Cement Bound Sand
- AC Cable Duct
- AC Cable
- Position of Earth Continuity Conductor
- Fibre Optic Cable Duct
- Protection Slab
- Native Soil Backfill
- Warning Tape
- Below Ground

Infrastructure Planning (Applications: Prescribed Forms & Procedure) Regulations 2009 - Regulation 5(2)(i)

REV	DATE	BY	DESCRIPTION	CHK	APP
1	25/10/2018	JPW	FIRST ISSUE	KH	NC

DRAWING STATUS: FIRST ISSUE

2 London Square, Cross Roads, Guildford, Surrey, GU1 1UN, UK
T+ 44 (0) 1483 528 400, F+ 44 (0) 1483 528 989
wsp.com

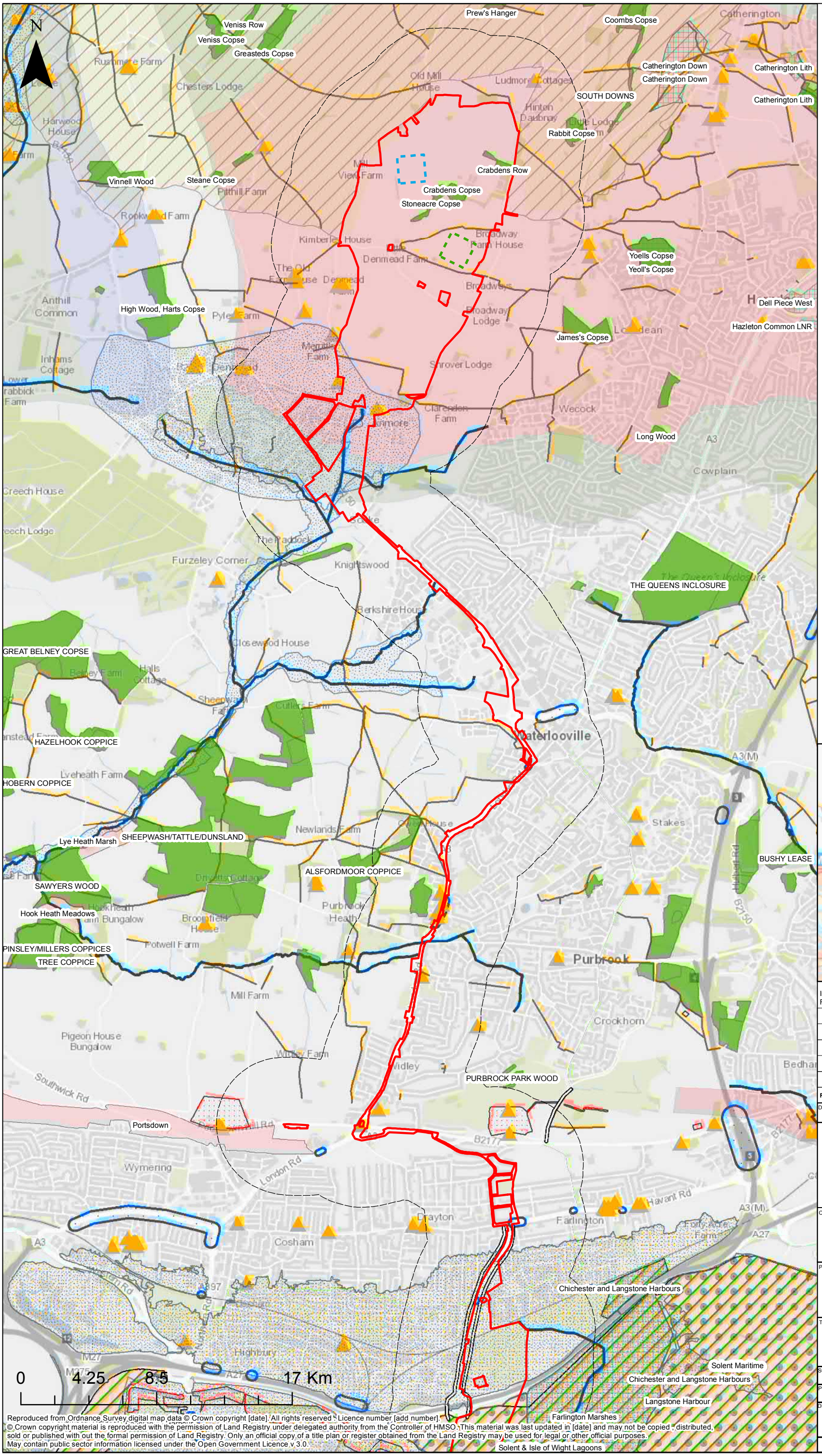
CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Typical AC cable construction corridor

SCALE AT A3:	CHECKED:		APPROVED:
1:10	KH		NC
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	KH	JPW	25/10/2019

DRAWING NO:	REV:
EN020022-SR-2.7	1



AQUIND Interconnector Constraints Map

- Option B
- Option A
- Common Land
- Redline Boundary
- 500m buffer
- Ancient Woodland Inventory (Eng)
- Statutory Main Rivers (Eng) (<250k)
- Flood Alert Areas (Eng)
- Flood Warning Areas (Eng) (<250k)
- National Trail (Eng)

Sustrans Local Route (<75K)

Local Route

- Off Road
- On Road

Sustrans National Route (<75K)

ON_ROAD

- National Route (on road)
- National Route (off road)

Sustrans NCN Link (<75K)

ON_ROAD

- NCN Link (on road)
- NCN Link (off road)

Sustrans Regional Route (<75K)

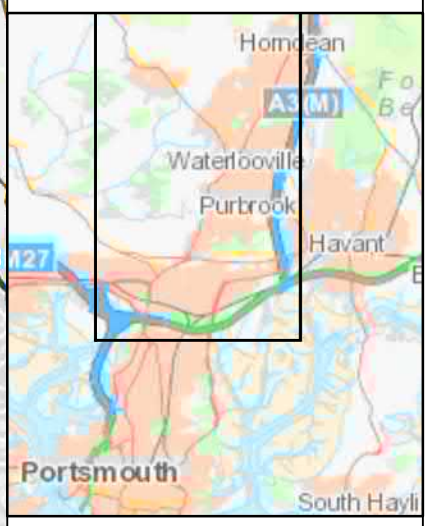
On_Road

- Regional Route (on road)
- Regional Route (off road)
- Public Rights of Way
- Local Nature Reserve (Eng)
- National Nature Reserve (Eng)
- National Park (Eng)
- Special Protection Area (Eng)
- Special Area of Conservation (Eng)
- Ramsar Site - Wetland of International Importance (Eng)
- Site of Special Scientific Interest (Eng)
- Listed Building - Point (Eng)
- Parks and Gardens (Eng)
- Parks and Gardens (Sco)
- Scheduled Monument (Eng)
- Scheduled Monument - Area (Sco)
- Air Quality Management Area (2017)
- Noise Action Planning Important Areas (NIA)
- Ancient Woodland Inventory (Sco)

Source Protection Zones

NUMBER

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment
- Zone of Special Interest



Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(i)

REV	DATE	BY	DESCRIPTION	CHK	APP

DRAWING STATUS: DRAFT

WSP House, 70 Chancery Lane, London, WC2A 1AF, UK,
T+ 44 (0) 020 7314 5000
wsp.com

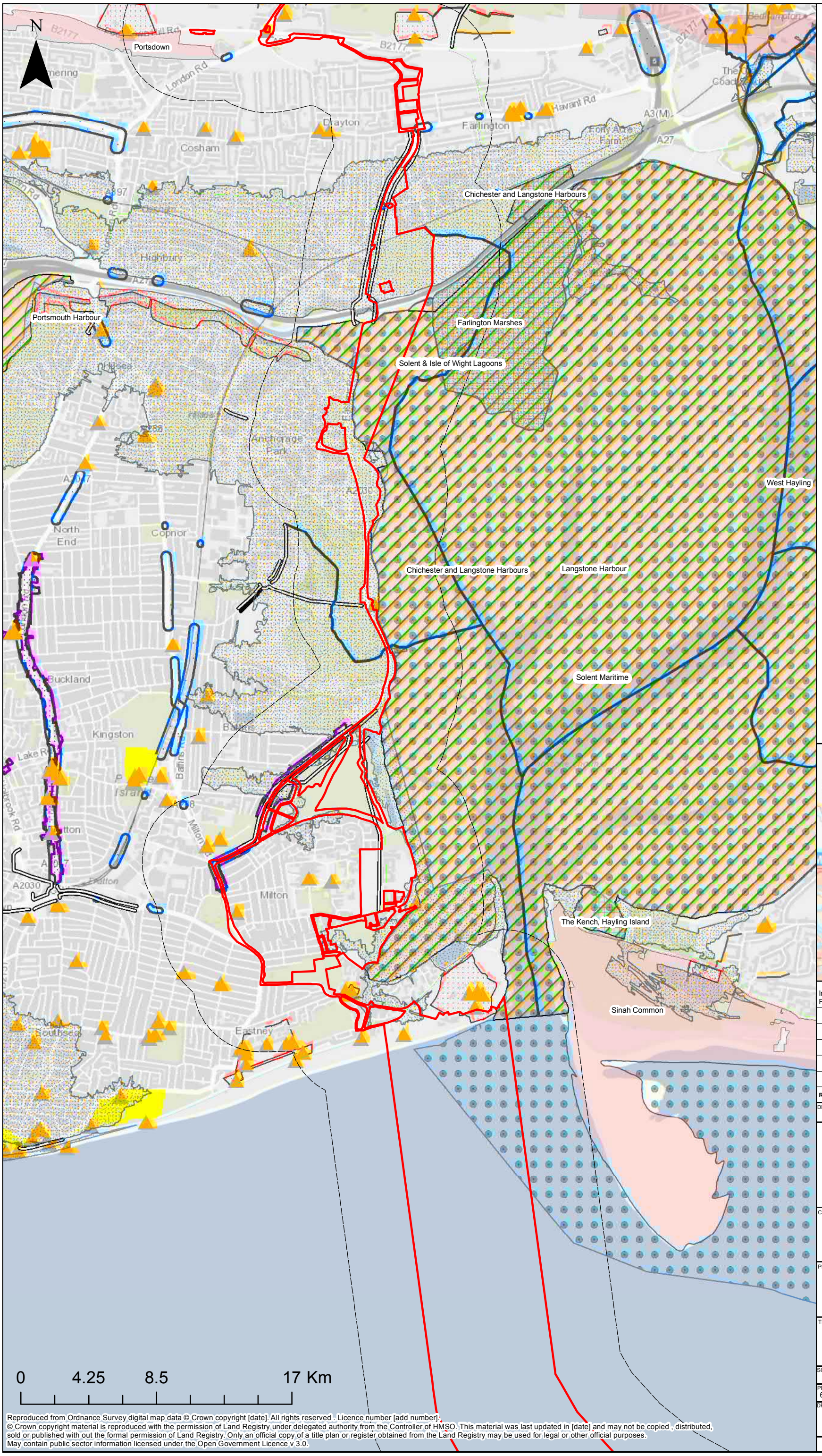
CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Converter Route Environmental Constraints Map

SCALE AT A1	CHECKED:		APPROVED:
1:26,653	JM		US
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
62100616	SJ	SJ	19/10/2018

DRAWING NO: EN020022-SR-4.1 REV.NO. 1



AQUIND Interconnector Constraints Map

- Option B
- Option A
- Common Land
- Redline Boundary
- 500m buffer
- Ancient Woodland Inventory (Eng)
- Statutory Main Rivers (Eng) (<250k)
- Flood Alert Areas (Eng) (<250k)
- Flood Warning Areas (Eng) (<250k)
- National Trail (Eng)

Sustrans Local Route (<75K)

Local Route

- Off Road
- On Road

Sustrans National Route (<75K)

ON_ROAD

- National Route (on road)
- National Route (off road)

Sustrans NCN Link (<75K)

ON_ROAD

- NCN Link (on road)
- NCN Link (off road)

Sustrans Regional Route (<75K)

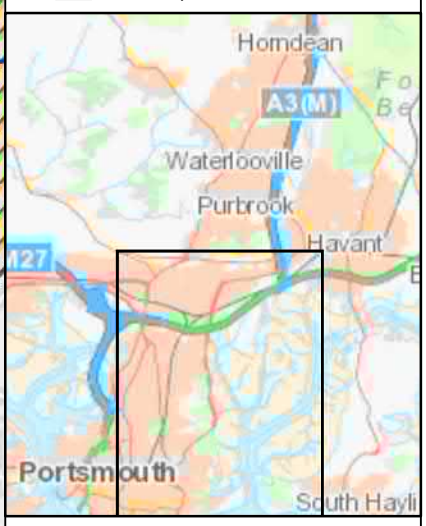
On_Road

- Regional Route (on road)
- Regional Route (off road)
- Public Rights of Way
- Local Nature Reserve (Eng)
- National Nature Reserve (Eng)
- National Park (Eng)
- Special Protection Area (Eng)
- Special Area of Conservation (Eng)
- Ramsar Site - Wetland of International Importance (Eng)
- Site of Special Scientific Interest (Eng)
- Listed Building - Point (Eng)
- Parks and Gardens (Eng)
- Parks and Gardens (Sco)
- Scheduled Monument (Eng)
- Scheduled Monument - Area (Sco)
- Air Quality Management Area (2017)
- Noise Action Planning Important Areas (NIA)
- Ancient Woodland Inventory (Sco)

Source Protection Zones

NUMBER

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment
- Zone of Special Interest



Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(i

REV	DATE	BY	DESCRIPTION	CHK	APP

DRAWING STATUS: DRAFT

WSP House, 70 Chancery Lane, London, WC2A 1AF, UK,
T+ 44 (0) 020 7314 5000
wsp.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Converter Route Environmental Constraints Map

SCALE AT A1	CHECKED:		APPROVED:
1:26,653	JM		US
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
62100616	SJ	SJ	19/10/2018

DRAWING NO: EN020022-SR-4.1 REV.NO. 1

N

Eastney

St Catherine's Deep

Northern Palaeovalley

0 5 10 15 20 km

AQUIND Interconnector

- Landfall location
- Marine Cable Corridor
- 12 NM Limit
- Exclusive Economic Zone (EEZ) boundary

Bathymetry mLAT

- -200
- -100
- -90
- -75
- -65
- -55
- -45
- -35
- -25
- -15
- -5
- 5
- 15

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

REV	DATE	BY	DESCRIPTION	CHK	APP
03	19/10/2018	LG	FINAL ISSUE	SL	RH
02	26/09/2018	LG	SECOND ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	SL	RH
01	19/09/2018	LG	FIRST DRAFT	SL	RH

DRAWING STATUS: FINAL

natural power
The Natural Power Consultants Limited, The Green House Forrest Estate, Dalry, Castle Douglas, DG7 3XS, UK
Tel: +44 (0)1644 430008 www.naturalpower.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Figure 6.1: Bathymetry in UK Waters

SCALE AT A3	CHECKED	APPROVED
1:300,000	SL	RH

PROJECT NO	DESIGNED	DRAWN	DATE
EN020022	LG	LG	19/10/2018

DRAWING NO: GB201394_M_042_A REV NO: 03

N

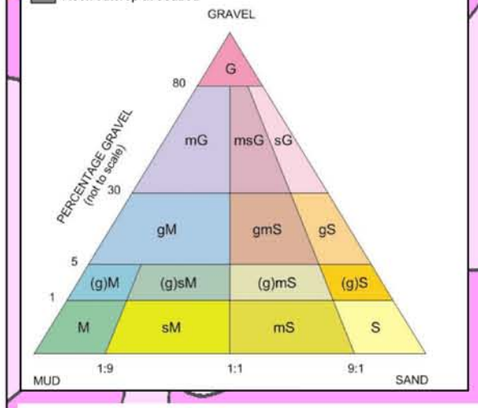
Eastney

AQUIND Interconnector

- Landfall location
- Marine Cable Corridor
- 12 NM Limit
- Exclusive Economic Zone (EEZ) boundary

BGS Seabed Sediments

Rock outcrop at seabed



0 5 10 15 20 km

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

REV	DATE	BY	DESCRIPTION	CHK	APP
03	19/10/2018	LG	FINAL ISSUE	SL	RH
02	01/10/2018	LG	SECOND ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	SL	RH
01	19/09/2018	LG	FIRST DRAFT	SL	RH

DRAWING STATUS: FINAL

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Tel: +44 (0)1644 430008 www.naturalpower.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Figure 6.2: Seabed Sediments in UK Waters

SCALE AT A3	CHECKED	APPROVED
1:300,000	SL	RH

PROJECT NO	DESIGNED	DRAWN	DATE
EN020022	LG	LG	19/10/2018

DRAWING NO: GB201394_M_043_A

REV NO: 03

N

0 2.5 5 km

1:180,000

0 5 10 15 20 km

AQUIND Interconnector

- Landfall location
- Geophysical Survey Area/Marine Cable Corridor
- Exclusive Economic Zone (EEZ) boundary
- AQUIND contaminated sediment stations

IFA2/Rampion contaminated sediment stations

- Cefas AL <1
- Cefas AL >1<2

EUNIS habitats*

- A3.1
- A3.2
- A3.3
- A4.1
- A4.2
- A4.27
- A5.13
- A5.14
- A5.15
- A5.23 or A5.24
- A5.25 or A5.26
- A5.33
- A5.33 or A5.34
- A5.35
- A5.43
- A5.44

*Habitats within Marine Cable Corridor as identified from geophysical survey

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

REV	DATE	BY	DESCRIPTION	CHK	APP
04	19/10/2018	LG	FINAL ISSUE	SL	RH
03	17/09/2018	LG	THIRD ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	SM	JL
02	21/09/2018	GR	SECOND ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	SM	JL
01	19/06/2018	LG	FIRST DRAFT	SM	JL

DRAWING STATUS: FINAL

natural power
The Natural Power Consultants Limited, The Green House Forrest Estate, Dalry, Castle Douglas, DG7 3XS, UK
Tel: +44 (0)1644 430008 www.naturalpower.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Figure 7.1: Contaminated Sediment Sampling Locations and Results

SCALE AT A3	CHECKED	APPROVED
1:350,000	SL	RH
PROJECT NO: EN020022	DESIGNED: LG	DRAWN: LG	DATE: 19/10/2018

DRAWING NO: GB201394_M_044_A REV NO: 04

N

1. Beachy Head East (pMCZ)	11. River Avon (SAC)
2. Beachy Head West (MCZ)	12. River Itchen (SAC)
3. Bembridge (pMCZ)	13. Selsey Bill and the Hounds (pMCZ)
4. Chichester and Langstone Harbours Wetland (Ramsar)	14. Solent and Isle of Wight Lagoons (SAC)
5. Isle of Wight Downs (SAC)	15. Solent and Southampton Water (Ramsar)
6. Kingmere (MCZ)	16. Solent Maritime (SAC)
7. Offshore Brighton (MCZ)	17. South Wight Maritime (SAC)
8. Offshore Overfalls (MCZ)	18. The Needles (MCZ)
9. Pagham Harbour (MCZ)	19. Utopia (MCZ)
10. Portsmouth Harbour Wetland of International Importance (Ramsar)	20. Wight-Barfleur Reef (SAC)
	21. Yarmouth to Cowes (pMCZ)

AQUIND Interconnector
- Landfall location
- Marine Cable Corridor
- 12 NM Limit
- Exclusive Economic Zone (EEZ) boundary
- Ramsar
- Special Area of Conservation (SAC)

Marine Conservation Zone (MCZ)
- Designated
- Proposed

0 5 10 15 20 km

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

REV	DATE	BY	DESCRIPTION	CHK	APP
03	19/10/2018	LG	FINAL ISSUE	SL	RH
02	27/09/2018	LG	SECOND ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	SM	SL
01	19/06/2018	LG	FIRST DRAFT	SM	SL

DRAWING STATUS: FINAL

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Tel: +44 (0)1644 430008 www.naturalpower.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Figure 8.1: Relevant Protected Areas (MCZs, Ramsar and SACs)

SCALE AT A3	CHECKED	APPROVED
1:450,000	SL	RH

PROJECT NO	DESIGNED	DRAWN	DATE
EN020022	LG	LG	19/10/2018

DRAWING NO: GB201394_M_045_A REV NO: 03

N

1. Adur estuary (SSSI) 2. Brading Marshes to St. Helen's Ledges (SSSI) 3. Brighton to Newhaven cliffs (SSSI) 4. Browndown (SSSI) 5. Chichester Harbour (SSSI) 6. Compton Chine to Steephill Cove (SSSI) 7. Gilkicker Lagoon (SSSI) 8. Hurst Castle and Lymington River Estuary (SSSI) 9. King's Quay Shore (SSSI) 10. Langstone Harbour (SSSI)	11. Medina Estuary (SSSI) 12. Newtown Harbour (SSSI) 13. North Solent (SSSI) 14. Pagham Harbour (SSSI) 15. Portsmouth Harbour (SSSI) 16. Ryde Sands and Wootton Creek (SSSI) 17. Seaford to Beachy Head (SSSI) 18. Thorness Bay (SSSI) 19. Whitecliff Bay and Bembridge Ledges (SSSI) 20. Yar Estuary (SSSI)

AQUIND Interconnector

- Landfall location
- Marine Cable Corridor
- 12 NM Limit
- Exclusive Economic Zone (EEZ) boundary
- Site of Special Scientific Interest (SSSI)

0 5 10 15 20 km

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

REV	DATE	BY	DESCRIPTION	CHK	APP
03	19/10/2018	LG	FINAL ISSUE	SL	RH
02	27/09/2018	LG	SECOND ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	SM	SL
01	21/09/2018	LG	FIRST DRAFT	SM	SL

DRAWING STATUS: FINAL

The Natural Power Consultants Limited, The Green House Forrest Estate, Dalry, Castle Douglas, DG7 3XS, UK
Tel: +44 (0)1644 430008 www.naturalpower.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Figure 8.2: Relevant Protected Areas (SSSIs)

SCALE AT A3	CHECKED	APPROVED
1:400,000	SL	RH

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	LG	LG	19/10/2018

DRAWING NO: GB201394_M_049_A REV NO: 03

N

Eastney

0 5 10 15 20 km

AQUIND Interconnector

- Landfall location
- Marine Cable Corridor
- 12 NM Limit
- Exclusive Economic Zone (EEZ) boundary

EUNIS Habitat

- A3.1
- A3.2
- A3.3
- A4.1
- A4.12
- A4.2
- A4.27
- A5.13
- A5.14
- A5.15
- A5.23 or A5.24
- A5.25 or A5.26
- A5.27
- A5.33
- A5.33 or A5.34
- A5.34
- A5.35
- A5.35 or A5.36
- A5.37
- A5.43
- A5.44
- A5.45

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

REV	DATE	BY	DESCRIPTION	CHK	APP
03	19/10/2018	LG	FINAL ISSUE	SL	RH
02	27/09/2018	LG	SECOND ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	SM	SL
01	19/09/2018	LG	FIRST DRAFT	SM	SL

DRAWING STATUS: FINAL

natural power
The Natural Power Consultants Limited, The Green House Forrest Estate, Dalry, Castle Douglas, DG7 3XS, UK
Tel: +44 (0)1644 430006 www.naturalpower.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Figure 8.3: EUNIS Habitat Types

SCALE AT A3	CHECKED	APPROVED
1:300,000	SL	RH

PROJECT NO.	DESIGNED	DRAWN	DATE
EN020022	LG	LG	19/10/2018

DRAWING NO.: GB201394_M_046_A REV NO.: 03

N

ENGLISH CHANNEL
NEWHAVEN TO DOVER
AND
CAP D'ANTIFER
TO
CAP GRIS-NEZ
DEPTHS IN METRES

Solent & Southampton Water SPA & Ramsar

Portsmouth Harbour SPA & Ramsar

Chichester and Langstone Harbours SPA & Ramsar

Pagham Harbour SPA & Ramsar

Dungeness, Romeny Marsh and Rye Bay SPA & Ramsar

Poole Harbour SPA & Ramsar

Solent and Dorset Coast pSPA

SOUTHAMPTON
PORTSMOUTH
BOURNEMOUTH
POOLE HR
ISLE OF WIGHT
BRIGHTON
SOUTH DOWNS
New Forest
Lymington
Ryde
Newport
Sandown
Shanklin
Ventnor
Yarmouth
Cowes
Newhaven
Eastbourne
Hastings
Worthing
Littlehampton
Chichester
Selsey Bill
Bembridge
Beachy Head
Pevensey Bay
Hollham
Bexhill
Harrstmonceux Castle

Inshore Traffic Zone

TSS IN THE STRAIT OF DOVER AND ADJACENT WATERS

Dredging Areas

UNITED KINGDOM
FRANCE

SUBMARINE EXERCISE AREA

Anchoring, Trawling, Dredging and Diving Prohibited

Rampion Wind Farm Under construction (2016-2018)

Channel Islands

Alderney West Coast and the Burhou Islands Ramsar

Casquets
Casquet Banks
Race of Alderney (see Note)
ALDERNEY
Milieu
St. Anne

0 5 10 15 20 km

0 25 50 75 100 km

50°00'N
1°00'W
0° 00'
0° 30'

AQUIND Interconnector

- Landfall location
- Marine Cable Corridor
- 12 NM Limit
- Exclusive Economic Zone (EEZ) boundary
- Ramsar
- Special Protection Area (SPA)
- Proposed Special Protection Area (pSPA)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

REV	DATE	BY	DESCRIPTION	CHK	APP
03	19/10/2018	LG	FINAL ISSUE	SL	RH
02	01/10/2018	LG	SECOND ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	EH	SL
01	19/06/2018	LG	FIRST DRAFT	EH	SL

DRAWING STATUS: FINAL

natural power
The Natural Power Consultants Limited, The Green House Forrest Estate, Dalry, Castle Douglas, DG7 3XS, UK
Tel: +44 (0)1644 430008 www.naturalpower.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Figure 11.1: Marine Ornithology – SPA and Ramsar Sites

SCALE AT A3	CHECKED	APPROVED
1:550,000	SL	RH

PROJECT NO	DESIGNED	DRAWN	DATE
EN020022	LG	LG	19/10/2018

DRAWING NO: GB201394_M_047_A REV NO: 03

N

ENGLISH CHANNEL
NEWHAVEN TO DOVER
AND
CAP D'ANTIFER
TO
CAP GRIS-NEZ
DEPTHS IN METRES

Rye Harbour

Brighton to Newhaven Cliffs

Seaford to Beachy Head

Langstone Harbour

Chichester Harbour

North Solent

Poole Harbour

Hurst Castle to Lymington River Estuary

Newton Harbour

Inshore Traffic Zone

TSS IN THE STRAIT OF DOVER AND ADJACENT WATERS

Dredging Areas

SUBMARINE EXERCISE AREA

UNITED KINGDOM FRANCE

0 25 50 75 100 km

AQUIND Interconnector

- Landfall location
- Marine Cable Corridor
- 12 NM Limit
- Exclusive Economic Zone (EEZ) boundary
- Site of Special Scientific Interest (SSSI)

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

REV	DATE	BY	DESCRIPTION	CHK	APP
03	19/10/2018	LG	FINAL ISSUE	SL	RH
02	27/09/2018	LG	SECOND ISSUE TO INCLUDE COMMENTS PRIOR TO EXAMINATION	RH	SL
01	20/06/2018	LG	FIRST DRAFT	RH	SL

DRAWING STATUS: FINAL

natural power
The Natural Power Consultants Limited, The Green House Forrest Estate, Dalry, Castle Douglas, DG7 3XS, UK
Tel: +44 (0)1644 430008 www.naturalpower.com

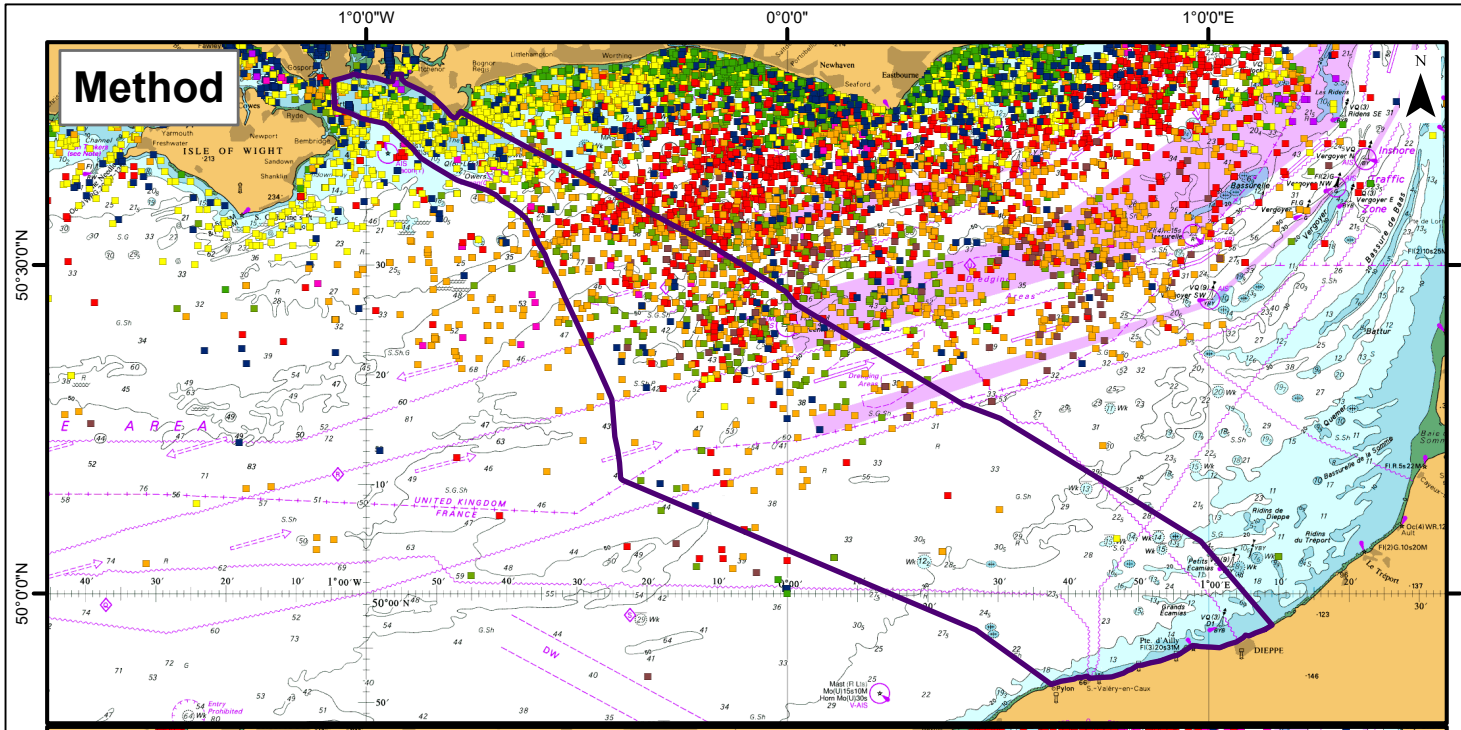
CLIENT: AQUIND

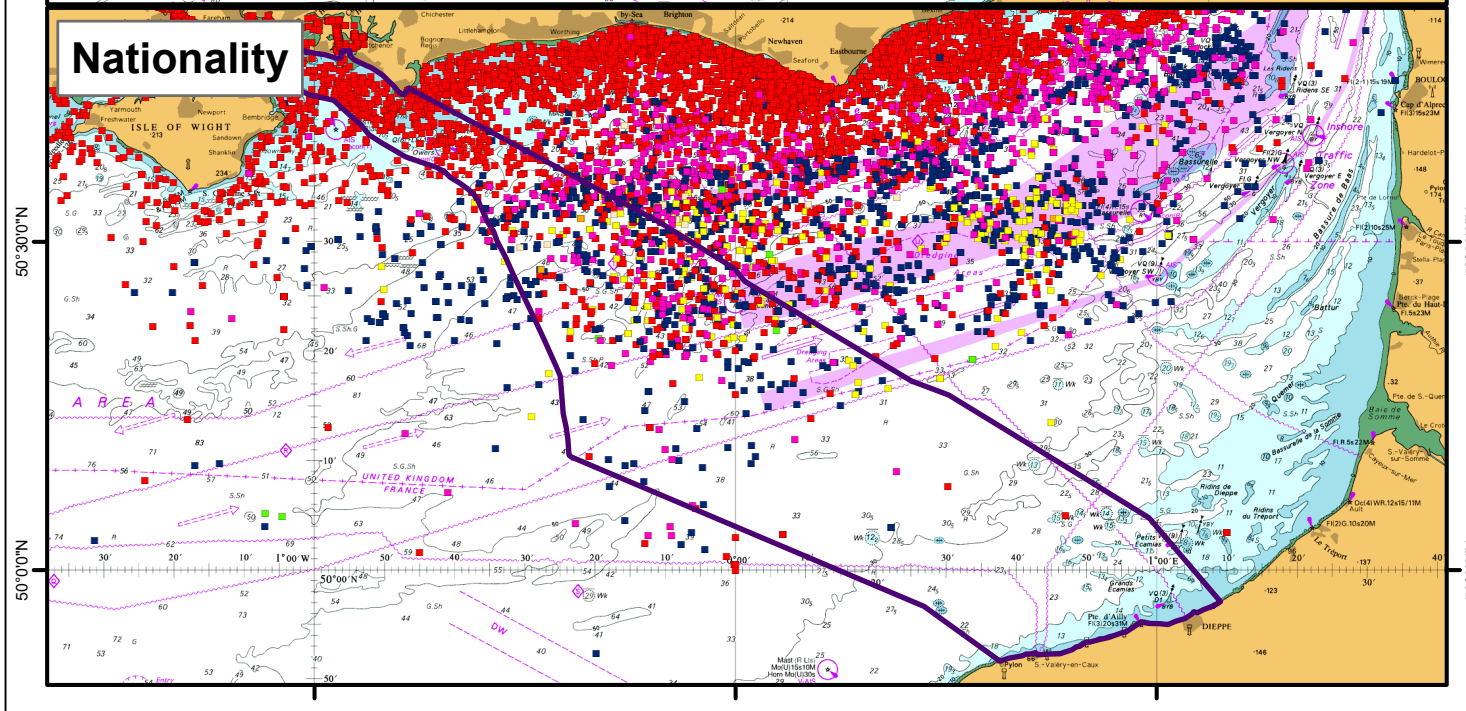
PROJECT: AQUIND Interconnector

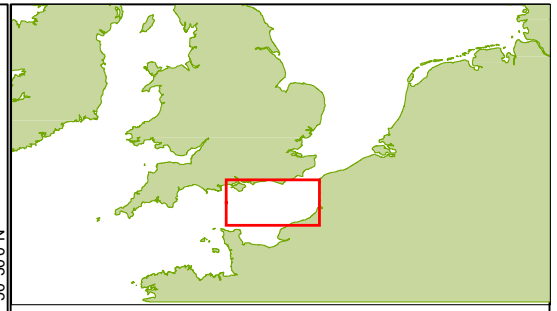
TITLE: Figure 11.2: Marine Ornithology – SSSI Sites

SCALE AT A3	CHECKED	APPROVED
1:550,000	SL	RH
PROJECT NO	DESIGNED	DRAWN	DATE
EN020022	LG	LG	19/10/2018

DRAWING NO: GB201394_M_048_A REV NO: 03







Legend

Study Area

Surveillance Sightings by Method

- Long Liner
- Trawler (Unspecified)
- Potter/ Whelker
- Beam Trawler
- Demersal Trawler
- Scallop Dredger
- Gill Netter
- Seine Netter
- Other Methods

Surveillance Sightings by Nationality

- Netherlands
- United Kingdom
- Belgium
- Denmark
- France
- Germany
- Other Nationalities

Notes:-
This map contains data from the following sources-
MMO 2016

PROJECT TITLE

WSP- Aquind Interconnector

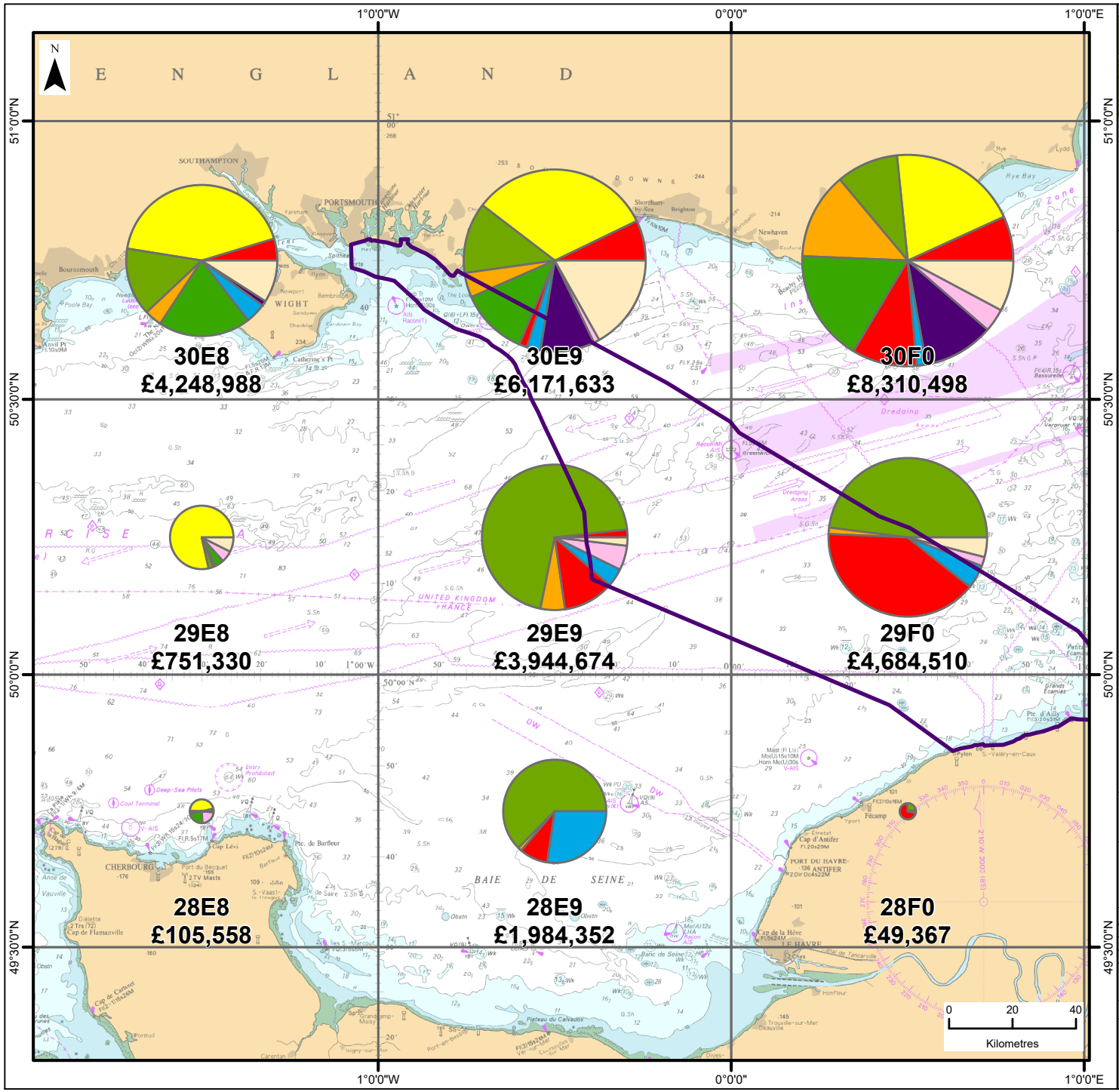
DRAWING TITLE **Surveillance Sightings by Nationalilty and Method 2011-2015**

VER	DATE	REMARKS	Drawn	Checked
A	27/09/2018	Draft	SF	JL/AF

DRAWING NUMBER: **Figure 12.1: WSP-AQND-02-003**

SCALE	PLOT SIZE	DATUM & PROJECTION
1:2,000,000	A4	WGS 1984 World Mercator

Brown & May Marine Ltd.



Legend

- Study Area
- Beam trawls
- Pots
- Mechanized dredges
- Otter trawls (not specified)
- Gillnets
- Scottish seines
- Boat dredges
- Otter twin trawls
- Trammel nets
- Midwater pair trawls
- Other methods
- ICES Rectangles

Notes:-
This map contains data from the following sources-
MMO 2016

PROJECT TITLE

WSP- Aquind Interconnector

DRAWING TITLE

UK Landings by Gear Type (£) Average 2011-2015

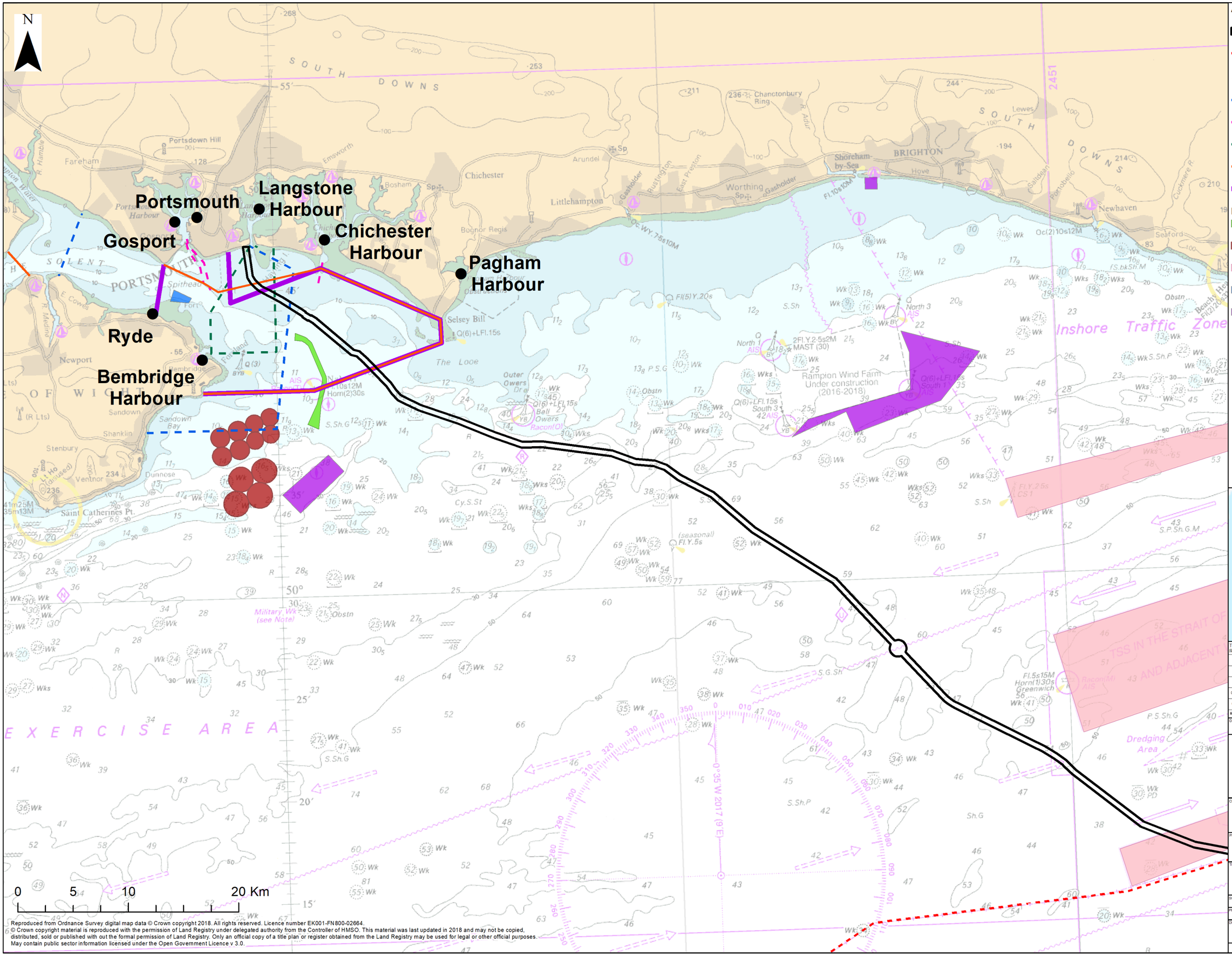
VER	DATE	REMARKS	Drawn	Checked
A	27/09/2018	Draft	SF	JL/AF

DRAWING NUMBER:

Figure 12.2: WSP-AQND-02-018

SCALE	PLOT SIZE	DATUM & PROJECTION
1:1,800,000	A4	WGS 1984 World Mercator

Brown & May Marine Ltd.



AQUIND Interconnector

- Marine Cable Corridor
- EEZ
- Port / Harbour
- Port Limit
- Port Approach
- LHB Pilotage Jurisdiction
- Southampton CHA Area
- Portsmouth CHA Area

Navigational Features

- Nab Channel
- Nab Anchorages
- Dover Strait TSS
- Ordnance Disposal Area
- Spoil Ground

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

REV	DATE	BY	DESCRIPTION	CHK	APP
02	18/10/2018	DS	FINAL	LEKM	SL
01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: Final

anatec
Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
T+ 44 (0) 01224 253700
anatec.com

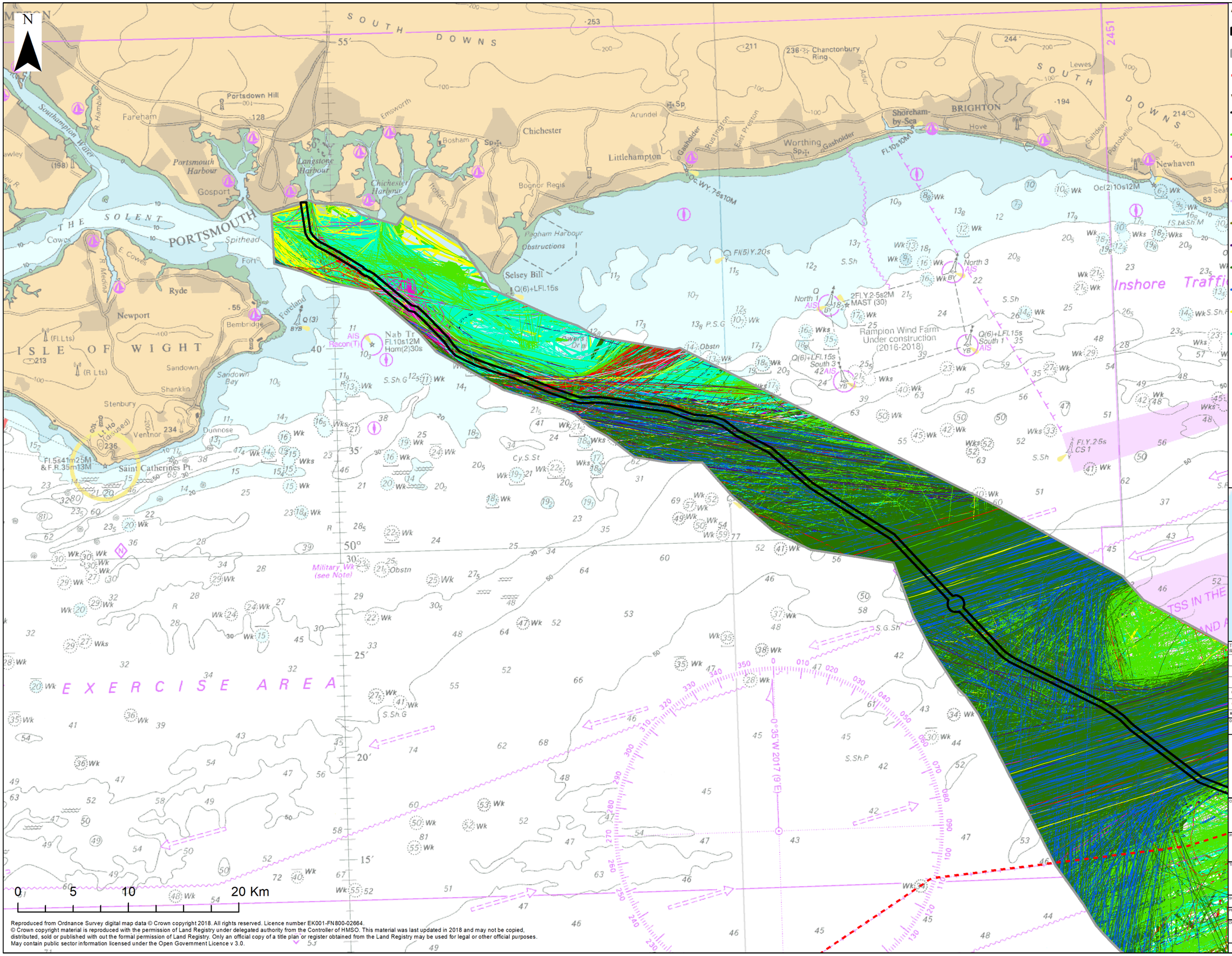
CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Navigational Features in UK Waters

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	LEKM	SL
PROJECT NO: EN020022	DESIGNED: LM / DRAWN: DS	DATE: 18/10/2018

DRAWING NO: Figure 13.1 REV NO: 02

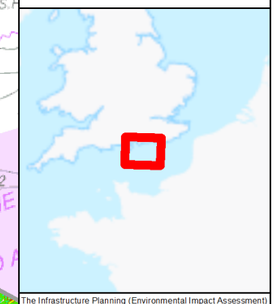


AQUIND Interconnector

- Marine Cable Corridor
- Study Area
- EEZ

Vessel Type

- Unspecified
- Fishing
- Military
- Dredger/Subsea
- HSC
- Tug
- Passenger
- Cargo
- Tanker
- Other
- Recreational



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

REV	DATE	BY	DESCRIPTION	CHK	APP
02	18/10/2018	DS	FINAL	LEKM	SL
01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: FINAL

Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
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anatec.com

CLIENT: AQUIND

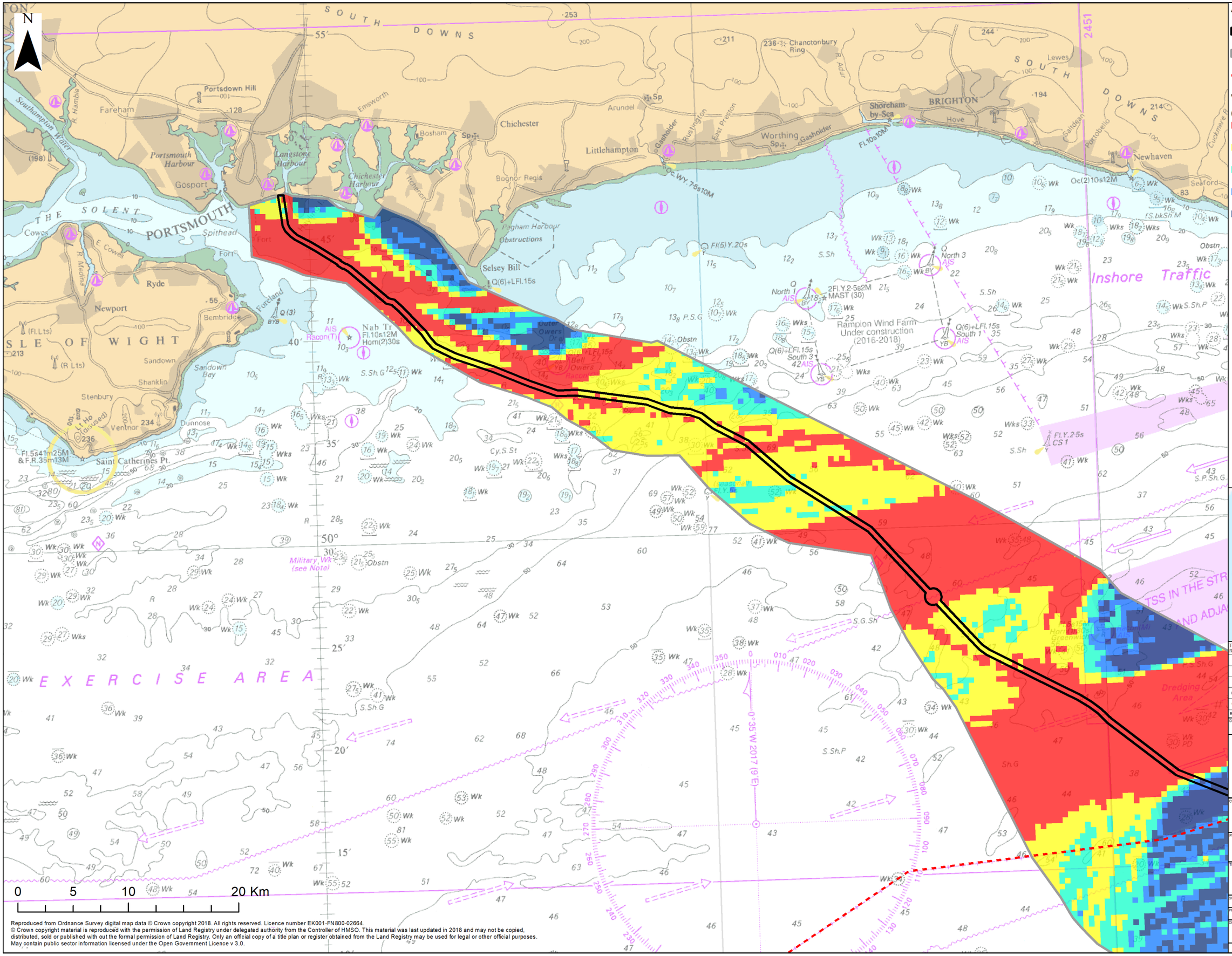
PROJECT: AQUIND Interconnector

TITLE: AIS Tracks by Vessel Type

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	LEKM	SL

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	LM	DS	18/10/2018

DRAWING NO: Figure 13.2 REV NO. 02

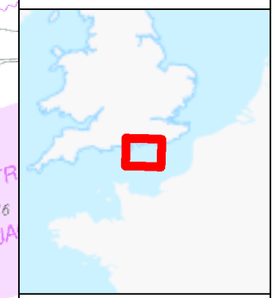


AQUIND Interconnector

- Marine Cable Corridor
- Study Area
- EEZ

Vessel Density (Summer 2015)

- 38-1,407
- 15-38
- 6-15
- 3-6
- 0-3



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

REV	DATE	BY	DESCRIPTION	CHK	APP
02	18/10/2018	DS	FINAL	LEKM	SL
01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: FINAL

anatec
Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
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anatec.com

CLIENT: AQUIND

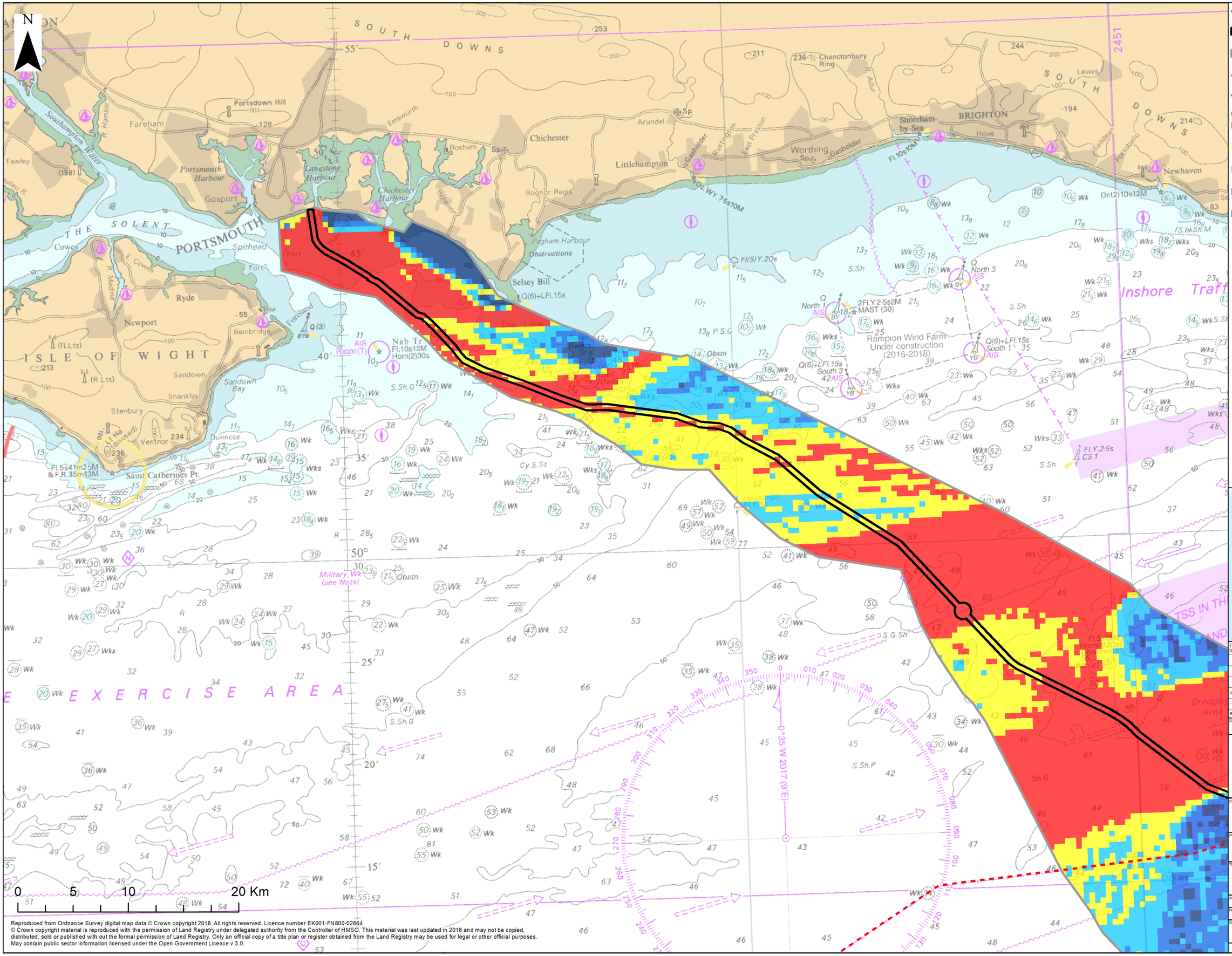
PROJECT: AQUIND Interconnector

TITLE: Vessel Density (Summer 2015)

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	LEKM	SL

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	LM	DS	18/10/2018

DRAWING NO: Figure 13.4 REV NO: 02

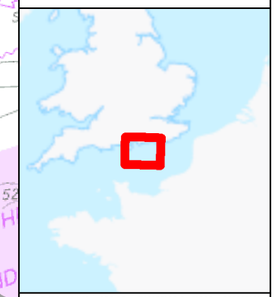


AQUIND Interconnector

- Marine Cable Corridor
- Study Area
- EEZ

Vessel Density (Summer 2016)

- 35-1,375
- 15-35
- 6-15
- 2-6
- 0-2



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

REV	DATE	BY	DESCRIPTION	CHK	APP
02	18/10/2018	DS	FINAL	LEKM	SL
01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: FINAL

anatec
Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
T+ 44 (0) 01224 253700
anatec.com

CLIENT: AQUIND

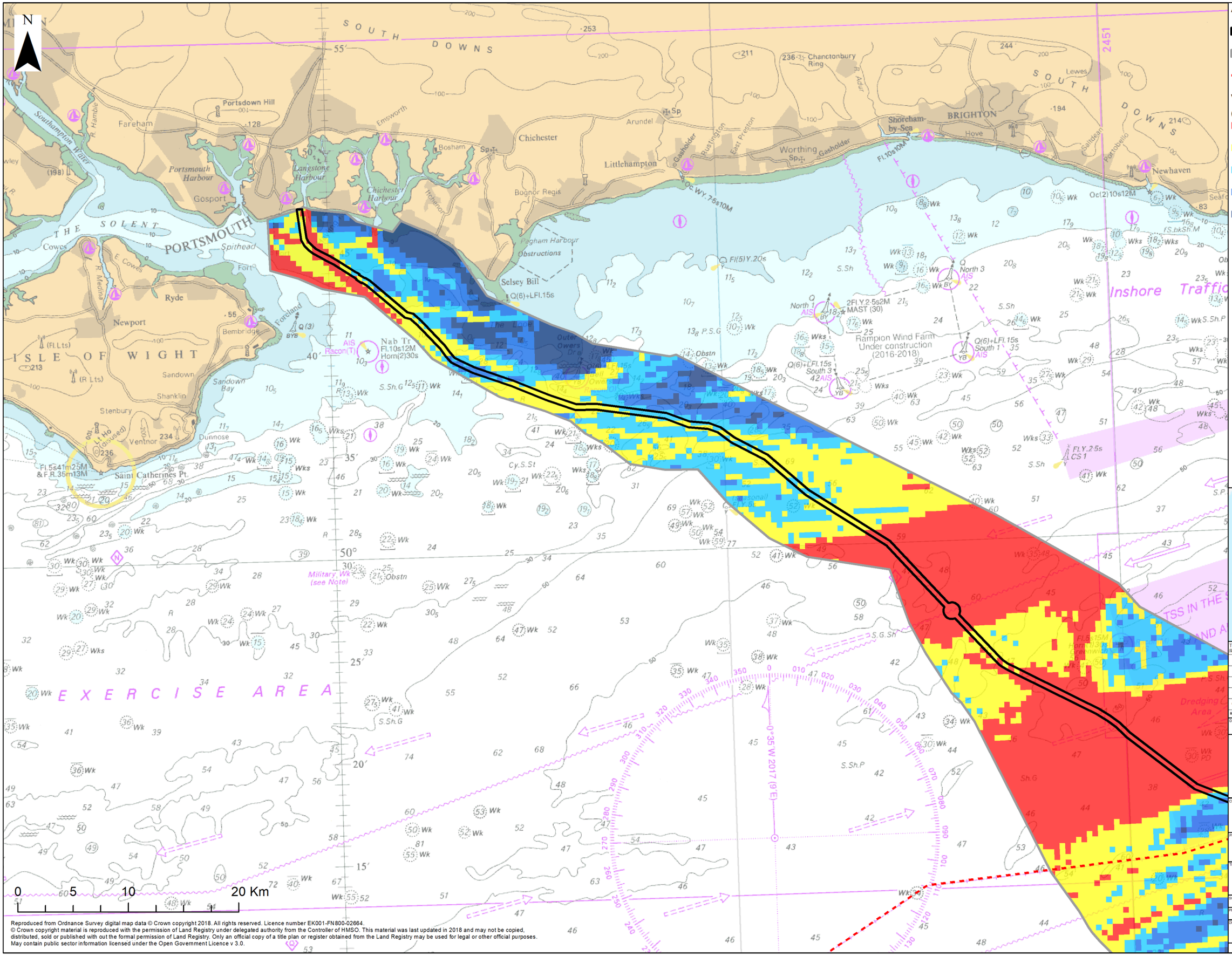
PROJECT: AQUIND Interconnector

TITLE: Vessel Density (Summer 2016)

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	LEKM	SL

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	LM	DS	18/10/2018

DRAWING NO: Figure 13.5 REV NO: 02

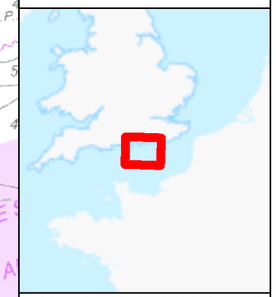


AQUIND Interconnector

- Marine Cable Corridor
- Study Area
- EEZ

Vessel Density (Winter 2016)

- 35-1,079
- 15-35
- 8-15
- 2-8
- 0-2



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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02	18/10/2018	DS	FINAL	LEKM	SL
01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: FINAL

anatec
Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
T+ 44 (0) 01224 253700
anatec.com

CLIENT: AQUIND

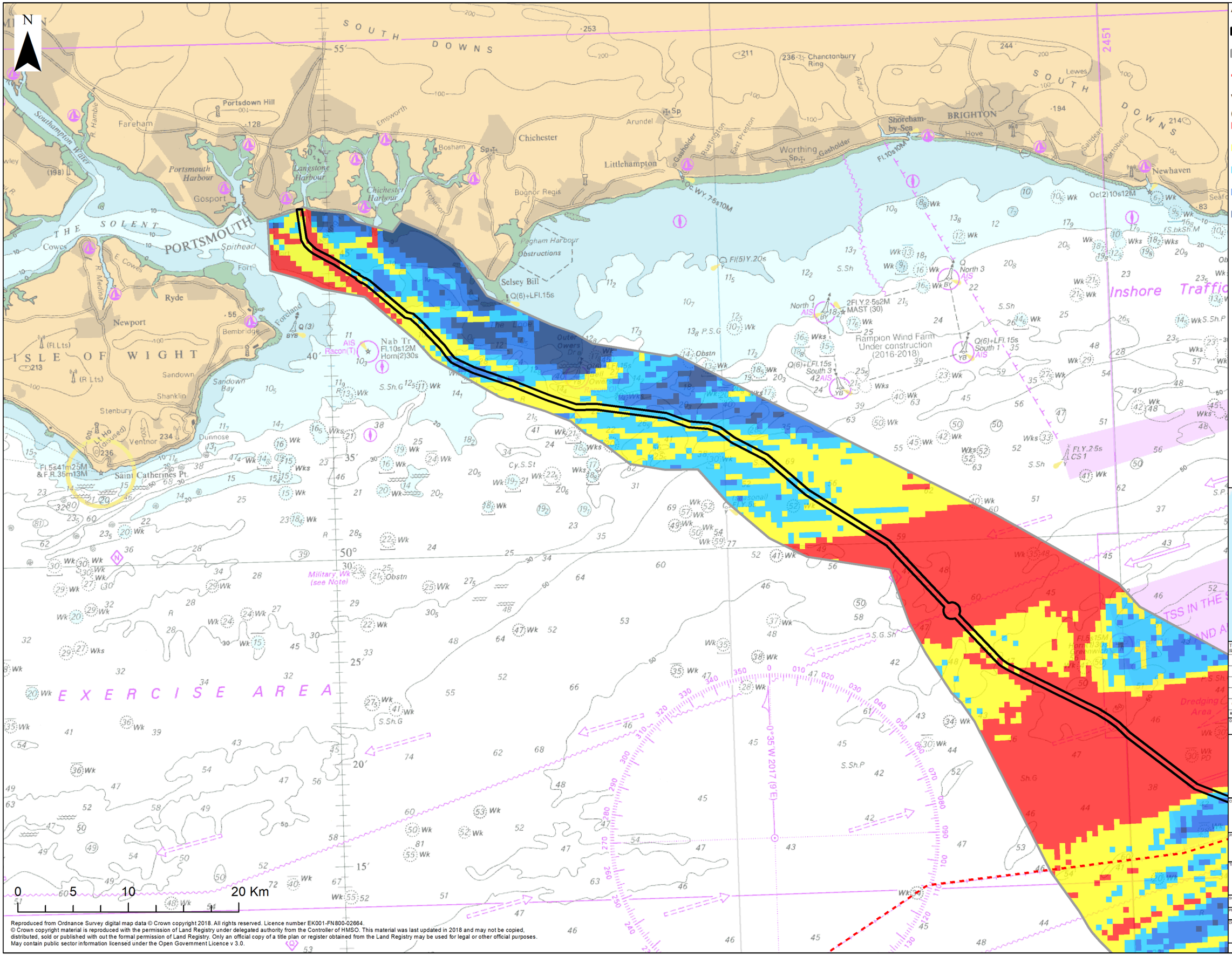
PROJECT: AQUIND Interconnector

TITLE: Vessel Density (Winter 2016)

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	LEKM	SL

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	LM	DS	18/10/2018

DRAWING NO: Figure 13.6 REV NO: 02

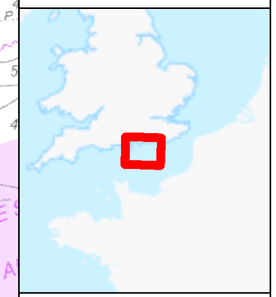


AQUIND Interconnector

- Marine Cable Corridor
- Study Area
- EEZ

Vessel Density (Winter 2016)

- 35-1,079
- 15-35
- 8-15
- 2-8
- 0-2



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

REV	DATE	BY	DESCRIPTION	CHK	APP
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01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: FINAL

anatec
Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
T+ 44 (0) 01224 253700
anatec.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Vessel Density (Winter 2016)

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	LEKM	SL

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	LM	DS	18/10/2018

DRAWING NO: Figure 13.6 REV NO: 02

N

0 5 10 20 Km

AQUIND Interconnector

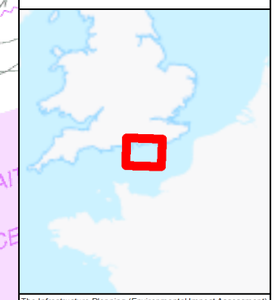
Marine Cable Corridor

Study Area

EEZ

Vessel Type

Fishing



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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02	18/10/2018	DS	FINAL	LEKM	SL
01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: FINAL

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T+ 44 (0) 01224 253700
anatec.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: AIS Fishing Tracks

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	LEKM	SL

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	LM	DS	18/10/2018

DRAWING NO: Figure 13.7 REV NO: 02

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0 5 10 20 Km

AQUIND Interconnector

Marine Cable Corridor

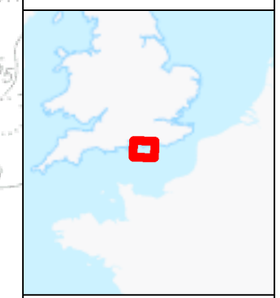
Study Area

Vessel Type

Dredger/Subsea

Tanker

Other



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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DRAWING STATUS: FINAL

anatec

Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
T+ 44 (0) 01224 253700
anatec.com

CLIENT: AQUIND

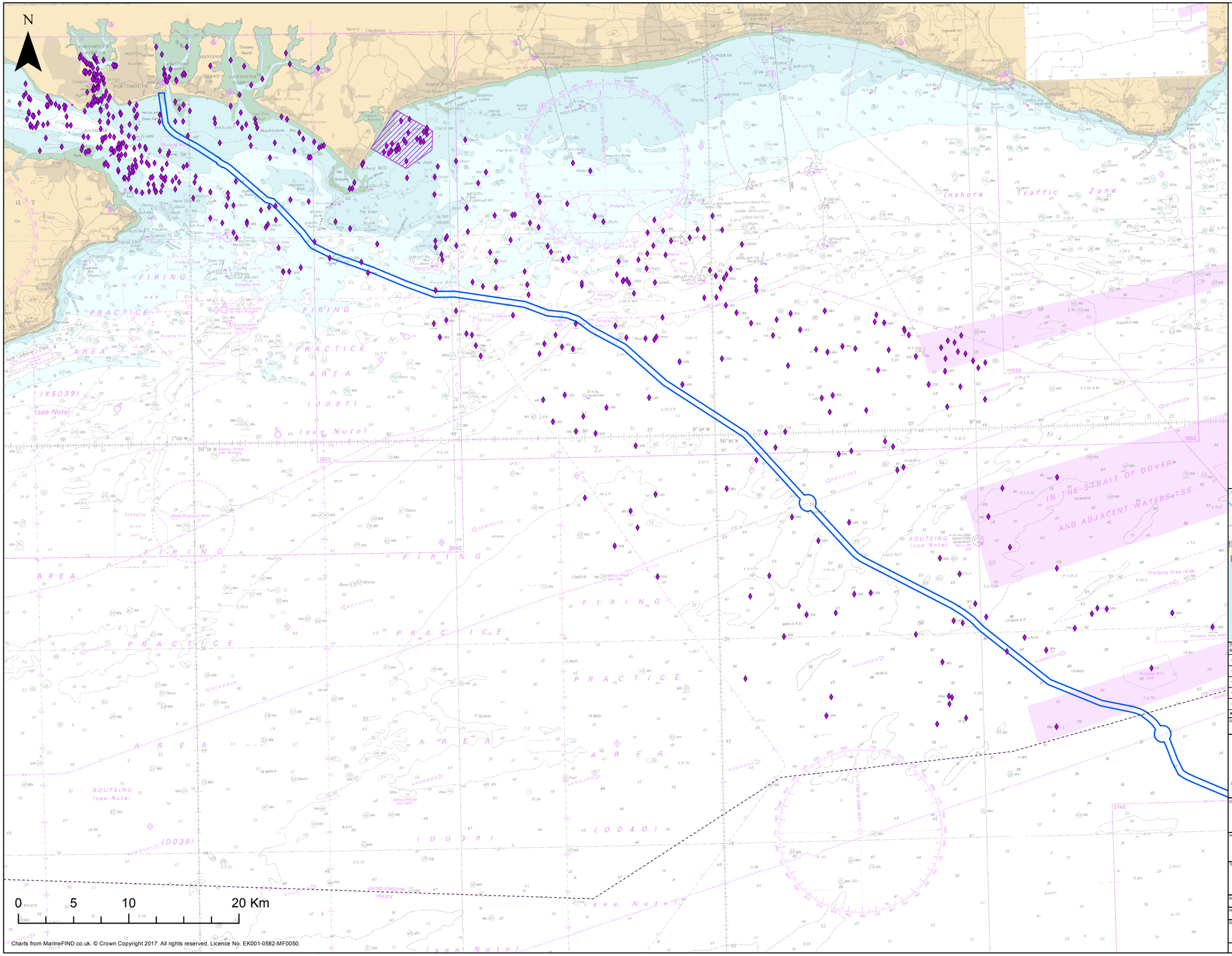
PROJECT: AQUIND Interconnector

TITLE: Anchored Vessels

SCALE AT A3	CHECKED	APPROVED
1:180,000	LEKM	SL

PROJECT NO.	DESIGNED	DRAWN	DATE
EN020022	LM	DS	18/10/2018

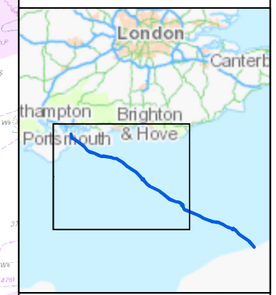
DRAWING NO: Figure 13.8 REV.NO. 02



AQUIND Interconnector Sheet

- Marine Cable Corridor
- UKHO wreck areas
- UKHO recorded positions
- --- UK EEZ limit

Coordinate system: WGS84 UTM z30N



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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04					
03					
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01	17/09/2018	KL	FIRST DRAFT	RD	AB

DRAWING STATUS: FINAL

wessex archaeology

Wessex Archaeology Ltd, registered office: Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB www.wessexarch.co.uk

CLIENT: AQUIND

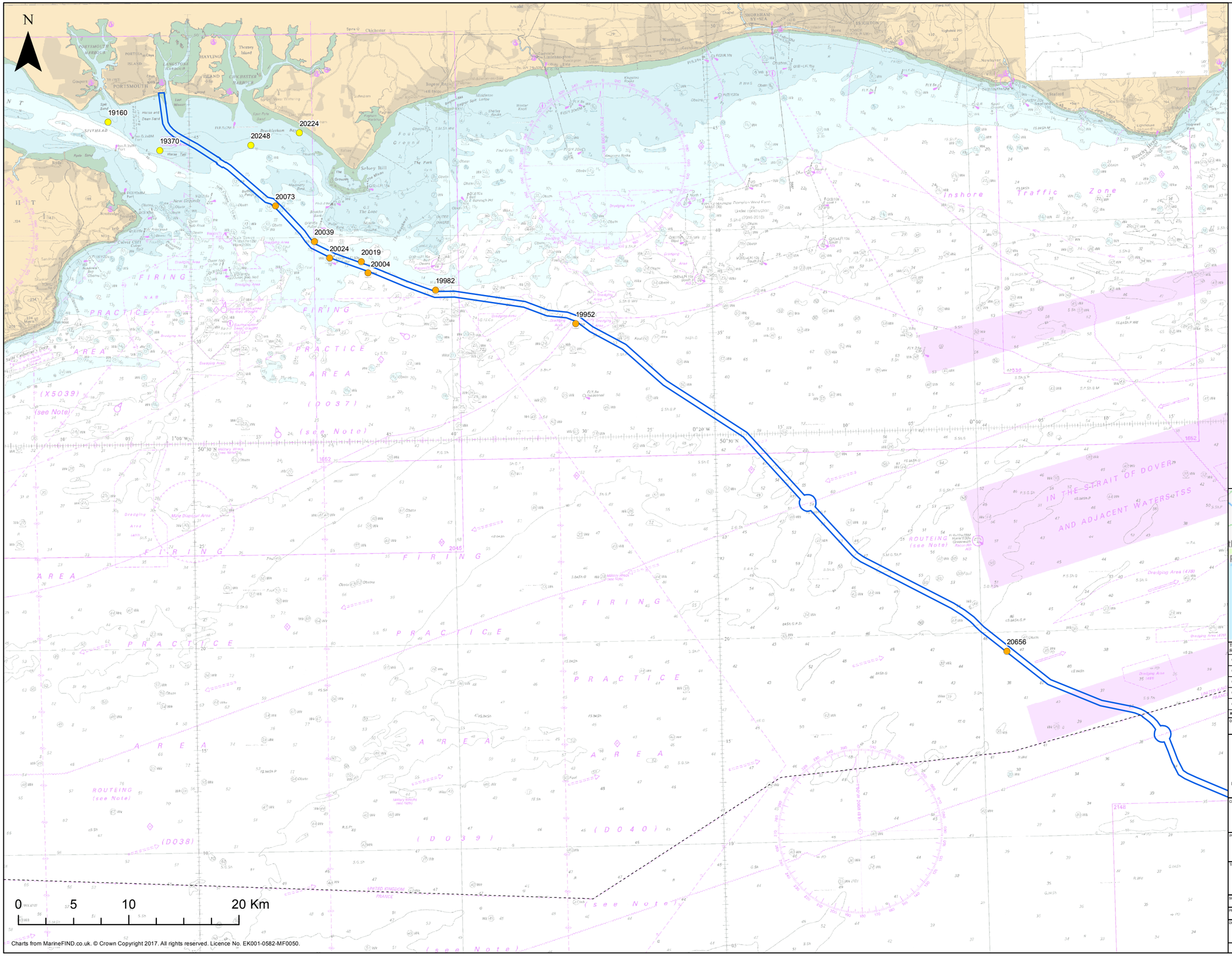
PROJECT: AQUIND Interconnector

TITLE: UKHO recorded positions located in and around the Marine Cable Corridor

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	RD	AB

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	KL	KL	19/10/2018

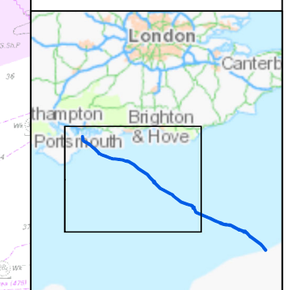
DRAWING NO: Figure 14.1 REV.NO: 02



AQUIND Interconnector Sheet

- Marine Cable Corridor
- UK EEZ limit
- Protected Wrecks
- UKHO wrecks within the Marine Cable Corridor

Coordinate system: WGS84 UTM z30N



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

REV	DATE	BY	DESCRIPTION	CHK	APP
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04					
03					
02	26/09/2018	KL	SECOND DRAFT	RD	AB
01	17/09/2018	KL	FIRST DRAFT	RD	AB

DRAWING STATUS: FINAL

Wessex Archaeology Ltd. registered office:
Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB
www.wessexarch.co.uk

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: UKHO recorded positions located inside the Marine Cable Corridor and Protected Wrecks in the vicinity

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	RD	AB

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	KL	KL	19/10/2018

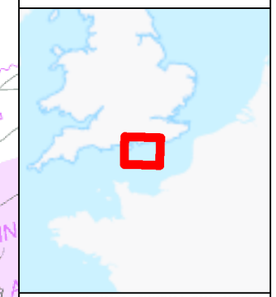
DRAWING NO: Figure 14.2 REV.NO: 02

AQUIND Interconnector

Marine Cable Corridor

EEZ

Military Practice Area



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: FINAL

anatec

Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
T+ 44 (0) 01224 253700
anatec.com

CLIENT: AQUIND

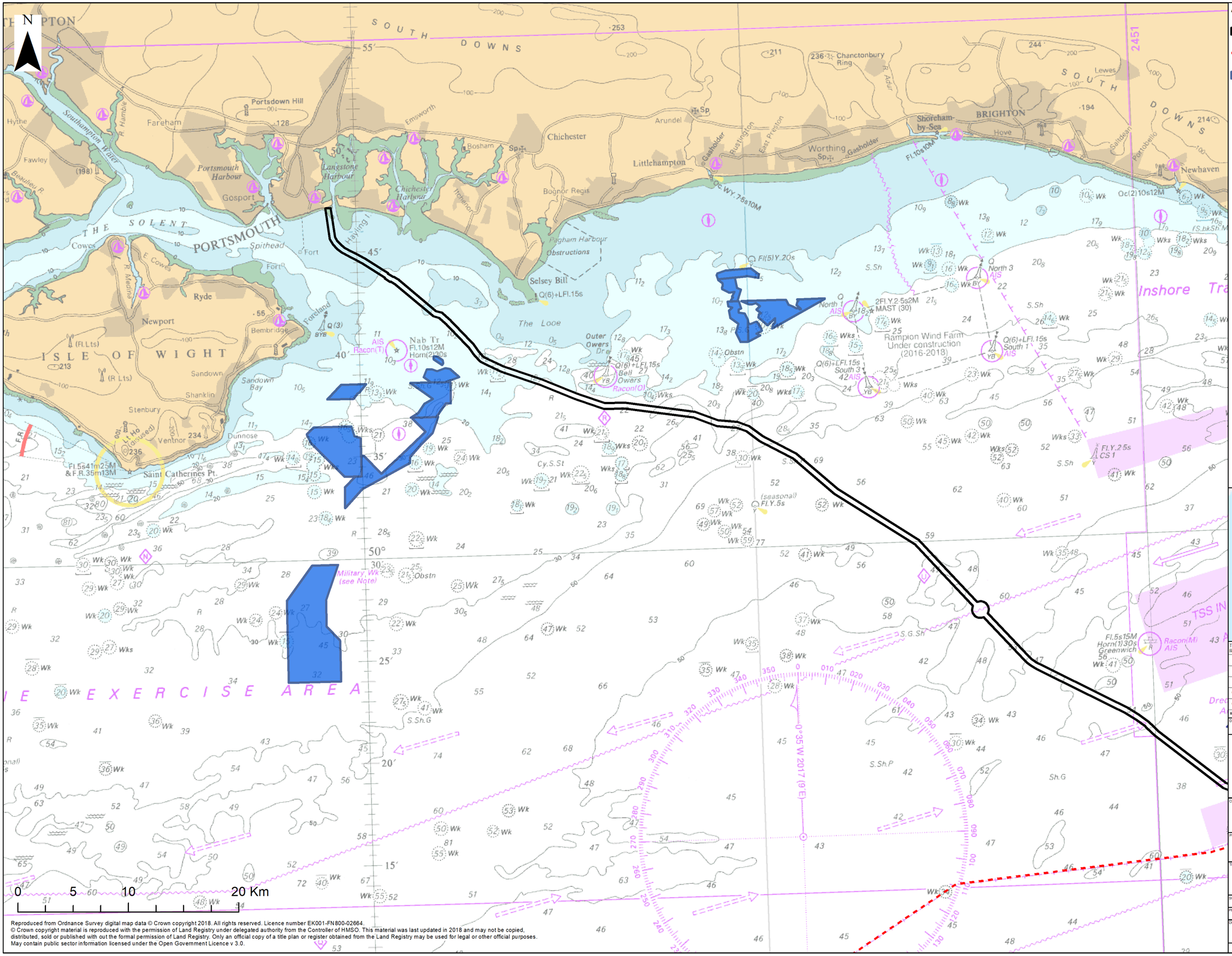
PROJECT: AQUIND Interconnector

TITLE: Military Practice Zones

SCALE AT A3	CHECKED	APPROVED
1:300,000	LEKM	SL

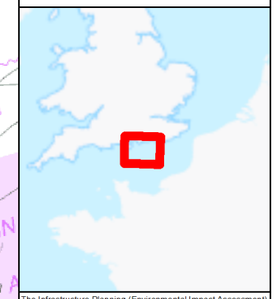
PROJECT NO.	DESIGNED	DRAWN	DATE
EN020022	LM	DS	18/10/2018

DRAWING NO: Figure 16.1 REV.NO: 02



AQUIND Interconnector

- Marine Cable Corridor
- EEZ
- Active Dredging Areas



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: FINAL

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T+ 44 (0) 01224 253700
anatec.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Aggregate Active Dredging Areas

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	LEKM	SL

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN020022	LM	DS	18/10/2018

DRAWING NO: Figure 16.2 REV NO: 02

N

0 5 10 20 Km

AQUIND Interconnector

Marine Cable Corridor

EEZ

RYA Clubs

RYA Training Centres

Marinas

Offshore Routes

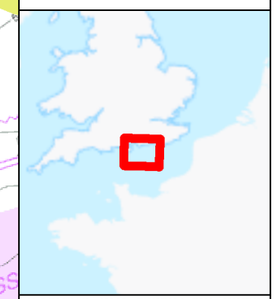
General Boating Areas

AIS Intensity

Intensity

High

Low



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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01	27/09/2018	DS	FIRST DRAFT	LEKM	SL

DRAWING STATUS: FINAL

anatec
Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
T+ 44 (0) 01224 253700
anatec.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Recreational Sailing Activity

SCALE AT A3	CHECKED:	APPROVED:
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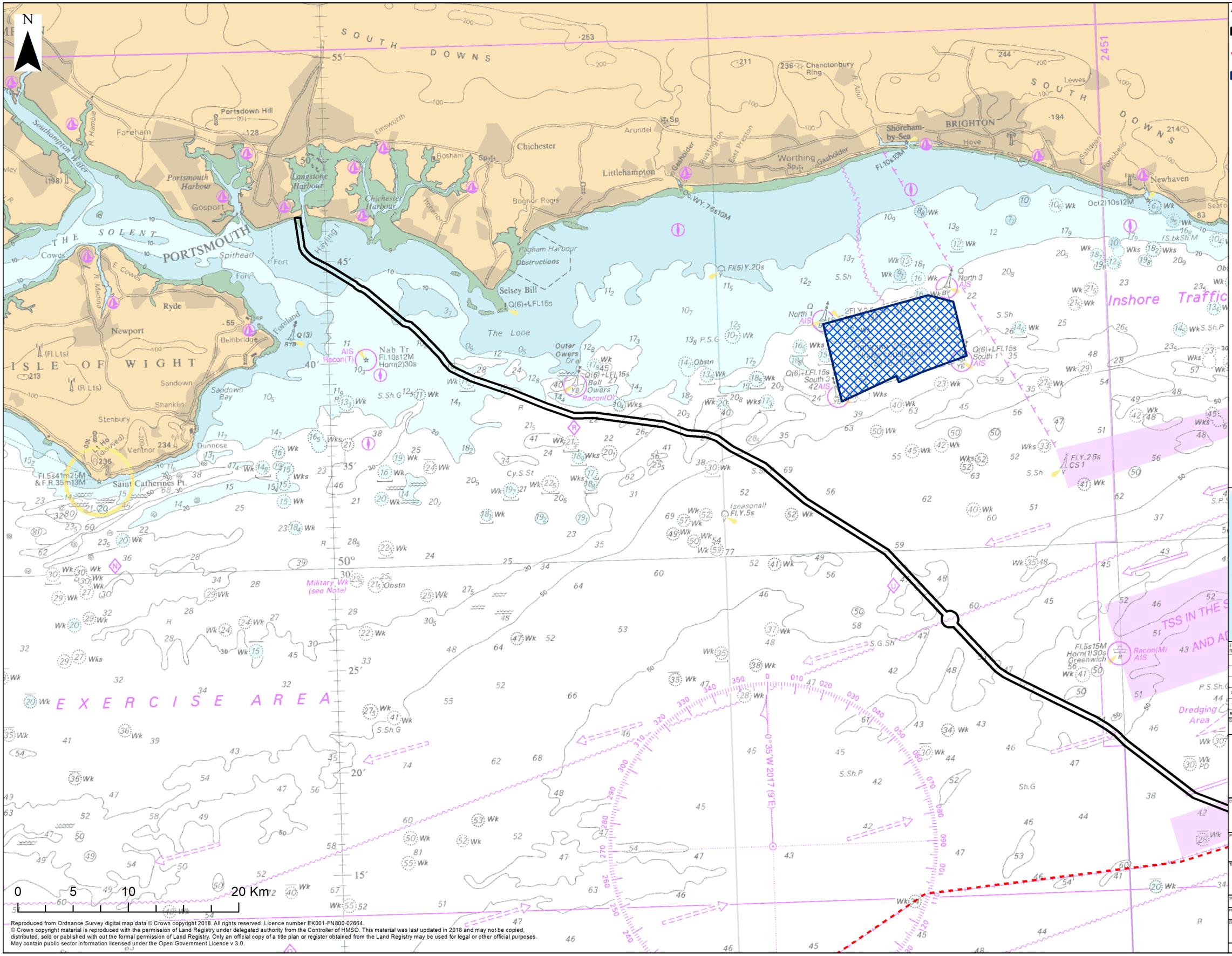
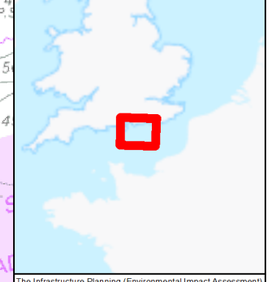
PROJECT NO: EN020022	DESIGNED: LM / DRAWN: DS	DATE: 18/10/2018

DRAWING NO: Figure 16.3 REV NO: 02



AQUIND Interconnector

- Marine Cable Corridor
- EEZ
- Operational Area



The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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DRAWING STATUS: FINAL

anatec
Anatec Ltd, Cain House, 10 Exchange Street, Aberdeen, UK
T+ 44 (0) 01224 253700
anatec.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Offshore Wind Farm Sites

SCALE AT A3	CHECKED:	APPROVED:
1:300,000	LEKM	SL
PROJECT NO: EN020022	DESIGNED: LM / DRAWN: DS	DATE: 18/10/2018

DRAWING NO: Figure 16.4 REV NO: 02

Project Number: 62100616
Drawing Number: 62100616-TCP-01
Revision: A

KEY

PREFIX

T	TREE
G	GROUP
W	WOODLAND
H	HEDGE

CATEGORY GRADING

- A CATEGORY
- B CATEGORY
- C CATEGORY
- U CATEGORY

ATTRIBUTES

- INDICATIVE ROOT PROTECTION AREA
- INDICATIVE TREE CANOPY

OTHER ATTRIBUTES

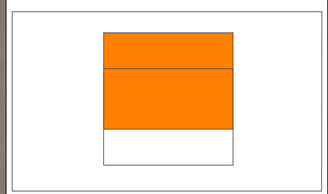
- ANCIENT SEMI-NATURAL WOODLAND
- SURVEY BOUNDARY
- NO ACCESS DURING SURVEY

N

Approximate North

0m 15 30 45 60 75m
Metres

SHEET LAYOUT:



INFORMATION ONLY

Rev	Date	Description	By	Chk	App
A	15/08/17	First Draft	CR		

Notes:
1. To be printed in colour on A1 paper.
2. All tree positions are approximate and should not be relied upon. If the position of these features is of importance then a topographic survey will be required.

WSP | PARSONS BRINCKERHOFF
1 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ
Tel: 44-(0)29 207 69235

Client: AQUIND LIMITED

Site/Project: AQUIND FRANCE UK INTERCONNECTOR
LOVEDEAN SUBSTATION

Title: TREE CONSTRAINTS PLAN

Drawn: CR | Checked:
Designed: BK | Approved:
Date: 15/08/2017 | Scale: 1:1,500 | A1 | Sheet: 1 of 2

Rev: A
Dwg No: 62100616-TCP-01
Job No: 62100616

KEY

PREFIX

T	TREE
G	GROUP
W	WOODLAND
H	HEDGE

CATEGORY GRADING

- A CATEGORY
- B CATEGORY
- C CATEGORY
- U CATEGORY

ATTRIBUTES

- INDICATIVE ROOT PROTECTION AREA
- INDICATIVE TREE CANOPY

OTHER ATTRIBUTES

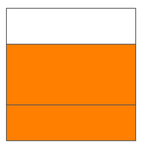
- ANCIENT SEMI-NATURAL WOODLAND
- SURVEY BOUNDARY
- NO ACCESS DURING SURVEY

N

Approximate North

0m 12.5 25 37.5 50 62.5m
Metres

SHEET LAYOUT:



INFORMATION ONLY

Rev	Date	Description	By	Chk	App
A	15/08/17	First Draft	CR		

Notes:
1. To be printed in colour on A1 paper.
2. All tree positions are approximate and should not be relied upon. If the position of these features is of importance then a topographic survey will be required.

WSP | PARSONS BRINCKERHOFF
1 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ
Tel: 44-(0)29 207 69235

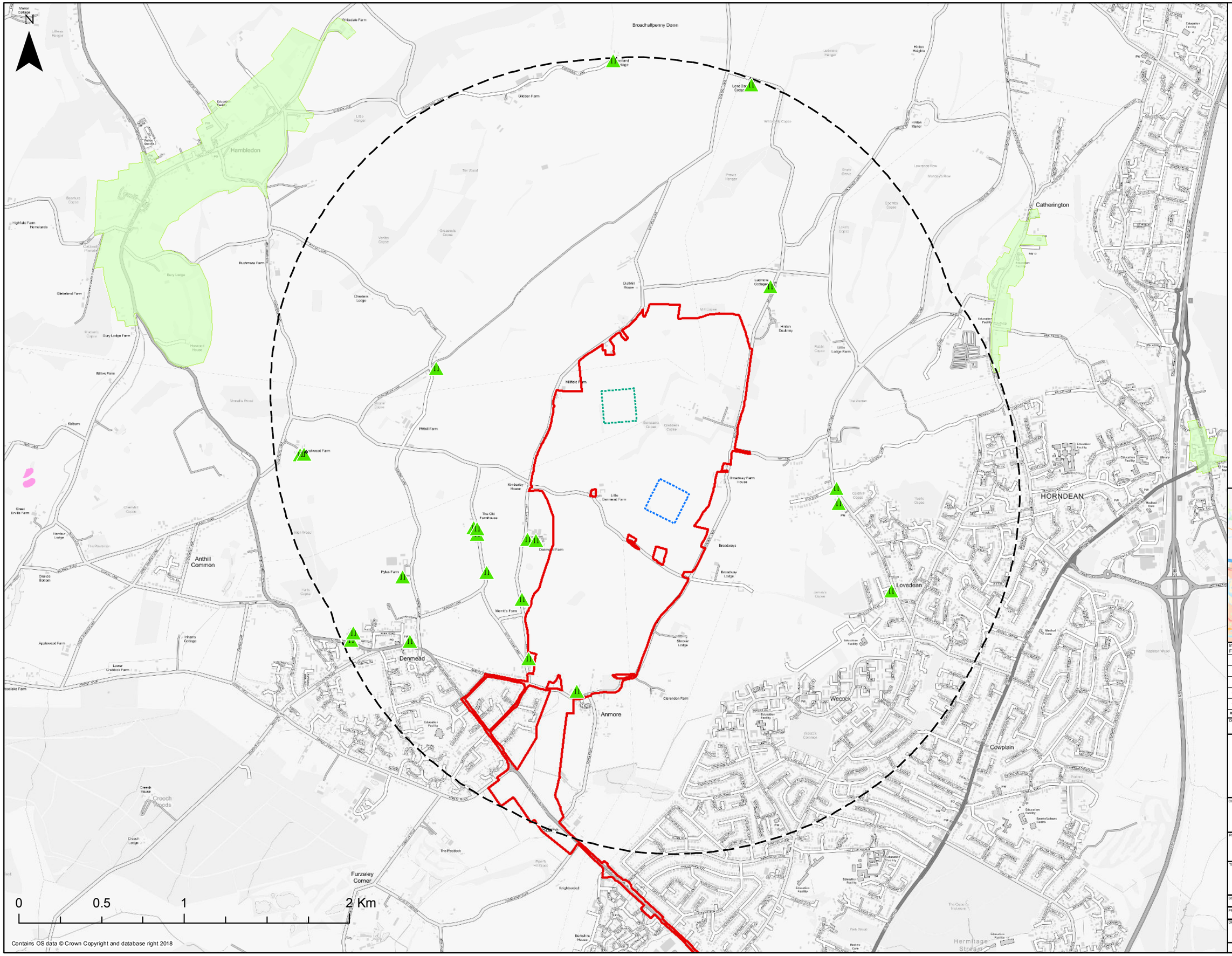
Client: AQUIND LIMITED

Site/Project: AQUIND FRANCE UK INTERCONNECTOR
LOVEDEAN SUBSTATION

Title: TREE CONSTRAINTS PLAN

Drawn: CR		Checked:	
Designed: BK		Approved:	
Date: 15/08/2017	Scale: 1:1,500 A1	Sheet:	2 of 2

Project Number:	Drawing Number:	Revision:
62100616	62100616-TCP-01	A



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Conservation Areas
Listed Building (within 2km)
Scheduled Monument
Site Boundary
Study Area (2km)
Proposed Convertor Station Boundary
Option A
Option B

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(i)

REV	DATE	BY	DESCRIPTION	CHK	APP
			XX		
			XX		
			XX		
1	19/10/2018	AS	FINAL	CF	US
1	09/10/2018	JT	FIRST DRAFT	XX	XX

DRAWING STATUS: FINAL

WSP House, 70 Chancery Lane, London, WC2A 1AF, UK.
T+ 44 (0) 020 7314 5000
wsp.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Designated Heritage Assets incl. Converter Station Options

SCALE AT A3	CHECKED:	APPROVED:
1:20,000	CF	US

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN20022	WSP	AS	18/10/2018

DRAWING NO: EN020022-SR-23.1 REV.NO: 1

N

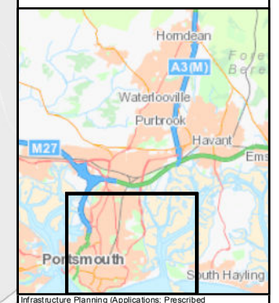
Tipner
Anchorage Park
Copnor
North End
Stamshaw
Whale Island
Buckland
Landport
Kingston
Portsea Island
Portsea
Fratton
PORTSMOUTH
Somers Town
Portsmouth
Southsea
Eastney
Milton
Baffins
Langstone Channel

0 0.5 1 2 Km

- Listed Building (within 500m)
- Registered Park and Garden
- Scheduled Monument
- Site Boundary
- Study Area (500m)

Proposed Convertor Station Boundary

- Option A
- Option B



Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(i)

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1	09/10/2018	JT	FIRST DRAFT	XX	XX

DRAWING STATUS: FINAL

WSP House, 70 Chancery Lane, London, WC2A 1AF, UK,
T+ 44 (0) 020 7314 5000
wsp.com

CLIENT: AQUIND

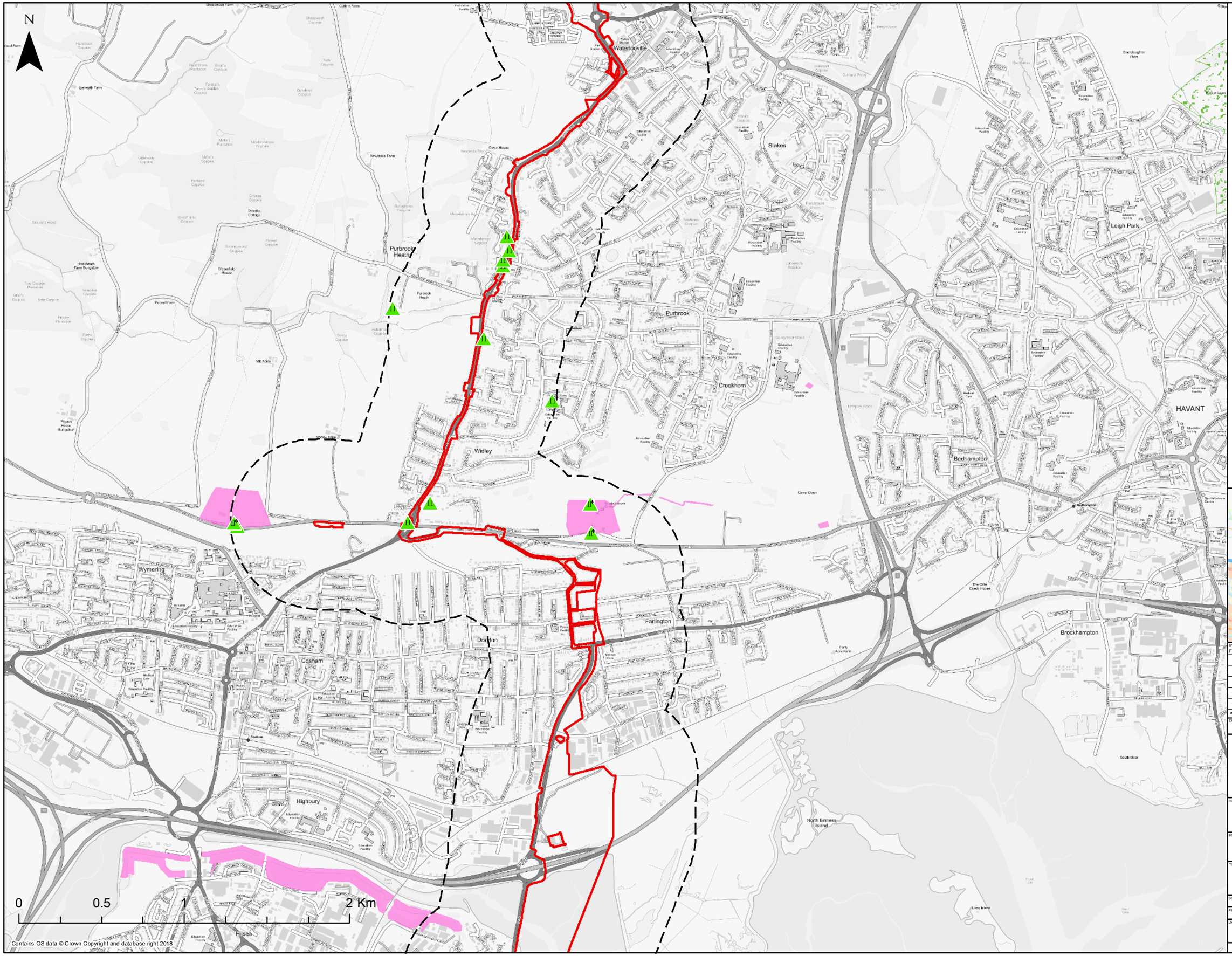
PROJECT: AQUIND Interconnector

TITLE: Designated Heritage Assets (1/3)

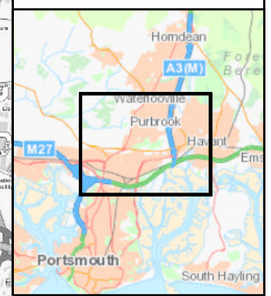
SCALE AT A3	CHECKED:	APPROVED:
1:20,000	CF	US

PROJECT NO:	DESIGNED:	DRAWN:	DATE:
EN20022	WSP	AS	22/10/2018

DRAWING NO: EN020022-SR-23.2 REV NO. 1



Listed Building (within 500m)
Registered Park and Garden
Scheduled Monument
Site Boundary
Study Area (500m)
Proposed Convertor Station Boundary
Option A
Option B



Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(i)

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DRAWING STATUS: FINAL

WSP House, 70 Chancery Lane, London, WC2A 1AF, UK,
T+ 44 (0) 020 7314 5000
wsp.com

CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Designated Heritage Assets (2/3)

SCALE AT A3	CHECKED	APPROVED
1:20,000	CF	US

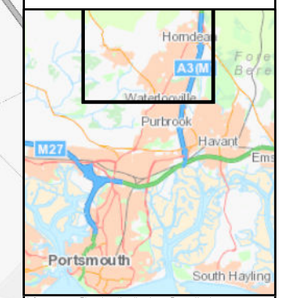
PROJECT NO	DESIGNED	DRAWN	DATE
EN20022	WSP	AS	19/10/2018

DRAWING NO: EN020022-SR-23.3 REV NO: 1

N

Conservation Areas
Listed Building (within 500m)
Registered Park and Garden
Site Boundary
Study Area (500m)
Proposed Convertor Station Boundary
Option A
Option B

0 0.5 1 2 Km



Infrastucture Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(i)

REV	DATE	BY	DESCRIPTION	CHK	APP
		XX			
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1	19/10/2018	AS	FINAL	CF	US
1	08/10/2018	JT	FIRST DRAFT.	XX	XX

DRAWING STATUS: FINAL

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CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Designated Heritage Assets (3/3)

SCALE AT A3	CHECKED:	APPROVED:
1:20,000	CF	US

PROJECT NO.	DESIGNED:	DRAWN:	DATE:
EN20022	WSP	AS	19/10/2018

DRAWING NO.: EN020022-SR-23.4 REV NO.: 1

N

Land Potentially Affected by the Proposed Development
Existing Substation Boundary
Committed Development
Proposed Convertor Station Boundary
Option A
Option B

57524/001
54596/001 & 54596/002
55562/001
13/02843/FUL
APP/10/00828
APP/12/00205
APP/14/00687
14/01387/FUL
11/00822/VOC
16/00085/FUL
11/00250/OUT
14/00128/FUL
16/00255/FUL

Waltham Chase
Shirrell Heath
Swanmore Golf Centre
Hambledon
Catherington
Compton
West Marden
Finchdean
Newtown
Lovedean
Horndean
Denmead
Wickham
Wickham Park Golf Club
North Boarhunt
Knowle
Southwick
Waterlooville
Staunton Country Park
Havant Academy
Lordington
Purbrook
Portsmouth Golf Course
Bedhampton
Havant
Emsworth
Westbourne
Hambrook
Hermitage
Prinsted
Nutbourne
Langstone
Fareham
Fareham Shopping Centre
Cams Hill School
Portchester
Drayton
Farlington
Queen Alexandra Hospital
King George's Field
Oyster Estate
Hayling Island
North Hayling
Airport Industrial Estate
Great Salterns Golf Course
Portsmouth Harbour
Continental Ferry Port
Hardway
Portsmouth
Lee-on-the Solent
Alver Valley Country Park
Gosport
Walpole Park
Privett Park
Alverstoke
Gosport Park
Eastney
Southsea
Rose Garden Eastney Esplanade
Hayling Golf Links
South Hayling
Tournerbury The Golf Centre Hayling College
Langstone & Chichester Harbours
West Wittering
Itchener
Cakeham Road
Sea Front
Southwood Road
Ferry Road
Clarence Esplanade
Stokes Bay Road
Fort Road
Portsdown Hill Road
Portsdown-Hill-Road
Havant-Road
Main-Road
Boarhunt Road
Purbrook Heath Road
Middle Park Way
Emsworth Common Road
Common Road
Woodmancote Lane
Foxbury Lane
Hares Lane
Castle Road
Padnell Road
Milton Road
Forest Road
Bent Lane
Hambledon Road
Pitt Hill Lane
Lovedean Lane
Hinton Manor Lane
Dogkennel Lane
Hambledon Lane
Armsworth Lane
Ingoldfield Lane
Hoe Street
East Hoe Road
Cott Street
Mislingford Road
Heath Road
High Street
Hundred Acres Road
Church Road
Shoot Hill
Trampers Lane
Beckford Lane
Southwick Road
Mayles Lane
Wickham Road
Winchester Road
Portchester Lane
Pylmoo Lane
Pigeon House Lane
Mill Lane
Widley Walk
Purbrook Heath Road
Newtown Lane
Sheepwash Lane
Belney Lane
Newlands Lane
Northern Parade
London Road
Copnor Road
Eastern Road
Tangier Road
Milton Common
Bransbury Road
Allaway Avenue
Harbourgate
Cote Avenue
Redlands Lane
Longfield Avenue
Tanfield Lane
Henry Cort Way
Wych Lane
Fareham Road
Newgate Lane
Crofton School
Gosport Road
Bloom Way
St Nicholas Avenue
Cherque Way
Grange Road
Military Road
Forton Road
Heritage Way
Broom Way
Mayles Lane
Lovedean Lane
Castle Road
Idsworth Park
Finchdean Road
Broad Walk
Watergate Park
Lockerley Lane
Woodcroft Lane
Havant Road
Southleigh Road
New Lane
Solent Retail Park
Southmoor Lane Industrial Estate
New Barn Farm Lane
South Lane
Thorney Road
Emsworth Road
Manor Road
West Lane
Broad Road
Foxbury Lane
Woodmancote Lane
Hayling Golf Links
Ferry Road
Transhipment Berth
Blue Point Industrial Estate
Brambles Business Park
New Lane Industrial Estate
Southmoor Lane Industrial Estate
Solent Retail Park
Havant Academy
Tournerbury The Golf Centre Hayling College
Langstone & Chichester Harbours
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Watergate Park
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Cams Hill School
Swanmore Golf Centre
Fareham Shopping Centre
Portsmouth Golf Course
Hayling Golf Links
Tournerbury The Golf Centre Hayling College
Havant Academy
Solent Retail Park
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New Lane Industrial Estate
Brambles Business Park
Blue Point Industrial Estate
Airport Industrial Estate
Continental Ferry Port
Transhipment Berth
The Pompey Centre
Queen Alexandra Hospital
Harbourgate
Allaway Avenue
Cote Avenue
Redlands Lane
Longfield Avenue
Tanfield Lane
Henry Cort Way
Wych Lane
Fareham Road
Newgate Lane
Crofton School
Gosport Road
Bloom Way
St Nicholas Avenue
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Solent Retail Park
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Newgate Lane
Crofton School
Gosport Road
Bloom Way
St Nicholas Avenue
Cherque Way
Grange Road
Military Road
Forton Road
Heritage Way
Broom Way
Mayles Lane

A32
A27
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A3(M)
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M275
A2030
A2047
A288
A259
B2149
B2150
B3177
A2030

0 1.75 3.5 7 Km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
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DRAWING STATUS: FINAL

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CLIENT: AQUIND

PROJECT: AQUIND Interconnector

TITLE: Proposed Committed Developments

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DRAWING NO: EN020022-SR-32.1		REV.NO. 1

APPENDICES

AQUIND Limited

AQUIND INTERCONNECTOR

EIA Scoping Report Appendices

The Planning Act 2008

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 – Regulation 10

Document Ref.: 0.2

PINS Ref.: EN020022

AQUIND Limited

AQUIND INTERCONNECTOR

EIA Scoping Report Appendices

VERSION: FINAL ISSUE

PINS REF.: EN020022
DOCUMENT: EIA SCOPING REPORT: APPENDICES

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DOCUMENT HISTORY

Document	EIA Scoping Report: Appendices		
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Document Owner	WSP UK Limited	AQUIND Limited	AQUIND Limited
Prepared by	AQUIND Project Team	WSP and Natural Power EIA Team	
Date	11 October 2018	19 October	
Approved by	Emanuele Stella	Ursula Stevenson	
Date	11 October 2018	19 October 2018	

CONTENTS

APPENDIX A: SOS DIRECTION AND LETTER

DIRECTION BY THE SECRETARY OF STATE UNDER SECTION 35 OF THE PLANNING ACT 2008 RELATING TO THE AQUIND INTERCONNECTOR

By letter to the Secretary of State received on 19 June 2018, AQUIND Limited formally requested that the Secretary of State exercise the power vested in him under section 35 of the Planning Act 2008 ("the Act") to direct that the proposed UK elements of the AQUIND Interconnector ("the proposed Development"), as set out in the Direction request, be treated as development for which development consent under the Act is required.

The Secretary of State is satisfied that:

- The proposed Development is in the field of energy and will be wholly within England, waters adjacent to England out to the seaward limits of the territorial sea and the Renewable Energy Zone when completed;
- The proposed Development does not currently fall within the existing definition of a "nationally significant infrastructure project" and therefore it is appropriate to consider use of the power in section 35 of the Act; and
- AQUIND Limited's request constitutes a "qualifying request" in accordance with section 35ZA(11) of the Act.

Having considered the details of AQUIND Limited's proposals as set out in their letter of 19 June 2018, the Secretary of State decided to request further justification for the inclusion of certain requests that are outside of the usual direction process. This information was requested by the Secretary of State on 28 June 2018. A response was received on 3 July 2018, re-starting the statutory deadline of 28 days from the receipt of this further information.

The Secretary of State is of the view that the proposed Development by itself is nationally significant, for the reasons set out in the Annex below.

The Secretary of State has taken the decision within the conditions as required by sections 35A(2), (4) and (5) of the Act, and issues this Direction accordingly under sections 35(1) and 35ZA of the Act. The Secretary of State has decided that the additional requests sought in the letter for the section 35 Direction should not be included in this Direction as the Secretary of State considers that insufficient reasons were given for the Secretary of State to exercise the discretion in section 35ZA(5) in the manner requested.

The Secretary of State has decided to exercise the discretion in section 35ZA(5) to direct that the Overarching National Policy for Energy (EN-1) should apply to the application as it would to a generating station of a similar generating capacity as the capacity of the interconnector. The Secretary of State considers that doing so would assist in ensuring that the application was treated in a manner consistent with that

which governs other applications for Nationally Significant Energy Projects considered under the Planning Act 2008.

THE SECRETARY OF STATE DIRECTS that the proposed Development, together with any development associated with it, is to be treated as development for which development consent is required.

The Secretary of State further directs in accordance with sections 35ZA(3)(b) and (5) of the Act that:

- An application for a consent or authorisation mentioned in section 33(1) or (2) of the Act for development identified in, or similar to that described in, the Request to the Secretary of State for Business, Energy and Industrial Strategy for a Direction under Section 35 of the Planning Act 2008 made by AQUIND Limited on 19 June 2018 is to be treated as a proposed application for which development consent is required; and

- That the Overarching National Policy Statement for Energy (EN-1) has effect in relation to an application for development consent under this Direction in a manner equivalent to its application to development consent for the construction and extension of a generating station within section 14(a) of the Act of a similar capacity as the proposed project so far as the impacts described in EN-1 are relevant to the proposed Development.

This Direction is given without prejudice to the Secretary of State's consideration of any application for development consent which is made in relation to the proposed Development.

Signed by

Gareth Leigh

Gareth Leigh
Head of Energy Infrastructure Planning
For and on behalf of the Secretary of State for Business, Energy and Industrial Strategy

30 July 2018

ANNEX

REASONS FOR THE DECISION TO ISSUE THE DIRECTION

The Secretary of State is of the opinion that the proposed Development, known as the AQUIND Interconnector, is of national significance having taken into account in particular that:

- The two giga-watt capacity of the proposed Development is similar in terms of electrical capacity to a generating station that would qualify to be considered under the Planning Act 2008 process as nationally significant.

- By progressing the proposed Development through the Planning Act 2008 development consent process, it would provide the certainty of a single, unified consenting process and fixed timescales.

- It will reduce the need to apply for separate consents from the Marine Management Organisation and local planning authorities.

Department for Business, Energy & Industrial Strategy

By email: Martyn.Jarvis@hsf.com

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30 July 2018

Dear Mr Jarvis,

AQUIND LIMITED: UK ELEMENTS OF THE PROPOSED AQUIND INTERCONNECTOR BETWEEN THE UK AND FRANCE: REQUEST FOR DIRECTION UNDER SECTION 35 PLANNING ACT 2008

Thank you for your letter dated 18 June 2018 on behalf of your client AQUIND Limited to the Secretary of State requesting the Secretary of State exercises powers under section 35 of the Planning Act 2008 to direct that the proposed UK elements of the AQUIND Interconnector, as set out in the Direction request, be treated as development for which development consent is required.

I am pleased to inform you that the Secretary of State has agreed to your request. However, the Secretary of State has decided that the additional requests sought in the letter for the section 35 Direction should not be included as he considers that insufficient reasons were given for the Secretary of State to exercise the discretion in section 35ZA(5) in the manner requested. A signed Direction to that effect is attached. This Direction is given without prejudice to the Secretary of State's consideration of any application for development consent which is made in relation to this proposed development.

Yours sincerely,

Gareth Leigh

Gareth Leigh
Head of Energy Infrastructure Planning

APPENDIX B – RELEVANT LEGISLATION AND POLICY

AIR QUALITY

UK AIR QUALITY STRATEGY

1.1.1. The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS). The AQS provides a framework for reducing air pollution in the UK with the aim of meeting the requirements of European Union legislation. The AQS also sets standards and objectives for nine key air pollutants to protect health, vegetation and ecosystems.

AIR QUALITY REGULATIONS

1.1.2. Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002 for the purpose of Local Air Quality Management (LAQM).

ENVIRONMENTAL PROTECTION ACT 1990 - CONTROL OF DUST AND PARTICULATES ASSOCIATED WITH CONSTRUCTION

1.1.3. The Environmental Protection Act sets out definitions of statutory nuisance relevant to dust and particles and the requirements and tools for Local Authorities to address nuisance issues.

ENVIRONMENT ACT 1995

1.1.4. Under Part IV of the Environment Act 1995, local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives defined in the Regulations. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

NATIONAL PLANNING POLICY FRAMEWORK

1.1.5. The Government's overall planning policies for England are described in the National Planning Policy Framework. One of the 12 core planning principles in the NPPF is that planning should 'contribute to conserving and enhancing the natural environment and reducing pollution.' The NPPF details a number of policies relating to air quality.

- The Control of Pollution Act (CoPA) 1974 which was introduced to cover a wide range of environmental pollution including noise. Parts of the Act have been superseded by the Environmental Protection Act 1990 (please see below); and

- The Environmental Protection Act (EPA) 1990 which amongst many other things requires local authorities to issue a noise abatement notice where a noise nuisance is proven.

NOISE POLICY STATEMENT FOR ENGLAND

1.1.6. This long term vision is supported by the following aims:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

1.1.7. To assist in the understanding of the terms "significant adverse" and "adverse", the NPSE acknowledges that there are two concepts that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO). They are:

- NOEL – No Observed Effect Level - This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

- LOAEL – Lowest Observed Adverse Effect Level - This is the level above which adverse effects on health and quality of life can be detected.

1.1.8. The NPSE introduces a third concept that it describes as a significant observed adverse effect level:

- SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur.

1.1.9. However, the NPSE goes on to state:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL

values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

NATIONAL PLANNING POLICY FRAMEWORK

1.1.10. The NPPF replaced the majority of previous Planning Policy Guidance notes and Planning Policy Statements, including PPG24: *Planning and Noise*. At present, no alternative detailed guidance has been provided.

1.1.11. The NPPF does not include any noise assessment methodologies, although it does make the following references to noise in the section entitled '*Conserving and Enhancing the Natural Environment*'.

1.1.12. Paragraph 109 states:

"the planning system should contribute to and enhance the natural and local environment by..[a number of points including]..preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability".

The main reference to noise within the NPPF is at paragraph 123 which is reproduced below:

"123. Planning policies and decisions should aim to:

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established, and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

PLANNING PRACTICE GUIDANCE

1.1.13. On 6th March 2014, the Department for Communities and Local Government (DCLG) launched a Planning Practice Guidance web-based resource. It is states that the guidance is to complement the NPPF and provides advice on how to deliver its policies.

1.1.14. The Planning Practice Guidance section on noise includes a table that summarises *"the noise exposure hierarchy, based on the likely average response"* which offers *"examples of outcomes"* relevant to the NOEL, LOAEL and SOAEL effect levels described in the NPSE (see above). These outcomes are in descriptive form.

BRITISH STANDARDS AND GUIDANCE DOCUMENTS

1.1.15. The noise and vibration assessment will be undertaken with reference to the following British Standards and guidance:

- British Standard 5228: 2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise and Part 2: Vibration; and
- World Health Organisation's Guidelines for Community Noise;
- British Standard 4142:2014 Methods for rating and assessing industrial and commercial sound; and
- Design Manual for Roads and Bridges Volume 11, Section 3, Part 7 (HD 213/11) revision 1.

LANDSCAPE AND VISUAL

- An Approach to Landscape Character Assessment", Natural England 2014
- Catherington Conservation Area Study and Character Appraisal, East Hampshire District Council, November 2006
- East Hampshire District Landscape Character Assessment, by Land Use Consultants on behalf of East Hampshire District Council, July 2006
- East Hampshire District Council Local Plan Part 1 Joint Core Strategy, East Hampshire District Council, 2014
- East Hampshire District Council Local Plan: Second Review - Saved Policies East Hampshire District Council, 2006
- European Landscape Convention, Committee of Ministers of the Council of Europe, 2000
- Guidelines for Landscape and Visual Impact Assessment - Third Edition, Landscape Institute and the Institute of Environmental Assessment, Routledge, 2013
- Hampshire County Integrated Character Assessment, Hampshire County Council, 2012
- Hampshire Historic Landscape Characterisation, Oxford Archaeology (South), 2013
- Havant Borough Landscape Character Assessment – Sensitivity Report, Kirkham Landscape Planning, Wessex Archaeology / Countryscape and Havant Borough Council, 2007

- Horndean Conservation Area Study and Character Appraisal, East Hampshire District Council, June 2010
- National Character Area Profiles, Natural England (undated)
- National Planning Policy Framework, Department for Communities and Local Government 2012
- National Planning Practice Guidance (NPPG), Department for Communities and Local Government ,March 2014
- Photography and photomontage in landscape and visual impact assessment' Landscape Institute Advice Note 01/11, 2011
- South Downs National Park: View Characterisation and Analysis, LUC, November 2015
- South Downs Integrated Landscape Character Assessment Updated, by Land Use Consultants on behalf of South Downs National Park, 2011
- South Downs Local Plan: Preferred Options (draft 2015) (Estimated adoption in 2018), South Downs National Park, draft 2015
- South Downs Partnership Management Plan – Shaping the future of your South Downs National park, 2014-2019, South Downs National Park
- Winchester Landscape Character Assessment, Winchester City Council, 2004
- Winchester City Council Local Plan Part 1 Joint Core Strategy, Winchester City Council, 2013
- Winchester City Council Local Plan Local Plan Part 2 - Development Management, Winchester City Council, 2017
- Winchester District Local Plan Review – Saved Policies, Winchester City Council, 2006

HERITAGE AND ARCHAEOLOGY

- Ancient Monuments and Archaeological Areas Act 1979
- Planning (Listed Buildings and Conservation Areas) (P(LBCA)) Act 1990;

- Burial Act 1857
- The Hedgerow Regulations 1997
- CIfA [Chartered Institute for Archaeologists] Dec 2014a, Standards and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment;
- CIfA [Chartered Institute for Archaeologists] Dec 2014b, Standards and guidance for historic environment desk-based assessment;
- DCLG March 2012, National Planning Policy Framework;
- DCLG March 2014, Conserving and Enhancing the Historic Environment: Planning Practice Guide;
- EH [English Heritage] 2008, Conservation principles, policies and guidance;
- Historic England, 2015 The Setting of Heritage Assets.

ECOLOGY (WITH ARBORICULTURE)

- The Conservation of Habitats and Species Regulations 2010 as amended (Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Natural Environment and Rural Communities (NERC) Act 2006;
- The Protection of Badgers Act 1992;
- The Hedgerows Regulations 1997;
- The National Planning Policy Framework (NPPF) 2012 (DCLG, 2012);
- The East Hampshire District Council Local Plan ; and
- The Portsmouth Plan (The Portsmouth Core Strategy), 2012.

SOCIO-ECONOMICS

POLICY

National Policy

National Policy Statement for ELECTRICITY networks infrastructure (en-1)

1.1.16. Within the National Policy Statement (NPS) for National Networks, published in 2013, the Government's vision and strategic objectives for electricity infrastructure includes supporting the economy and reduces adverse impacts.

National Policy Statement for ELECTRICITY networks infrastructure (en-5)

1.1.17. There is no specific guidance relevant to socio-economics within the National Policy Statement EN-5, other than the requirement to ensure sufficient assessment of the proposals in the context of the surrounding environment and the need to minimise adverse effects where possible.

National Planning Policy Framework (NPPF)

1.1.18. The NPPF, published in 2012 has an overarching presumption in favour of sustainable development that should be the basis of every plan and every decision. The NPPF notes at paragraph 7 that there are three dimensions to sustainable development: economic, social and environmental. The role of the planning process is to contribute to building a strong, responsive and competitive economy and to identify and coordinate development requirements, including the provision of infrastructure.

1.1.19. Paragraph 18 states *'the Government is committed to securing economic growth in order to create jobs and prosperity, building on the country's inherent strengths…'.*

1.1.20. Paragraph 19 states *'the Government is committed to ensuring that the planning system does everything it can to support sustainable economic growth. Planning should operate to encourage and not act as an impediment to sustainable growth. Therefore significant weight should be placed on the need to support economic growth through the planning system'.*

National planning practice guidance (NPPG)

1.1.21. The socio-economic assessment has also been guided by the following sections of the online NPPG:

- Open space, sports and recreation facilities, public rights of way and local green space.

Local Policy

- East Hampshire District Council Local Plan Part 1 Joint Core Strategy, East Hampshire District Council, 2014
- East Hampshire District Council Local Plan: Second Review - Saved Policies East Hampshire District Council, 2006
- South Downs Local Plan: Preferred Options (draft 2015) (Estimated adoption in 2018), South Downs National Park, draft 2015
- Winchester Landscape Character Assessment, Winchester City Council, 2004
- Winchester City Council Local Plan Part 1 Joint Core Strategy, Winchester City Council, 2013
- Winchester City Council Local Plan Local Plan Part 2 - Development Management, Winchester City Council, 2017
- Winchester District Local Plan Review – Saved Policies, Winchester City Council, 2006

WATER RESOURCES AND FLOOD RISK

EUROPEAN POLICY

Water Framework Directive (2000/60/EC)

1.1.22. The overall objective of the Water Framework Directive (WFD) is to bring about the effective co-ordination of water environment policy and regulation across Europe. The main aims of the legislation are to ensure that all surface water and groundwater reaches 'good' status (in terms of ecological and chemical quality and water quantity, as appropriate), promote sustainable water use, reduce pollution and contribute to the mitigation of flood and droughts.

Groundwater Directive (2006/118/EC)

1.1.23. The Groundwater Directive aims to set groundwater quality standards and introduce measures to prevent or limit pollution of groundwater, including those listed with the 'List of Priority Substances'. The directive has been developed in response to the requirements of Article 17 of the WFD, specifically the assessment of chemical status of groundwater and objectives to achieve 'good' status.

NATIONAL POLICY

National Planning Policy Framework (2012)

The NPPF sets out the Government's planning policies for England and provides a framework which allows Local Authorities to produce their own plans that better reflect the specific needs of their communities. Planning Practice Guidance (PPG) has been published and is regularly updated, alongside the NPPF to provide guidance on the implementation of the planning policies, including those relating to flood risk, set out in the NPPF. The NPPF also sets out the requirements for a site specific FRA to be undertaken and states that development should not increase flood risk elsewhere.

Flood and Water Management Act (2010)

The Flood and Water Management Act created the role of the LLFA to take responsibility for leading the co-ordination of local flood risk management in their areas. In accordance with the Flood and Water management Act the Environment Agency is responsible for the management of risks associated with main rivers, the sea and reservoirs. LLFAs are responsible for the management of risks associated with local sources of flooding such as ordinary watercourses, surface water and groundwater. The Act is also guiding the role of the LLFA in the review and approval of surface water management systems, leading to LLFAs reviewing and commenting on significant development in regard to the Non-Statutory Technical Standards for Sustainable Drainage Systems.

Environmental Permitting (England and Wales) Regulations (2010)

Under the Environmental Permitting Regulations it is an offence to cause or knowingly permit a water discharge activity, including the discharge of polluting materials to freshwater, coastal waters, relevant territorial waters or groundwater, unless complying with an exemption or an environmental permit (obtained from the EA). The EA sets conditions which may control volumes and concentrations of particular substances or impose broader controls on the nature of the effluent, taking into account any relevant water quality standards from EC Directives. The Environment Permitting Regulations also manages works that have the potential to affect a watercourse under the jurisdiction of the Environment Agency. Any works in, under or near a main river requires permission from the EA to ensure no detrimental impacts on the watercourse.

Non-Statutory Technical Standards for Sustainable Drainage Systems (2015)

The Non-Statutory Technical Standards for Sustainable Drainage Systems set out the core technical standards for SUDS proposed within England. These standards should be used in accordance with the NPPF and Planning Practice Guidance. The standards include guidance on controlling flood risk within a development boundary and elsewhere, peak flow and runoff volume control, and the structural integrity of SUDS.

Land Drainage Act (1991)

Local Authorities and Internal Drainage Boards have additional duties and powers associated with the management of flood risk under the land Drainage Act. As Land Drainage Authorities, consent must be given for any permanent or temporary works that could affect the flow within an ordinary watercourse under their jurisdiction in order to ensure that local flood risk is not increased. The Land Drainage Act also sets out the maintenance responsibilities riparian owners have in order to reduce local flood risks.

LOCAL PLANNING POLICY

Havant Borough Local Plan (2011 - 2026)

1.1.24. The Havant Borough Local Plan 2011 – 2026 provides guidance for new development within the council's administrative area up to 2026. In order to achieve the vision set out in the framework, a number of strategic objectives and policies have been adopted. Policy CS15 (Flood and Erosion Risk) sets out to direct development away from areas indicated to be at risk of flooding now or in the future and ensure development does not increase flood risk elsewhere.

GROUND CONDITIONS

LEGISLATION

1.1.25. Part 2A of the Environmental Protection Act 1990 [1] provides a statutory definition of "contaminated land" as any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that – (a) significant harm is being caused or there is a significant possibility of such harm being caused; or (b) significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused.

GUIDANCE

1.1.26. In the guidance that accompanies the Environmental Protection Act 1990, there is advice on what constitutes significant harm and what constitutes a significant possibility. The following reports provide further guidance on the risk assessment process, and introduce the Contaminated Land Exposure Assessment (CLEA) model:

- Model Procedures for the Management of Land Contamination: Contaminated Land Report 11 (Defra and the Environment Agency);
- Guidance on the legal definition of contaminated land[2];
- Human Health Toxicological Assessment of Contaminants in Soil[3];

[1] HM Government (1990), Environmental Protection Act. London, The Stationery Office
[2] Department of Environment, Food and Rural Affairs (Defra) (2008), Guidance on the legal definition of contaminated land, Defra
[3] Environment Agency(2008), Science Report – SC050021/SR2 - Human Health Toxicological Assessment of Contaminants in Soil, Environment Agency

- Updated Technical Background to the CLEA Model[4]; and
- Guiding Principles on Land Contamination[5].

CARBON AND CLIMATE CHANGE

LEGISLATIVE AND POLICY CONTEXT

European Union EIA Directive

Directive 2014/52/EU ('the EIA Directive') provides the overarching legislative framework for assessing the significance of impacts and effects from schemes on the environment.

The Directive requires that the EIA shall identify, describe and assess the direct and indirect significant effects of a project on climate (Article 3). It also stipulates that the information to be included within the EIA report should include "the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change" (Annex IV).

UK Climate Change Act

The Climate Change Act (2008) established a legal requirement for an 80% reduction in the GHG emissions of the UK economy by 2050 in comparison to the 1990 baseline. The Act also created the Committee on Climate Change, with responsibility for:

- Setting 5 year Carbon Budgets covering successive periods of emissions reduction to 2050.
- Advising and scrutinising the UK Government's associated climate change adaptation programmes, and
- Producing a National Adaptation Plan for the UK Government to implement.

Infrastructure Carbon Review

In 2013, the UK government published the Infrastructure Carbon Review, aiming to "release the value of lower carbon solutions and to make carbon reduction part of the DNA of infrastructure in the UK". Major infrastructure owners, operators and developers were invited to endorse, become signatories and make commitments under the review.

The review provided increased emphasis on 'capital carbon' (GHG emissions associated with raw materials, activities and transport for construction, repairs, replacement, refurbishment and de-construction of infrastructure) while acknowledging that 'operational carbon' (associated with energy consumption for the operation and use of infrastructure) will continue to dominate overall emission to 2050 and beyond.

The Infrastructure Carbon Review highlighted the need to assess GHG emissions early in the lifecycle of an infrastructure scheme when there is the greatest carbon reduction potential. It also led to the publication of a Publically Available Specification on infrastructure carbon management; PAS2080:2016.

[4] Environment Agency (2008), Science Report – SC050021/SR3 - Updated Technical Background to the CLEA Model, Environment Agency
[5] Environment Agency (2010), Guiding Principles on Land Contamination, Environment Agency

National Planning Policy Framework

The NPPF (2012)[6] sets out the core planning principle of supporting "the transition to a low carbon future in a changing climate…"

Chapter 10: Meeting the Challenge of Climate Change, Flooding and Coastal Change, establishes that Local Planning Authorities should "adopt proactive strategies to mitigate and adapt to climate change" with particular focus on reducing emissions, energy (efficiency and renewables, for example), flood risk and coastal change.

HUMAN HEALTH

NATIONAL POLICY

National Planning Policy Framework

1.1.27. The National Planning Policy Framework was published in March 2012 and is key in ensuring the planning system focusses on delivering sustainable development. The NPPF supports 'promoting healthy communities' and its core planning principles require consideration of local strategies for health improvement in both plan-making and decision-taking. In particular the social dimension of sustainable development created a role for the planning system to promote healthy communities. According to the framework, the planning system can play an important role in facilitating social interaction and creating healthy, inclusive communities.

LOCAL POLICY

Havant Borough Core Strategy 2011

- CS1 Health and Wellbeing 24
- CS2 Employment 33
- CS3 Skills and Employability 39
- CS6 Regeneration of the Borough 49
- CS7 Community Support and Inclusion 52
- CS8 Community Safety 54
- CS11 Protecting and Enhancing the Special Environment and Heritage of Havant Borough 66

[6] Department for Communities and Local Government, National Planning Policy Framework (2012)

- CS13 Green Infrastructure 72

East Hampshire Local Plan

- Theme 1 – CP1, CP11, HE 18, HE19
- Theme 2 – T4, T7, T9, P6, P7
- Theme 4 – IB2, IB3
- Theme 5 – HC1, HC2, HC3, UI1
- Joint Core Strategy – CP5, CP16, CP17, CP20, CP25, CP27, CP28, CP30,

Portsmouth Local Plan

- Portsmouth Local Plan 2006, Retained Policies – DC4, DC5, DC6, DC12, DC20, DC21
- Portsmouth Local Plan 2012 – PCS12, PCS13, PCS14

Winchester District Local Plan

- Joint Core Strategy 2013 – CP7, CP9, CP15, CP17

SOILS AND LAND USE

NATIONAL PLANNING POLICY FRAMEWORK

- Paragraph 109 of the NPPF states that 'the planning system should contribute to and enhance the natural and local environment' by protecting and enhancing soils.
- Paragraph 112 advises that when considering applications, local authorities should take into account both the economic and other benefits of the BMV land (i.e. that within Grades 1, 2 and 3a of the Agricultural Land Classification System of England and Wales). Where the significant development of agricultural land is deemed to be necessary, areas of poorer quality land should be used in preference to higher quality land.

ELECTRIC AND MAGNETIC FIELDS

- ICNIRP guidance: "Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)". Health Physics April 1998, Volume 74, Number 4:494-522.

- Details the guideline limits for general public exposure to power frequency electric and magnetic fields in the UK.

- Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz), Official Journal of the European Communities, 1999/519/EC.

- Includes a guideline for general public exposure to static magnetic fields in the UK,aligning with Ref. 6 and comments on electric fields.

- Power Lines: Demonstrating compliance with EMF public exposure guidelines. A Voluntary Code of Practice. Department of Energy and Climate Change March 2012.

- ICNIRP, 1994: "ICNIRP Guidelines on limits of exposure to static magnetic fields". Health Physics 1994, Volume 66, Number 1:100-106.

WASTE AND MATERIAL RESOURCES

1.1.28. The Waste Framework Directive (2008/98/EC) provides the overarching legislative framework for the collection, transport, recovery and disposal of waste in the EU.

1.1.29. The Directive explicitly sets a target for recycling/reuse of 70% for CDE (construction, demolition and excavation) wastes by 2020. This requirement has been implemented at the national level through the Waste (England and Wales) Regulations 2011 (HM Government, 2012).

1.1.30. The Directive sets out the Waste Hierarchy against which action to reduce the production and disposal of waste shall be taken. The Waste Hierarchy is enshrined in law through the Waste (England and Wales) Regulations 2011.

1.1.31. The following legislative instruments in the UK govern the storage, collection, treatment and disposal of waste:

- The Control of Pollution Act 1974;

- Environmental Protection Act (EPA) 1990;

- Waste Minimisation Act 1998; and

- The Clean Neighbourhoods and Environment Act 2005.

- Hazardous Waste (England and Wales) Regulations 2005;

- The Waste (England and Wales) Regulations 2011; and

- The Controlled Waste (England and Wales) Regulations 2012.

NATIONAL POLICY DOCUMENTS

1.1.32. The following national policy documents provide a context and strategic basis for the storage, collection, treatment and disposal of waste in the UK:

- Waste Management Plan for England (2013);
- National Policy Statement for Hazardous Waste (2013);
- National Planning Policy for Waste (2014); and
- National Policy Statement for National Networks (2014).

LOCAL POLICY DOCUMENTS

- Hampshire Minerals and Waste Plan (2013);
- East Hampshire District Local Plan: Joint Core Strategy (2014);
- Winchester District Local Plan Review (2006);
- Havant Borough Core Strategy (Local Development Framework, 2011); and
- The Portsmouth Plan (2012).

MARINE

1.1.33. Relevant policy, legislation and guidance in relation to marine aspects is described below as appropriate. This is not an exhaustive list of all the legislation that is relevant or needs to be considered for the specialist Chapters relating to the marine environment but it gives an overview of the leading key legislation for competent authorities that the Proposed Development will be assessed against to ensure that they are meeting their legal obligations in exercising their functions.

Habitats Regulation Assessment

1.1.34. EC Council Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and EC Council Directive 2009/147/EC on the conservation of wild birds (Birds Directive) enable European Union member states to work together within the same legislative framework to protect Europe's most valuable species and habitats, irrespective of political or administrative boundaries. At the heart of these Directives is the creation of a network of Europe's most valuable species and habitat sites known as Natura 2000.

1.1.35. The aim of the Natura 2000 network is to ensure the long-term survival of European threatened species and habitats. The network comprises Special Areas of Conservation (SACs) designated under the Habitats Directive, and Special Protection Areas (SPAs) designated under the Birds Directive. SPAs and SACs are designated by the individual member states.

1.1.36. Under Article 6(3) of the Habitats Directive, project-related activities within or adjacent to Natura 2000 sites must be assessed with regard to their implications for the site conservation objectives. In England and Wales, the Habitats and Birds Directives are transposed into national legislation by The Conservation of Habitats and Species Regulations 2017, which covers the terrestrial environment and marine waters up to the 12 nm limit, and the conservation of Offshore Marine Habitats and Species Regulations 2017, which covers all UK waters beyond the 12 nm limit.

1.1.37. The UK Government and devolved administrations jointly published a UK Marine Policy Statement: Habitats Regulations Assessment report in March 2011 (Defra, 2011). The report recommends the following four stage process in order to meet the requirements of the Habitats Directive:

- Screening for LSE;
- Appropriate Assessment;
- Assessment of alternative solutions; and
- Assessment where no alternative solutions exist but where adverse effects remain.

1.1.38. Under the Conservation of Habitats and Species Regulations 2017, any development or works that may have a likely significant effect (LSE) on an SPA or SAC, either alone or in combination with other projects, requires an Appropriate Assessment (AA). The AA is to be carried out by the relevant competent authority, to determine whether or not the works would have an adverse effect on the integrity of these sites.

1.1.39. Guidance also requires potential SPAs (pSPA), candidate SACs (cSAC) and Ramsar sites to be subject to the same assessment process.

NATURAL ENVIRONMENT AND RURAL COMMUNITIES ACT 2006

1.1.40. Section 40 of the NERC Act places a duty to conserve biodiversity on public authorities in England. It requires local authorities and government departments to have regard to the purposes of conserving biodiversity in a manner that is consistent with the exercise of their normal functions such as policy and decision-making. 'Conserving biodiversity' may include enhancing, restoring or protecting a population or a habitat

1.1.41. Section 41 requires the Secretary of State to publish and maintain lists of species and types of habitats which are regarded by Natural England to be of "principal importance" for the purposes of conserving biodiversity in England. Priority habitats and species are drawn from lists of Biodiversity Action Plan Priority Species and Habitats. The Section 41 lists are needed by decision-makers in local and regional authorities when carrying out their duties under Section 40 of the Act and therefore, consideration should be given to those species and habitats included in the UK and Hampshire Biodiversity Plans.

MARINE CONSERVATION ZONES

1.1.42. A Marine Conservation Zone (MCZ) is a type of marine nature reserve in UK waters. They are established under the MCAA 2009 and are areas designated with the aim to protect nationally important, marine wildlife, habitats, geology and geomorphology, and can be designated anywhere in English and Welsh territorial and UK offshore waters.

1.1.43. In England, management measures for MCZs are put in place by the MMO and Inshore Fisheries and Conservation Authorities (IFCAs) on a site by site basis. Natural England and the Joint Nature Conservation Committee (JNCC) will advise the regulators about the vulnerability of the features designation and activities that are currently occurring within the site that will have a negative impact on the protected features.

WATER AND SEDIMENT QUALITY

1.1.44. Water and sediment quality are monitored and regulated in the UK under a number of EC Directives. The most relevant to the project are:

- Directive 2008/56/EC establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive, MSFD);
- Directive 2000/60/EC establishing a framework for community action in the field of water policy (Water Framework Directive, WFD);
- Directive 2006/7/EC concerning the management of bathing water quality (Bathing Waters Directive, BWD); and
- Directive 2008/98/EC and 2018/851 establishing a framework for the collection, transport, recovery and disposal of waste (Waste Framework Directive, WaFD)

MARINE STRATEGY FRAMEWORK DIRECTIVE AND WATER FRAMEWORK DIRECTIVES

1.1.45. The European Marine Strategy Framework Directive (MSFD) (2008/56/EC) requires Member States to prepare national strategies to manage their seas to achieve or maintain Good Environmental Status (GES) by 2020.

1.1.46. The Water Framework Directive (WFD) (2000/60/EC) requires Member States to establish a framework (through River Basin Management Planning) for the protection of inland surface waters (i.e. rivers and lakes), transitional waters (i.e. estuaries), coastal waters and groundwater, in order to achieve GES.

1.1.47. The Directives are complementary to, and provides the overarching framework for, a number of other key Directives and legislation at the European and UK level such as the EC Habitats Directive, the EC Birds Directive, and the UK MCAA 2009.

1.1.48. The MSFD only considers waters beyond 1 nm from the coast. The sea from the mean low water mark to 1 nm from shore is protected under the WFD.

1.1.49. The WFD requires that a project or activity does not cause or contribute to deterioration in water body status' or 'jeopardise the water body achieving good status'. For Projects which may impact on one or more Water Body, the Competent Authority under the WFD must make sure that the granting permission for the Project is compatible with the WFD and any river basin management plan.

1.1.50. The Environment Agency is the competent authority for the WFD and it advises PINs and / or Secretary of State on WFD issues before a decision is made.

BATHING WATER DIRECTIVES (BWD)

1.1.51. BWD requires Members States to monitor and assess the bathing water for at least two parameters of (faecal) bacteria. In addition, they must inform the public about bathing water quality and beach management, through the so-called bathing water profiles. These profiles contain for instance information on the kind of pollution and sources that affect the quality of the bathing water and are a risk to bathers' health. Testing is undertaken by the Environment Agency and only occurs at designated bathing waters during the bathing season between May and September each year.

WASTE FRAMEWORK DIRECTIVE (WAFD)

1.1.52. The WaFD sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. The Directive lays down some basic waste management principles: it requires that waste be managed without endangering human health and harming the environment, and in particular without risk to water, air, soil, plants or animals, without

causing a nuisance through noise or odours. The Directive was transposed into UK law by the Waste (England and Wales) Regulations 2011.

1.1.53. Before granting permission for the Project the regulator must make sure that waste generated by the project or activity is dealt with in an environmentally friendly way before it can grant a licence. To do this it applies the waste hierarchy from the WaFD, which gives an order of preference for how waste is dealt with:

- prevention –this can include not carrying out an activity and the refusal of a marine licence
- re-use – finding an alternative, beneficial use for waste material
- recycling –this can include making high grade products from waste material
- other recovery - including treatment to alter the physical nature of the waste material
- disposal at sea.

APPENDIX C – SUMMARY AND SCOPE OF THE EIA

TABLE C1 – SCOPE OF THE EIA (MARINE)

This table should be read in conjunction with the tables presented within each topic chapter for context (Chapters 6 -16).

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
Physical Environment	Physical disturbance to shallow geology and seabed sediments	✓		Potential direct effects during installation works on seabed geology and features.	Detailed desk-based assessment Analysis of data collected from geophysical, geotechnical and benthic surveys Development of a coupled hydrodynamic and wave model. Undertaking a series of sediment plume model simulations utilising the hydrodynamic model with a particle tracking module. Cable Burial Risk
	Impacts to local sediment regimes and coastal processes	✓		Potential effects on sediment regimes within the vicinity of the Proposed Development.	
	Impacts on air quality		✓	Vessel exhaust emissions during cable installation will generally be distant from sensitive receptors and are not	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				anticipated to result in significant effects.	Assessment
	Impacts to coastal processes	✓		Potential effects on coastal processes within the vicinity of the Proposed Development.	
Marine Water and Sediment Quality	Impacts on water quality	✓			Benthic and intertidal surveys Desk-based assessments
	Temporary increase in suspended sediment concentrations during construction (and decommissioning).	✓			
	Impacts from the resuspension of contaminated sediment during construction (and decommissioning).	✓			
	Temporary increase in suspended sediment concentrations and		✓	Impacts during operation and maintenance activities	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
	impacts associated with resuspension of contaminated sediment during operation and maintenance.			are likely to be much smaller in scale than those during construction.	
Intertidal and benthic ecology	Seabed disturbance (construction and decommissioning)	✓		Activities undertaken will cause disturbance to the seabed, which can lead to the loss of biodiversity and habitat. Depending on the habitat type affected, potentially significant effects may arise if sensitive habitats are affected.	Benthic and intertidal surveys Desk-based assessments
	Deposition of sediment (construction and decommissioning)	✓		Sediment will be displaced during construction. This will result in adjacent habitats which are otherwise unaffected by direct works becoming buried or smothered to a certain	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				degree. Effects may be significant where sensitive habitats are present.	
	Increase in suspended sediments (construction and decommissioning)	✓		Disturbance to the seabed will cause an increase in suspended sediments in the water column. Sediment suspension can impede the capacity for organisms to feed or respire, but also reduce light levels, which can affect photosynthetic organisms particularly in shallow water. Effects may be significant where sensitive habitats are present.	
	Impacts from the resuspension of contaminated	✓		Disturbance to the seabed may cause an increase in suspended sediments in the water	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
	sediment (construction and decommissioning)			column which may include an increase in contaminants.	
	Introduction of invasive non-native species (construction and decommissioning)		✓	No significant effects predicted.	
	Habitat loss (operation)	✓		Any secondary cable protection used along the route will result in loss of habitats. Depending on the habitat type affected and its location, potentially significant effects may arise from habitat loss.	
	EMF emissions (operation)		✓	No significant effects predicted due to cable shielding and cable burial.	
	Heat emissions (operation)		✓	No significant effects predicted due to cable shielding and cable burial.	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
	Seabed disturbance (operation and maintenance)	✓		Activities undertaken will cause disturbance to the seabed, which can lead to the loss of biodiversity and habitat. Depending on the habitat type affected, potentially significant effects may arise if sensitive habitats are affected.	
Fish and shellfish	Temporary habitat disturbance (construction and decommissioning)	✓		Cable laying activities require the construction of a trench causing disturbance to the seabed and any habitats which may be present. One potential impact of disturbance is the loss of habitat. This habitat loss can be temporary or permanent	Desk-based assessments
	Temporary increase in suspended sediments	✓		Cable burial and associated works may	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
	(construction and decommissioning)			cause an increase to suspended sediment concentrations. This may result in smothering or eggs and nests and temporary barrier to migration	
	Noise and vibration (construction and decommissioning)	✓		Increased survey noise from vessels may displace fish species	
	Electro-magnetic field effects (operation)	✓		Elasmobranch may be affected by electromagnetic fields produced by the cable	
	Habitat loss (operation)	✓		Any secondary cable protection used along the route will result in loss of habitats. Depending on the habitat type affected and its location, potentially significant	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				effects may arise from habitat loss.	
Intertidal and Marine Ornithology	Disturbance and displacement from installation plant and support vessels	✓		Disturbance effects can manifest through the deterrence of birds from using suitable or preferred habitat. During installation, noise and visual disturbance has the potential to arise as a result of the presence of vessels and installation activity.	Desk-based assessments
	Indirect effects as a consequence of prey disturbance and/or habitat loss	✓		Potential effects of installation on habitats, benthic organisms, fish and shellfish species. The physical presence of cable components during operation, in addition to ongoing maintenance activities may affect the	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				availability of prey species.	
	Exposure to surface hydrocarbons or chemicals due to accidental spills		✓	Accidental release of hydrocarbon fuel from vessels by its nature is unplanned and an unexpected impact as a result of the project. However, pollution prevention measures will be detailed within the ES as part of the DCO application.	
	Barrier effects		✓	Potential collision risk and barrier effects to seabirds are not relevant to subsea cables and are therefore scoped out.	
	Collision risk		✓	Potential collision risk and barrier effects to seabirds are not relevant to subsea cables and are therefore scoped out.	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
Marine Mammals	Collision with vessels		✓	Vessels will be following pre-defined linear routes when working. Working speeds will be low to moderate. It is considered that the additional, vessels associated with the Proposed Development will not significantly increase the amount of vessel traffic which uses the Channel, and therefore do not present a more significant risk of collision than animals experience on a daily basis.	Desk-based assessments

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
	Increased vessel noise		✓	Maximum impact ranges are likely to be very small even for large vessels (<1-22 m, Inchcape Offshore Ltd [ICOL] 2013). Sound from vessels associated with the Proposed Development is unlikely to significantly add to existing noise levels from vessels in the Channel.	
	Increased anthropogenic noise from geophysical survey and positioning equipment which emits sound e.g. sonars, sub-bottom profilers, USBL positioning systems and transponder beacons	✓		Potential for physical and/or auditory injury.	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
	Increased anthropogenic noise from geotechnical investigations, HDD, seabed preparation, route clearance, cable lay and burial		✓	Auditory injury: SEL modelling indicates that maximum impact ranges are likely to be < 1 m (Inch Cape Offshore Ltd [ICOL], 2013). Therefore, it is unlikely that marine mammals will receive a level of noise sufficient to induce auditory injury. Behavioural response: Noise modelling for these activities indicates that the maximum impact ranges are likely to be small (< 30 m for drilling, suction dredging and cable laying; ≤140 m for trenching; <100 m for rock placement (ICOL, 2013). Given the small	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				maximum impact ranges, the relatively low densities of the species which are known to occur in The Channel, and the short duration of these activities (weeks or months), the potential for animals to come into contact with, and therefore have the potential to be impacted by sound from these installation-related activities, is considered to be very low. Furthermore, sound from these activities is unlikely to significantly add to existing noise levels in the Channel.	
	Presence of EMF		✓	Although behavioural responses by electro-sensitive species such	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				as basking sharks to the presence of EMF have been demonstrated, it is very unlikely that basking sharks will be impacted by the presence of EMF around the cable(s). This is because the potential zones of impact are likely to be very small (i.e. within a small number of metres from the cable's surface), the cable(s) will be buried or protected, and basking sharks are a pelagic species and therefore generally distant from the seabed where the cable(s) will be located.	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				No evidence for electro-sensitivity in marine mammals has been reported (Normandeau *et al*., 2011). In terms of sensitivity to magnetic fields from buried cables, theoretical results suggest that any changes to swimming behaviour are likely to be corrected within a few metres and therefore have minimal effect (Normandeau *et al*., 2011). Therefore, it is proposed that the presence of EMF is scoped out.	
Commercial Fisheries	Temporary loss or restricted access to established fishing grounds (construction and decommissioning)	✓		Temporary safety zones around installation activities, installed or partially installed unattended	Desk-based assessments and consultation with fishermen's groups to determine baseline.

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				infrastructure, advisory exclusion zones along vulnerable exposed sections of cables are all required to ensure the safety of other sea users. This will result in temporary restriction of access to fishing grounds.	
	Temporary displacement of fishing activity into other areas (construction and decommissioning)	✓		Temporary safety zones around installation activities, installed or partially installed unattended infrastructure, advisory exclusion zones along vulnerable exposed sections of cables are all required to ensure the safety of other sea users.	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				This will result in temporary restriction of access to fishing grounds, which will displace fishing activity into other areas.	
	Interference to normal fishing activities (construction and decommissioning)	✓		Survey and installation vessels are required for surveying and installation/burial of the cable, which may cause interference to fishing activity.	
	Safety issues for fishing vessels (construction and decommissioning)	✓		Unsafe areas such as installation activities will be made safe by using exclusion zones to prevent access and subsequent safety risks to fishing vessels.	
	Temporary increases in steaming times (construction and decommissioning)	✓		Temporary safety zones around installation activities, installed or partially	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				installed unattended infrastructure and advisory exclusion zones along vulnerable exposed sections of cables are required to ensure safety to other sea users.	
	Obstacles on the seabed after installation (operation)	✓		Obstacles on the seabed will arise as a result of cable installation activities.	
	Temporary loss or restricted access to established fishing grounds (operation)	✓		The cable will be buried in the seabed as part of the installation process. It is ultimately the choice of the vessel owner/skipper to choose to fish over the buried cable.	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
	Temporary displacement of fishing activity into other areas (operation)	✓		Temporary safety zones in place around maintenance/repair vessels are required to ensure the safety of other sea users.	
	Interference to normal fishing activities (operation)	✓		Maintenance and operation vessels are required to ensure the ongoing operation of the cable.	
	Safety issues for fishing vessels (operation)	✓		Obstacles on the seabed will arise as a result of cable installation activities.	
	Increase steaming times (operation)	✓		Maintenance activities may be required, and temporary safety zones needed to	

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
				ensure the safety of other sea users.	
	Obstacles on the seabed after maintenance (operation)	✓		Obstacles on the seabed are likely to arise as a result of maintenance activities.	
Shipping and Navigation	Installation vessels causing deviation to established vessel routes and displacement of recreational activity	✓			Desk-based NRA
	Increase in the risk of a vessel-to-vessel collision due to installation vessel activity	✓			
	Risk of interaction with vessel anchors and displacement of anchoring activity	✓			
	Displacement of fishing vessels into	✓			

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
	commercial shipping lanes				
	Displacement of third party marine activities	✓			
	Reduction in under keel clearance resulting from laid cable and associated protection	✓			
	Interference with marine navigational equipment	✓			
Marine Archaeology	Damage to known and unknown archaeological resources.	✓			Desk-based assessment of existing records (including offshore geophysical survey and geotechnical survey data)
Other marine users	Vessel route deviation and displacement of recreational activity	✓			Desk-based assessment
	Increase in vessel to vessel collision risk	✓			

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons	Surveys and Investigations
	Displacement of third party marine activities	✓			
	Reduction in under keel clearance resulting from laid cable and associated protection	✓			
	Interference with marine navigational equipment	✓			

TABLE C1 – SCOPE OF THE EIA (ONSHORE)

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
Traffic and Transport	Employees during the operational stage of the Proposed Development.		✓	In traffic and transportation terms, the small number of employees at the proposed converter station will be insignificant.
	Nuisance and disruption, fear and intimidation, pedestrian and cyclist amenity access to users of the local road network from construction traffic proposed converter station).	✓		Local receptors including vehicles, pedestrians, equestrians and cyclists.
	Fear and intimidation, increased traffic delay, severance and road safety impacts on residents from construction traffic (proposed converter station).	✓		There are residents within the local area that live alongside construction traffic routes.
	Fear and intimidation, increased traffic delay, severance, pedestrian and cyclist amenity and road safety impacts of road closures and traffic diversions (cable route).	✓		Users of the local road network, including vehicles, pedestrians, equestrians and cyclists could be impacted.
Air Quality	Generation of dust and particulate matter during site preparation and construction.	✓		Proximity of Proposed Development to human and ecological receptors.

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
	Increases in pollutant concentrations due to exhaust emissions from construction vehicle and plant.	✓		Proximity of Proposed Development to human and ecological receptors.
	Increase in pollutant concentrations due to construction traffic.	✓		Changes in traffic are expected to be minimal.
	Increase in pollutant concentrations due to exhaust emissions from road vehicles delayed due to construction works and road closures.	✓		Proximity of Proposed Development to human and ecological receptors.
	Increase in pollutant concentrations due to operational traffic.		✓	Changes in traffic are expected to be minimal.
Noise and Vibration	Construction stage noise and vibration effects for both the proposed converter station and cable route.	✓		Proximity of residential receptors and low levels of baseline noise around the proposed converter station.
	Converter station noise.	✓		Low level of baseline noise around the proposed converter station.
	Operational noise along the cable route.		✓	Expected to be negligible.

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
Landscape and Visual	Effects on landscape character within and beyond 3km of the proposed converter station site during operation and construction.	✓		Changes on the landscape are likely due to the construction works and new built form and landscaping.
	Effects on visual receptors within 3km of the proposed converter station boundary during construction, operation and decommissioning.	✓		Changes in the visual amenity of visual receptors due to on site demolition, construction and decommissioning as a result of changes to landscape character.
	Effects on visual receptors beyond 3 km of the proposed converter station boundary.		✓	Changes in the visual amenity of visual receptors due to on site demolition, construction and decommissioning as a result of changes to landscape character.
	Effects on landscape/seascape character and features associated with the landfall during construction, operation and decommissioning.		✓	Whilst temporary effects will be generated associated with the landfall these will be short term and the scale of construction works will be minimal. Works will result in a below ground structure which will house the transition bay. Land will be

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
				reinstated following construction.
	Effects on landscape character and features associated with the DC cable route during construction, operation and decommissioning.	✓		Permanent landscape effects will be insignificant along the route apart from the last 2km where the route will cross fields rather than utilise existing roads. Here there may be subject to determination of the preferred option and route option the permanent loss of landscape features which contribute to landscape character and screening.
	Effects on landscape character and features associated with the AC cable route during construction, operation and decommissioning.	✓		Due to the width of the route required for the AC cables there is likely to be a permanent loss in landscape features which contribute to landscape character and screening.
	Effects on visual receptors within 100m buffer on either side of the cable route and landfall beyond 2km of the proposed converter		✓	Temporary short term effects will be generated during construction along the route and adjacent to the landfall. The land will

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
	station during construction, decommissioning and operation.			be reinstated following the installation of the cables and returned to its previous use.
	Effects on visual receptors within 100m buffer on either side of the cable route up to 2km of the proposed converter station.		✓	Changes in the visual amenity of visual receptors due to land take and loss of vegetation. Extent of vegetation loss associated with hedgerows and hedgerow trees will be dependent on route option selected.
Heritage and Archaeology	Partial or complete loss to buried heritage assets (construction).	✓		Proposed Development will involve ground disturbance through excavation and topsoil removal activities.
	Removal of Historic Hedgerows (construction).	✓		Direct disturbance to Historic Hedgerow.
	Impact on setting of nearby designated heritage assets at the proposed converter station site (construction).	✓		Construction activities may temporarily impact setting of heritage assets.
	Impact on the setting of above ground designated heritage assets		✓	Works will comprise only below ground disturbance.

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
	at the landfall and throughout the cable route (construction).			
	Permanent impact on the setting of above ground designated heritage assets at the proposed converter station (operation).	✓		Presence of permanent above ground structures.
	Impact to buried archaeological remains (operation).		✓	No further ground disturbance following completion of the construction stage.
	Impact on the setting of above ground designated heritage assets at the landfall and throughout cable route (operation).		✓	Works will comprise only below ground disturbance.
Ecology	Effects on designated sites for nature conservation, including SPA, SAC, Ramsar, SSSI, LNR, SINC and RVEI: • Land-take; • Habitat removal and damage; • Disturbance (visual, noise, lighting);	✓		10 European or internationally designated sites are located within 10km of the scheme and 11 nationally designated sites are located within 2km. Due to the presence of Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar/SSSI and Solent and Dorset Coast

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
	• Pollution (air quality, dust generation, deposition, run-off); • Construction site hazards; • Habitat creation; and • Hydrology and pollution.			pSPA the Proposed Development must be screened and assessed, to determine whether significant effects are likely to result. Based on the current design and indicative areas required for construction, it is understood that the following locally designated sites have potential to be affected by the scheme through disturbance, hydrological change, pollution effects or direct land-take: • Eastney Beach SINC • Land West of Fort Cumberland SINC • Melville Road Verge SINC and RVEI • Milton Common SINC • Great Salterns Lake SINC

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
				• Golf Course North of Burrfields Road SINC • Hilsea Lines SINC • Farlington Avenue SINC and RVEI • Meadow West of Farlington Avenue SINC • London Road Fen SINC • Kings Pond Meadow SINC • Crabdens Copse SINC • Crabdens Row SINC
	Effects on habitats: • Land-take; • Habitat removal and damage; • Disturbance (visual, noise, lighting);	✓		72.79ha of woodland listed on the National Inventory of Woodland and Trees and 13 types of Priority Habitat was present within 1km of the scheme

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
	• Pollution (air quality, dust generation, deposition, run-off); • Construction site hazards; • Habitat creation; and • Hydrology and pollution.			
	Effects on protected species: • Species-specific effects (direct mortality, injury, disturbance) • Severance and barriers to dispersal	✓		The following species may occur within the survey area: • Bats; • Badger; • Otter; • Water vole; • Dormouse; • Breeding Birds; • Wintering and Passage Birds; • Reptiles; • Great crested newt; and • Invertebrates.

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
Socio-economics	Generation of direct, indirect and induced employment opportunities during the construction stage.	✓		Due to the anticipated direct job creation and spending / contracts being placed with contractors, there is anticipated to be a positive effect of the Proposed Development in relation to employment opportunities within the economy.
	Changes in local service demand (education and healthcare), accommodation and community facilities due to an increase in population from construction workers.	✓		Due to the specialist nature of the works associated with the Project, there is likely to be an influx of construction workers from outside of the local and regional area. This may cause an increase in the demand on local services, accommodation and community facilities.
	Disruption and changes to amenity value for users of recreational / open space.	✓		Proposed Development and associated activities may cause disruption and changes in amenity value for users of publicly accessible recreational / open space.

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
	Generation of direct, indirect and induced employment opportunities during the operational stage.		✓	The additional direct, indirect and induced employment opportunities associated with the Proposed Development are considered to be minimal. As such, effects in relation to employment during operation will not be considered further within the ES.
Water Resources and Flood Risk	Impact on surface water features.	✓		Proposed Development located in proximity to watercourses, land drains and ponds and crosses numerous watercourses.
	Impact on groundwater features.	✓		Proposed Development located within Principle Aquifier and Inner Zone (Zone 1) SPZs.
	Impacts to flooding.	✓		Proposed Development located within and in close proximity to Flood Zone 2 and 3. Also within areas identified to be at risk of surface water flooding.

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
Ground Conditions	Land contamination.	✓		During construction, land and ground water that was previously contaminated may be encountered.
	Mineral resources.	✓		If contaminated land is found, it may need to be treated or disposed of.
	Sites of geological interest.	✓		Proximity to land that has special geological significance.
Carbon and Climate Change	GHG assessment covering construction, operation and beyond system boundary.	✓		Potential for significant construction emissions as well as potential for significant emissions savings during operation due to transfer of low carbon intensity power.
	GHG assessment of the end of life stage.		✓	Decommissioning timescales and process are distant and uncertain. Materials are expected to be recycled in many cases thereby offering emissions savings for the next product system.

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
	Climate resilience assessment.	✓		The changing climate may affect the Proposed Development in terms of the construction and operation of the infrastructure its ability to function and the end-users.
Human Health	Desktop Health Impact Assessment	✓		The screening exercise has identified a number of health determinants to be assessed by a rapid desktop HIA.
Soils and Land Use	Potential loss of best and most versatile agricultural land.	✓		Development will be required on agricultural land.
	Potential loss or damage to soil resources.	✓		Soil resources may be lost or damaged due to construction of the Proposed Development.
	The viability of farm holdings.	✓		The loss of land during and following construction, and the temporary severance of land during construction,

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
				may negatively impact local farm holdings.
Electric and Magnetic Fields	Consideration of AC and static electric and magnetic fields.	✓		The Proposed Development uses both AC and DC technologies so both AC and static electric and magnetic fields will be produced.
Waste and Material Resources	Consumption of materials and products and the generation and use of site arisings recovered from the Proposed Development.	✓		The Proposed Development will use materials and produce site arisings.
	The production and disposal of waste to landfill.	✓		Some waste generated from the Proposed Development may need to be disposed of to landfill.
	Lifecycle assessment of materials and arisings and waste.		✓	The resource required to complete a full lifecycle assessment is disproportionate to the benefit it would offer the assessment of significance of effects.
	Materials consumption, site arisings and waste production		✓	Associated impacts of operation waste after the

Discipline	Potential Effect	Scoped In	Scoped Out	Reasons
	beyond the first full year of operation.			first full year are not likely to be significant.

APPENDIX D – PROPOSED STRUCTURE OF THE ENVIRONMENTAL STATEMENT

1.1.54. The structure proposed for the ES is in line with Schedule 4 of the *EIA Regulations* and other relevant good practice guidance. Essentially, the ES will comprise four main parts:

- Volume 1 – Non-Technical Summary
- Volume 2 – Environmental Statement (see table below for content)

Chapter Number	Chapter
Part 1: Introduction	
1	Introduction
2	Consideration of Alternatives
3	Project Description
4	EIA Methodology

5	Consultation
Part 2: Marine UK	
6	Physical Process
7	Marine Water and Sediment Quality
8	Intertidal and Benthic Ecology
9	Fish and Shellfish
10	Marine Mammals
11	Intertidal and Offshore Ornithology
12	Commercial Fisheries
13	Shipping and Navigation

14	Marine Archaeology
15	Other Marine Users
Part 3: UK Onshore	
16	Landscape and Visual
17	Ecology (and Arboriculture)
18	Soils and Land Use
19	Ground Conditions
20	Water Resources and Flood Risk
21	Heritage and Archaeology
22	Traffic and Transport

23	Air Quality
24	Noise and Vibration
25	Socio-economics
26	Human Health
27	Waste and Material Resources
28	Carbon and Climate Change
Part 4: Concluding Chapters	
29	Cumulative and Transboundary Impacts (Onshore and Marine)
30	Summary and Conclusions

- Volume 3: Technical Appendices and Supporting Information

APPENDIX E – SCOPING OPINIONS AND CONSULTATION RESPONSES

TABLE E1: MARINE MANAGEMENT ORGANISATION (MMO) SCOPING OPINION RESPONSES

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
Physical Environment		
4.6.12	Impacts of physical disturbance to seabed geology and morphology are scoped in (Table 5.1.1).	The impacts of physical disturbance to seabed geology and morphology will be assessed as part of the EIA process.
4.6.13	Impacts due to increased suspended sediments will be scoped in (Table 5.2.3). The ES must include transboundary effects if models (or other evidence) suggests that sensitive receptors and/or designated sites beyond the immediate vicinity of the cable corridor could be affected	The effects associated with suspended sediments (including potential transboundary effects) will be assessed as part of the EIA process. This will include an assessment of impacts associated with dredge disposal via a numerical modelling approach (described in Chapter 6 of this report).

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
4.6.14	The application potentially involves the introduction of hard substrate into a mainly sedimentary environment. Although the changes are not necessarily considered as having a significant impact in this instance, the amount of hard substrate material to be used must be kept to a minimum.	The effects associated with potential cable protection measures will be assessed as part of the EIA process as described in Chapter 6 of this report.
4.7	The MMO agrees with the potential impacts on coastal processes that have been considered for inclusion within the ES: • Potential direct effects during installation works on seabed geology and features; • Potential effects on sediment regimes within the vicinity of the proposed development; and • Potential effects on coastal processes within the vicinity of the proposed development.	These potential impacts on coastal processes will be assessed as part of the EIA process.
	The Scoping Report states that the EIA will be based on geophysical data (bathymetry, sidescan sonar, sub-bottom profiling and magnetometer or gradiometer) collected from survey vessels. The Proposer does not plan to make their own wave and tide measurements and will obtain these from pre-existing sources. The MMO agree with this approach given the spatial extent of the project and the requirement to consider the wave climate over an extended period of time (i.e. tens of years).	The baseline hydrodynamic regime (tides and waves) is to be assessed through the development of a coupled hydrodynamic and wave model described in Chapter 6 of this report. This approach enables assessment of the wave

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
		climate over a 20-year period (1998 – 2017).
Marne Water and Sediment Quality		
4.6.3	The MMO disagrees with the conclusion that water quality impacts can be scoped out on the basis that 'the potential release of sediment bound contaminants is considered unlikely to result in significant effects as there are no dredge disposal sites within the vicinity of the Proposed Development. As there are elevated levels of metals and other pollutants within sediments in the area, the benthic surveys that will be carried out along the cable route must also sample for contaminants, focusing on inshore areas where sediments are muddy (i.e. 'A5.23 or A5.24' and 'A5.25 or A5.26') as this is the environment in which contaminants are most likely to be retained and thus mobilised when disturbed. The presence or absence of elevated levels of contaminants in these areas will help to determine whether impacts, and associated receptors, due to the resuspension of contaminated sediments should be scoped in or out of the EIA. If the collection of such data is not feasible, then the Proposer must clarify whether existing data are available on contaminant levels specifically in muddy sediments around the proposed cable route and, if so, confirm that all contaminants were below Cefas action levels within these areas.	Contaminated sediments will be scoped in. See Chapter 7 of this document.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
4.13.1	The MMO disagrees with the Scoping Report's conclusion that marine water quality and Water Framework Directive (WFD) compliance can be scoped out of the EIA. All activities below Mean High Water Springs (MHWS) and within 1 nautical Mile offshore require an assessment of WFD compliance unless they are explicitly exempt.	WFD scoped in to assessment. See Chapter 7 of this document.
4.13.2-4.13.4	A WFD assessment will be required for all elements of the works that fall within, or have the potential to affect, a WFD water body and any of the protected areas therein (including Bathing Waters and Shellfish Waters). An assessment of water quality impacts must also be included. There are Bathing Waters and Shellfish Waters around the area of landfall. Any sediment disturbances that lead to increases in suspended solids in the water column could potentially affect compliance with the WFD. Suitable evidence of no likely impact will be required for any marine works. Hence, marine water quality and a WFD assessment must be included as a Chapter in the ES. The WFD assessment must follow the 'Clearing the Waters for All' guidance, which has been published on https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters. The WFD Assessment must comprise either: • an explanation of why the activity has been screened out; or	WFD scoped in to assessment. See Chapter 7 of this document The Marine Water and Sediment Quality Chapter within the final ES will summarise the WFD assessment

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
	• an explanation of why all elements have been scoped out, ideally using the scoping template; or • an impact assessment. The size and scale of the WFD Assessment should be proportional to the risk posed by the potential works, but the Proposer must demonstrate that they have assessed the risks and provided mitigation.	
Biological Environment (Intertidal and Benthic Ecology)		
4.2.2	Under Regulation 63 of the Conservation of Habitats and Species Regulations 2017, an appropriate assessment needs to be undertaken in respect of any plan or project which is (a) likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and (b) not directly connected with or necessary to the management of the site.	A Habitats Regulations Assessment report will be produced (see Chapter 8 of the Report).
4.2.3	The MMO considers that this proposal is not directly connected with or necessary to the conservation management of the site and therefore requires a Habitats Regulations Assessment to determine whether there will be a likely significant effect on the European sites listed below. Given the limited information available at this stage on the final design and potential construction/operational impacts, the MMO is of the view that, at present, it cannot be excluded, on the basis of the objective information supplied in the Scoping Report, that the application will have a likely significant effect on the internationally designated sites listed below. This is because there is	As above.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
	a risk that it will affect the following features of the designated site(s): • Benthic habitats;	
4.2.12 and 4.2.13	The works, as set out in the information supplied in the Scoping Report, is near to the following designated Special Area of Conservation: • Solent Maritime SAC; and • Solent and Isle of Wight Lagoons SAC. The ES must thoroughly assess the potential for the proposal to affect the designated sites listed above.	As above.
4.2.14 and 4.2.15	The works, as set out in the information supplied in the Scoping Report, are near to the following designated Ramsar Sites: • Portsmouth Harbour Wetland of International Importance under the Ramsar Convention (Ramsar site); and • Chichester and Langstone Harbours Wetland of International Importance under the Ramsar Convention (Ramsar site). The ES must thoroughly assess the potential for the proposal to affect the designated sites listed above.	As above.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
4.3.1 and 4.3.2	The works, as set out in the information supplied in the Scoping Report, are near to the following designated or proposed (pMCZ) Marine Conservation Zones: • Offshore Overfalls MCZ; • Utopia MCZ; • Offshore Brighton MCZ; • Kingmere MCZ; • Bembridge pMCZ; and • Selsey Bill and the Hounds pMCZ. The MMO understands that the current proposed cable route will not transect any of the above listed (p)MCZs, however, welcomes the planned assessment for potential impacts on their geomorphological features and benthic communities to be included within the ES.	Noted. The assessment will include consideration to both MCZs and pMCZs.,
4.3.3	The Scoping Report states that in the offshore area the HVDC cable route will pass close to the Offshore Overfalls and Offshore Brighton MCZs: the former is partly in English inshore waters (within 12nm of Mean High Water Springs (MHWS)) and the latter is entirely offshore (outwith 12nm of MHWS). If it is possible that either of the MCZs will be impacted by the proposed operations, the EIA must	Noted.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
	include an assessment of the impacts on the habitats and species of conservation importance for these designated sites.	
4.3.4	The Scoping Report states the cable route passes near to four recommended Marine Conservation Zones (Bembridge rMCZ; East Meridian rMCZ; Norris to Ryde rMCZ and Selsey Bill and the Hounds rMCZ). Two of these sites are now out to consultation as part of the third tranche of MCZ designations: Bembridge rMCZ, and Selsey Bill and the Hounds rMCZ, and now have a proposed MCZ (pMCZ) status. The East Meridian rMCZ and the Norris to Ryde rMCZ have not been taken forward to consultation, however the impacts to the features of these sites must still be considered, should they be designated in the future.	Noted. Impacts to both MCZs and pMCZs will be considered and an MCZ assessment undertaken if connectivity exists. The features of those sites not taken through for the third tranche of MCZ designations will be considered as part of the impact assessment where relevant.
4.3.5	Material consideration must be given to pMCZs and any additional features in existing MCZs out to consultation, as if they are already designated.	Noted.
4.3.6 and 4.3.8	The MMO can confirm that the proposed works are located within the vicinity of the following Sites of Special Scientific Interest: • Chichester Harbour SSSI; • Langstone Harbour SSSI; and • Portsmouth Harbour SSSI. The ES must include a full assessment of the direct and indirect effects of the proposal on the features of special interest within these sites and must identify such mitigation measures, as may be	Noted. Interest features of these SSSIs will be accounted for in the assessment.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
	required in order to avoid, minimise or reduce any adverse significant effects.	
4.4.2 - 4.4.4	Government Circular 06/2005 states that Biodiversity Action Plan (BAP) species and habitats 'are capable of being a material consideration…in the making of planning decisions'. Therefore, surveys, impact assessment and mitigation proposals for Habitats and Species of Principal Importance must be included in the ES. Consideration must also be given to those species and habitats included in the UK and Hampshire BAPs. For example, construction work could increase suspended sediment concentrations, and this could result in smothering effects on beds of native oysters (Ostrea edulis) within the Solent. The record centre for the relevant Local Authorities should be able to provide the relevant information on the location and type of BAP habitat for the area under consideration. The EIA must include details of: • Any historical data for the sites affected by the proposal (e.g. from previous surveys); • Additional surveys carried out as part of this proposal; • The habitats and species present; • The status of these habitats and species (e.g. whether BAP priority habitat);	Noted.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
	• The direct and indirect effects of the development upon those habitats and species; and • Full details of any mitigation or compensation that might be required. The development must avoid adversely impacting the most important wildlife areas within the area of the project, and must if possible provide opportunities for overall wildlife gain.	
4.4.5	The onshore elements of this proposal in particular may also have an impact upon species which are protected by the Wildlife and Countryside Act 1981 (as amended) or the Conservation of Habitats and Species Regulations 2017. If any protected species are present within the application area, the ES must include details of: • The species concerned; • The population level at the site affected by the proposal; • The direct and indirect effects of the development upon that species; • Full details of any mitigation or compensation that might be required; and • Whether the impact is acceptable and/or licensable.	Onshore elements are included within the onshore assessments. See Chapters 18-32 of this document for onshore assessments.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
4.4.7	The MMO advises that it is critical to provide evidence of sensitive habitats and species present in the area of the cable route: Annex I species and Annex II habitats (under the Offshore Marine Regulations 2007, as amended), UK BAP and OSPAR Threatened and/or Declining Habitats and Species. The MMO must stress that in the survey design, characterisation is best achieved with a combination of acoustic mapping of the seabed followed by targeted ground-truthing using grab sampling and/or seabed imagery. The standard approach for benthic habitat characterisation involves the collection of new, or analysis of existing, acoustic data to identify seabed habitats and seabed features, followed by targeted ground-truthing surveys whose design is guided by interpretation of acoustic data. The MMO recommends the use of Noble-James et al (2017) to inform survey decisions.	Noted. The benthic surveys are now complete and have utilised both acoustic and targeted ground truthing. Once analysed the survey data will provide evidence for all habitat types present along the route, including those considered sensitive or protected.
4.4.8	Where guidelines exist for the detection and quality assessment of particular habitats (e.g. Irving 2009 for stony reef; and Gubbay, 2007 and Limpenny *et al.* 2010 for *Sabellaria spinulosa* reef) then these should be followed.	Noted.
4.6.1	The MMO agrees with the potential impacts on benthic species and habitats that have been considered for inclusion within the ES (Section 5.2.5 of the Scoping Report): Seabed disturbance; • Deposition of sediment; • Increase in suspended sediments;	Noted.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
	• Habitat loss; and • Seabed disturbance due to operation and maintenance activity.	
4.6.4	The MMO agrees that the introduction of invasive non-native benthic species can be scoped out of the ES	Noted.
4.6.7	It is not clear from the Scoping Report how intertidal habitats will be surveyed. More information is needed in this regard before the MMO can advise on whether the evidence base is appropriate.	Intertidal surveys will be reported in full within the EIA report. In summary however, the extent and distribution of intertidal biotopes in the vicinity of the proposed cable corrdidor (500 m either side) have been recorded and mapped using the *in situ* ACE biotope mapping techniques outlined in Procedural Guidance No 3-2 of the Marine Monitoring Handbook (Hiscock, 2001). Full description of survey methodologies will be provided within the ES.
4.6.9	There is no reference to the use of existing benthic community data in the Scoping Report, and such data will likely not be necessary if surveys of both the cable corridor and nearby sensitive/protected habitats will be conducted. If surveys of nearby sensitive habitats will	The benthic survey will provide characterisation of the entire marine cable corridor. If required,

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
	not be conducted, then existing data on sensitive habitats in nearby designated sites will suffice. This must be clarified in the ES.	habitats outside of this will be identified using existing data.
4.6.11	Section 4.9 of the Scoping Report states that cumulative impacts will be considered. However, there is no indication in Section 5.2 of the Scoping Report that cumulative impacts on benthic species or habitats will be scoped into the EIA. It is not clear whether this is because cumulative impacts on the benthos have not been considered or because there are no plausible cumulative impacts on the benthos. This must be clarified in the ES.	Cumulative effects on the benthos will be assessed.
4.6.12	Impacts of physical disturbance to seabed geology and morphology are scoped in (Table 5.1.1). Any knock-on effects that such changes may have on benthic habitats and species must be considered under the impact of 'seabed disturbance', which is scoped in with regard to benthic ecology (Table 5.2.3).	Noted.
4.6.13	Impacts due to increased suspended sediments will be scoped in (Table 5.2.3). The ES must include transboundary effects if models (or other evidence) suggests that sensitive receptors and/or designated sites beyond the immediate vicinity of the cable corridor could be affected. It may also be necessary to include the potential transboundary impacts of the suspension of contaminated sediments.	Noted.
4.6.14 and 4.6.15	The application potentially involves the introduction of hard substrate into a mainly sedimentary environment. Although the changes are not necessarily considered as having a significant impact in this instance, the amount of hard substrate material to be used must be kept to a minimum. The MMO note that the long-term effect of the introduction of substratum into naturally sandy or muddy	Although every effort will be made to provide detail on the type and coverage of the rock to be used for any additional protection required, the level of detail described here is

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	sea beds is not fully understood at present, and must be carefully considered. The ES must include details of the potential cable protection to be used to allow further understanding of their actual nature conservation impact. This must include: • Location of dump sites; • Size / grade of rock to be used; • Tonnage / volume to be used; • Contingency tonnage / volume to be used; • Method of delivery to the seabed; • Footprint of rock • Assessment of the impact; and • Expected fate of deposit after end of production, i.e. will it be left in situ or recovered.	unlikely to be achievable prior to submission of the ES. Details of relevance to each individual impact will be included in the design envelope assessed. It is expected that full details of any cable protection would be provided pre-construction in a Construction Method Statement.
4.6.16	Where stabilisation material cannot be avoided, the MMO recommends using a more targeted placement method e.g. fallpipe vessel rather than using vessel-side discharge methods.	Noted.

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Biological Environment (Fish and Shellfish)		
4.3.1 and 4.3.2	The works, as set out in the information supplied in the Scoping Report, are near to designated or proposed (pMCZ) Marine Conservation Zones: The MMO understands that the current proposed cable route will not transect any of the listed (p)MCZs, however, welcomes the planned assessment for potential impacts to be included within the ES.	Noted. The assessment will include consideration to both MCZs and pMCZs.
4.3.4	The Scoping Report states the cable route passes near to four recommended Marine Conservation Zones (Bembridge rMCZ; East Meridian rMCZ; Norris to Ryde rMCZ and Selsey Bill and the Hounds rMCZ). Two of these sites are now out to consultation as part of the third tranche of MCZ designations: Bembridge rMCZ, and Selsey Bill and the Hounds rMCZ, and now have a proposed MCZ (pMCZ) status. The East Meridian rMCZ and the Norris to Ryde rMCZ have not been taken forward to consultation, however the impacts to the features of these sites must still be considered, should they be designated in the future.	Noted. Impacts to both MCZs and pMCZs will be considered and an MCZ assessment undertaken if connectivity exists. The features of those sites not taken through for the third tranche of MCZ designations will be considered as part of the impact assessment where relevant.
4.3.5	Material consideration must be given to pMCZs and any additional features in existing MCZs out to consultation, as if they are already designated.	Noted. The assessment will include consideration to both MCZs and pMCZs.,
4.4.2	Government Circular 06/2005 states that Biodiversity Action Plan (BAP) species and habitats 'are capable of being a material consideration…in the making of planning decisions'. Therefore, surveys, impact assessment and mitigation proposals for Habitats	Species of Principle Importance (NERC act 2006), and both UK and National BAP species will be

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	and Species of Principal Importance must be included in the ES. Consideration must also be given to those species and habitats included in the UK and Hampshire BAPs. For example, construction work could increase suspended sediment concentrations, and this could result in smothering effects on beds of native oysters (*Ostrea edulis*) within the Solent.	given consideration in ES. See Chapter 9 of this Report.
4.5.6	The potential impacts of Electromagnetic Fields must be scoped into EIA when assessing the impacts to Elasmobranchs.	The impact of electromagnetic fields on elasmobranches will be assessed in the ES. See Chapter 9 and 31 of this Report.
4.8.1	The MMO agree with the impacts to shellfisheries that have been scoped in to the ES: temporary habitat loss, major works near a river mouth, temporary increase in suspended sediments, and noise and vibration have been considered to have potential impacts during the installation and decommissioning phases.	Noted. All are scoped in except major works near a river mouth. This latter impact is scoped out because estuarine and nearshore waters will be assessed in the Marine Water and Sediment Quality Chapter as shellfish waters. In addition, the works are not located near a river mouth with any effect to receptors assessed under the remaining impacts.

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4.8.2	There is reference to the spider crab (*Maja squinado*) being present within the area of works. *Maja squinado* is now considered to be the Mediterranean species, with *Maja brachydactyla* being present around the UK. The ES must refer to *M. brachydactyla*.	Noted. Reference to *Maja squinado* will be replaced with *Maja brachydactyla.*
4.8.3	The EIA must clarify whether the above potential impact[s] includes consideration to egg-bearing shellfish species such as the edible/brown crab (*Cancer pagurus*) which may be buried along the route of works.	Potential impacts on buried shellfish will be considered in the ES.
4.8.4	During operation, electro-magnetic field effects have also been considered to have potential impacts. Proposed mitigation for EMF includes a likely depth of sediment cover of 0.6m in a cable trench depth >0.9m. The ES must detail what mitigation has been considered should the sediment cover of 0.6m and/or a cable trench depth of >0.9m not be achieved.	Mitigation measures in the event that the cable does not attain burial depth of 0.6m will be detailed, where relevant, in the ES.
4.9.1	Cumulative and inter-related effects to marine/estuarine and migratory fish as well as commercial fishing must be scoped into the assessment.	The cumulative effects (and where effects overlap) will be considered on those receptors identified in the Valued Ecological Receptors (VER) table presented within the ES of which marine, estuarine and migratory fish are included. Impacts to commercial fisheries will be assessed in a separate chapter in the ES.

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4.9.2	The Scoping Report has correctly identified potential overlap of the cable corridor with fish spawning and nursery grounds mapped in Coull *et al.* (1998) and Ellis *et al.* (2012); although no charts of the cable route and overlap with indicative spawning / nursery areas are present in the report. In addition, the report has considered fish features of designated sites that are in proximity to the cable corridor (Table 5.3.1 of the report).	Noted. Figures of spawning/nursery areas for key fish and shellfish species in the vicinity of the cable route (Regional Study Area) will be included in the Fish and Shellfish Chapter of the ES.
4.9.3	The Scoping Report refers to some appropriate data sources for inclusion in the ES. These include indicative spawning and nursery ground maps in Coull *et al.* (1998) and Ellis *et al.* (2012), together with International Council for the Exploration of the Seas (ICES)/Marine Management Organisation (MMO) landing data, reports from the Inshore Fisheries and Conservation Authority (IFCA) as well as studies undertaken for other developments.	Noted.
4.9.5	There data sources recommended in the following points must be considered in the EIA. Migratory fish such as Atlantic salmon (Salmo salar), sea trout (*Salmo trutta*), lamprey (*Petromyzontidae*) and European eel adults and elvers (*Anguilla anguilla*), may occur in proximity to the cable route at various times of the year. The MMO recommends that the most recent data is obtained from the Environment Agency's transitional and coastal waters (TraC) Fish Monitoring Programme for inclusion in the EIA, for TraC relevant to the project.	Migratory fish species and juveniles will be assessed in the Fish and Shellfish Chapter of the ES. Data from the (TraC) Fish Monitoring by the Environment Agency will be included in the Fish and Shellfish Chapter of the ES where relevant.

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	The Cefas Young Fish Survey provided indices of abundance of small demersal fish for several areas around the UK coastline, including the south coast. Data on the fish community within Langstone Harbour (including Eastney Point) has been collected through the Small Fish Survey since 2012. The 2012-2017 survey reports by the Langstone Harbour Board are available online The Fish Atlas of the Celtic Sea, North Sea and Baltic Sea (Heessen *et al.,* 2015) provides an overview of 40 years of information collected from internationally coordinated and national surveys to present data and information on the recent distribution and biology of demersal and small pelagic fish in these ecoregions. There are designated nursery areas for seabass (*Dicentrarchus labrax*) in Portsmouth, Langstone and Chichester Harbours. The Solent Seabass Pre-recruit Survey has been undertaken since 1983 and is aimed at providing abundance indices of 2-4 year old seabass.	The Cefas young fish survey data will be included in the baseline for the Fish and Shellfish Chapter of the ES, where relevant. It dates form 1981 and 1997. Small fish surveys undertaken by both the Sussex and Southern IFCA will be reviewed and those survey sites relevant to the marine cable corridor will be included in the Fish and Shellfish Chapter in the ES. The Fish Atlas of the Celtic Sea, North Sea and Baltic Sea will be reviewed and included in the Fish and Shellfish Chapter in the ES, where relevant. The Solent Seabass Pre-recruit Survey by Cefas will be reviewed

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		and relevant areas for sea bass recruitment and nursery areas included in the Fish and Shellfish Chapter in the ES.
4.9.6	Potential impacts scoped into the EIA during installation, operation and decommissioning are appropriate; however, there are additional impacts recommended as follows: • The EIA must consider potential impacts to seabass within the context of the current measures i.e. whether any of the activities likely to disturb or potentially impact juvenile fish and nursery grounds. The EIA must consider potential impacts to seabass within the context of the current Defra management measures i.e. whether any of the activities likely to disturb or potentially impact juvenile fish and nursery grounds. • The EIA must adequately assess the potential impacts upon sandeels and Atlantic herring, such as from sedimentation, release of contaminated material and disturbance of spawning habitat. • The 2016/17 Central North Sea IHLS data is available and indicates herring spawning occurred in the vicinity of the cable route in 2016/17. It is advisable that the latest IHLS	Noted. The impacts identified in the scoping document will be considered in the context of juvenile fish and nursery grounds. Bass have been identified as a Valued Ecological Receptor (VER) and will be assessed. Impacts from sedimentation on both sandeels and Atlantic herring will be assessed. Contaminated sediments will be assessed in the Marine Water and sediment Quality Chapter of the ES. IHLS data will be used to assess impacts to herring spawning

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	data for herring larvae is considered within the EIA for assessing potential impacts to herring spawning habitat. • The Proposer may wish to use the methods of MarineSpace *et al.* (2013a; 2013b) for assessments of the potential suitability of habitat for sandeel and Atlantic herring spawning (from the project alone and cumulatively). The limitations and caveats associated with the assessments should be read and acknowledged if the reports are used. Also, it should be noted that these assessments are currently in the process of being updated with more recently available data. • An eastern English Channel specific herring spawning assessment (RPS, 2013) was produced for the East Channel Association, which is formed of five UK marine aggregates companies. The report may provide further regional context of Atlantic herring habitat availability, though the limitations and caveats associated with the report and timeliness of the data must be acknowledged if used as an information source for the EIA.	Noted The East English Channel Herring Spawning assessment for The East Channel Association (RPS, 2013) will be reviewed and used within the baseline presented within the ES, where relevant.
4.9.7	There are no mitigation and monitoring for fish receptors detailed in the Scoping Report, which is appropriate given the stage of the application. It is clear from the report that the Proposer will be considering mitigation measures during the EIA, thus any mitigation measures must be clearly described in the ES.	Mitigation specific to Fish and Shellfish receptors will be identified in the ES Chapter.

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Biological Environment (Intertidal and Marine Ornithology)		
4.2.3	The MMO considers that this proposal is not directly connected with or necessary to the conservation management of the site and therefore requires a Habitats Regulations Assessment to determine whether there will be a likely significant effect on the European sites listed below. Given the limited information available at this stage on the final design and potential construction/operational impacts, the MMO is of the view that, at present, it cannot be excluded, on the basis of the objective information supplied in the Scoping Report, that the application will have a likely significant effect on the internationally designated sites listed below. This is because there is a risk that it will affect the following features of the designated site(s): • Breeding and non-breeding birds.	A shadow HRA will be submitted as part of the DCO application, in which those designated sites identified by Natural England (and MMO where appropriate) will be considered as a minimum.
4.2.5 and 4.2.6	The works, as set out in the information supplied in the Scoping Report, are near to the following designated Special Protection Areas: • Poole Harbour SPA extension; • Chichester and Langstone Harbours SPA; • Pagham Harbour SPA;	A shadow HRA will be submitted as part of the DCO application, in which those designated sites identified by Natural England (and MMO where appropriate) will be considered as a minimum

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	• Solent and Dorset Coast pSPA; and • Portsmouth Harbour SPA. The ES must thoroughly assess the potential for the proposal to affect the designated sites listed above.	
4.2.8	The feature 'Common Tern' must be considered within the ES within the list of features for the Chichester and Langstone Harbours SPA and Ramsar or for the Pagham Harbour SPA.	The shadow HRA, will consider all qualifying ornithological features for relevant designated sites as agreed with Natural England and other consultees where appropriate.
4.2.9	Poole Harbour SPA extension has now been classified and assessment must be included within the ES.	Poole Harbour SPA extension will be considered in the shadow HRA.
4.2.10	The risk to Portsmouth Harbour SPA site must be considered within the ES.	Portsmouth Harbour SPA will be considered in the shadow HRA.
4.2.14 and 4.2.15	The works, as set out in the information supplied in the Scoping Report, are near to the following designated Ramsar Sites: • Portsmouth Harbour Wetland of International Importance under the Ramsar Convention (Ramsar site); and	Both SPAs and Ramsar sites identified by the MMO will be considered in the shadow HRA. Further advice will be sought from the Natural England in preparation

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	• Chichester and Langstone Harbours Wetland of International Importance under the Ramsar Convention (Ramsar site). The ES must thoroughly assess the potential for the proposal to affect the designated sites listed above.	of the shadow HRA to support the DCO application.
4.3.3	The Scoping Report states that in the offshore area the HVDC cable route will pass close to the Offshore Overfalls and Offshore Brighton MCZs: the former is partly in English inshore waters (within 12nm of Mean High Water Springs (MHWS)) and the latter is entirely offshore (outwith 12nm of MHWS). If it is possible that either of the MCZs will be impacted by the proposed operations, the EIA must include an assessment of the impacts on the habitats and species of conservation importance for these designated sites. Information on these MCZs is available via the following links: • Offshore Overfalls MCZ - http://jncc.defra.gov.uk/page-6776 • Offshore Brighton MCZ - http://jncc.defra.gov.uk/page-6775	The MCZs identified by the MMO do not include any ornithological features. While a MCZ assessment will be undertaken (see Chapters 8 and 9), it is not relevant to marine and intertidal ornithology.
4.3.4	The Scoping Report states the cable route passes near to four recommended Marine Conservation Zones (Bembridge rMCZ; East Meridian rMCZ; Norris to Ryde rMCZ and Selsey Bill and the Hounds rMCZ). Two of these sites are now out to consultation as part of the third tranche of MCZ designations: Bembridge rMCZ, and Selsey Bill and the Hounds rMCZ, and now have a proposed MCZ	Where ornithological features are present within a recommended, proposed, or designated MCZ,

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	(pMCZ) status. The East Meridian rMCZ and the Norris to Ryde rMCZ have not been taken forward to consultation, however the impacts to the features of these sites must still be considered, should they be designated in the future.	potential impacts will be considered in the DCO application.
4.3.5	Material consideration must be given to pMCZs and any additional features in existing MCZs out to consultation, as if they are already designated.	Where ornithological features are present within a recommended, proposed, or designated MCZ, potential impacts will be considered in the DCO application.
4.4.2	Government Circular 06/2005 states that Biodiversity Action Plan (BAP) species and habitats 'are capable of being a material consideration…in the making of planning decisions'. Therefore, surveys, impact assessment and mitigation proposals for Habitats and Species of Principal Importance must be included in the ES. Consideration must also be given to those species and habitats included in the UK and Hampshire BAPs.	Where relevant, reference will be made to those species considered to be of Principal Importance in England under the Natural Environment and Rural Communities Act (2006) in the DCO application. The Hampshire BAPs will be referenced in the Marine and Onshore Ornithology Chapters of the ES as part of the DCO application
4.3.9 and 4.3.11	Chichester Harbour SSSI, Langstone Harbour SSSI and Portsmouth Harbour SSSI must be considered within the ES.	Chichester Harbour SSSI, Langstone Harbour SSSI, and Portsmouth Harbour SSSI will be

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		considered as part of the DCO application. However, there are no ornithological interests for Portsmouth Harbour SSSI which are relevant to marine ornithology (and therefore, this site is not included in Table 11.2 in Chapter 11 of this Report).
4.3.10	The feature 'Common Tern' must be considered within the ES within the list of features for the Chichester Harbour SSSI and Langstone Harbour SSSI.	For those nationally designated sites included in the DCO application, all notified ornithological features will be considered.
Biological Environment (Marine Mammals)		
4.5.1	The MMO agrees with the Scoping Report that the following impacts to marine mammals have been scoped in for further assessment: • Increased anthropogenic noise from geophysical survey and positioning equipment which emits sound e.g. sonars, sub-bottom profilers, USBL positioning systems and transponder beacons; and	The EPS risk assessment for future UXO survey works and any assessment and licence application for further investigative works on UXO removal will be undertaken separately to the DCO application

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	• Unexploded Ordnance (UXO) removal (if in situ detonations are required).	
4.5.2	The MMO note the Scoping Report's conclusion to scope out 'Increased anthropogenic noise from geotechnical investigations, seabed preparation, route clearance, cable lay and burial'. The MMO disagree with this conclusion and it must be scoped in. Full details and references must be included within the final ES, as to why the risk of significant impact on marine mammals from these sources is considered to be low. For example, increased anthropogenic noise from geotechnical investigations, seabed preparation, route clearance, cable lay and burial is to be scoped out of the ES on the basis that the maximum impact ranges are likely to be small (< 30m for drilling, suction dredging and cable laying; ≤140m for trenching; <100m for rock placement). The impacts of increased vessel noise are also proposed to be scoped out for similar reasons and that sound from vessels is unlikely to significantly add to existing noise levels from vessels in the Channel.	Further references and details on why impacts from increased anthropogenic noise from geotechnical investigations, seabed preparation, route clearance, cable lay and burial is to be scoped out have been provided in Chapter 10 of this Report. Impacts from increased vessel noise are scoped out and details for this are presented in Chapter 10 of this Report.

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4.5.5	The MMO recommends reviewing the Solent Seals project which monitored the foraging behaviour of harbour seals in the Solent; and the MARINE Life Charm III project for more site-specific information regarding marine mammal sightings.	A summary of the key findings of the Solent Seal Project has been located. These will be used when describing the baseline within the ES Chapter.
4.5.6	The potential impacts of Electromagnetic Fields must be scoped into EIA when assessing the impacts to Marine Mammals and elasmobranchs.	The presence of EMF and potential impacts on marine mammals and basking sharks has been considered in this scoping report. Further details on why it is considered that this potential impact can be scoped out are provided in Chapter 10 of this document.
Human Environment (Commercial Fisheries)		
4.10.1	The MMO welcomes the early consideration of mitigation measures for commercial fishing and note the range of measures proposed in Scoping Report. These measures include the following: • Establishment of a Fisheries Working Group with key fisheries stakeholders to provide a forum for ongoing engagement with the fishing industry;	Noted.

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	• Appointing a Fisheries Liaison Officer (FLO) to disseminate installation (and decommissioning) schedule and associated safety risks will be shared through notices to all potential stakeholders; • Partially installed cable and associated infrastructure that is not fully installed would be marked, possibly guarded and advisory exclusion zones implemented; • Discussions with relevant vessel owners to determine appropriate mitigation; • Post maintenance surveys; and • Accidently dropped objects and/or debris will be removed.	
4.10.2	Regarding proposed mitigation measures associated with obstacles and safety risks associated with fishing activities, the MMO suggests this should be expanded to include: • Communication of post-installation survey and remedial works surveys to the fishing industry; • Contingency response procedures for reporting of cable exposures post installation; • Communication of hazard information to Kingfisher; and • Relevant mitigation and operational arrangements associated with fisheries impacts, disruption and safety to be collated and detailed in a liaison and coexistence plan.	Noted.
4.10.3 and 4	With regards to commercial fishing, the Scoping Report has identified a range of appropriate data sources. These include published fisheries statistics for the ICES statistical rectangles of relevance to the proposal, vessel monitoring systems (VMS) data, fisheries surveillance from overflight and surface vessel sightings	Consultation with both Southern and Sussex IFCA's has been undertaken (September 2018). Any advice on inshore fishing activity in these districts will be

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	and consultation with fishermen, particularly from vessels not fitted with VMS. In addition to these sources, the MMO advises the Proposer to consult with Southern and Sussex IFCAs regarding inshore fishing activity in the respective districts, which may improve the commercial fisheries evidence base.	included in the commercial fisheries baseline.
4.10.6	The MMO recommends seeking consultation with the industry at the earliest opportunity as the greater the level of consultation the greater the opportunity to mitigate against any impact to the fishing industry. The MMO also recommends working with members of the recreational fishing community. The Solent represents an important area for both private anglers and for charter vessels providing a platform for recreational fishers.	Consultation with the fishing industry has been undertaken (in October 2017 and September 2018) and will continue as the project develops. Consultation with the recreational fishing community will be undertaken (see Chapter 16 of this document).
4.10.8	Figure 5.6.1 of the Scoping Report is to be used in the ES, it must be separated out into different charts for different fishing methods and vessel nationalities to make the figure(s) clearer and easier to interpret.	This figure was provided for scoping only as an indication of the level of fishing by different nationalities in the marine cable corridor. The commercial fisheries Chapter will provide more detailed spatial data (as figures) from both VMS and sightings, as well as that gathered from consultation with fishermen and their representatives, which will be

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		broken down by gear type, species targeted, nationality.
Human Environment (Shipping and Navigation)		
4.12.1	The MMO notes that the Scoping Report includes a Chapter on Human Environment (Shipping and Navigation) which states that a Navigational Risk Assessment (NRA) will be undertaken as part of the EIA. The NRA must include a baseline study, which summarises the available background navigation data and focuses on any key shipping routes and / or anchoring areas and fishing activity in the vicinity of the cable corridor. It must be noted that a considerable amount of recreational boating activity in this area, particularly during the summer months when it likely that this cable will be laid and this must be factored into the NRA.	An NRA will be undertaken as part of the EIA. The NRA will include a baseline assessment using six months recent AIS data to analyse shipping, including recreational activity, in the area. Additional desk-top sources will also be used to inform the baseline.
4.12.2	The NRA must also include appropriate risk mitigation measures and a detailed methodology, to ensure the risk remains reduced to 'As Low As Reasonably Practicable' (ALARP). This must include assessments on collision risk, emergency response, marking and lighting during the works and the promulgation of Notices to Mariners.	A Formal Safety Assessment (FSA) will be carried out in line with the International Maritime Organisation (IMO) FSA process within the NRA. This assessment will consider collision risk, emergency response, marking lighting and appropriate mitigation. The assessment will review baseline data, consultation, and expert opinion to identify the level

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		of significance of each impact, taking embedded mitigation into account. Additional mitigation measures will then be identified as necessary to reduce the risk to ALARP levels. The FSA within the NRA will then be used to inform the EIA.
4.12.3	The NRA must include considerations for the effects on vessel navigation and communication equipment, as well as any electromagnetic deviation on ships compasses. The MMO will accept a three degree deviation for 95% of the cable route. For the remaining 5% of the route no more than five degrees will be attained. The MMO would however expect a deviation survey post the cable being laid; this will confirm conformity with the consent condition (if given). The data must also be provided to the UKHO via a hydrographic note (H102), as they may want a precautionary notation on the appropriate Admiralty Charts.	Impact on vessel navigation and communication equipment will be assessed in the NRA, taking into consideration the requirements stated by the MMO. Requirements will be included as embedded mitigation.
4.12.4	Particular attention must be paid to cabling routes and burial depth for which a Burial Protection Index study must be completed and, subject to the traffic volumes, an anchor penetration study may be necessary. Any consented cable protection works must ensure existing and future safe navigation is not compromised, accepting a maximum of 5% reduction in surrounding depth referenced to Chart Datum.	A Cable Burial Risk Assessment (CBRA) will be undertaken to determine suitable protection for the cable. Burial or other protection of cables (e.g. rock placement) will not reduce surrounding water depth by more than 5%. This will

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		be included as embedded mitigation within the NRA.
4.12.5	Noting that part of the cable route will transit through the South-Western end of the Dover Traffic Separation Scheme (TSS), a specific Navigation Risk Assessment for the area to be laid within the TSS must be provided in the ES. This will need to include a specific methodology with regards to the cable laying operation, and must be compliant with the International Regulations for Preventing Collisions At Sea 1972 (COLREGs).	This section of cable will be considered as a high risk area within the NRA.
4.12.6	The MMO notes that the current proposal seeks to lay a section of the pipe through a Separation Area. Under COLREGS Rule 10(e), this area is provisioned for vessels transiting in/out of a TSS, and for vessels in emergency distress, plus also fishing vessels. The use of trawlers and anchors also increases the risk of a cable strike before burial is complete	This will be addressed in the NRA.
4.12.7	Rule 10(l) allows for an exemption for a "vessel restricted in her ability to manoeuvre" (defined in Rule 3 to include a cable laying vessel) during a specific cable laying operation. However, this exemption may not extend to guard vessels, unless an exemption under Rule 10(k) (vessels engaged in the maintenance of the safety of navigation) can also be sought. The MMO advises the Proposer to undertake full consultation with MCA Dover CNIS, so that operations can be safely managed.	Consultation with MCA Dover CNIS will be undertaken as part of the NRA process.
4.12.8	The COLREGs are an internationally-accepted treaty and enshrined under UK law. Contraventions of the COLREGs may also constitute an offence and may be liable to prosecution by the MCA Enforcement Unit. Implications of these rules must also be	Compliance with International Regulation for Preventing Collisions at Sea (COLREGs) and

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	considered within the ES for any future survey or maintenance work both prior and after completion.	International Regulations for the Safety of Life at Sea (SOLAS) will be included as embedded mitigation during both construction and operational phases.
Human Environment (Other Marine Users)		
4.10.6	The MMO also recommends working with members of the recreational fishing community. The Solent represents an important area for both private anglers and for charter vessels providing a platform for recreational fishers.	Consultation with this sector will be undertaken and Southern IFCA will be contacted to assist with initial points of contact within this sector. See Chapter 16 of this document.
4.12.9	The MMO notes that the cable route transits through part of the NAB VTS area, which is managed by ABP Southampton in co-ordination with HM Queen's Harbour Master at Portsmouth.	Consultation with NAB VTS User Group including ABP Southampton and HM Queen's Harbour Master, Portsmouth will be undertaken as part of the NRA process. AQUIND attended a Nab VTS User Group meeting on 18 September 2018 to introduce the project and seek initial views from stakeholders.

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4.12.10	Cable laying operations are likely to impact traffic routes into the Solent area, and so the MCA-chaired NAB VTS area User Group must be fully consulted with at an early stage. The User Group includes other local stakeholders including ferries, dredging operators, harbour authorities, fishing associations and the RYA.	As above, consultation will be undertaken as part of the NRA process.
4.12.11	Particular emphasis must also be placed on considering any impacts to local military operations out of Portsmouth.	This impact will be considered within the NRA and will be assessed using a Formal Safety Assessment (FSA) in line with the International Maritime Organisation (IMO) FSA process. Consultation and liaison will also take place with QHM Portsmouth and MOD as part of the NRA process.
4.12.12	The MMO notes that the cable route through the English Channel will have a high probability of encountering unexploded ordnance (UXO) during laying operations. Appropriate safeguards should be put in place by the Proposer for safe disposal and mitigation where needed.	A separate marine licence application will be made for survey and safe disposal of UXO.
4.12.13	The proposed cable route passes through Langstone Harbour Board (LHB) Area of Pilotage Jurisdiction which is illustrated in the chart on the Langstone Harbour website: http://www.langstoneharbour.org.uk/images/upload/files/commercial-pilotage_docs_pdf_336.pdf. Therefore, consultation must be undertaken with LHB.	Consultation will be undertaken with LHB as part of the NRA process.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
4.12.14	The RYA coastal Atlas referred to in paragraph 5.8.19 of Appendix 1 of the Scoping Report is copyrighted and the data it contained is available under licence from the RYA.	Licence and data has been acquired from the RYA and is now presented in Figure 16.3.
Human Environment (Marine Archaeology)		
4.11.1	The MMO notes that in paragraph 3.1.5 of the Scoping Report specific attention is directed at the use of geophysical data to provide data to inform the ES and to provide baseline characterisation for the benthic and archaeological impact assessments. The MMO would add that geotechnical data acquisition which is sufficient to support palaeo-environmental analysis, is also directly relevant to the preparation of the ES	Agreement is acknowledged on the approach of using geophysical data to inform the baseline. Geotechnical survey datasets will be archaeologically assessed to investigate submerged prehistory potential and reported within the EIA (see Chapter 14 of this document).
4.11.2	the Scoping Report explains the action to remove seabed debris that might be considered a hindrance to cable installation and the MMO adds that archaeological assessment will be necessary prior to route clearance to ensure that any anomalies of known or possible archaeological interest are avoided. The MMO also notes the explanation in paragraph 3.1.9 that workboats could deploy Remotely Operated Vehicles (ROVs) or utilise geophysical survey and positioning equipment to monitor the progress of the works and we add that such measures should also be used to support anomaly investigation to aid determination of archaeological interest.	A detailed desk-based assessment will inform the EIA. Where necessary following the desk-based assessment, further work including geophysical, geotechnical, deployment of ROV and dive investigations will be subject to archaeological

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
		assessment to support anomaly investigation and identification of asset value.
4.11.5	The ES must clearly explain the processes and procedures for data analysis and interpretation that enables identification of possible impact that might be direct or indirect, negative or positive. Following this analysis, the ES must set out the full set of necessary mitigation measures, such as preparation of an archaeological Written Scheme of Investigation (WSI), should consent be obtained. It is the purpose of a WSI to steer the final design of this interconnector cable project in reference to the full suite of survey techniques that will be employed at that stage. Other appropriate mechanisms must then be explained, such as the use of an archaeological reporting protocol should any discoveries occur during implementation (this risk is clearly explained within paragraph 5.9.15) and how all relevant project documentation used by any contractor or sub-contractor will utilise the reporting protocol and spatially identify any Archaeological Exclusion Zones.	Chapter 14 of this document briefly describes the potential impacts of the installation, operation and decommissioning of the Proposed Development. These will be further elaborated within the EIA. Chapter 14 also identifies the mitigation proposed to minimise the impacts on marine archaeology. Both a WSI and Protocol for Archaeological Discoveries are being proposed as the main ways of ensuring impacts are minimised.
4.11.6 and 4.11.7	The Scoping Report gave insufficient attention to the potential to encounter either unknown or known heritage assets at the proposed cable landfall at Eastney (near Portsmouth, Hampshire), with particular reference to any aspects of the proposed project (e.g. as described in the paragraphs under “Landfall cable installation and protection”) that may occur within defined area of Fort Cumberland scheduled monument (and Grade II* listed building) or in close	Chapter 14 of this document identifies data sources that will be utilised to inform the baseline data. Further analysis of these available data sources relating to the terrestrial, intertidal and marine

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
	proximity to this scheduled monument. An appropriate assessment of risk and planning of survey work must be provided in the ES, given that there are surviving remains of both Fort Cumberland and the earlier Eastney Fort that exist as upstanding structures and as buried archaeological deposits, both within and immediately outside the scheduled areas. the MMO advises that all options to choose a route that will not impact the Fort (either physically impact or impact it through development within its setting) are to be explored as part of this EIA exercise and reported through the ES.	archaeology will be undertaken and reported in the EIA. A field walk survey will also be undertaken to identify any archaeological features located within the proposed landfall at Eastney (up to MHWS).
4.11.8	The MMO advises the Proposer of the obligation to report any recovered wreck material to the MCA Receiver of Wreck, and to take any recovered wreck to a UK port only. A significant breach of this legislation may also constitute an offence under UK law.	Noted and will be actioned as required.
Cumulative Impacts		
4.14.1	The EIA must identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out. To conduct the assessment of cumulative and in combination effects, the following types of projects must be included (subject to the availability of information): • Existing completed projects; • Approved but uncompleted projects; • Ongoing activities; • Plans or projects for which an application has been made and which are under consideration by the consenting authorities; and	A cumulative assessment for each topic will be undertaken in accordance with PINs Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects. See Chapter 17 of this Report for further details.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
	• Plans or projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects	
4.14.2	All potential pathways linking this proposal with other plans or projects to designated features or sensitive receptors within the surrounding sites must be assessed.	A cumulative assessment for each topic will be undertaken in accordance with PINs Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects and presented within the ES. See Chapter 17 of this document for further details.
4.14.3	Information on transboundary impacts and effects on the environment must be provided in the potential cumulative effects assessment.	See Chapter 17 of this document for further details.
4.14.4	A cumulative impact assessment is to be reported in the ES. Therefore, cumulative and inter-related effects on marine/estuarine and migratory fish as well as commercial fishing must be scoped into the assessment.	A cumulative assessment for each topic will be undertaken in accordance with PINs Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects and presented within the ES. See Chapter 17 of this document for further details.

MMO Scoping Opinion Section	Summary of Comments Received	How This Has Been Addressed
4.14.5	Within the cumulative assessment, aggregates dredging must be included in the list of projects/activities for assessment. There are several operational aggregate extraction sites off the South Coast and within the Eastern English Channel which are in proximity to the cable corridor. Further information regarding these sites can be obtained from the British Marine Aggregate Producers Association (BMAPA) at bmapa@mineralproducts.org or on their website: http://www.bmapa.org/index.php	A cumulative assessment for each topic will be undertaken in accordance with PINs Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects and presented within the ES. See Chapter 17 of this document for further details.
4.14.6	Should any other projects come to light during the EIA process, these must also be included in the cumulative and in combination assessment of the EIA.	A cumulative assessment for each topic will be undertaken in accordance with PINs Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects and presented within the ES. See Chapter 17 of this document for further details.

TABLE E2: ADDITIONAL MARINE CONSULTATION RESPONSES

Consultee	Method Consultation/ Section	Summary of Comments Received	How This Has Been Addressed
Physical Environment			
Cefas	Scoping Consultation Response Question 14	22. Section 4.9.2 states consideration will be given to cumulative effects.	Cumulative effects will be assessed as part of the EIA process.
	Scoping Consultation Response Question 15	23. Section 4.9.2 states consideration will be given to transboundary effects. 24. The cable will, at some point, transition from UK to French waters, and hence there are likely to be some transboundary effects due to the physical structure of the cable. However, it is likely these will be very small in magnitude and scale and the product of the same project that will have been approved by the French authorities.	Potential transboundary effects will be assessed as part of the EIA process.
Marine Water and Sediment Quality			

Cefas	Scoping Consultation Response Question 3	19. I am not convinced that impacts from the resuspension of contaminated sediments can be scoped out of the ES based on the rationale provided in sections 5.2.8 and 5.2.9. 20. As there are elevated levels of metals and other pollutants within sediments in the area, the benthic surveys that will be carried out along the cable route should also sample for contaminants, focusing on inshore areas where sediments are muddy (i.e. 'A5.23 or A5.24' and 'A5.25 or A5.26') as this is the environment in which contaminants are most likely to be retained and thus mobilised when disturbed. The presence or absence of elevated levels of contaminants in these areas will help to determine whether impacts due to the resuspension of contaminated sediments should be scoped in or out of the EIA. 21. If the collection of such data is not feasible (see my response to Question 5 below), then could the Applicant please clarify whether existing data are available on contaminant levels specifically in muddy sediments around	Contaminated sediments will be scoped in. See Chapter 7 of this document.

		the proposed cable route and, if so, confirm that all contaminants were below Cefas action levels within these areas?	
	Scoping Consultation Response Question 9	33. Existing data on contaminants within the area are relied upon (section 5.2.8), but additional data on contaminants may need to be collected through survey (see my response to Question 3 above).	Contaminated sediments will be scoped in. See Chapter 7 of this Report.
Natural England	Consultation on Horizontal Directional Drilling (HDD) methods in Langstone Harbour (teleconference and emails_16/07/2018)	Natural England agrees that HDD is a preferred method for this type of construction as it can reduce environmental impacts in some cases. Natural England recognised that Langstone Harbour possesses the full suite of designations and as such, features such as those (but not limited to) below will need to be given consideration: • Grasslands • Lagoons • Strandline communities • Saltmarsh • Seagrass • Mudflats • Native Oyster	Noted.

		• Overwintering birds (noise and visual impacts) Natural England's understanding of the HDD method is that a hole would be drilled underneath the area with an increasing in diameter drill bit. Natural England request that a water based mud lubricant is used that is Cefas approved. Natural England also recognise that a fair amount of slurry can exit the drill entry and exit holes. It will be important that this slurry is disposed of correctly (e.g. use of groundsheets to contain the material is often effective as the slurry can then be removed from site). If the HDD entry and exit holes are anywhere near the marine environment that may directly affect the marine environment then Natural England would generally require survey work to be undertaken. However, as the HDD compound and exit and entry holes will be above MHWS (and as pollution prevention measures should be in place in the HDD compound above MHWS) then Natural England has advised that it would not be proportionate to ask for survey., but that consideration to the	

		designated features/habitats of Langstone Harbour can be undertaken by desk based assessment using datasets available in the public domain. Natural England has habitats datasets available on their website and the Langstone Harbour environment officer (Louise MacCallum) should be contacted as they hold a wealth of knowledge on the area.	
Southern Inshore Fisheries and Conservation Agency (IFCA) **Fishermen**	Meeting(s) held 18th – 20th Sept	Anecdotal information provided on (unofficial) munitions dumping at the end of WW2 from warships in the Solent may have contributed to increased contaminated sediments in the area.	Project specific contaminated sediment sampling has been undertaken which will inform the ES.
Intertidal and Benthic Ecology			
Cefas	Scoping Consultation Response Question 2	13. Based on what is written in section 5.2.17, it is unclear whether sensitive/protected habitats will be surveyed only if they occur along the corridor or, in addition, if they occur outside the cable corridor but within areas that may be indirectly affected by the proposed works (i.e., within the	The entire marine cable corridor will be characterised through a combination of the results obtained from the acoustic surveys and targeted benthic sampling. No additional sampling

		predicted zone of influence). The former approach would be acceptable, as information on sensitive and protected habitats in nearby designated sites is already available (Table 5.2.1), but the latter would be preferable as contemporary, quantitative data would allow more reliable assessments of potential impacts.	outside this corridor has been undertaken.
	Scoping Consultation Response Question 3	17. I agree that the introduction of invasive non-native benthic species can be scoped out of the ES (Table 5.2.3 and section 5.2.10). 18. I agree that the impact of EMF emissions from HVDC cables on the benthos can be scoped out of the ES (Table 5.2.3 and sections 5.2.11-5.2.13).	Noted.
	Scoping Consultation Response Question 10 and 11	34 and 35. No such details [on any standard practices, quality standards or assurance methods] have been provided in section 5.2 of the Scoping Report. I would expect further details to be presented in the ES with regard to benthic community and contaminant sampling.	Full details of the survey methods (including standards and quality assurance methods) will be presented in the ES.

	Scoping Consultation Response Question 14	39. However, there is no indication in section 5.2 of the Scoping Report that cumulative impacts on benthic species or habitats will be scoped into the EIA. It is not clear whether this is because cumulative impacts on the benthos have not been considered or because there are no plausible cumulative impacts on the benthos.	Cumulative impacts on the benthos will be assessed.
Natural England	Consultation on Horizontal Directional Drilling (HDD) methods in Langstone Harbour (teleconference and emails_16/07/2018)	Natural England agrees that HDD is a preferred method for this type of construction as it can reduce environmental impacts in some cases. Natural England recognised that Langstone Harbour possesses the full suite of designations and as such, features such as those (but not limited to) below will need to be given consideration: • Grasslands • Lagoons • Strandline communities • Saltmarsh • Seagrass • Mudflats • Native Oyster	Noted.

		• Overwintering birds (noise and visual impacts) Natural England's understanding of the HDD method is that a hole would be drilled underneath the area with an increasing in diameter drill bit. Natural England request that a water based mud lubricant is used that is Cefas approved. Natural England also recognise that a fair amount of slurry can exit the drill entry and exit holes. It will be important that this slurry is disposed of correctly (e.g. use of groundsheets to contain the material is often effective as the slurry can then be removed from site). If the HDD entry and exit holes are anywhere near the marine environment that may directly affect the marine environment then Natural England would generally require survey work to be undertaken. However, as the HDD compound and exit and entry holes will be above MHWS (and as pollution prevention measures should be in place in the HDD compound above MHWS) then Natural England has advised that it would not be proportionate to ask for surveys, but that consideration to the	

		designated features/habitats of Langstone Harbour can be undertaken by desk based assessment using datasets available in the public domain. Natural England has habitats datasets available on their website and the Langstone Harbour environment officer (Louise MacCallum) should be contacted as they hold a wealth of knowledge on the area.	
Fish and Shellfish			
Cefas	Scoping Consultation Response Question 10	36. Within the cumulative assessment, aggregates dredging could be included in the list of projects/activities for assessment. There are several operational aggregate extraction sites off the South Coast and within the Eastern English Channel, that are in proximity to the cable corridor.	Aggregate abstraction will be considered in the cumulative assessment.
	Scoping Consultation Response Question 11	37. A cumulative impact assessment is to be reported in the ES and will include transboundary effects as the project crosses the median line between the United Kingdom and France.	Transboundary effects will be considered in the ES. See Chapter 17 of this document for further details.

	Scoping Consultation Response Question 12	38. For completeness, impacts and effects from the potential re-mobilisation of sediment-bound contaminants and chemical contamination, for example from accidental spillages during operation/maintenance works, should be scoped into the EIA.	Contaminants will be assessed in the Marine Water and Sediment Quality Chapter of the ES. Accidental spillages will not be assessed as a route to impact within the ES, but will be fully considered as part of the project documentation relating to Construction Method Statements and pollution prevention measures and plans.
	Scoping Consultation Response Question 17.	17. I would expect details of quality standards to be detailed in the ES.	Quality standards will be detailed in the ES.
Natural England	Consultation on Horizontal Directional Drilling (HDD) methods in Langstone Harbour (teleconference and emails_16/07/2018)	Natural England agrees that HDD is a preferred method for this type of construction as it can reduce environmental impacts in some cases. Natural England recognised that Langstone Harbour possesses the full suite of designations and as such, features such as those (but not limited to) below will need to be given consideration:	Noted. Only native oysters are relevant to the Fish and Shellfish Chapter and will be assessed. Both the native oyster and clam fishery will be considered in the Commercial Fish Chapter of the ES.

		• Grasslands • Lagoons • Strandline communities • Saltmarsh • Seagrass • Mudflats • Native Oyster • Overwintering birds (noise and visual impacts) Consideration should also be given to the local shellfisheries. The main activity in the higher regions of the harbour area is manila clam and native oyster and there may be a small amount of netting. Some new byelaws exist for fishing which has led to some parts of the SAC being permanently closed and only seasonal fishing being allowed (Nov-Feb inclusive) and therefore there may be timing considerations required when undertaking works. In the wider Solent, more to the west in the Solent, native oyster stocks have been seriously challenged and the fishery has been shut for 4-5 seasons. Clam fishing is usually open for four months whereas the native oyster season in the harbours has been reduced in length in recent seasons.	All NERC Act fish and shellfish species will be given consideration in the Fish and

		The native oyster is covered by the NERC Act and is considered a high-profile species. If there is any route to impact, mitigation protocols have been previously requested which might include translocation of oysters. The Blue Marine Foundation spearheads a project aiming to raise awareness of the species and is trying to restore the population. Natural England advise that early engagement with the Southern IFCA (who work in partnership with the Foundation) would be beneficial.	Shellfish Chapter. The sensitivity of the native oyster and possible mitigation (if connectivity exists) will be identified. The Solent Oyster Restoration Project by the Blue Marine Foundation will be studied as part of the Fish and Shellfish baseline. Engagement with the Southern IFCA is ongoing
Intertidal and Marine Ornithology			
Natural England	Scoping Consultation Response Protected Species	The onshore elements of this proposal in particular may also have an impact upon species which are protected by the Wildlife and Countryside Act 1981 (as amended) or the Conservation of Habitats and Species Regulations 2017. If any protected species are present within the application area, the Environmental Statement (ES) should include details of: • The species concerned; • The population level at the site affected by the proposal;	Where relevant, reference will be made to Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) in the Marine and Onshore Ornithology Chapters of the ES for the DCO application. Reference to European Protected Species listed under the Conservation of Habitats and Species Regulations 2017 will be provided in the Marine Mammal

		• The direct and indirect effects of the development upon that species; • Full details of any mitigation or compensation that might be required; • Whether the impact is acceptable and/or licensable.	and Onshore Ecology Chapters of the DCO application, where relevant. The outlined approach to assessment will be followed for all receptors.
	Consultation on Horizontal Directional Drilling (HDD) methods in Langstone Harbour (teleconference and emails_16/07/2018)	Natural England agrees that HDD is a preferred method for this type of construction as it can reduce environmental impacts in some cases. Natural England recognised that Langstone Harbour possesses the full suite of designations and as such, features such as those (but not limited to) below will need to be given consideration: • Grasslands • Lagoons • Strandline communities • Saltmarsh • Seagrass • Mudflats • Native Oyster • Overwintering birds (noise and visual impacts)	Potential noise and visual impacts on overwintering birds, including those notified features of the Langstone Harbour SSSI, will be considered in the Onshore and Marine Ornithology Chapters of the DCO application (where relevant). Full consideration of potential impacts on qualifying ornithological features of the Chichester and Langstone Harbours SPA will be provided in the shadow HRA submitted as part of the DCO application. Subsequent consultation has been undertaken with NE following receipt of the Scoping Opinion. It was agreed that as the HDD compound and exit and entry holes will be above MHWS

		If the HDD entry and exit holes are anywhere near the marine environment that may directly affect the marine environment then Natural England would generally require survey work to be undertaken. However, as the HDD compound and exit and entry holes will be above MHWS (and as pollution prevention measures should be in place in the HDD compound above MHWS) then Natural England has advised that it would not be proportionate to ask for surveys, but that consideration to the designated features/habitats of Langstone Harbour can be undertaken by desk based assessment using datasets available in the public domain. Natural England has habitats datasets available on their website and the Langstone Harbour environment officer (Louise MacCallum) should be contacted as they hold a wealth of knowledge on the area.	(and as pollution prevention measures should be in place in the HDD compound above MHWS) then it would not be proportionate to undertake surveys. Instead, consideration to the designated features/habitats of Langstone Harbour should be undertaken by desk-based assessment using datasets available in the public domain.
Commercial Fisheries			

Cefas	Scoping Consultation Response Question 10	36. Within the cumulative assessment, aggregates dredging could be included in the list of projects/activities for assessment. There are several operational aggregate extraction sites off the South Coast and within the Eastern English Channel, that are in proximity to the cable corridor.	Aggregates dredging will be considered in the cumulative assessment.
	Scoping Consultation Response Question 11	37. A cumulative impact assessment is to be reported in the ES and will include transboundary effects as the project crosses the median line between the United Kingdom and France.	Both cumulative impact assessment and transboundary effects will be assessed in the ES.
	Scoping Consultation Response Question 12	38. For completeness, impacts and effects from the potential re-mobilisation of sediment-bound contaminants and chemical contamination, for example from accidental spillages during operation/maintenance works, should be scoped into the EIA.	Contaminants will be assessed in the Marine Water and Sediment Quality Chapter of the ES and their impact on natural receptors in the Fish and Shellfish Chapter of the ES. Accidental spillages will not be assessed as a route to impact within the ES but will be fully considered as part of the project documentation relating to Construction Method Statements

			and pollution prevention measures and plans.
MMO Coastal Officer	Scoping Consultation Response	There are significant fishing activities, commercial and recreational vessels frequently transiting this area. Fishing operations are likely to be affected by this, to mitigate this impact advanced notice of works need to be issued and fisheries liaison officer appointed. Fisheries is an all year-round activity. Suggested conditions if licence were granted: Local notice to mariners, fisheries liaison officer appointment.	To ensure any potentially affected fishing operations are aware of the works Notice to Mariners and a Fisheries Liaison Officer will be employed.

TABLE E3: LPA SCOPING OPINION RESPONSES

Response number	Local Planning Authority	Comments	How will this be addressed
1	EHDC and WCC:	'There should be analysis of the proposal against the relevant planning policies demonstrating how the proposal is policy compliant.'	We will include this within the Planning Statement and ES.
2	EHDC:	'The South Downs National Park Authority is progressing its Local Plan and submitted the 'Submission' version of the Local Plan at the end of April 2018.'	We will include the consideration of emerging policies relevant to the development.
3	EHDC:	'a number of policies referred to in Appendix 3 within the East Hampshire Local Plan are not applicable as not all policies were not 'saved' by the introduction of the Joint Core Strategy. Policies CSWB2 and CSWB10 of the JCS are not applicable as they apply	We will make sure we update and correct our planning policy elements in the ES to include all applicable policies, and exclude any that are not saved or have been superseded.

Response number	Local Planning Authority	Comments	How will this be addressed
		specifically to the development of the Whitehill Bordon new town.'	
4	WCC:	'It is noted that the proposal lies within the Denmead Neighbourhood Plan Area (DNP) and this carries the same weight as adopted local plans. This should be reflected in the policy assessment of the proposed development.'	We will make sure that our planning policy assessment/consideration includes all relevant planning policies, at National, Local and Neighbourhood level, and including relevant supplementary planning guidance and advice notes.
5	WCC:	'A number of the development management policies in LP2 are applicable particularly with regard to the siting and appearance of the proposed building itself - DM1; DM10; DM15; DM16; DM17; DM18; DM19; DM20; DM22; DM23.'	We will make sure that our planning policy assessment/consideration includes all relevant planning policies.
6	WCC:	'The route however passes through the designated gap between Denmead and Waterlooville and therefore Policy CP18 of LPP1 is relevant. The route also passes through a minerals safeguarding area so this will also need to be	We will make sure that our planning policy assessment/consideration includes all relevant planning policies.

Response number	Local Planning Authority	Comments	How will this be addressed
		assessed, against the policies and proposals of the Hants Minerals and Waste Local Plan. Part of the site also lies within 5.6 km of the Solent SPA.'	
Cumulative Effects			
7	EHDC:	'One scheme that should be included as part of a cumulative assessment in the ES is the energy storage system (our planning ref: 57524/001 and included at the top of table 3.4) now has planning permission. This will have implications for construction traffic and particularly on landscape impact, including landscape capacity. It will also likely have cumulative implications for amenity of nearby residents through noise, outlook, electric and magnetic fields, ecological impacts and ground water.'	Include within list of committed developments and cumulative assessment.

Response number	Local Planning Authority	Comments	How will this be addressed
8	EHDC and WCC:	Need to include the development at land to the West of Waterlooville, the existing Lovedean Electricity Substation and the existing Solar Farm at Day Lane.	Existing developments will form part of the baseline and so would not be included within the cumulative assessment. This will be explained within the PEIR and Environmental Statement.
9	WCC:	'A further site that has not been included in the scope and should, relates to the Major Development Area at Land West of Waterlooville.'	Consult with WCC to identify this application and include within list of committed developments and cumulative assessment in the ES.
10	EHDC and WCC:	'the Environmental Statement should also consider known forthcoming planning applications in close proximity to the development application, where there is potential impacts on key ecological interests.'	Identify further schemes to be included within the list of committed developments for cumulative assessment.
11	HBC: '	The Grainger development has commenced with a number of phases under construction'	Update status of the West Waterlooville development in the list of committed developments to be 'under construction'.

Response number	Local Planning Authority	Comments	How will this be addressed
			Engagement with the housing developer and/or various utilities about planned services might be required.
12	PCC:	Need to identify the future phases of the North Portsea coastal defence scheme.	Noted. The Applicant will consult with PCC during preparation of the ES to identify the programme for Phase 4 of the North Portsea Coastal Defence Scheme.
Design / Alternatives			
13	EHDC and WCC:	'The absence of details of design make a full assessment of the impact on the landscape more difficult even where indications of scale are provided.'	Landscape mitigation plans will be prepared to integrate the development into its surroundings. The LVIA team will work with the design team to micro site the Proposed Scheme and ensure measures associated with noise and ecology mitigation are included. The LVIA Chapter will refer to the landscape mitigation plans.

Response number	Local Planning Authority	Comments	How will this be addressed
			Further information (e.g. photomontages) will be provided for the public consultation to be held in October 2018.
14	EHDC and WCC:	'Evidence must be submitted demonstrating what alternative sites for the converter have been considered that may have a less sensitive impact on the environment, particularly on groundwater, landscape and visual impacts. This issue is particularly important in relation to the setting of the South Downs National Park.'	Design team to advise on site selection process. The ES will include a standalone Chapter clearly illustrating the alternative options considered and the design evolution of the converter station location. The content of this will also draw upon previous optioneering studies carried out by the design team and the feasibility analysis used.
15	EHDC:	'mitigation measures should not be developed in isolation as they may have implications for other topic areas.'	Where possible, the scheme will include inherent mitigation measures which would be designed-in to the scheme. The ES will make clear which mitigation measures form part of the design and those that are recommended.
Traffic and Transport			

Response number	Local Planning Authority	Comments	How will this be addressed
16	EHDC, WCC and HBC:	The cable route will need to be discussed with the Highway Authority in more detail.	Initial meetings now completed with HCC, PCC and Highways England as relevant highways authority. On-going dialogue will be required as further details of the route become available in order to discuss potential impacts and agree on scope of assessment.
17	EHDC, WCC and HBC:	'Information regarding cable laying proposals, carriageway widths are required and appropriateness of routes should be provided to support any application. Consideration must also be given to committed development in the area and measures taken to ensure service information and highway layout is up-to-date.'	An outline cable laying methodology and typical cross sections can be provided. A Transport Statement will be completed to cover the cable route, Eastney and Lovedean converter station. This will propose traffic management strategy for the cable route and the need for diversion routes, impacts from construction worker traffic generation and car parking requirements and construction traffic movements. Discussions will be held with the LPAs in order to agree the scope of the traffic management strategy impact assessment. The transport Chapter will cross reference the Transport Statement and include an assessment of all transport users. Detailed traffic management plans required to support the planning application, potentially split into 500m sections. This will require additional fee as

Response number	Local Planning Authority	Comments	How will this be addressed
			original scope included for high-level strategy in support of planning application.
18	WCC:	'In addition it is acknowledged by the SDNP the potential traffic routes will rely on local rural roads. Therefore impacts on residents, recreational users and tranquillity will need to be assessed.'	This will be included within the Transport Statement and ES Chapter.
19	PCC:	'The LHA considers the significant impacts will be experienced by all road users on the highway network in Portsmouth. Mitigation of disruption and delay should be effectively managed by detailed Construction Traffic Management Plan(s) (for each phase).'	A Transport Statement will be completed to cover the cable route, Eastney and Lovedean converter station. This will propose traffic management strategy for the cable route and the need for diversion routes, impacts from construction worker traffic generation and car parking requirements and construction traffic movements. Discussions will be held with Portsmouth CC in order to agree the scope of the traffic management strategy impact assessment. The transport Chapter will cross reference the Transport Statement and include an assessment of all transport users. An outline Construction Traffic Management Plan (CTMP) can be included, the principles of which will

Response number	Local Planning Authority	Comments	How will this be addressed
			be enacted in the detailed CTMP that will be produced by the contractor in due course. Detailed traffic management plans required to support the planning application, potentially split into 500m sections. This will require additional fee as original scope included for high-level strategy in support of planning application.
20	PCC:	Identify a need for co-ordination and restrictions during major events.	Discussions will be held with the LPAs in order to agree the scope of the traffic management strategy impact assessment.
21	EDC:	'Traffic routes should be directed away from Source Protection Zones where feasible to reduce risk of collision and/or spills during construction and operation.'	Noted.
22	PCC:	'The ecologist suggests extending the distance (beyond the 50m of the site boundary are construction routes) that air quality impacts on ecologically sensitive	The ecologist refers to a 200m distance that should apply when assessing to impacts on air from vehicular traffic. The air quality assessment has scoped out impacts from operational and construction traffic and only includes the assessment of construction dust. The construction dust

Response number	Local Planning Authority	Comments	How will this be addressed
		receptors are captured by the assessment.'	assessment will consider ecological receptors within 50m from Site boundary, 50m construction routes and 500m from site entrance(s), in line with the IAQM/EPUK guidance on construction dust. No action – proceed as originally scoped.
23	EHDC, WCC, HBC and PCC:	Noise and vibration implications should also be assessed in terms of ecologically sensitive receptors.	Acoustics to provide an assessment of the proposed noise and vibration from construction and operational phases (in the N&V Chapter), with context, to inform an assessment of impacts undertaken by Ecology. Identify locally designated aquatic and terrestrial sites and species. Map should be included in the PEIR and ES. Ensure coordination between the Noise & Vibration lead to co-ordinate with applicable ecological teams.

Response number	Local Planning Authority	Comments	How will this be addressed
24	EHDC, WCC and HBC:	Noise and vibration impacts must also be assessed in terms of implications on groundwater. Mitigation of vibration causing turbidity is best dealt with during the design phase.	Hydrogeology would usually provide discussion on physical water contamination (turbidity). Typically covered in the drainage Chapter (if required at all). Whilst vibration-based, it would be unusual for Acoustics to undertake an assessment of this. Acoustics will provide support where required.
Landscape and Visual			
25	EHDC and WCC:	'The SDNPA recommend that the baseline study responds to the site's location close to the National Park boundary and clearly explores, using evidence, how the site contributes to the setting of the National Park, both in visual and landscape character terms. The inclusion of the South Downs Integrated Landscape Character Assessment (2011) is supported as part of the baseline evidence.'	Confirm that we will review the additional list of evidence outlined by East Hampshire including historic evidence, historic landscape characterisation, SDNP study on viewshed characterisation, tranquillity and Green Infrastructure. The LVIA will consider both landscape character and specific local landscape features. Consideration will be given to the direct and indirect effect of the Proposed Scheme on the SDNP.

Response number	Local Planning Authority	Comments	How will this be addressed
26	WCC and PCC:	'The landscape and visual assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area.'	The LVIA will consider the cumulative effect of other similar developments. Advice will be sought from the LPAs and Natural England on the extent of the Cumulative Zone of Visual Influence and whether this should be extended beyond the 3km that has already been agreed.
27	EHDC and WCC:	'It proposes to scope out visual receptors beyond 3km of the site boundary, and this should be scoped in.'	The LVIA will consider the impacts on receptors within 3km of the Study Area which lie within the SDNP. In addition, three specific viewpoints were agreed outside of the 3km Study Area and these include Old Windmill Hill and Old Winchester Downs within the SDNP and a viewpoint close to Fort Widley, Port Down. The extent of the Study Area plus these additional viewpoints was agreed within the landscape officers at SDNP, HBC and WCC. The LVIA will consider the visual impact of the Proposed Converter Station on receptors on the edge of HBC boundary. It should be noted that one viewpoint (viewpoint 6) was agreed which lies close to the edge of HBC and Jame's Copse.

Response number	Local Planning Authority	Comments	How will this be addressed
			Visual receptors beyond 3km are outside of current scope. Additional fee will be needed to re-run ZTV's and to determine additional viewpoints.
28	EHDC and WCC:	'The design and siting of the building should be landscape led.'	The LVIA will inform the design and siting of the converter station, whilst the design should be landscape led, other factors need to be considered in the siting of the converter station e.g. noise, ecology and arboriculture.
29	EHDC and WCC:	'Natural England would wish to see details of local landscape character areas mapped at a scale appropriate to the development site as well as any relevant management plans or strategies pertaining to the area. The EIA should include assessments of visual effects on the surrounding area and landscape together with any physical effects of the development, such as changes in topography.'	A local landscape character assessment will be undertaken as part of the baseline to the LVIA - the extent of this will be determined with landscape officers. The assessment of local landscape character will inform discussions over colour as well as the form and materials of the Proposed Scheme.

Response number	Local Planning Authority	Comments	How will this be addressed
30	EHDC and WCC:	It is recommended that a lighting assessment is also scoped in to consider potential environmental pollution impacts. Consideration should also be given to temporary effects during construction. The lighting assessment should consider the cumulative impact from any existing/approved developments.	Given our current understanding of the proposals, and with a suitable evidence base, we will seek to rebut this request without having to do surveys/assessments etc on the basis that there will be very limited lighting – both for construction and operation. An evidence base will be prepared to scope out lighting from the EIA.
31	EHDC, WCC, HBC and PCC:	Assessment should consider non-designated heritage assets.	In accordance with the NPPF, the significance of undesignated assets outside the site is not considered to be high enough to warrant an assessment of their setting. Where appropriate, locally listed buildings have been addressed.
32	EHDC, WCC, HBC and PCC:	'The assessment should clearly demonstrate that the extent of the proposed study area is of the appropriate size to ensure that all heritage assets	A Zone of theoretical visibility (ZTV) for Options A and B was obtained from the landscape team; which showed that the study areas used for the settings

Response number	Local Planning Authority	Comments	How will this be addressed
		likely to be affected by this development have been included and can be properly assessed.'	assessment was appropriate to ensure heritage assets likely to be affected have been considered. A figure showing this will be included in the Historic Environment Desk Based Assessment.
33	EHDC, WCC and HBC:	'The County Archaeologist comments that the site is in an area of good archaeological interest with evidence of a Bronze Age cemetery and a round barrow in the immediate area together with isolated Iron Age and medieval finds recorded in the vicinity. It is confirmed that the archaeological Desk Based Assessment (DBA) should address the below ground archaeological potential of the site and the route of the cables. The DBA must set out (as proposed by the submitted Scoping Report) the nature of the archaeological potential and the impact of the proposals on that potential as well as a mitigation strategy.'	Assessment will set out the nature of the potential archaeological resource across the cable route and converter station site, and will assess the potential impact on this resource and the appropriate mitigation strategy.
	WCC:	'The EIA assessment stage should include further site surveys (such as	Further site surveys have been undertaken in the form of archaeological monitoring of geotechnical

Response number	Local Planning Authority	Comments	How will this be addressed
		geophysical survey) and site investigations (trial trenching) for those areas of the cable route which lie outside of the existing road network and for the proposed site of the sub-station.'	works. The final investigation report is pending; the results of the surveys will be incorporated into the baseline assessment. Trial trench evaluation of the proposed cable route, where it lies outside the existing road network, is not deemed appropriate in light of the localised nature of the proposed impact. Should significant remains encountered within the 1.0-1.5m wide cable trench during a watching brief, these can be excavated and recorded. Within the 'working width' for plant movement, any significant remains could be avoided and preserved, e.g. through the laying of terram. This approach would be set out in the Construction Environment Management Plan (CEMP). In terms of the proposed substation site, geophysical survey and subsequent trial trench evaluation will be proposed where topsoil will be removed (substation, access roads, construction compounds etc). Further consultation regarding the timings for potential investigations at the proposed substation will be made following the completion of the baseline assessment and selection of the converter station location.

Response number	Local Planning Authority	Comments	How will this be addressed
			We would propose that this work could be undertaken post-submission, prior to determination, however the LPAs may disagree. We need to engage with the LPAs on this matter ASAP in order to understand the position.
34	PCC:	Particular concern for Fort Cumberland Schedules Ancient Monument/Grade II* listed building, or areas in close proximity to the Fort. Appropriate level of engagement with the Hampshire County Archaeologist and Conservation Officer is encouraged.	The potential archaeological resource within the area of Fort Cumberland has been assessed in the report. Further engagement with Hampshire County Archaeology/Conservation Officers will be carried at the appropriate stage (once the assessment is completed).
35	EHDC, WCC:	'The cable route option through Denmead Meadows has been identified for its nature conservation value and is currently being considered by Natural England for designation as a SSSI and detailed consideration of this will be required.'	We are aware of the pSSSI and we are looking at alternative routes around this site or a directional drill underneath it to avoid direct impacts.

Response number	Local Planning Authority	Comments	How will this be addressed
36	EHDC, WCC:	'Species information should include a data search from the Hampshire Biodiversity Information Centre'	HBIC data has been obtained.
37	EHDC:	'Where the ecologist considers that the very rare Bechstein's bat may occur (the woodlands around the upper sections of the route are within the potential 'Bechstein's zone' in both East Hampshire and Winchester districts), bat surveys should be suitable for that species'	We are aware of Bechstein bat records are associated with the Forest of Bere. We are undertaking bat activity and roost surveys in relevant areas to ensure effects on bats are avoided.
38	EHDC:	'Hazel dormouse is highly likely to occur within hedgerows in the agricultural land within the area, and there is a recent record from woodland immediately adjacent to the Lovedean substation.'	We are aware of dormouse records in close proximity to the scheme. Dormouse surveys have been undertaken where associated habitats may be affected.
39	EHDC, WCC, HBC and PCC:	Natural England advise that the ES is supported by a Biodiversity Mitigation and Enhancement Plan (BMEP) to include measures for mitigating impacts on	A mitigation plan will be produced to consolidate the mitigation and enhancement identified in the ES.

Response number	Local Planning Authority	Comments	How will this be addressed
		protected species and habitats and include biodiversity compensation measures for residual biodiversity losses that cannot be mitigated on-site.	
40	EHDC and WCC:	'In terms of habitat impacts within the National Park, Catherington Down SSSI (calcareous grassland) is within 2Km of the site and also adjacent to one of the potential traffic routes. Although the scoping report includes this within Table 10.3 (Nationally Designated Sites), it does not appear to be included within the Scope of Assessment (Section 10.2).'	The current cable route option and converter station trace is not within the IRZ for the site and therefore is unlikely to be affected. If traffic routes are available these need to be shared with ecology to determine if air quality effects will be a problem.
41	EHDC:	'Natural England strongly recommends that this proposal achieves a net gain for biodiversity and we advise that a biodiversity metric is used that would be relevant to each local authority.'	Much of the cable route impact is temporary; however we can undertake a biodiversity metric calculation if required.
42	WCC and PCC:	'Natural England note in paragraph 10.2.22 that in addition to the SPA and Ramsar sites, a number of suitable fields	We have obtained HBIC data and carried out both winter and breeding bird surveys. High tide roost sites have also been surveyed as we have

Response number	Local Planning Authority	Comments	How will this be addressed
		exist across the proposed cable route suitable to support roosting, loafing and foraging during high-tide. These sites, and additional sites in the vicinity of the landfall area, are identified within the Solent Wader and Brent Goose Strategy (SWBGS).' ... 'Detailed consideration of these sites within the EIA is required with respect to land take and disturbance and we recommend that you seek further information from the Hampshire Biodiversity Information Centre and other appropriate bodies to supplement surveys.'	incorporated a terrestrial element to the winter bird surveys.
43	EHDC and WCC:	'An Arboricultural Implications Assessment would identify the impact of the development on existing trees and Crabdens Copse and identify suitable protection/mitigation.'	An arboricultural impact assessment will be undertaken to support the planning application.
44	WCC:	'Direct drilling should be used as opposed to works that may result in loss of any hedgerow/trees. A collaborative	Acknowledged. We will seek to avoid impacts in the first instance. This needs to be considered,

Response number	Local Planning Authority	Comments	How will this be addressed
		approach to tree protection during works is encouraged between parties.'	particularly in the context of AC cables and the DC approach to the converter station through fields.
45	PCC:	Areas outside of SPA boundaries may support important high-tide waders. The review of the Solent Wader and Brent Goose Strategy should be incorporated into any further review of the HRA and EIA.	HRA obligations will be fulfilled as part of assessment works.
46	WCC, HBC and PCC:	'We note from the report that the cable route may cross and 'unnamed watercourse' north of the B2150. We believe this water course to be the North Purbrook Steam, classified as a statutory watercourse. This watercourse is a known eel migratory route and is likely to have a resident fish population.'	Acknowledged. Currently we do not have access to this area to conduct surveys. The upstream migration and recruitment into freshwater bodies of juvenile eels occurs between March and September. Surveys using habitat traps or fine mesh seine netting, are best carried out during April/May to capture the glass eel stage. Later on in the year the elver and young yellow eel stages can be caught by electrofishing surveys, seine nets, and fyke nets. The adult eel downstream migration occurs during autumn. Adult eels are best surveyed using fyke nets or by electrofishing between September-November. It is suggested to undertake at least one survey to encapsulate the upstream

Response number	Local Planning Authority	Comments	How will this be addressed
			migration (recruitment) and one to capture the downstream migration (escapement). Eels are exceptionally sensitive and any work being undertaken beneath Purbrook stream would need to be minimally invasive, as eels are sensitive to vibrations, sound and changes in water quality.
Socio-economics			
47	PCC:	'Comments of the LHA highlight significant impacts by all road users along the routing of the cable during construction, which are mostly classified roads and from the Eastern corridor linking the eastern areas of Portsmouth to the national strategic network.'	This crosses over with the transport assessment. Impacts caused by disruption to the local and national highway network will be considered within the transport and access Chapter of the ES in relation to nuisance and disruption, fear and intimidation, traffic delay, severance and road safety of all road users. The Chapter will also consider the cumulative impact of potential road closures and diversions during the route construction.
48	PCC:	'In addition to road users there is an existing ambulance station located on Eastern Road likely to be effected by	This crosses over with the traffic management strategy. Emergency services will be taken into account as part of the ES.

Response number	Local Planning Authority	Comments	How will this be addressed
		disruption and delay to the local highway network.'	
49	PCC:	'there are a range of local businesses (shops and other services) also likely to be significantly effected by disruption and changes to the local highway network during the construction stage, notably from the junction of Bransbury Road/A288 Eastney Road to the junction of A2030 Velder Avenue/A288 Milton Road.'	Impacts on local businesses will be considered within the socio-economics Chapter of the ES. Impacts caused by disruption to the local highway network will be considered within the transport and access Chapter of the ES. There will be an impact on this junction is the cable route passes through it but the mitigation of these impacts will be included within the traffic management strategy. PCC have agreed that detailed junction capacity assessments will not be required given the temporary nature of the construction impacts.
50	HBC:	'The EIA should consider potential impacts on access land, public open land, rights of way in the vicinity of the development. Appropriate mitigation measures should be incorporated for any adverse impacts. We also recommend reference to the relevant Right of Way Improvement Plans (ROWIP) to identify	Design team to note this request from HBC with respect to PRoW. This will be picked up by the traffic and transport Chapter, although only in relation to existing PRoW given the temporary nature of construction.

Response number	Local Planning Authority	Comments	How will this be addressed
		public rights of way within or adjacent to the proposed site that should be maintained or enhanced.'	Consideration of ROWIP will therefore only be relevant for the convertor station.
51	HBC:	'Hampshire County Council as Highway Authority for Publics Rights of Way would like to make the application aware that there must be not surface alterations to the rights of way, not any works carried out which could affect their surface, without first seeking the permission of this department.'	Design team to note this request from HBC with respect to PRoW. This would form part of the planning application, with any requirements identified as part of route option appraisal. Additional plans would be required for diversion or temporary closure of PRoW.
52	HBC:	'The application will need to apply for Temporary Closure Orders of the rights of way.'	This would form part of the planning application, with any requirements identified as part of route option appraisal.
53	PCC:	A Water Framework Directive Assessment is required for all elements of the work that fall within, or have the potential to affect, a WFD water body and any protected areas therein.	WFD assessment required. Identify surface and groundwater bodies relevant to the WFD assessment; agree with EA and LLFA in PEIR.

Response number	Local Planning Authority	Comments	How will this be addressed
			Identify surface and groundwater bodies relevant to the WFD assessment, put into ES.
54	EHDC, WCC, HBC, PCC:	'The noise and vibration assessment must include any anticipated vibration impacts on groundwater i.e. increased turbidity, on Portsmouth Water's supply. Vibrations caused during development works must form part of this assessment to understand potential risks associated with turbidity.'	Turbidity is a measure of suspended solid within a liquid. Generally groundwater turbidity is not directly impacted upon by near surface activities. Turbidity in the groundwater regime is usually caused by piling or groundwater dewatering. Geotechnical engineers may have a better grasp of how to install piles without causing turbidity i.e. rotary drilling not exceed a certain speed or the use of driven piles. Groundwater turbidity must not exceed 4 NTU's. The groundwater turbidity comment could also be due to the potential for surface water run-off high in suspended solids (turbid waters) to enter the groundwater aquifer. A well drafted CEMP with best practices outlined will reduce, if not eliminate, these turbidity impacts. An issue here is how the concrete slap will be constructed and how long the slab area will be left open; if uncapped then there is potential for turbidity to impact upon the groundwater regime.

Response number	Local Planning Authority	Comments	How will this be addressed
			We will ensure that the noise and vibration team coordinates with the groundwater team where necessary.
55	EHDC, WCC, HBC, PCC:	'The study area should encompass ground and surface water features within at least 1000m when reviewing baseline conditions. There are potential impacts on groundwater abstractions due to solution features and rapid transit times between the proposed site and drinking water sources.'	Water Features survey to be completed for the area. Will also need interpretation/conceptualisation of groundwater regime to satisfy groundwater risk issue.
56	EHDC, WCC, HBC, PCC:	'The Source Protection Zones (SPZ) must be identified in any future reporting to ensure the appropriate level of risk is assigned to the risk assessments and design/operations.'	Noted and agreed.
57	EHDC, WCC, HBC, PCC:	'The risk assessment must consider the risks posed to groundwater associated with leaving the cable in-situ at the end of the cable's 40 year design life.'	Agreed. Complications here could arise as cable is founded in SPZ. The cable installation and methodology is a key consideration.

Response number	Local Planning Authority	Comments	How will this be addressed
			The use of a low permeability and inert grout would alleviate these concerns. Design Team Response- The cables are made from inert materials and hence the risk posed to ground water if the cables remain in-situ are negligible. However, if required the cables could be pulled out of the ducts.
58	EHDC, WCC, HBC, PCC:	'Hydrological Receptors - Effects of and on solution features, aquifer, water quality including turbidity must be included.'	Agreed. EIA to be updated for these risks. Suggest CEMP to be referenced and to include for both surface water and groundwater protection measures.
59	EHDC, WCC, HBC, PCC:	'Portsmouth Water would like to guarantee consultation via the LPA.'	Noted.
60	WCC, WCC, HBC, PCC:	'We are also aware of concerns by Portsmouth Water regarding disturbance to the chalk (from, for example the installation of boreholes or piles) and the potential to cause turbidity and impact	Consultations with Portsmouth Water (PW) have already taken in place, the outcome resulted to update the drilling methodology and subsequent site visits were held during ground investigations at site. Daily communication was in place with PW during site works and impact on drinking water supplies

Response number	Local Planning Authority	Comments	How will this be addressed
		drinking water supplies. This must be considered in detail in the EIA'	were unaffected. No installations were installed during ground investigations.
61	WCC, HBC:	'We would like to understand if these [the converter stations] need to be located next to the existing National Grid Substation or if there are alternative and suitable locations which would move them outside of the SPZ1 and away from the area where Karst features have been identified. We would like to see this explained in the EIA.'	Justification for the converter station location, including details of discounted options will be included. The ES will include a standalone Chapter for alternatives and design evolution. The content of which will draw upon previous optioneering studies carried out by the design team.
62	WCC, HBC, PCC:	'Chapter 12 does not specifically identify the need to discuss the potential for pollution from the proposed development in the EIA. This, along with the mitigation measures needed to protect groundwater should be included in the EIA.'	Noted and agreed.

Response number	Local Planning Authority	Comments	How will this be addressed
63	EHDC, WCC, HBC, PCC:	'The proposed route passes within SPZs for the Havant & Bedhampton Springs, the study must reflect this.'	Noted and agreed.
64	WCC, PCC:	If they haven't already, the East Solent Coastal Partnership need to should be consulted.	Noted and agreed - consultation in progress.
65	HBC:	'Southern Water's (SW) current sewerage records shows that there are multiple public sewerage infrastructure (minor and major) within the boundaries or the proposed works, please see attachments. The exact position of this public apparatus must be determined on site by the applicant. No excavation, mounding, new development/building works or tree planting should be carried out close to the existing sewers.'	This is currently under review and consultation will take with the statutory undertaken at detailed design stage.

Response number	Local Planning Authority	Comments	How will this be addressed
66	EHDC, WCC, HBC and PCC:	'Environment Surveys and Inspections must include consideration of soils, potential contamination, geology, superficial cover, bedrock, hydrogeology, solution features, source protection zones and nearby abstractions.' 'The risk assessment must consider the risks posed to groundwater associated with leaving the cable in situ at the end of the cable's 40 year design life.'	At the time of preparing their scoping opinion, the LAs had not seen a copy of the draft Preliminary Risk Assessment (RPA) that has been produced. In particular, PCC has requested sight of this in advance of commenting further. The draft PRA was submitted to Jeff Downing (CL Officer at PCC) on 14/05/18, and the Sampling Strategy and Methodology for GI works submitted 18/05/18. Response to date is that further details and specific methodology are required for each GI location in PCC area. CF emailed JD on 06/06/18 to note that we understood no planning permission was required for GI works, although we had wanted to seek approval for methodology for GI works in consultation with PCC given we had undertaken consultation with PW and EA WRT GI works at Lovedean to ensure risks to SPZ were minimised.
67	PCC:	The PRA needs to include a review of the in-house records.	This has not yet happened but will be carried out before the finalisation of the PRA for inclusion in the ES. (AJO to agree process of review of PCC data

Response number	Local Planning Authority	Comments	How will this be addressed
			with CLO on 14 May 2018 and carry out the review ahead of finalisation of the PRA)
68	EHDC, WCC, HBC and PCC:	'The proposed cable route has solution features present. These features contribute to a karstic environment with rapid transit times therefore pollution prevention is key. Consideration of the solution features must form part of the scope of work particularly in key areas i.e. close to the Lambeth Group and Chalk boundaries and Clay with Flints and Chalk boundaries.'	A number of LAs have stated that the assessment of contamination must include an assessment of solution features and karst rock conditions and how this may affect pollution transit times. However, this would be reflected in the size of SPZs produced by the EA and is not considered necessary. (AJO to discuss with relevant CLOs to agree way forward)
69	EHDC, WCC, HBC and PCC:	'Sites of geological interest should include solution features.'	Some LPAs have requested that sites of geological interest should include solution features. Unclear as to what is required here. (AJO to seek clarification from relevant CLOs)
70	EHDC, WCC, HBC and PCC:	Table 13.1 - Where Secondary A Aquifers overlie Principal Aquifers this should have a receptor assessment of High due to the potential connectivity of the aquifer and the presence of solution features.	Table 13.1 to be updated to include receptor assessment where Secondary A aquifer over Principal aquifer with a classification of High. (AJO -

Response number	Local Planning Authority	Comments	How will this be addressed
		Secondary A and B Aquifers should lie in Moderate Risk and it is recommended that Unproductive Strata is present in Low Risk.'	agreed and will be included in the assessment and ES Chapter)
71	EHDC, WCC, HBC and PCC:	'All imported soils material must be clean and inert and not pose a contaminant threat to the underlying aquifer.'	This issue will be dealt with in the Waste section. However, we would never advocate, nor would legislation permit, the importation of contaminated soils to the site.
72	EHDC, WCC, HBC and PCC:	'The assessment must be designed to understand the potential for pathway creation through impacted soils and/or long-term spill and incident management if preferential pathways are created.'	The development phase and the introduction of potential pollutants will be addressed by the Code of Construction Practice or Construction Environmental Management Plan and will not be covered specifically in the PRA or ES. (AJO to get clarification from WSP team as to where potential future contamination/pollution during the construction and operational phases of the development will be addressed)
73	EHDC, WCC, HBC and PCC:	'Operational sources of contamination should consider new preferential	The development phase and the introduction of potential pollutants will be addressed by the Code of Construction Practice or Construction Environmental Management Plan and will not be covered

Response number	Local Planning Authority	Comments	How will this be addressed
		pathways and, if relevant, Oil filled cables.'	specifically in the PRA or ES. (AJO to get clarification from WSP team as to where potential future contamination/pollution during the construction and operational phases of the development will be addressed).
74	EHDC, WCC, HBC and PCC:	'The Conceptual Site Model (CSM) should also look at the development phase as well as legacy contamination and how mitigation measures can be deployed to prevent pollution occurring during the pre-development, during and operational phases.'	Noted and agreed.
75	EHDC, WCC, HBC and PCC:	'Confirmation should be provided as to the proposed cooling options at the converter station, eg. do they involve the use of oils?'	Oil is necessary for the cooling of transformers and it the basis of any transformer design. Details of approximate quantities and measures to prevent uncontained spills will be included in the ES. The IGBTs (converter technology within the station) will be cooled using a water/glycol mixture.

Response number	Local Planning Authority	Comments	How will this be addressed
			Although reactors can be oil-cooled, air cooled reactors will be specified, to reduce the risk of oil contamination. All cables will have polymeric (XLPE) insulation and therefore oil-free.
76	EHDC, WCC, HBC and PCC:	'Details of temporary laydown areas will be required, the applicant should ensure these are low permeability and that pollution prevention measures are in place prior to use such as spill kits and incident management systems.'	Temporary laydown areas will be identified within the scheme redline. A CEMP will be prepared and provided as part of the planning application will have control measures to manage these requirements.
77	EHDC, WCC, HBC and PCC:	'Details of Horizontal Directional Drilling (HDD) locations and methodology will be required for approval prior to commencement to understand the pollution prevention methodologies employed to mitigate potential impacts on groundwater. The potential land	Noted. The location of HDDs and methodology will be included including risk mitigation.

Response number	Local Planning Authority	Comments	How will this be addressed
		contamination risks must be addressed prior to commencement.'	
78	EHDC, WCC, HBC and PCC:	'Construction details of the proposed joint bays should be provided for approval.'	Joint bay locations will be identified within the redline boundary. A typical joint-bay is 2 m (wide) x 8 m (long) x 1.5 m (deep). A further 10 m prior to the joint maybe required to allow cable "pull-back".
79	EHDC, WCC, HBC and PCC:	'The specification and location of all oil filled cables, existing and proposed, should be provided to understand the potential risks posed to groundwater in the catchment.'	N/A – There are no oil filled cables being supplied. Next generation plastic insulation. We are aware that SSE have some oil-filled 132kV cables emanating from the south of the substation and are engaging with SSE on the safe crossing of these cables.
80	EHDC, WCC, HBC and PCC:	'Details/method statement for trenchless techniques for the installation of cable ducts should be provided.'	Noted – this will be provided.

Response number	Local Planning Authority	Comments	How will this be addressed
81	EHDC, WCC, HBC and PCC:	'The preparation of a Construction Environmental Management Plan (CEMP) is supported.'	CEMP to be prepared in support of the planning application.

TABLE E4: ADDITIONAL TERRESTRIAL CONSULTATION RESPONSES

Consultee	Topic	Discussion Summary
South Downs National Park	Landscape and Visual	SDNP confirmed that they were: a) happy with the viewpoints selected b) Consider that the wider ZTV would support the rationale for viewpoint selection. c) Suggested that the two study areas (covering a 3km the second an 8km area) should be well justified and understandable. d) Sought to ensure that lighting is assessed in terms of: visual/perceptual impact of lighting in the countryside (to include the infrastructure that goes with it) and the impact upon Dark Night Skies Reserve status is considered. 'No lighting' is preferable and anything above that will need to be justified and impacts understood. Current night time views will be needed to be understood and the extent of the harm. As stated this should form part of the visual baseline evidence to enable an assessment to be undertaken. WSP Response: a) In terms of the viewpoints selected both Havant/ East Hampshire and Winchester CC are happy with the ones proposed. WSP suggested to extend (subject to the agreement of the client) the ZTV to cover a 8 km area to be comprehensive. There are already three viewpoints which will lie beyond 3 km but within 8 km which should be sufficient but can be reviewed once the ZTV has been run.

		b) In terms of the different study areas, these will be explained and justified in the LVIA. A 3 km study area will pick up on local landscape character, whilst a 8km study area would refer to district / county level assessments. c) In terms of lighting the EIA team is determining the need for a separate lighting assessment. The proposed converter station will not be illuminated during the hours of darkness. There will be lighting around the perimeter road but this would only be activated in the event of detection of an intruder by motion sensors. WSP requested confirmation of whether the baseline should gather evidence on current night time views.
South Downs National Park	Landscape and Visual	SDNP agreed with the suggestions in previous email (see above). SNDP added that in relation to the lighting the need for night time views is reduced however they would expect to see lighting covered in the LVIA and not just reference made to the Lighting Assessment. It will require an understanding of the impact in relation to the 3 types of harm (impact upon DNS Reserve Status – info online and in pack of evidence submitted with the Local Plan on their website, ecological harm – specific impact upon bats (and other species) and species they reply upon, visual impact relating to people's perception and subsequent wellbeing) that can potentially be generated and ensure each is addressed through the lighting design. Motion sensors are a great way of mitigating for harm but there are others.
South Downs National Park	Landscape and Visual	SDNP confirmed that it would be beneficial as background information to have an 8km ZTV which would form part of the initial baseline. There would be two study areas; an 8km study area referring to district / county level assessments and more long distance views agreed and a 3km which would focus on local landscape character and views. In terms of lighting, the proposed converter station will be a dark site, with emergency lighting which would only be used in case of an emergency. The LVIA would consider the

		visual impact of the Proposed Converter Station on the DNS reserve and visual perceptions whilst ecological harm would be covered by our ecologists. SDNP confirmed that they were happy with this approach as long lighting was covered and explained in the ES and relevant Chapters including project description. Consideration will also be given to alternative lighting options.
HBC, EHDC and WCC	Landscape and Visual	HBC, EHDC and WCC confirmed that they were happy with the revised viewpoint locations, the creation of a second study area and did not consider that a further ZTV was required.
HBC, EHDC and WCC	Landscape and Visual	Confirmation that all parties were satisfied with the planned approach of 3 wirelines and 3 fully rendered photomontages.
HCC	Archaeology	Archaeological Written Scheme of Investigation for the archaeological monitoring of geotechnical works. Issued by WSP for information only as the monitoring is not a planning requirement. The monitoring was targeted to 17 geotechnical trial pits in the area of the proposed convertor stations. Geotechnical boreholes were not proposed to be monitored, as this would provide limited archaeological information, although the logs descriptions following the work will be consulted. It was not proposed to monitor the occasional geotechnical trial pits planned along on the Proposed Cable Route south of the proposed Convertor Station site, or at the Eastney Landfall Site, as these are sparsely placed and thus have little potential to clarify the broader archaeological potential in these areas.

		HCC responded that there may have been a missed opportunity for those pits along the cable route that were not monitored, but recognised that they were isolated and too few to reveal archaeological potential. WSP reiterated that the results of the boreholes and trial pits along the cable route would be reviewed by an archaeologist.
Natural England	Ecology/ Ground Investigation locations	Natural England were consulted regarding the borehole locations and trial pits and the requested ground investigation locations were moved out of Denmead Meadows. It was also agreed that sites would be assessed by an ecologist prior to work starting/agreed. Natral England were concerned with the BH26 and advised further discussions on this. Natural England agreed to locations in Portsmouth being conducted outside of wintering bird season.

APPENDIX F – MARINE CUMULATIVE ASSESSMENT MATRIX

Figure F1: Projects/plans and Marine Licence Case References to be considered for cumulative assessment

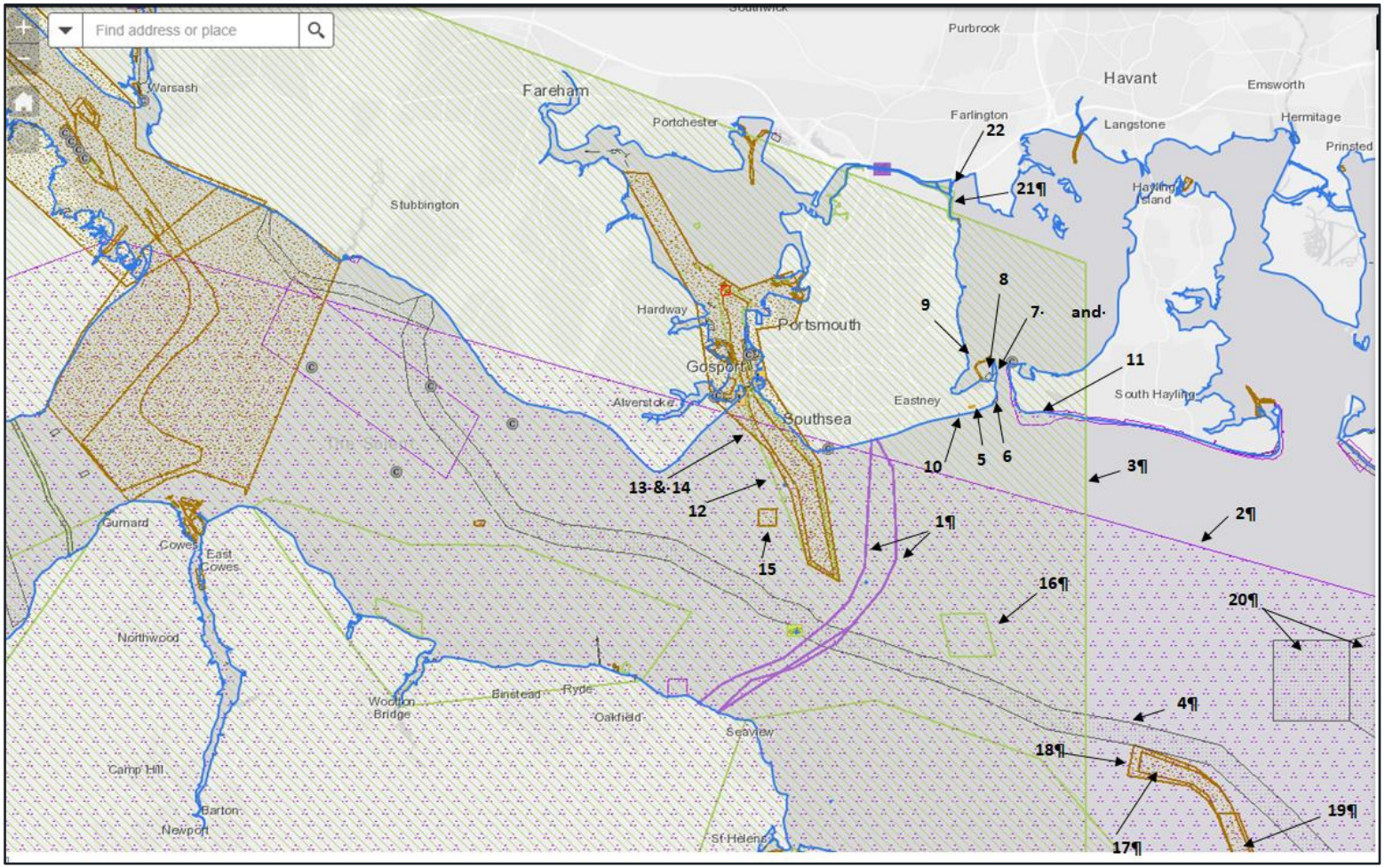
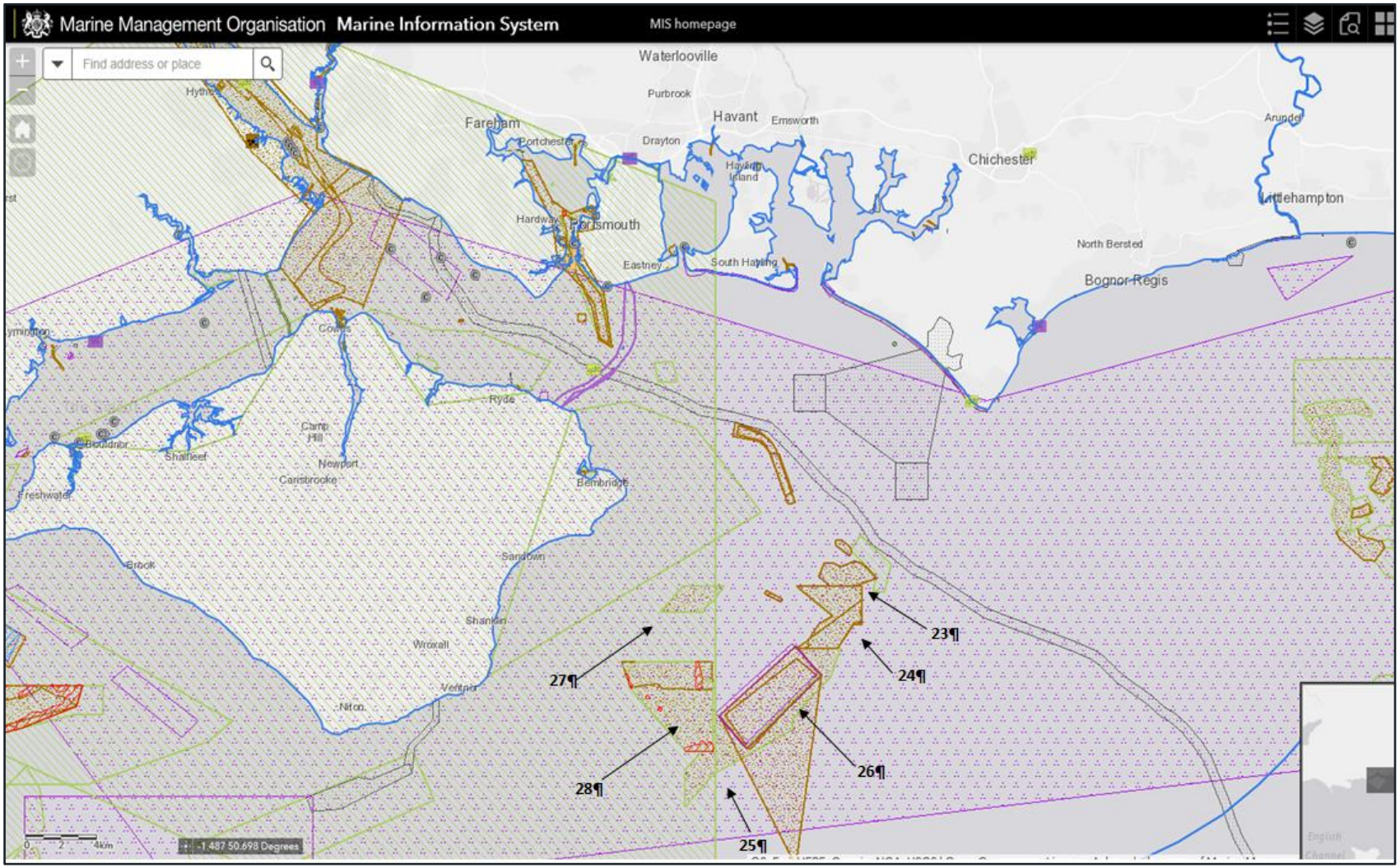


Figure F2: Projects/plans and Marine Licence Case References to be considered for cumulative assessment



1.1.55. Project/plans shown in Figures F1 and B2 and in the table below have been sourced from interrogation of the MMO's portal located at http://defra.maps.arcgis.com/apps/webappviewer/index.html?id=3dc94e81a22e41a6ace0bd327af4f346. Further projects and plans have been included from the PINs Programme of Projects and relevant LPA planning portals. .

1.1.56. This list is not exhaustive and specialists will carry out their own investigations as to which projects/plans are relevant to their assessment and add to this list where possible. Further advice and agreement will be sought from PINs and other key consultees including MMO and Natural England. Further information relating to each item can be obtained through the MMO, PINs website and LPA planning portal. Distances are approximate and are measured from the closest point of the project/plan polygon as shown on the MMO portal interactive map (where relevant) to the closest point of the marine cable corridor shapefile (as of 14/08/2018).

1.1.57. The ID number in the Table below represents the relevant polygon number identified in Figure B1 and B2, where the project is located.

Cumulative Projects					**Stage 1**		**Stage 2**			
ID No.	**Application /Case Ref.**	**Applicant and Brief Description**	**Distance from Project**	**Tier**	**Within Zone of influence (Zol)?**	**Progress to stage 2?**	**Overlap in temporal scope?**	**Scale and nature of development likely to be significant effect?**	**Other Factors**	**Progress to Stage 3/4?**
~~1.~~	~~MLA/2014/00019/4~~	~~BT Fibre Optic – Decommissioning/Construction of new works.~~					~~No -Licence end date 30.09.2016~~			
~~2.~~	~~MLA/2012/00223~~	~~Environment Agency - Tracer Deposit Area~~					~~No -Licence end date 26.06.2015~~			
3.*	MLA/2017/00473/1	Blue Seas Protection Charity - licence for removal ghost fishing and abandoned fishing nets, metals and plastics.	0 km				Licence end date November 2018			

4.*	MLA/2016/00209/1	National Grid - IFA2 HDVC Interconnector from France to the UK. UK landfall at Lee-on-the-Solent	5 km				Licence end date January 2117			
~~5.~~	~~MLA/2014/00200~~	~~Qinetic Group – Emergency Works Fraser Range Sea Wall Repairs Southsea /Eastney~~					~~No - Licence expired 30.09 2014~~			
6.*	MLA/2016/00064/3	Southern Water Services Ltd - Flood defence improvement scheme stretching for 4.5 km from Old Portsmouth to Eastney. Replacement of existing coastal sea defences with a rock revetment, and maintenance of existing structures.	Approx. 0.25 km in entrance to Langstone Harbour				Licence end date 31.10.2017			
	16/00255/FUL (Portsmouth City Council T&CPA application)						Submitted (Terrestrial planning work to start 2019)			
7.*	MLA/2018/00044/1	Eastney Cruising Association - Gabion repairs.	Approx. 700 m				Licence end date 22.01.2019			
7a.*	MLA/2017/00041/1 - Regional Licence for Low Impact Maintenance Works	RNLI East Division - Portsmouth Lifeboat Station. 10 year maintenance licence for 1. Maintenance to Moorings 2. Maintenance to Pontoon Berths 3. Minor beach re-profiling works 4. Maintenance to Lifeboat Station Boathouses, slipways & launch ramps 5. Maintenance Activities associated with safety of lifeboat launch and recovery 6. Maintenance to beach lifeguard	Approx. 900 m				Licence end date 31.05.2027			

		units 7. Navigational Dredging								
8.	~~MLA/2012/00067 Pontoon berth holds two~~	~~Pontoon C extension, Eastney lake~~					~~No - Licence end date 30.09.2013~~			
9.*	MLA/2015/00216/1	Premier Marinas (Southsea) Ltd - Southsea Marina Maintenance Dredging of Marina Entrance - three campaigns over a ten-year licence period.	1.5 km in Eastney and Lock Lake in Langstone Harbour				Licence end date 16.11.2025			
~~10.~~	~~MLA/2017/00310~~	~~Beasley Christopher Ltd - Maintenance of existing works. surface water outfall at Melville Road.~~					~~No - Licence end date 06.08.2018~~		~~n/a~~	~~No~~
11.*	MLA/2017/00104	Eastern Solent Coastal Partnership - South Hayling Beach Management Plan (2017-2022) Implementation. Maintaining Eastoke beach height / profile through beach nourishment. As this is an ongoing activity works are generally programmed to take place in early March and / or September each year. Each beach management campaign is expected to last for 2-4 weeks.	Approx. 700 m				Licence end date September 2027			

~~12.~~	~~MLA/2011/00185/1~~	~~Westminster Dredging Company Ltd - Site Investigation for Capital Dredging Works, Portsmouth.~~					~~No - Licence end date 22.11.2012~~			
~~13.~~	~~MLA/2013/00342/4~~	~~Defence Infrastructure Organisation (DIO) - Dredging of the Portsmouth Harbour and approach channel, and disposal.~~					~~No - Licence end date 17.06.2018~~			
14.*	MLA/2017/00478	DIO - HMNB Portsmouth Maintenance Dredging and Disposal. Dredging of the Portsmouth Harbour and approach channel using trailing suction hopper dredger (TSHD), and disposal.. Ten year licence with a total disposal quantity of approximately 2,300,000 tonnes.	Approx. 1.5 km				Licence end date 27.07.2028			
15.*	MLA/2017/00381	Mary Rose Trust - Annual visual inspection of Mary Rose site and removal of sediments required to locate our reference point on the mooring block.	Approx. 4.7 km				Licence end date 18.09.2018 – not sure if this will be applied for in subsequent years if this is an annual inspection.			
16.*	MLA/2017/00014	Maritime Archaeology Sea Trust - HMS Invincible Project. Excavation of an internationally significant part of military heritage, to archaeologically excavate, record, conserve and display the remains of the HMS INVINCIBLE.	Approx. 2 km				Licence end date 30.04.2020			

~~17.~~	~~34302/0901 14/11~~	~~Associated British Ports – Southampton. Dredged Material Disposal at to ensure the safe navigation of commercial vessels within the harbour area.~~		~~1?~~			~~Licence end date 28.02.2018~~			
18.*	MLA/2014/0 0592/1	Associated British Ports – ABP Southampton - Navigational Maintenance Dredge. This application is a renewal of the Port's Navigational Maintenance Dredge licence to maintain safe navigation of the harbour and its approaches.	Approx. 2 km				Licence end date 31.10.2025			
~~19.~~	~~MLA/2012/0 0326/2~~	~~Esso Petroleum Company – Esso Fawley Marine Terminal Maintenance Dredging and Disposal. Renewal Nab Channel Dredged Material Disposal (Source Site).~~					~~No - Licence end date 7.11.2015~~			
~~20.~~	~~MLA/2011/0 0051/6~~	~~EA - Medmerry Managed Realignment (MMR) scheme. The flood defence scheme including construction of inland flood banks.~~					~~No - Licence end date 01.08.2014~~			
21.*	MLA/2014/0 0506/1	The Eastern Solent Coastal Partnership - North Portsea CFERM Scheme - Phase 1 works.	0 km				Licence end date 31.10.2016			
	14/01387/F UL PO3 5LY – Portsmouth City Council	Coastline Between Ports Creek Railway Bridge And Kendall's Wharf Portsmouth - Construction of new coastal defences consisting of raised earth					Decision for approval in February 2015. Development to			

		embankments with rock armour on the seaward side, together with wave walls to abut the A2030 Eastern Road bridge to tie into the new embankments (along the alignment of the existing coastal defences).					be begun within 3 years.			
~~22.~~	~~MLA/2017/00005~~	~~Portsmouth City Council - The A2030 Eastern Road Water Maintenance Works. The bridge crosses over the tidal waters of Langstone Harbour, connecting the A2030 from the mainland at Farlington to Portsea Island.~~					~~Licence end date 12.10.2018~~			
23.*	MLA/2012/00195/5 Aggregate dredging Area 395 licence renewal	Tarmac Marine Dredging Ltd. - To obtain a Marine Licence to allow aggregate dredging operations at Area 395 in the outer approaches to the Solent to continue.	Approx. 2 km				Licence end date 31.08.2027			
24.*	MLA/2012/00374/5 Area 351 Full Term Licence Application MLA/2012/00375/4 Area 351 Full Term Licence Application	Tarmac Marine Dredging Ltd/Volker Dredging Ltd The purpose of this application is to obtain a marine licence that will permit continued marine aggregate extraction at Area 351, east of the Isle of Wight.	Approx. 3 km				Licence end date 31.12.2035			

25.*	MLA/2012/00302/5 Marine aggregate dredging licence Area 451 renewal	Westminster Gravels Ltd. - Marine aggregate dredging licence Area 451 renewal					Licence end date 31.03.2028			
26.*	MLA/2013/00216/3 Disposal of dredged material	Home and Communities Agency, Cowes Outer Harbour Project Dredge disposal renewal Licence ref: L/2013/00306/3					Licence end date: 01.01.2024			
	MLA/2013/00321/3 Navigational dredging (maintenance)	Premier Marinas (Hamble) Ltd, Swanwick Marina Maintenance Dredge & Lifting Dock Licence ref: L/2013/00343/2					Licence end date: 21.10.2023			
	MLA/2013/00371/1 Disposal of dredged material	Cowes Yacht Haven, Maintenance Dredging 2014 Licence ref: L/2014/00061/1					Licence end date: 05.03. 2020			
	MLA/2013/00485/3 Disposal of dredged material	Premier Marinas Ltd, Chichester Marina Approach Channel Licence ref: L/2014/00154/3					Licence end date: 29.02.2024			
	MLA/2014/00004/5 Disposal of dredged material	Marina Developments Ltd, Sparkes Marina Maintenance dredging Licence ref: L/2014/00144/4					Licence end date: 30.04.2024			

	MLA/2014/00208/1 Disposal of dredged material	Marina Developments Ltd, Shamrock Quay - Maintenance Dredging Licence ref: L/2014/00407/1					Licence end date: 02.12.2024			
	MLA/2014/00210/2 Disposal of dredged material	Marina Developments Ltd, Ocean Village Marina – maintenance dredging Licence ref: L/2014/00388/2					Licence end date: 30.11.2024			
	MLA/2014/00288/1 Disposal of dredged material	Marina Developments Ltd, Northney Marina – maintenance dredging Licence ref: L/2014/00368/1					Licence end date: 20.12.2024			
	MLA/2014/00392/5, Disposal of dredged material	Premier Marinas Ltd, Gosport Marina Maintenance Dredge Licence ref: MLA/2014/00392/5					Licence end date: 16.11.2024			
	MLA/2015/00285/1 Disposal of dredged material	Marina Developments Ltd, Hythe Marina Village (Approach Channel) - Maintenance Dredging Licence ref: L/2015/00355/1					Licence end date: 30.04.2026			
	MLA/2014/00420/1, Disposal of dredged material	Premier Marinas Ltd, Port Solent Approach Channel Dredge Licence ref: L/2015/00066/1					Licence end date: 08.03.2025			

	MLA/2014/00592/1, Disposal of dredged material	Associated British Ports, Southampton, ABP Southampton – Maintenance Dredge Licence Licence ref: L/2015/00330/1					Licence end date: 31.10.2025			
	MLA/2015/00216/1, Disposal of dredged material	Premier Marinas (Southsea) Ltd, Southsea Marina Maintenance Dredge of Marina Entrance Licence ref: L/2015/00402/1					Licence end date: 16.11.2025			
	MLA/2015/00284/1 Disposal of dredged material	Marina Developments Ltd, Saxon Wharf – maintenance dredging Licence ref: L/2016/00279/1					Licence end date: 13.10.2026			
	MLA/2015/00287 Disposal of dredged material	Marina Developments Ltd, Port Hamble Marina - Maintenance Dredging Licence ref: L/2015/00381					Licence end date: 31.03.2026			
	MLA/2015/00331 Disposal of dredged material	Lafarge Tarmac Ltd, Burnley Wharf Silt Disposal Licence ref: L/2015/00416					Licence end date: 02.12.2025			
	MLA/2015/00426/1 Disposal of dredged material	Thornham Marina Ltd, Thornham Marine Maintenance Dredge Licence ref: L/2016/00007/1					Licence end date: 12.01.2019			

	MLA/2016/00025/2 Disposal of dredged material	Esso Petroleum Company Ltd, Esso Fawley Marine Terminal Maintenance Dredging and Disposal Licence Renewal Licence ref: L/2016/00108/2					Licence end date: 14.04.2026			
	MLA/2016/00036/1 Disposal of dredged material	Portsmouth Naval Base Property Trust, Portsmouth Heritage Pontoon and HMS Warrior Dredging and Construction Works, Licence ref: L/2016/00101/1					Licence end date: 01.05.2020			
	MLA/2016/00093/2 Disposal of dredged material	Cowes Harbour Commission, Maintenance Dredge of the area in and around Shepards Wharf Marina and Town Quay (Cowes) Licence ref: L/2016/00191/2					Licence end date: 29.06.2026			
	MLA/2016/00098 Disposal of dredged material	Royal Yacht Squadron, RYS Jubilee Haven Licence ref: L/2016/00132					Licence end date: 06.06.2026			
	MLA/2016/00215 Disposal of dredged material	Marina Developments Ltd, Mercury Yacht Harbour Licence ref: L/2016/00323					Licence end date: 13.10.2026			
	MLA/2016/00216/1 Disposal of dredged material	Marina Developments Ltd, Hamble Point Marina - Maintenance Dredging Licence ref: L/2016/00318/1					Licence end date: 13.10.2026			

	MLA/2016/00255/2 Disposal of dredged material	Dean & Reddyoff Ltd, Haslar Marina Maintenance Dredge Licence ref: L/2016/00274/1					Licence end date: 11.09.2021			
	MLA/2016/00341/3 Disposal of dredged material	BP Oil (UK) Ltd, BP Oil UK Ltd - Hamble jetty and approaches Maintenance Dredging Licence ref: L/2017/00105/2					Licence end date: 03.04.2027			
	MLA/2016/00355/1 Disposal of dredged material	Kendall Bros. (Portsmouth) Ltd, Kendalls wharf aggregate washings silt disposal Licence ref: L/2016/00347/1					Licence end date: 29.11.2019			
	MLA/2016/00421 Disposal of dredged material	Southampton International Boat Show Ltd, Southampton Boat Show Maintenance Dredge Licence ref: L/2017/00058					Licence end date: 26.02.2027			
	MLA/2016/00433/1 Disposal of dredged material	Kendall Bros (Southampton) Ltd, Maintenance Dredging at Kendalls Wharf Licence ref: L/2017/00466/1					Licence end date: 30.11.2020			
	MLA/2016/00446 Disposal of dredged material	Cowes Corinthian Yacht Club Ltd, CCYC Marina maintenance dredge Licence ref: L/2017/00246					Licence end date: 24.07.2027			

	MLA/2016/00471 Disposal of dredged material	Emsworth Yacht Harbour Ltd, Emsworth Yacht Harbour Maintenance Dredge Licence ref: L/2017/00052					Licence end date: 30.04.2019			
	MLA/2016/00484 Disposal of dredged material	Royal Naval Sailing Association, RNSA - Alliance, Haslar Pontoon & Hornet Licence ref: L/2017/00106					Licence end date: 27.04.2027			
	MLA/2016/00501 Disposal of dredged material	Oceanic Estates Ltd, Hythe Marine Park Maintenance Dredge Licence ref: L/2017/00116					Licence end date: 25.04.2027			
	MLA/2016/00507/1 Disposal of dredged material	Tarmac Ltd, Bedhampton Approach Channel and Berth Maintenance Dredge Licence ref: L/2017/00084/1					Licence end date: 16.03.2027			
	MLA/2016/00509 Disposal of dredged material	Cemex UK, Leamouth Wharf Silt Disposal Licence ref: L/2017/00090					Licence end date: 28.02.2027			
	MLA/2017/00094 Disposal of dredged material	Raymond Brown Aggregates, Marchwood Wharf - Silt Disposal Licence ref: L/2017/00201					Licence end date: 16.11.2027			

	MLA/2017/00095/1 Disposal of dredged material	Tarmac Trading Ltd, Bedhampton Silt Disposal Licence ref: L/2017/00197/1					Licence end date: 09.10.2027			
	MLA/2017/00105 Disposal of dredged material	Gosport Ferry Ltd, Gosport Ferry Clarence Wharf Maintenance Dredging Licence ref: L/2017/00148					Licence end date: 02.07.2027			
	MLA/2017/00174 Disposal of dredged material	Portsmouth City Council, RE: Portsmouth International Ferry Port - Berth 2 Deepening Licence ref: L/2018/00029					Licence end date: 17.01.2019			
	MLA/2017/00308 Disposal of dredged material	Trafalgar Wharf Ltd, Trafalgar Wharf Approach Channel Licence ref: L/2017/00406					Licence end date: 31.10.2027			
	MLA/2017/00478 Disposal of dredged material	Defence Infrastructure Organisation, HMNB Portsmouth Maintenance Dredging and Disposal Licence ref: L/2018/00293					Licence end date: 27.07.2028			
	MLA/2018/00082 Disposal of dredged material	Beaulieu Enterprises Ltd, Buckler's Hard Maintenance Dredge Licence ref: L/2018/00279					Licence end date: 29.09.2028			

	MLA/2018/00133 Disposal of dredged material	Chichester Harbour Conservancy, Bosham Quay Dredge Licence ref: L/2018/00215					Licence end date: 30.04.2019			
	MLA/2018/00167 Disposal of dredged material	Premier Marinas (Gosport) Ltd, Gosport Marina - Endeavour Quay Link Pontoon Dredge Licence ref: L/2018/00261					Licence end date: 31.08.2020			
27.*	MLA/2017/00227	Hansen aggregates Marine Ltd. - Aggregate Extraction Area 372/1.	Approx. 8.5 km				Licence end date 21.01.2029			
28.*	MLA/2012/00320/6	Volker Dredging Ltd/Cemex UK marine Ltd - Area 340 full term licence application.	Approx. 15 km				Licence end date 31.08.2035			
30*		Oil and Gas Authority (OGA) 31st Offshore Licensing Round	Overlap		The AQUIND marine cable corridor is intersected by blocks 99/12, 99/12 and 99/14		Blocks not yet awarded.			
31.	NSIP application EN010024	Navitus Bay Wind Park – the project has been refused in 2015, and the developer has chosen not to appeal the decision of the minister. We will monitor future developments of					None			

		this project and include cumulative impacts assessments where appropriate.								
32.	NSIP application EN010032	Rampion Wind Farm - is currently in the commissioning and testing phase and is expected to be fully operational by late 2018. The Project will only be considered with regard to any possible asset management activities where relevant.					None			
33*	None	AQUIND Interconnector in French EEZ and territorial waters.	0 km							
34	Fécamp Offshore Wind Farm									
35	Dieppe Le Tréport Offshore Wind Farm									
*Those rows marked with an asterisk might overlap temporally or geographically with the Aquind works and are considered to be relevant to cumulative assessment. Further work will be undertaken on the cumulative impact assessment in accordance with PINs Advice Note Seventeen.										