8.3 Onshore Air Quality and Dust

1060. This chapter of the Scoping Report considers the potential likely effects of the Project associated with onshore air quality and dust, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the onshore ECC, landfall area and the OCS zone.

1061. The onshore air quality assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation;**
- **Chapter 8.9 Traffic and Transport; and**
- **Chapter 9.2 Human Health.**

8.3.1 Study Area

1062. The construction phase of the onshore elements of the Project may give rise to dust and fine particulate matter from construction-related activities, emissions from Non-Road Mobile Machinery (NRMM) and construction road traffic on the Affected Road Network (ARN). These aspects will be assessed and presented at the PEIR stage.

1063. Offshore air quality impacts are proposed to be scoped out of the assessment, as they are unlikely to be significant (discussed further in **Chapter 7.14 Offshore Air Quality**).

1064. Within the PEIR, the Onshore Air Quality Study Area (hereafter referred to as 'the Study Area') will be defined using the criteria detailed below:

- Dust and fine particulate matter emissions during the construction phase:
  - Human receptors within 250m of the Onshore Development Area (for the PEIR) and / or within 50m of trackout (i.e. the transport of dust and dirt from the construction site onto the public road network) routes, extending 250m from the Onshore Development Area at the trackout location; and
  - Ecological receptors within 50m of the Onshore Development Area and / or within 50m of trackout routes used by construction vehicles on the public highway, extending up to 250m from the Onshore Development Area at the trackout location.
- NRMM emissions during the construction phase:
  - Human and ecological receptors within 200m of the Onshore Development Area where NRMM will be located.
- Road traffic emissions during the construction phase:
  - Human and ecological receptors within 200m of all roads that trigger the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) traffic screening criteria (IAQM & EPUK, 2017) and adjoining roads within 200m, referred to as the ARN.

1065. For the purposes of this scoping chapter, the Onshore Scoping Area (**Figure 1-2**, defined in **Chapter 1 Introduction**) has been used to define the existing environment noted below.

8.3.2 Existing Environment

1066. Air quality effects arising from the construction of projects of this nature are typically associated with the impacts of dust generation and road traffic emissions. The spatial extent of the road network which will be utilised by the Project is not yet fully defined but is likely to include road links within ERYC jurisdiction, as well as that of Hull City Council. As such, at this stage, baseline air quality conditions have been considered within both local authority areas.

1067. The Onshore Scoping Area is located within ERYC's area of jurisdiction. The latest air quality Annual Status Report (ASR) (ERYC, 2023) notes that air quality within the area is good, and no statutory AQMAs have been declared. The Onshore Scoping Area is predominantly rural in nature and therefore higher levels of pollutants are likely to occur in closer proximity to major roads and more densely populated areas in East Riding of Yorkshire such as Beverley and Hornsea, as well as residential areas in Kingston upon Hull.

1068. Roads within Hull City Council's area of jurisdiction may be used by Project-related construction phase traffic to access the port within the city centre. Hull City Council has declared a statutory AQMA (the Hull AQMA No.1) within the city centre for exceedances of the nitrogen dioxide (NO_2) annual mean due to road traffic emissions from the A63 trunk road. The latest air quality ASR (Hull City Council, 2023) published by Hull City Council show that NO_2 concentrations continue to fall across the city, and there were no exceedances of the annual mean objective in 2022, including within the AQMA. The ASR also notes that there are currently numerous on-going highways-related changes across the city which are expected to improve air quality and result in a future revocation of the AQMA. Elsewhere within the city, the focus is to continue to reduce pollutant concentrations by implementation of several actions to improve air quality.

8.3.2.1 Sensitive Receptors

1069. The following receptors may be sensitive to changes in air quality:

- Human receptors present across the Onshore Scoping Area, and more isolated residential properties, that are within 250m of dust generating construction works, 200m of construction NRMM and within 200m of roads along which project generated traffic may travel; and
- Designated ecological sites (including Special Protection Areas (SPA), Special Areas of Conservation (SAC), Ramsar Sites, Sites of Special Scientific Interest (SSSI), Ancient Woodlands and Local Nature Reserves (LNR)), where these sites contain habitats or features which are sensitive to dust within 200m of construction work and / or sensitive to changes in airborne pollutant concentrations or nitrogen and / or acid deposition within 200m of the ARN may also be affected. The designated sites within the Onshore Scoping Area are presented in **Table 8-13** in **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation**.

8.3.3 Potential Impacts

8.3.3.1 Potential Impacts during Construction

1070. Impacts during construction may occur at human and ecological receptors as a result of the generation of dust and particulate matter during onshore construction works, e.g. from earthworks, stockpiling of stripped soils, establishment and use of temporary construction compounds to support onshore construction activities, onshore export cable and Transition Joint Bay (TJB) installation, landfall works, construction and landscaping works within the OCS zone, etc.

1071. Impacts may also occur as a result of exhaust emissions (such as nitrogen dioxide (NO_2) and particulate matter) from construction phase plant (i.e. NRMM) and road vehicle movements during construction. These emissions will add to existing pollutant concentrations at human receptors and pollutant concentrations and deposition levels of pollutants at designated ecological sites. As such, all dust and air quality impacts during construction have been scoped into the EIA.

8.3.3.2 Potential Impacts during Operation

1072. It is anticipated that air quality impacts during the operational phase would be negligible. During operation, the infrastructure within the OCS zone (including OCS(s) and ESBI) would not generate any emissions to air, with the exception of potential backup-generators that may be required during the operational phase.

1073. Details surrounding the number and capacity of back-up generators that may be required during the operational phase are not yet known and it is unlikely that this level of information would be available pre-consent; however, any local air quality impact is very unlikely to be significant. Given their purpose, such plant operate very infrequently, although need to be regularly tested, but typically this is for a short time, on a periodic basis, such as weekly or monthly. Generators which have a thermal input rating greater than 1 MWth will require an operational Environmental Permit. Emergency standby generators which are tested <50 hours/year are exempt from the 'Specified Generator' requirements, but they are still classed as 'Medium Combustion Plants'. The new units would be considered in aggregate capacity, according to the rated thermal input not electrical output. Depending on various factors including the location, a Standard Rules Permit may be required. The Applicants will apply for and have in place the requisite Permit(s) for its back-up power provision at the appropriate time, likely in the post-consent stages of the Project.

1074. Maintenance activities would generate a nominal amount of additional road vehicles on an infrequent basis, which would not give rise to any significant air quality effects. There are not anticipated to be any sources that would generate dust emissions during the operation of the Project, given the onshore export cable will be buried and the infrastructure within the OCS zone would only require infrequent maintenance activities.

1075. It is therefore proposed to scope operational phase air quality impacts out of the EIA. This is consistent with the approach agreed by the Planning Inspectorate for other comparable offshore wind farm projects, such as Hornsea Project Four, Sheringham Shoal and Dudgeon Extension Projects, and Dogger Bank South.

8.3.3.3 Potential Impacts during Decommissioning

1076. It is anticipated that decommissioning impacts on local air quality would be similar in nature to those of construction, although the magnitude of impact is likely to be lower.

1077. The same potential impacts identified for construction will therefore be scoped in (and out) of the EIA for the decommissioning phase (as per **Table 8-4**).

8.3.4 Potential Cumulative Effects

1078. There is potential for cumulative effects to arise in which other projects or plans could act collectively with the Project to affect onshore air quality and dust receptors. These cumulative impacts may affect both human and ecological receptors. Therefore, cumulative effects related to air quality and dust are scoped into the EIA. The CEA will follow the approach outlined in **Chapter 5 EIA Methodology**.

1079. Any other project with the potential to result in impacts that may act cumulatively with the Project will be identified during consultation and following a review of available information these projects would then be included in the CEA.

1080. As no potential effects have been identified during the operational phase, the proposed Project is not anticipated to contribute to cumulative effects with other onshore emission sources. It is therefore proposed that operational cumulative onshore air quality effects should be scoped out of the EIA.

1081. The assessment will consider the potential for significant cumulative effects to arise due to the construction and decommissioning of the Project, including infrastructure at landfall and within the onshore ECC and OCS zone, in the context of other developments that are existing, consented or at application stage.

8.3.4.1 Summary of Scoping Proposals

1082. **Table 8-4** outlines the onshore air quality impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities, and as additional project information and site-specific data become available.

Table 8-4 Summary of Impacts Proposed to be Scoped In (✓) and Scoped Out (X) for Onshore Air Quality

Potential Impact	Construction	Operation	Decommissioning
Impacts of emissions of dust on human and ecological receptors	✓	x	✓
Impacts of emissions from plant and machinery on human health and ecological sites	✓	x	✓
Impacts of emissions from road traffic on human health and ecological sites	✓	x	✓
Cumulative impacts	✓	x	✓

8.3.5 Approach to Data Gathering

1083. Based on the approach taken to other infrastructure project of this nature within the area, it is expected that there will be sufficient data available from monitoring undertaken by the relevant local authorities as part of their statutory duties for use in the air quality assessment. Both ERYC and Hull City Council have comprehensive networks of both continuous analyser and passive diffusion tube monitoring sites across their jurisdictions. As such, it is not proposed to collect any primary datasets (i.e. a project-specific air quality survey) for the assessment. This will be reviewed once the Onshore Development Area for the PEIR is available to refine the Study Area to ensure that appropriate data are available and discussed and agreed with stakeholders through the EPP.

1084. It is anticipated that 2022 (or if available 2023) monitoring data will be used in the assessment to characterise baseline conditions. This would be agreed with the relevant authorities through the EPP.

1085. The sources of information that will be used to inform the baseline assessment are listed in **Table 8-5** and include:

- Air quality monitoring data collected by the local authorities and reported in the annual ASRs (ERYC (2023); Hull City Council (2023));
- Defra's mapped background pollutant concentrations for 1km x 1km grid squares across the UK (Defra, 2020); and
- The Air Pollution Information System (APIS) website (UK Centre for Ecology and Hydrology (UKCEH), 2024) for background pollution concentrations and deposition rates at designated ecological sites.

Table 8-5 Desk-Based Data Sources for Onshore Air Quality and Dust

Data Source	Date	Data Contents
ERYC Air Quality ASR 2023	2018 to 2022	Local monitoring data and baseline information
Hull City Council Air Quality ASR 2023	2018 to 2022	Local monitoring data and baseline information
Defra Local Air Quality Management (LAQM) Support Portal	Assessment years	2018 1km x 1km grid background pollution maps
Background pollutant mapping data	Assessment years	Defra 1km x 1km background pollution mapping
MAGIC GIS resource	2024	Designated ecological site information
UKCEH APIS App	2024	Details of Critical Levels and Loads for ecological habitats

8.3.6 Approach to Assessment

1086. Existing air quality conditions within the Study Area will be characterised using the data sources as identified in **Table 8-5**. Potential sensitive receptors will be identified using Ordnance Survey (OS) mapping data (2024) for human receptors and the Defra MAGIC website (2024) for designated ecological sites. No field surveys are proposed to inform the characterisation of the existing environment.

1087. The air quality assessment will be undertaken in accordance with the following guidance documents:

- Defra (2022) Local Air Quality Management Technical Guidance LAQM.TG (22);
- IAQM (2024) Guidance on the Assessment of Dust from Demolition and Construction;
- IAQM and EPUK (2017) Land-Use Planning and Development Control: Planning for Air Quality;
- IAQM (2020) A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites;
- JNCC (2021) Guidance on Decision Making Thresholds for Air Pollution; and
- Natural England (2018) Natural England's Approach to Advising Competent Authorities on the Assessment of Road Traffic Emissions under the Habitats Regulations.

1088. An assessment of dust generated during construction will be undertaken in accordance with IAQM guidance (IAQM, 2024). The assessment is risk-based, and the risk of dust impacts will be determined for both human and ecological receptors in proximity to the construction works. Mitigation measures will be recommended which are commensurate with the identified risk, to ensure that significant impacts would not occur.

1089. During construction, NRMM and plant can increase air emissions which may impact upon human and ecological receptors. Technical guidance provided by Defra (Defra, 2022) states that emissions from NRMM on construction sites are typically unlikely to lead to significant air quality impacts. However, intensive construction activities, for example trenching crossing technique works, may temporarily increase pollutant concentrations in the vicinity of receptors. The location of human and ecological receptors in relation to construction works will be reviewed to determine whether any further assessment of emissions from NRMM is required. If required, this assessment may be qualitative or quantitative depending on the scale and nature of activities, their duration and existing air quality conditions.

1090. The increase in construction traffic flows generated by the Project will be screened using criteria in IAQM and EPUK (IAQM and EPUK, 2017) and Natural England (Natural England, 2018) guidance. Where traffic flows exceed the screening criteria and there are relevant human or ecological receptors located within 200m of the road, a detailed dispersion modelling assessment will be undertaken to consider impacts at these locations. Concentrations of NO2 and particulate matter (PM10 and PM2.5) will be predicted at human receptors, and concentrations of oxides of nitrogen (NO_x), ammonia (NH_3) and associated nutrient nitrogen and / or acid deposition will be calculated at ecological receptors. The significance of effects at human receptors will be determined in accordance with IAQM and EPUK guidance (IAQM and EPUK, 2017). The significance of effects on ecological receptors will be considered by the Project's terrestrial ecologists (see **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation**).

1091. The approach to assessment would be discussed and the relevant input parameters and receptor locations would be agreed with stakeholders prior to undertaking the assessment.

8.3.7 Scoping Questions to Consultees

1092. The following questions are posed to consultees to help them frame and focus their response to the onshore air quality scoping exercise, which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment?
- Have all the onshore air quality impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the onshore air quality and dust impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

8.4 Water Resources and Flood Risk

1093. This chapter of the Scoping Report considers the potential likely effects of the Project associated with water resources and flood risk, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the onshore ECC, landfall area and the OCS zone.

1094. The water resources and flood risk assessment considers the hydrology, geomorphology and quality of surface waters, the quantity and quality of groundwaters, potable water resources and flood risk.

1095. The water resources and flood risk assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

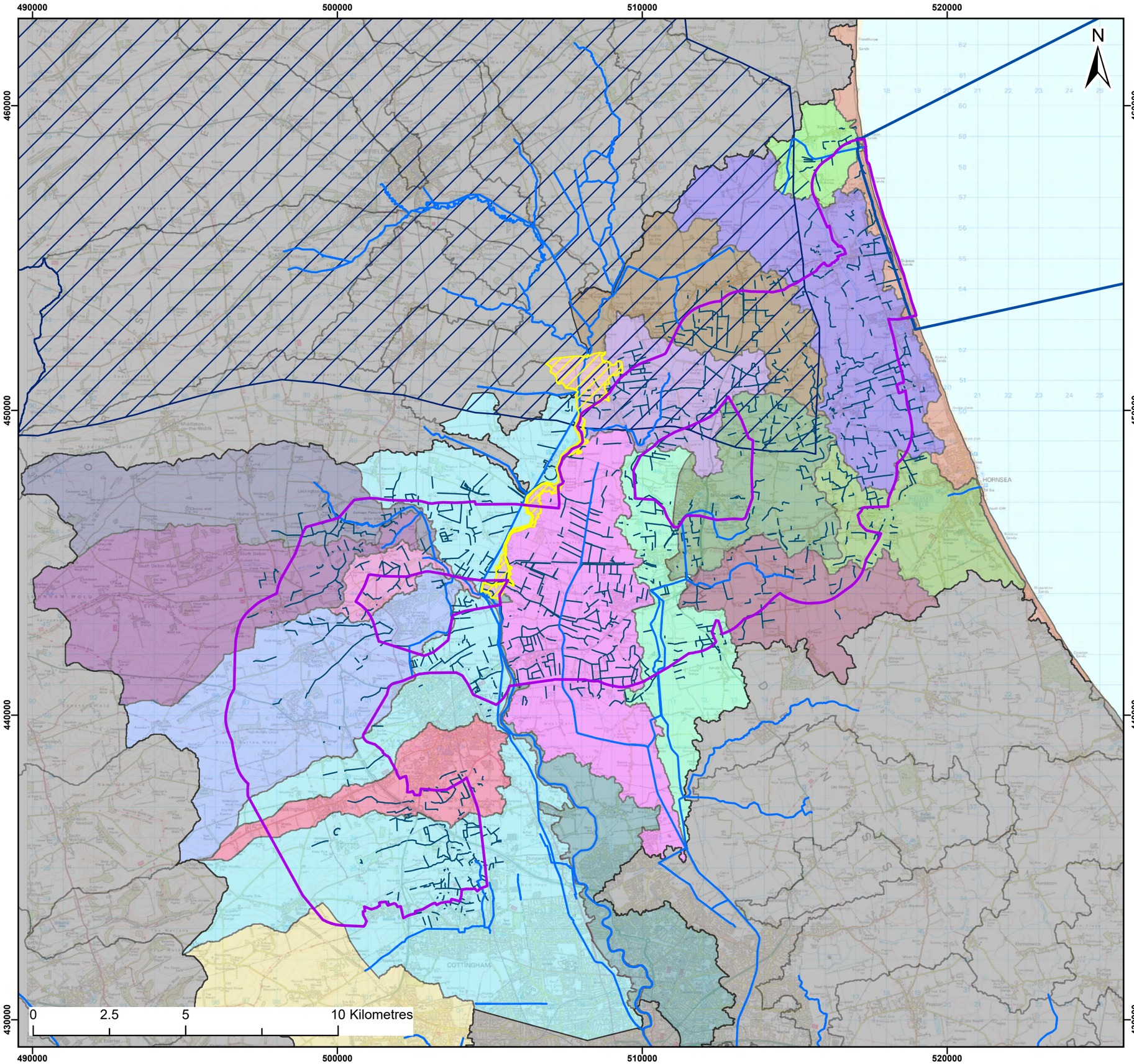
- **Chapter 8.2 Geology and Ground Conditions;**
- **Chapter 8.5 Soils and Land Use;**
- **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation;** and
- **Chapter 9.4 Climate Change.**

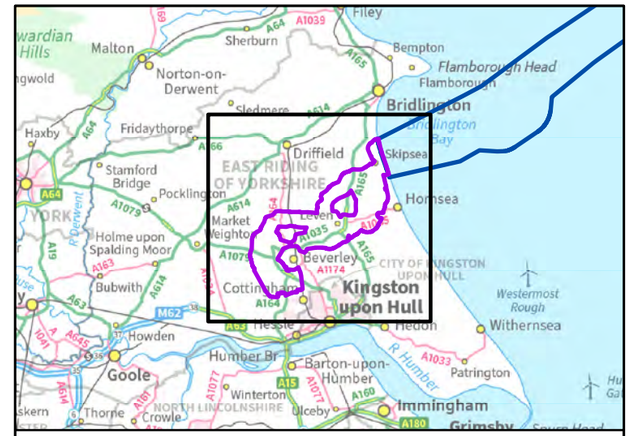
8.4.1 Study Area

1096. The Onshore Scoping Area refers to the boundary in which all potential onshore infrastructure associated with the Project will be located, which extends landward of MHWS.

1097. The water resources and flood risk Study Area includes all surface hydrological catchments (as defined in the Humber River Basin Management Plan (RBMP)) (Environment Agency, 2022a) that may contain components of the Project, or are hydrologically connected to these catchments (i.e. directly downstream) (**Figure 8-8**).

1098. For groundwater resources, the Study Area includes all large-scale hydrogeological units (as defined in the Humber RBMP) (Environment Agency, 2022a) that underlie the Project or are hydrologically connected to these units (**Figure 8-9**).





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Main River
- Ordinary Watercourse
- Tophill Low Drinking Water Safeguard Zone Surface Water
- Hull from West Beck to Arram Beck Drinking Water Protected Area

WFD River Water Body Catchments

- Humber
- Barmston Sea Drain / Skipsea Drain to Conf
- Barmston Sea Drain from Skipsea Drain to N Sea
- Beverley and Barmston Drain
- Bryan Mills Beck Source to Bryan Mills Farm
- Catchwater Drain
- Ella Dyke
- Fleet Drain
- Foredyke Stream Lower to Holderness Dr
- Foredyke Stream Upper
- High Hunsley to Arram Area
- High Hunsley to Woodmansey Area
- Holderness Drain Source to Foredyke Stream
- Hull from Arram Beck to Humber
- Hull from West Beck to Arram Beck
- Mickley Dike Catchment
- Old Howe/Frodingham Beck to R Hull
- Scorborough Beck
- Stream Dyke Hornsea Mere to N Sea
- Catchments Outside of the Study Area

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Surface Water Features

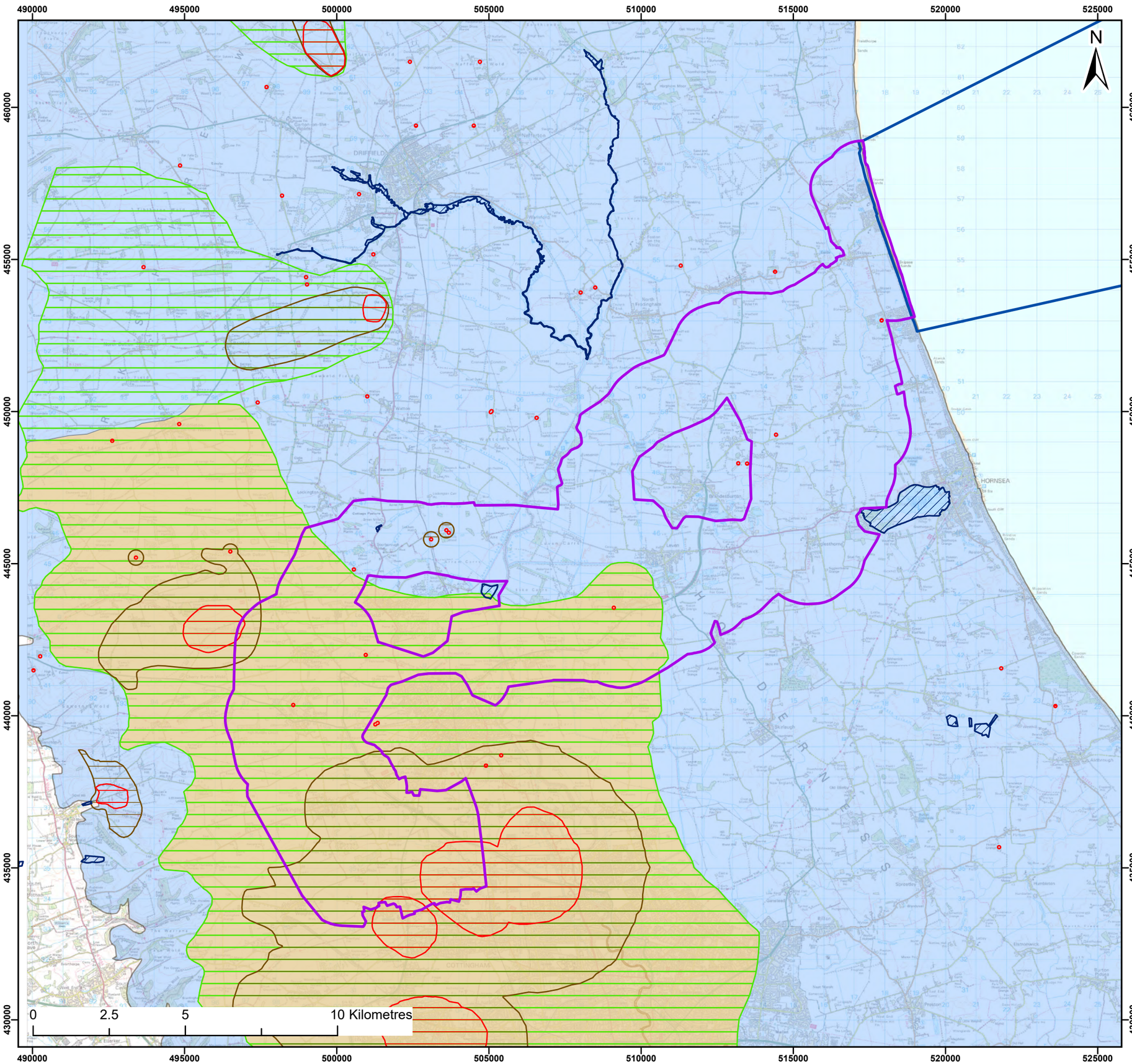
Figure: 8-8

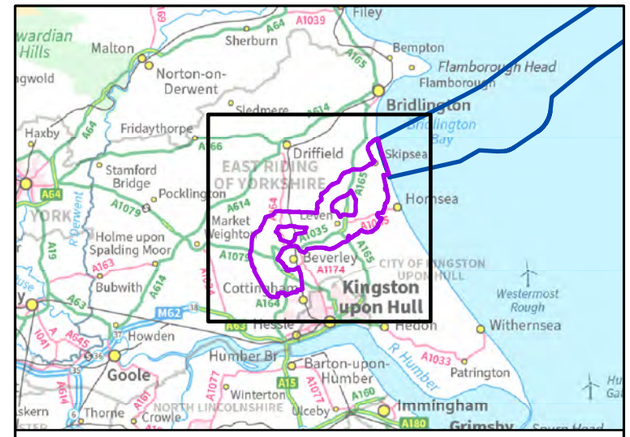
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0038

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	05/04/2023	JR	AG	A3	1:125,000
00	09/02/2023	JR	ID	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Groundwater Dependent Terrestrial Ecosystems (GWDTES)
- Cottingham Drinking Water Safeguard Zone (Groundwater)

WFD Groundwater Bodies

- Hull and East Riding Chalk

Source Protection Zone

- 1
- 2
- 3

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Groundwater Features

Figure:	Drawing No:
8-9	PC3991-RHD-ON-ZZ-DR-Z-0041

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:125,000
01	05/04/2023	JR	AG	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables

equinor

8.4.2 Existing Environment

8.4.2.1 Surface Water Drainage

1099. The majority of the Onshore Scoping Area is located within the catchment of the River Hull, which drains the eastern and north-eastern areas of the Yorkshire Wolds. Many of the watercourses in the Onshore Scoping Area flow in a generally north-south direction to join the Humber Estuary at Hull. Near the North Sea coast some watercourses drain in an easterly direction to the North Sea.

1100. The Onshore Scoping Area comprises a number of surface water catchments, which are analogous to the river water body catchments identified in the Humber RBMP (Environment Agency, 2022a) **(Figure 8-8).** These surface water catchments are listed below and grouped by their Environment Agency operational catchment. Further details relating to water quality of these water bodies are provided in **Table 8-6:**

- Barmston Sea Drain:
  - Barmston Sea Drain from Skipsea Drain to N Sea (GB104026077780);
  - Barmston Sea Drain / Skipsea Drain to Conf (GB104026077770); and
  - Stream Dyke Hornsea Mere to N Sea (GB104026066620).
- Hull Upper:
  - Old Howe / Frodingham Beck to R Hull (GB104026067021);
  - Mickley Dike Catchment (GB104026066990); and
  - Hull from West Beck to Arram Beck (GB104026067000).
- Hull Lower:
  - Beverley and Barmston Drain (GB104026067211);
  - Bryan Mills Beck Source to Bryan Mills Farm (GB104026066960);
  - Catchwater Drain (GB104026066970);
  - Ella Dyke (GB104026066941);
  - Fleet Drain (GB104026066750);
  - Foredyke Stream Lower to Holderness Dr (GB104026066910);
  - Foredyke Stream Upper (GB104026066890);
  - High Hunsley to Arram Area (GB104026066841);
  - High Hunsley to Woodmansey Area (GB104026066820);
  - Hull from Arram Beck to Humber (GB104026067212);
  - Holderness Drain Source to Foredyke Stream (GB104026066950); and
  - Scorborough Beck (GB104026066901).

1101. Adjacent to the North Sea near Skipsea there is an area of onshore coastal catchment drained by several small artificial drains (**Figure 8-8**). Onshore coastal catchments are areas which drain directly to coastal or estuarine waters, rather than through a defined river water body catchment.

1102. A large part of the Study Area is drained by channels managed by the Beverley and South Holderness Internal Drainage Board (IDB). The Onshore Scoping Area crosses 64 IDB drains (as shown on **Figure 8-10**).

1103. Channel planforms are typically straight and are very likely to have been re-sectioned for land drainage and flood defence purposes. Most water body catchments in the Study Area are classified as artificial or heavily modified. The baseline geomorphological characteristics of watercourses in the Onshore Scoping Area will be updated in the PEIR based on the results of a walkover survey.

1104. The Onshore Scoping Area overlaps several designated sites (as per **Figure 8-18** of **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation**) which are likely to have varying degrees of surface and / or groundwater connectivity. These are:

- Withow Gap Site of Special Scientific Interest (SSSI):
  - The unique feature of the site is the exposure in a coastal section of a sequence of mere deposits which occupies a hollow in the Late Devensian (Skipsea) till. The organic rich mere deposits are located in a hollow and would be susceptible to drying if surface and sub-surface flow paths are disturbed.
- Leven Canal SSSI:
  - Following drainage of surrounding marshland, Leven Canal provides a refuge for wetland plants and now supports an important remnant of this once much more widespread vegetation (Crackles, 1968). The canal is fed by calcareous springs supplying water of a very high quality.
- Bryan Mills Field SSSI:
  - Bryan Mills Field comprises a tall fen community in a low-lying central area of a field that is spring-fed. The fen area has developed over a complex of spring heads which create small areas of surface water. Numerous marsh and fen species are present. Bryan Mills is also designated as a Groundwater Dependent Terrestrial Ecosystem (GWDTE) so there will be groundwater connectivity.

- Burton Bushes SSSI:
  - Burton Bushes SSSI is an area of oak woodland known to exceed 200 years in age. It is considered a good example of the woodland characteristic of Holderness Till soils. The undisturbed nature of the soil profile is an important feature of the site. It is unclear to what extent the site is dependent on surface and / or groundwater. Surface water channels do not cross the site but the woodland is located on a gentle slope in a shallow valley, so there may be some groundwater flow below the site.
- Hornsea Mere SSSI; Hornsea Mere Special Protection Area (SPA):
  - Although the SSSI and SPA are located outside of the Onshore Scoping Area, there is surface water connectivity associated with ordinary watercourses and surface water flood risk flow paths. Hornsea Mere is also designated as a GWDTE so there will be groundwater connectivity.
  - Hornsea Mere is a site of national ornithological importance. It consists of a large shallow eutrophic lake of about 120 hectares, together with its associated habitats of reedswamp, fen and carr woodland, representing a relic of the once-extensive marshes and lakes of Holderness.
- Pulfin Bog SSSI
  - Pulfin Bog SSSI is located outside of the Onshore Scoping Area, but it is in a river water body crossed by the Onshore Scoping Area. This means there is likely to be surface water connectivity. Pulfin Bog is also designated as a GWDTE so there will be groundwater connectivity.
  - Pulfin Bog is one of the last remnants of a fenland reedswamp community in the Hull Valley. It is valued both for its botanical interest, and for the reedbed habitat it provides for breeding birds.
- Tophill Low SSSI
  - Tophill Low SSSI is located outside of the Onshore Scoping Area. Although it is in a river water body crossed by the Onshore Scoping Area, it is upstream, so there is limited potential for surface water connectivity. There may be some degree of groundwater connectivity.
  - Tophill Low consists of two artificial storage reservoirs situated in the River Hull valley some ten kilometres south west of Driffield. The site is important as one of few inland standing open water bodies suitable for wintering wildfowl in North Humberside.
- Beverley Parks Local Nature Reserve (LNR):
  - The LNR comprises an orchard, woodland and meadows. Small watercourses form the boundary of the site.
  - Further details of these sites are provided in **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation**.

8.4.2.2 Surface Water Quality

1105. A summary of the water quality data shown in the Catchment Data Explorer (Environment Agency, 2022b) for the surface water bodies in the Onshore Scoping Area is provided in **Table 8-6.** Of the 18 river water bodies crossed by the Onshore Scoping Area, the majority (15) are either artificial or heavily modified, and all water bodies are at moderate ecological potential or status.

1106. Significant water management issues that are affecting water quality, as identified by the Environment Agency (2022b), include point source pollution (sewage discharge), diffuse (agricultural) pollution and physical modifications to river channels for land drainage, flood protection and navigation. Most water bodies are affected by high concentrations of nutrients, resulting in pressures on aquatic invertebrates and in some cases fish and aquatic plants.

1107. The chemical status of all water bodies in England has been classified as not requiring assessment in the 2022 update by the Environment Agency (Environment Agency, 2022b). This is due to a group of global pollutants (polybrominated diphenyl ethers (PBDEs – a group of brominated flame retardants); mercury; certain polycyclic aromatic hydrocarbons (PAHs) and perfluorooctane sulfonate (PFOS – a group of per-and polyfluoroalkyl substances (PFAS)). No feasible technical solution exists to remove these chemicals entirely and that they will take time to naturally drop to required levels; 2040 to 2063 is listed as the objective date for recovery for water bodies in the Onshore Scoping Area.

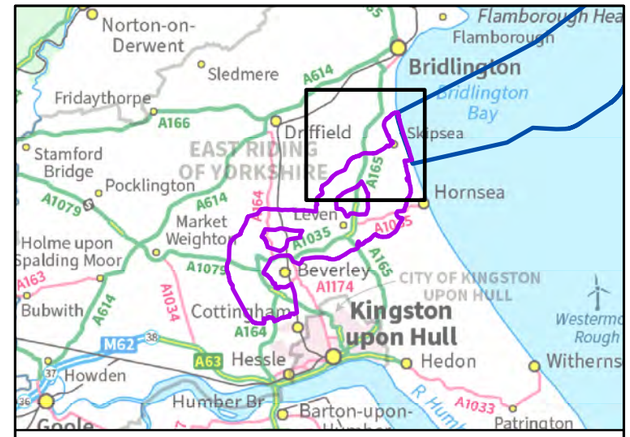
510000 515000 520000

460000 455000 450000

N

Demming Drain
Stonehills Drain
Burton Drain
Lingholms Drain
Warren Hill Drain
Gransmoor Drain
White Dike Branch
Nutholmes Dyke
Yew Dike
Barmston Drain
Kelk Beck Soak Dike
Creyke Dike
Main Drain (Wanless Drain)
Dringhoe Drain
Skipsea Drain
Waterloo Drain
Old Howe Side Drain North (Foston Side Dike)
Skipsea Drain East Branch
Dunnington Sewer
Nafferton Drain
Constable Dike
Inholmes Drain - Braemar Drain
Brigham Drain
Rotsea Drain
Frodingham Mill Drain
Fisholme Drain
Frodingham Church Drain
Andrew Hole Drain
New Cross Drain. In Roam Drain
Towns Drain
Old River North of Scruff
Old River South of Scruff
Harrison's Drain
Holts Drain
Roam Drain
Halls Drain
Decoy House Drain
Decoy Drain
Hallytreeholme Farm
Holderness Drain

0 1 2 4 Kilometres



Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Beverley and North Holderness Internal Drainage Board Catchment Area
- Beverley and North Holderness Internal Drainage Board Maintained Drains

Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

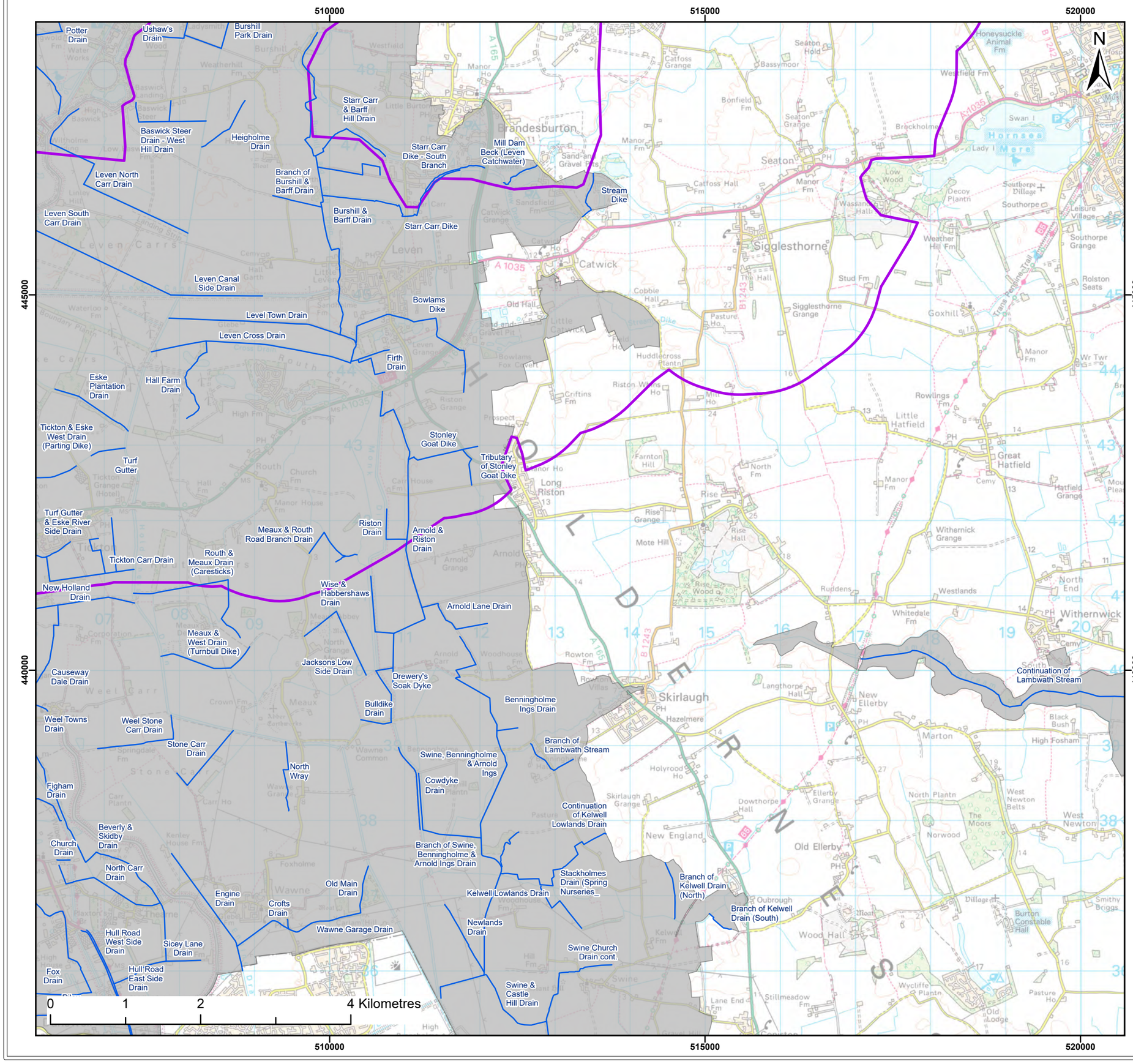
Title:
IDB Drains
(sheet 1 of 4)

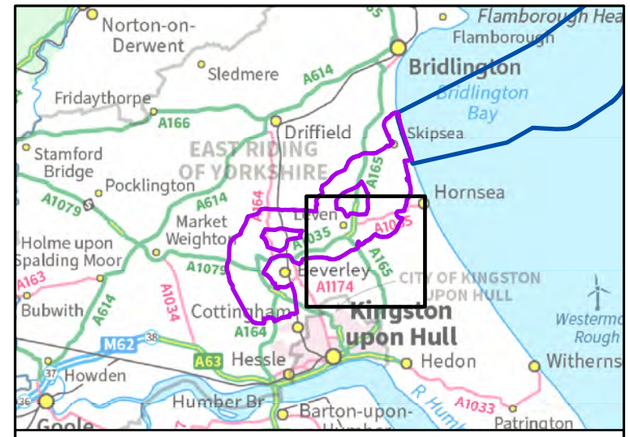
Figure: 8-10
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0039

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	07/06/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Beverley and North Holderness Internal Drainage Board Catchment Area
- Beverley and North Holderness Internal Drainage Board Maintained Drains

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: IDB Drains (sheet 2 of 4)

Figure: 8-10

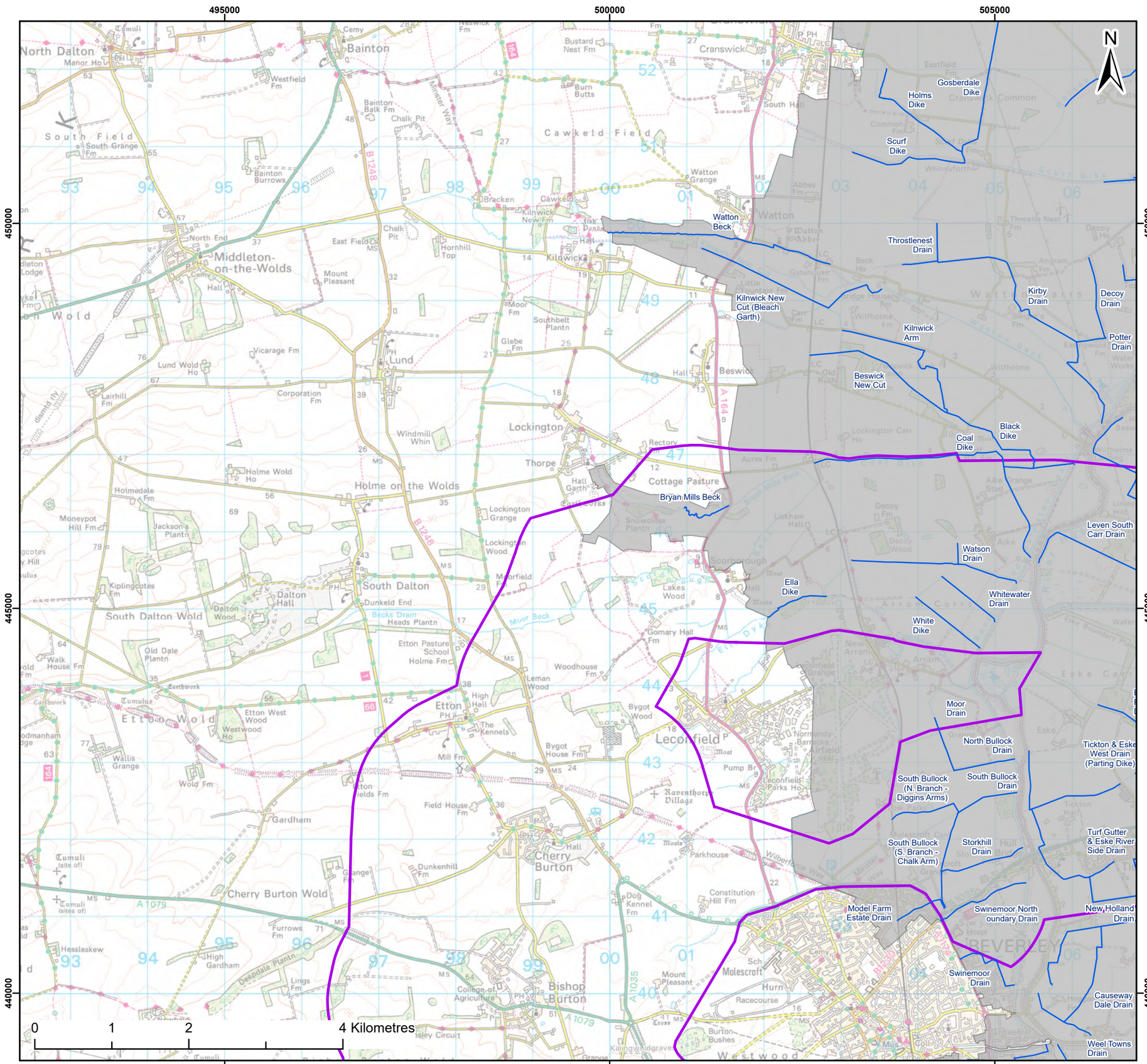
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0039

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	07/06/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor



Legend:

- Onshore Scoping Area
- Beverley and North Holderness Internal Drainage Board Catchment Area
- Beverley and North Holderness Internal Drainage Board Maintained Drains

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

IDB Drains
(sheet 3 of 4)

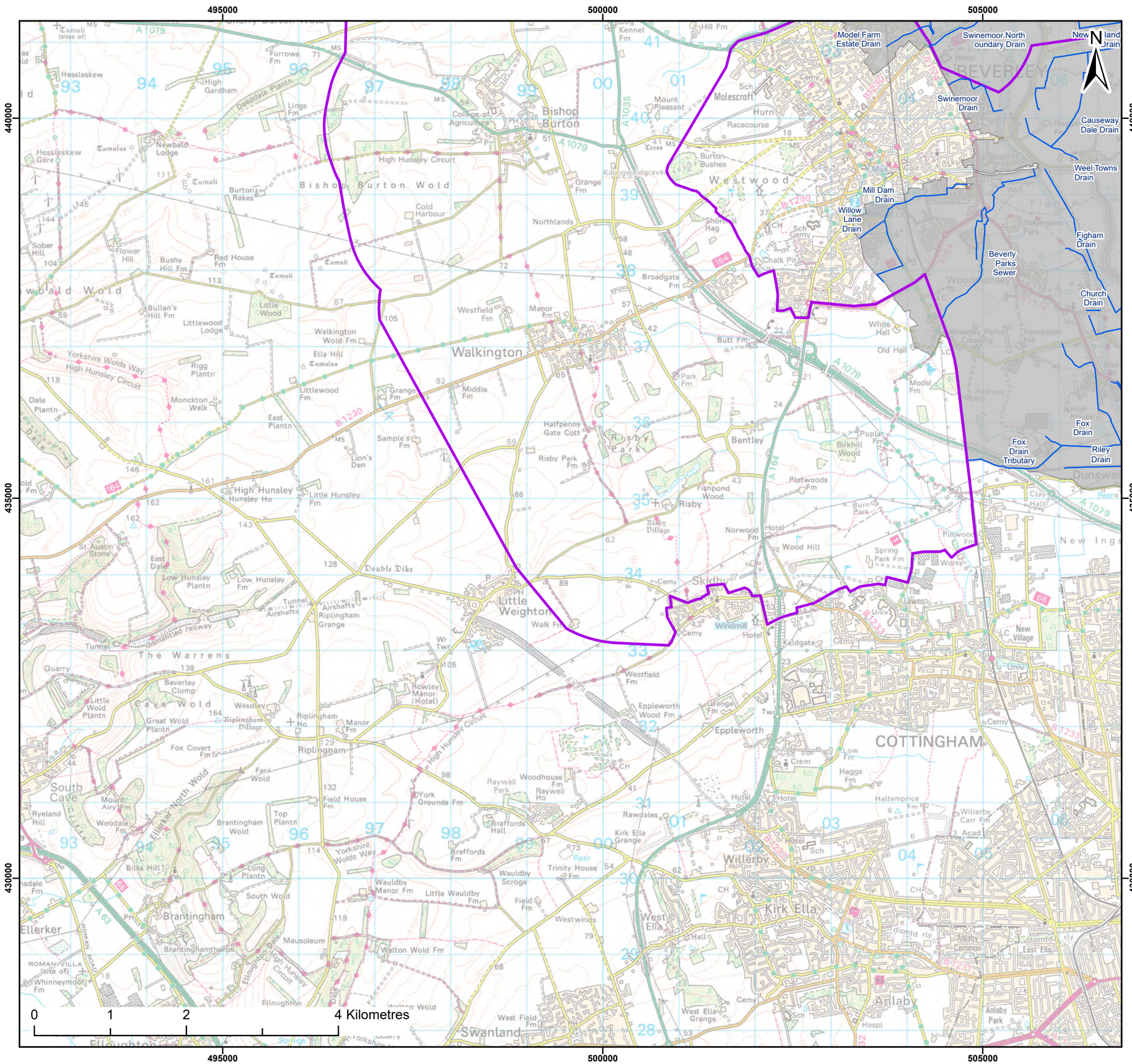
Figure:	Drawing No:
8-10	PC3991-RHD-ON-ZZ-DR-Z-0039

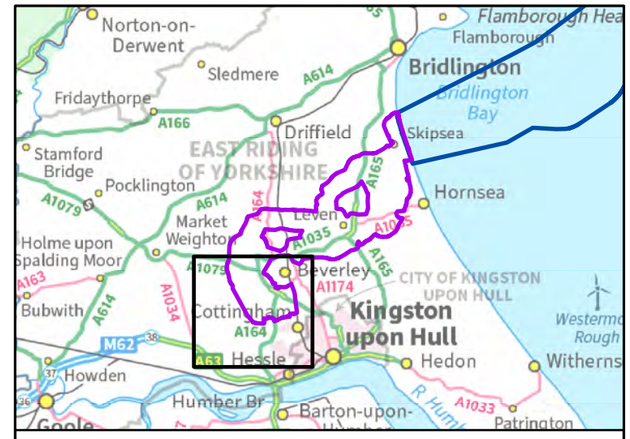
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	07/06/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Beverley and North Holderness Internal Drainage Board Catchment Area
- Beverley and North Holderness Internal Drainage Board Maintained Drains

Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
IDB Drains
(sheet 4 of 4)

Figure:	Drawing No:
8-10	PC3991-RHD-ON-ZZ-DR-Z-0039

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	07/06/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor

Table 8-6 Water Quality Summary Data for Surface Water Catchments in the Onshore Scoping Area (Environment Agency, 2022b)

Water Body	Type and Designation	Ecological Status / Potential	Chemical Status	Reasons for Not Achieving Good Status (RNAG)
Barmston Sea Drain from Skipsea Drain to N Sea GB104026077780	River Artificial	Moderate	Does not require assessment	• Phosphate • Mercury and Its compounds • PBDE
Barmston Sea Drain / Skipsea Drain to Conf GB104026077770	River Not designated artificial or heavily modified	Moderate	Does not require assessment	• Macrophytes and Phytobenthos Combined • Phosphate • Invertebrates • Ammonia • Dissolved oxygen • Mercury and Its compounds • PBDE
Stream Dyke Hornsea Mere to N Sea GB104026066620	River Heavily modified	Moderate	Does not require assessment	• Phosphate • Invertebrates • Dissolved oxygen • Mitigation Measures Assessment • Mercury and Its compounds • PBDE
Old Howe / Frodingham Beck to R Hull GB104026067021	River Heavily modified	Moderate	Does not require assessment	• Mitigation Measures Assessment • Mercury and Its compounds • PBDE
Catchwater Drain GB104026066970	River Artificial	Moderate	Does not require assessment	• Phosphate • Invertebrates • Ammonia • Dissolved oxygen
				• Mercury and Its compounds • PBDE
Foredyke Stream Upper GB104026066890	River Artificial	Moderate	Does not require assessment	• Phosphate • Invertebrates • Ammonia • Dissolved oxygen • Mitigation Measures Assessment • Mercury and Its compounds • PBDE
Foredyke Stream Lower to Holderness Dr GB104026066910	River Artificial	Moderate	Does not require assessment	• Fish • Phosphate • Ammonia • Dissolved oxygen • Mitigation Measures Assessment • Mercury and Its compounds • PBDE • PFOS
Mickley Dike Catchment GB104026066990	River Artificial	Moderate	Does not require assessment	• Dissolved oxygen • Mitigation Measures Assessment • Mercury and Its compounds • PBDE
Hull from West Beck to Arram Beck GB104026067000	River Heavily modified	Moderate	Does not require assessment	• Fish • Mitigation Measures Assessment • Mercury and Its compounds • PBDE

Water Body	Type and Designation	Ecological Status / Potential	Chemical Status	Reasons for Not Achieving Good Status (RNAG)
Hull from Arram Beck to Humber GB104026067212	River Heavily modified	Moderate	Does not require assessment	• Phosphate • Mitigation Measures Assessment • Mercury and Its compounds • PBDE • Benzo(g-h-i)perylene • Benzo(k)fluoranthene • Benzo(b)fluoranthene • Tributyltin compounds
Holderness Drain Source to Foredyke Stream GB104026066950	River Artificial	Moderate	Does not require assessment	• Phosphate • Ammonia • Dissolved oxygen • Mitigation Measures Assessment • Mercury and Its compounds • PBDE
Beverley and Barmston Drain GB104026067211	River Artificial	Moderate	Does not require assessment	• Phosphate • Dissolved oxygen • Mitigation Measures Assessment • Mercury and Its compounds • PBDE
Bryan Mills Beck Source to Bryan Mills Farm GB104026066960	River Not designated artificial or heavily modified	Moderate	Does not require assessment	• Phosphate • Mitigation Measures Assessment • Mercury and Its compounds • PBDE
Scorborough Beck GB104026066901	River	Moderate	Does not require assessment	• Macrophytes and Phytobenthos Combined
	Not designated artificial or heavily modified			• Mercury and Its compounds • PBDE
Ella Dyke GB104026066941	River Heavily modified	Moderate	Does not require assessment	• Phosphate • Dissolved oxygen • Mitigation Measures Assessment • Mercury and Its compounds • PBDE
High Hunsley to Arram Area GB104026066841	River Artificial	Moderate	Does not require assessment	• Ammonia • Mitigation Measures Assessment • Mercury and Its compounds • PBDE • Benzo(g-h-i)perylene • Benzo(k)fluoranthene • Benzo(b)fluoranthene
High Hunsley to Woodmansey Area GB104026066820	River Artificial	Moderate	Does not require assessment	• Fish • Mercury and Its compounds • PBDE
Fleet Drain GB104026066750	River Artificial	Moderate	Does not require assessment	• Phosphate • Invertebrates • Mitigation measures assessment • Mercury and Its compounds • PBDE
Leven Canal GB70410003	Canal Artificial	Moderate	Does not require assessment	• Mercury and Its compounds • PBDE

1108. The Onshore Scoping Area crosses Tophill Low Drinking Water Safeguard Zone (Surface Water) (ID: SWSGZ6010) and Hull from West Beck to Arram Beck Drinking Water Protected Area (Surface Water) (**Figure 8-8**).

1109. The Onshore Scoping Area crosses the following surface water Nitrate Vulnerable Zones (NVZs), which are areas designated as being at risk from agricultural nitrate pollution (**Figure 8-11**):

- Hornsea Mere Eutrophic Lake NVZ (ID: 113);
- Holderness Drain from Fordyke Stream to Humber NVZ (ID: 251);
- River Hull from Arram Beck to Humber NVZ (ID: 254); and
- Barmston Sea Drain from Skipsea Drain to N Sea NVZ (ID: 259).

8.4.2.2.1 Groundwater Features

1110. The chalk bedrock (Rowe Chalk Formation; Flamborough Chalk Formation; Burnham Chalk Formation) that underlies the Onshore Scoping Area (**Figure 8-9**) comprises a single groundwater body (Hull and East Riding Chalk (GB40401G700700)), as defined by the Humber RBMP (Environment Agency, 2022a). The entirety of this groundwater body supports a Principal Aquifer, defined as providing significant quantities of drinking water, and water for business needs. Principal Aquifers may also support rivers, lakes and wetlands.

1111. Superficial deposits in the Onshore Scoping Area are mainly diamicton (Devensian till), which supports Secondary (undifferentiated) aquifers. These are defined as aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value in terms of water supply.

1112. Large areas of the River Hull valley north-east of Beverley, and in a line across to Hornsea, are characterised by alluvium (clay, silt, sand and gravel) and glaciofluvial sand and gravel. The Onshore Scoping Area also crosses an area of marine deposits (sand and gravel) near Hornsea Mere. These deposits support Secondary A aquifers. Smaller Secondary A aquifers are also located between Skipsea and Hornsea, and in some of the eastern draining tributary valleys that flow towards the River Hull form the Yorkshire Wolds west of Beverley. Secondary A aquifers comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers.

1113. In the Skipsea-Atwick-Dunnington area there several small areas of lacustrine sediment that support Secondary B aquifers. These are mainly lower permeability layers that may store and yield limited amounts of groundwater, through characteristics such as fissures or eroded layers.

1114. Groundwater vulnerability is medium to medium-high across the majority of the Onshore Scoping Area. Medium risk areas offer some groundwater protection due to the presence of superficial deposits. West of Beverley, groundwater vulnerability is high and there is a soluble rock risk. High risk areas are characterised by high-leaching soils and the absence of low-permeability superficial deposits. Soluble rock risk areas are characterised by solution features that would enable the rapid movement of a pollutant through the aquifer.

1115. The Onshore Scoping Area crosses Cottingham Drinking Water Safeguard Zone (Groundwater) (ID: GWSGZ0240) (**Figure 8-9**). Groundwater Drinking Water Safeguard Zones are established around public water supplies where additional pollution control measures are needed. The geometry of Groundwater Safeguard Zones is based on Groundwater Source Protection Zones (SPZs).

1116. To the north of Beverley, the Onshore Scoping Area enters SPZ 3 (total catchment) (**Figure 8-9**). SPZ 3 defines the area around a water supply source within which all the groundwater ends up at the abstraction point. The Onshore Scoping Area also crosses small areas of SPZ 2 (outer zone) and SPZ 1 (inner zone) north-west of Cherry Burton, and more extensively south of Beverley and towards Cottingham. SPZ 2 is defined as having a 400-day travel time of pollutant to source of abstraction. This has a 250m or 500m minimum radius around the source depending on the amount of water taken. SPZ 1 has a 50-day travel time of pollutant to the abstraction source with a 50m default minimum radius.

8.4.2.2.2 Groundwater Quality

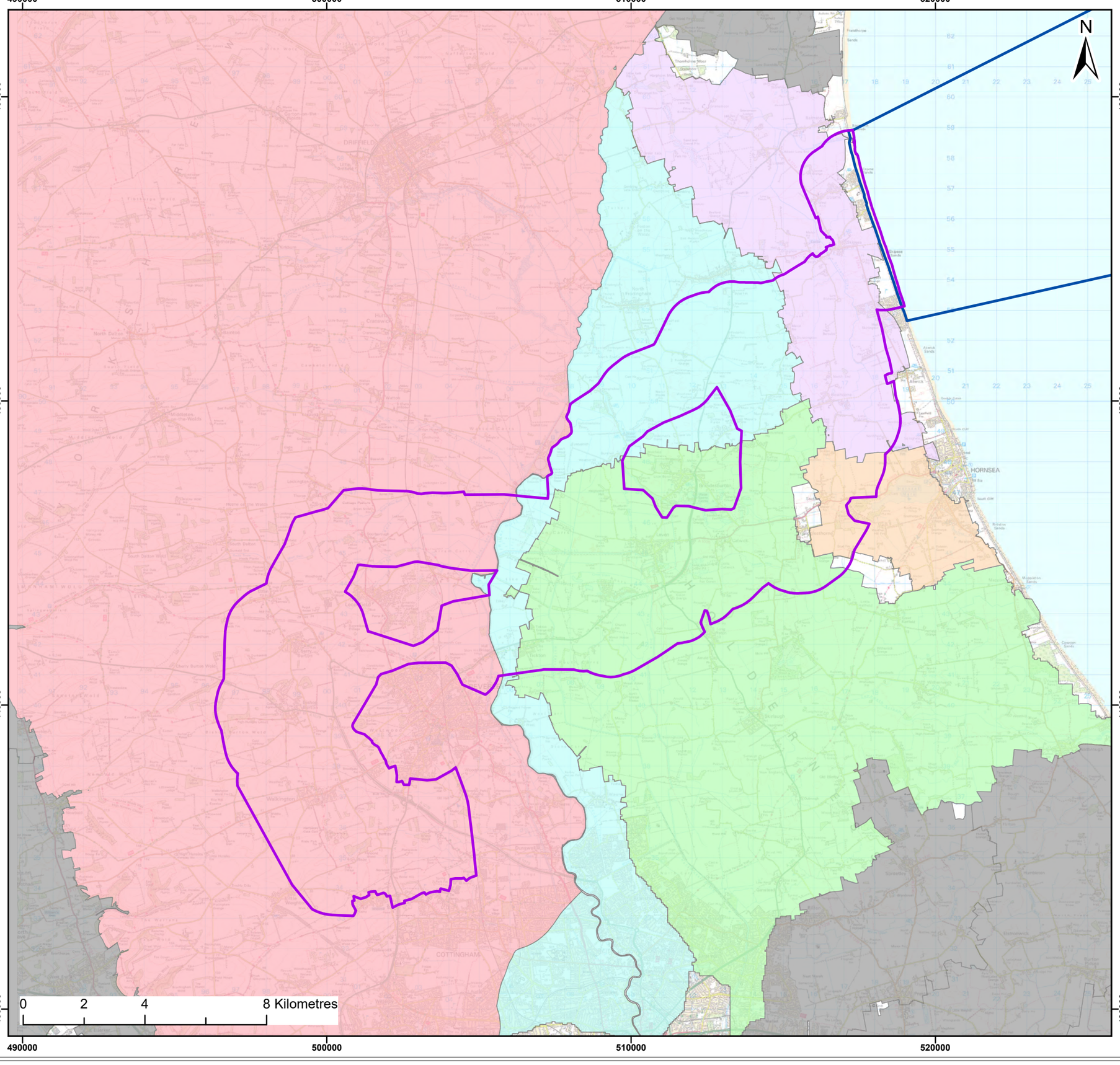
1117. The Onshore Scoping Area is underlain by a single groundwater body: Hull and East Riding Chalk (GB40401G700700) (**Figure 8-9**). Both quantitative and chemical classification elements are Poor (Environment Agency, 2022b). The Environment Agency (2022b) has identified that groundwater quality pressures are being caused by:

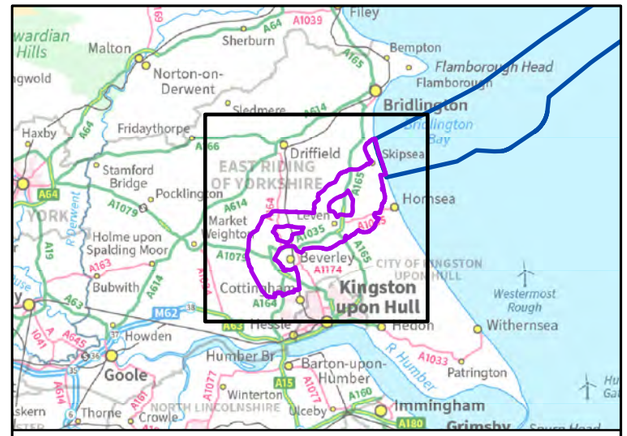
- Poor nutrient management;
- Atmospheric deposition;
- Private sewage treatment;
- Sewage discharge (continuous);
- Farm / site infrastructure; and
- Groundwater abstraction.

1118. These pressures affect the following classification elements that result in the water body not achieving good status:

- General chemical test;
- Trend assessment;
- Chemical Drinking Water Protected Area;
- Chemical GWDTEs test;
- Quantitative saline intrusion; and
- Chemical saline intrusion.

1119. Due to high levels of nutrients, the underlying chalk aquifer is classified as a NVZ (Yorkshire Chalk (ID:106)) (**Figure 8-11**).





Legend:

- Onshore Scoping Area
- Offshore Scoping Area

Nitrate Vulnerable Zones

- Barmston Sea Drain from Skipsea Drain to N Sea NVZ
- Holderness Drain from Fordyke Stream to Humber NVZ
- Hornsea Mere Eutrophic lake NVZ
- River Hull from Arram Beck to Humber NVZ
- Yorkshire Chalk
- Other NVZ

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Nitrate Vulnerability Zones

Figure:	Drawing No:
8-11	PC3991-RHD-ON-ZZ-DR-Z-0040

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:125,000
01	17/05/2024	JH	AB	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables

equinor

8.4.2.3 Flood Risk

8.4.2.3.1 Fluvial and Coastal Flood Risk

1120. The East Riding Level One Strategic Flood Risk Assessment (SFRA) (ERYC, 2019) notes that much of the East Riding of Yorkshire is defended against fluvial and coastal flooding. On this basis, much of the flood risk posed to the Onshore Scoping Area comprises a residual risk as a result of flood events exceeding the standard of protection afforded by the defence, defence or pumping failure, or flooding behind the defences due to local runoff or groundwater (ERYC, 2019).

1121. The online Flood Map for Planning (Environment Agency, undated), reproduced on **Figure 8-12**, provides a summary of the Flood Zones in the Onshore Scoping Area. This mapping shows that much of the area is in Flood Zone One (<0.1% Annual Probability (AP)).

1122. Within the relatively flat River Hull valley, there are extensive areas of floodplain in Flood Zone 2 (between 1% and 0.1% AP) and Flood Zone 3 (>1% AP). The Onshore Scoping Area also crosses narrower areas of floodplain (mainly Flood Zone 3) associated with watercourses to the north and west of Skipsea, as well as in the area near Atwick and Bewholme associated with watercourses that drain the eastern slopes of the Yorkshire Wolds.

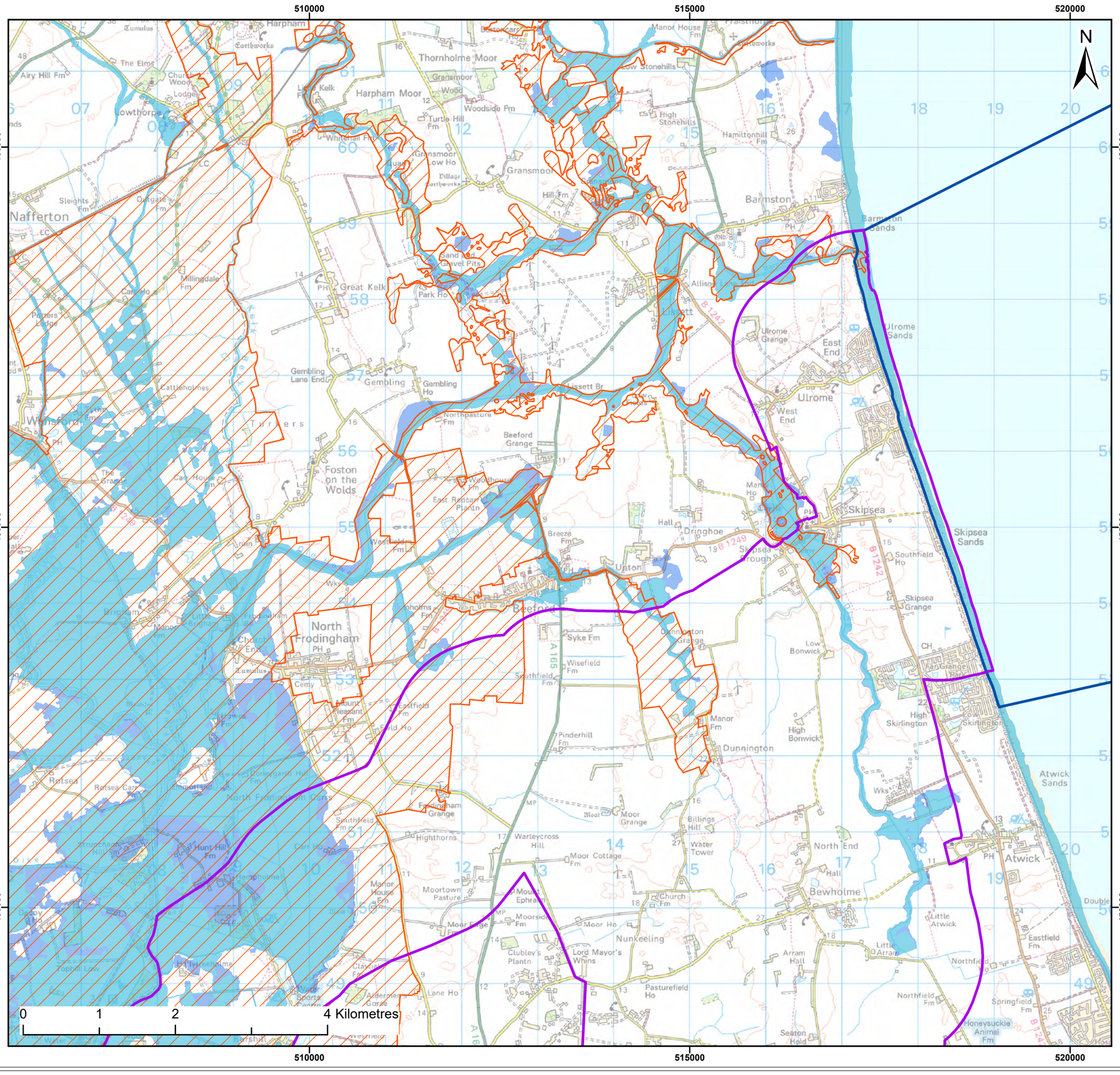
8.4.2.3.2 Surface Water Flood Risk

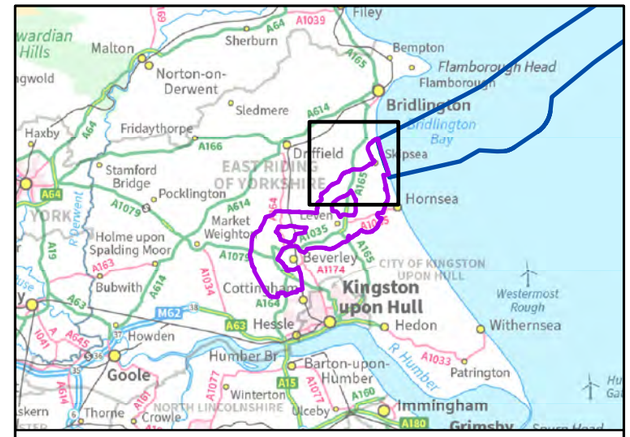
1123. Surface water flood risk has been obtained from the Environment Agency Long Term Flood Risk Information online mapping, as shown on **Figure 8-13**.

1124. This mapping shows that there are areas of increased surface water flood risk across the Onshore Scoping Area and this follows a similar spatial pattern as the fluvial flood risk, with the high risk areas associated with key watercourses. Given the relatively flat nature of the land in the Onshore Scoping Area, there are also numerous isolated areas of ponding and smaller surface water flow pathways.

8.4.2.3.3 Reservoir Flood Risk

1125. The Onshore Scoping Area crosses an area at risk of reservoir flooding when river levels are normal (dry day scenario) and when there is also flooding from rivers (wet day scenario) beside the River Hull near Aike and also to the south-east of Hempholme (**Figure 8-13**).





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Flood Zone 2
- Flood Zone 3

Internal Drainage Boards

- Beverley and North Holderness Internal Drainage Board

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Fluvial and Tidal Flood Risk
(Sheet 1 of 4)

Figure: 8-12

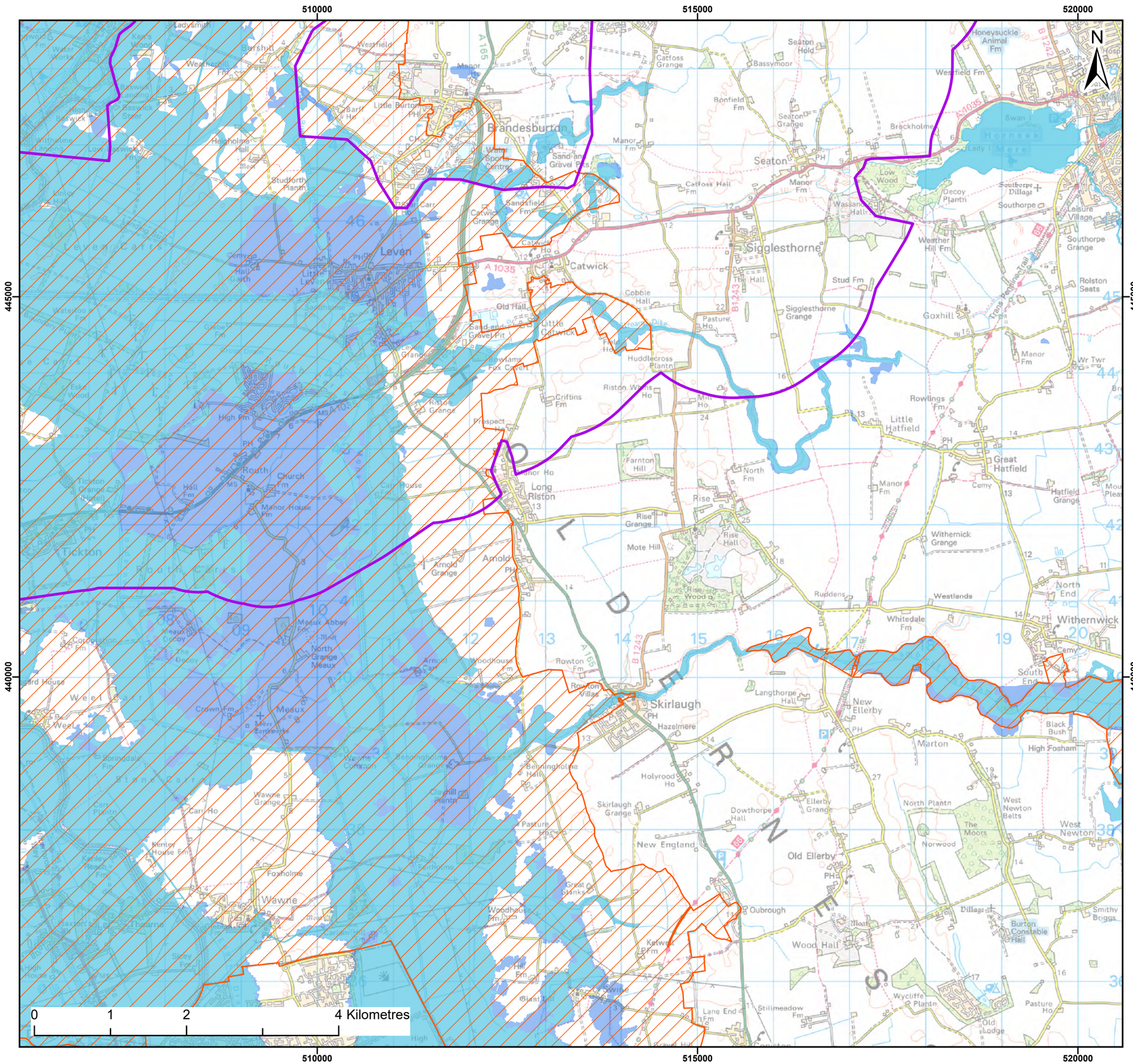
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0044

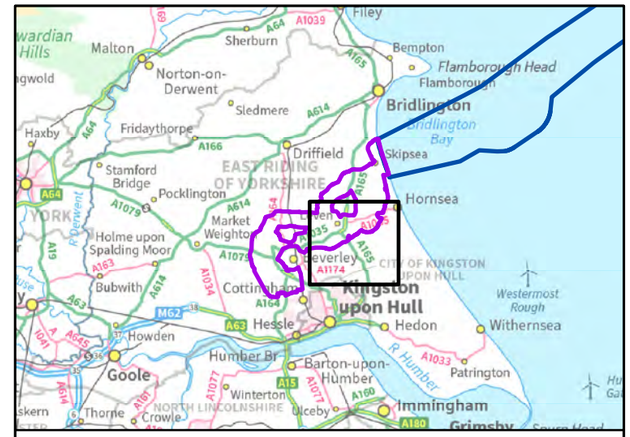
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:50,000
01	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Flood Zone 2
- Flood Zone 3

Internal Drainage Boards

- Beverley and North Holderness Internal Drainage Board

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Fluvial and Tidal Flood Risk (Sheet 2 of 4)

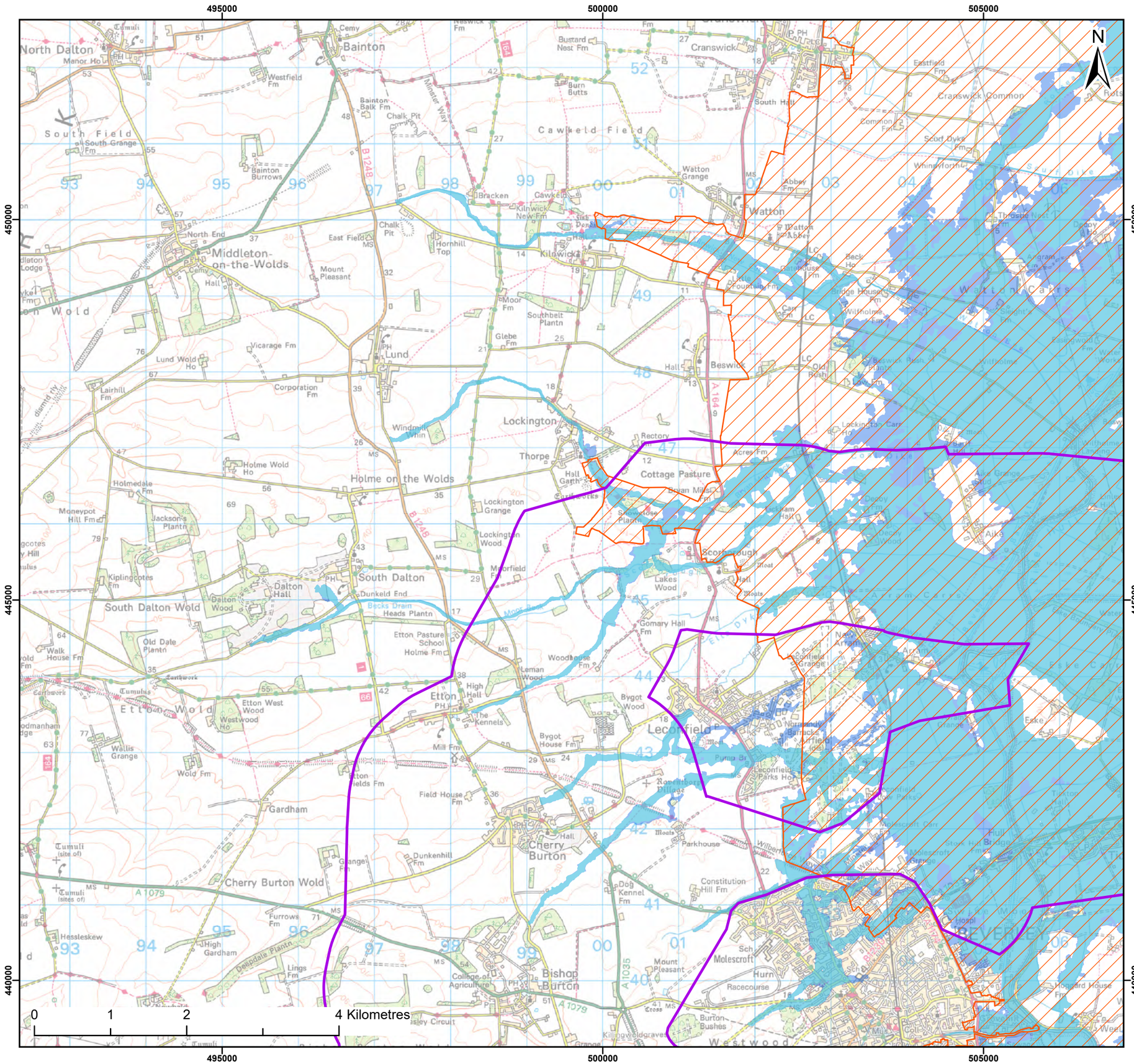
Figure: 8-12

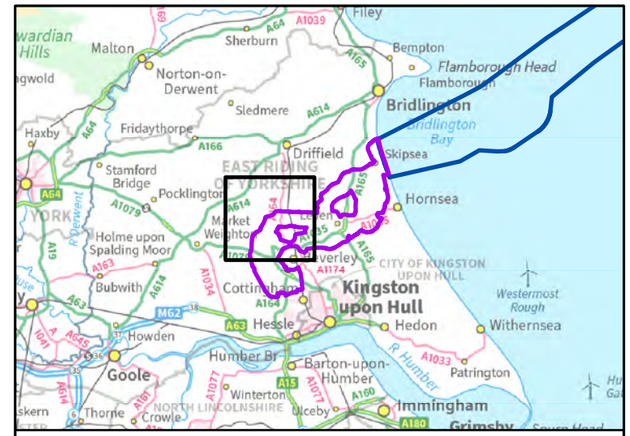
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0044

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:50,000
01	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Flood Zone 2
- Flood Zone 3

Internal Drainage Boards

- Beverley and North Holderness Internal Drainage Board

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

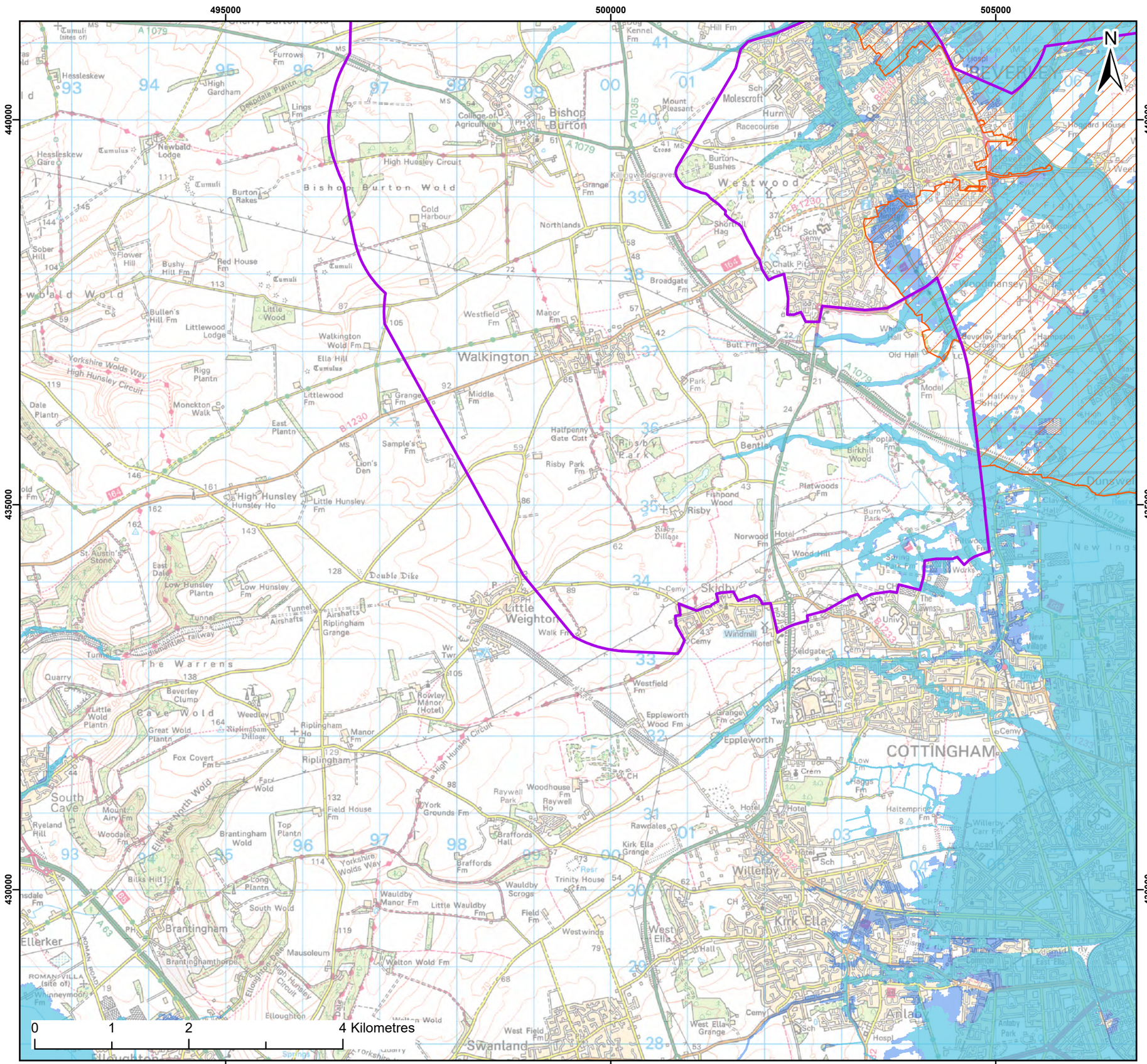
Fluvial and Tidal Flood Risk
(Sheet 3 of 4)

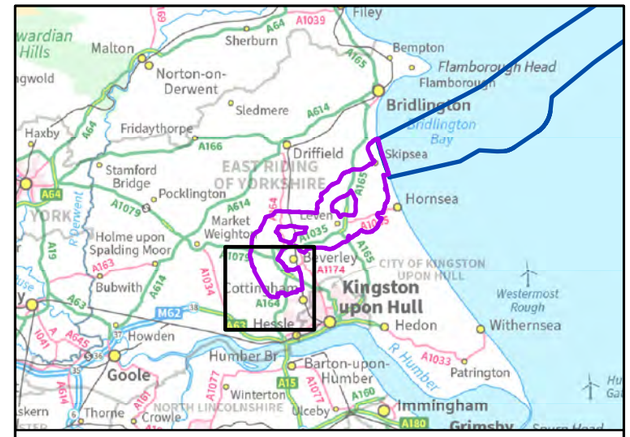
Figure:	Drawing No:
8-12	PC3991-RHD-ON-ZZ-DR-Z-0044

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:50,000
01	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Flood Zone 2
- Flood Zone 3

Internal Drainage Boards

- Beverley and North Holderness Internal Drainage Board

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Fluvial and Tidal Flood Risk
(Sheet 4 of 4)

Figure: 8-12

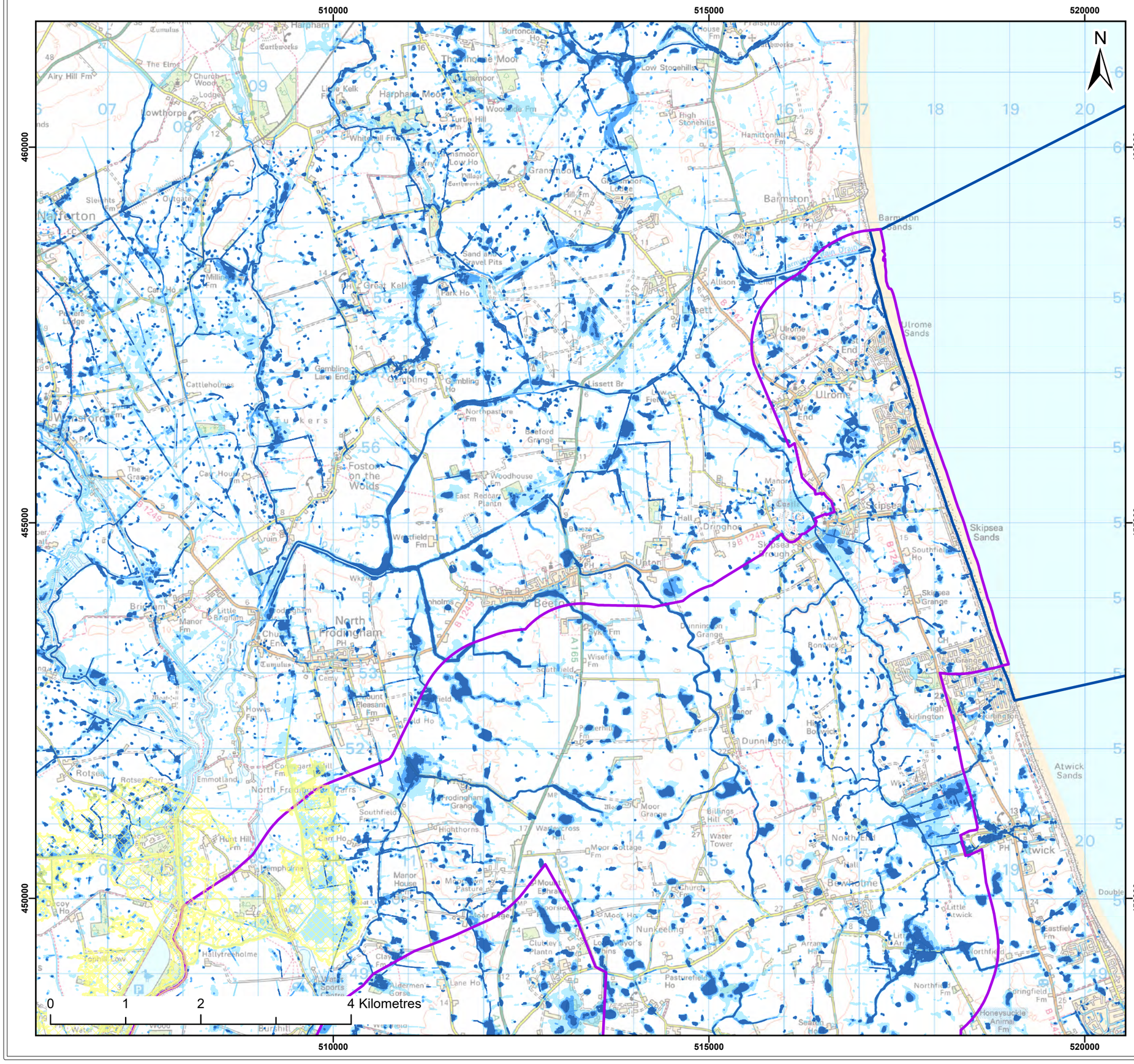
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0044

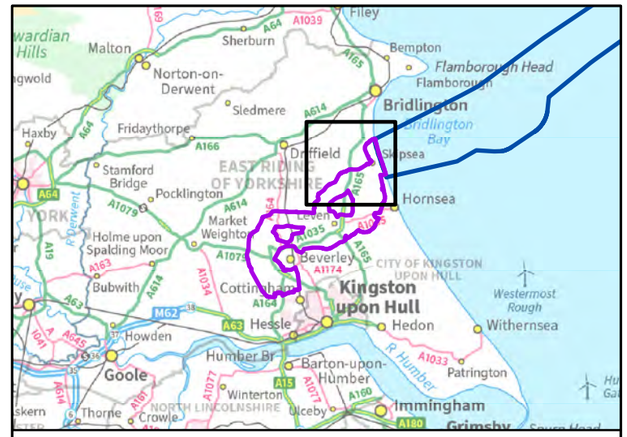
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:50,000
01	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Reservoir Flood Extents

Risk of Surface Water Flooding

- 3.3% Annual Chance
- 1% Annual Chance
- 0.1% Annual Chance

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Surface Water and Reservoir Flood Risk
(Sheet 1 of 4)

Figure: 8-13

Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0051

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:50,000
01	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

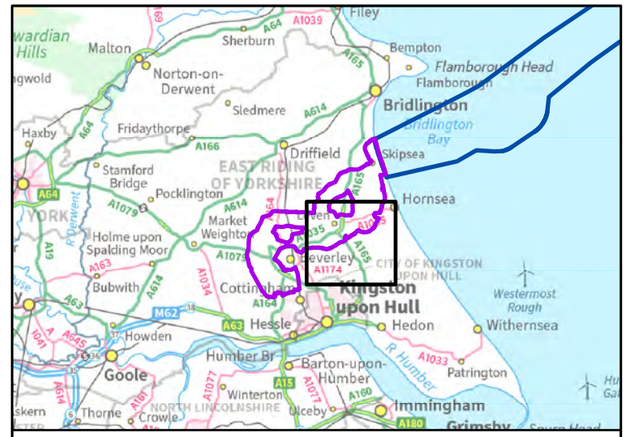
equinor

510000 515000 520000

445000

440000

N



Legend:

- Onshore Scoping Area
- Reservoir Flood Extents

Risk of Surface Water Flooding

- 3.3% Annual Chance
- 1% Annual Chance
- 0.1% Annual Chance

0 1 2 4 Kilometres

Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Surface Water and Reservoir Flood Risk
(Sheet 2 of 4)

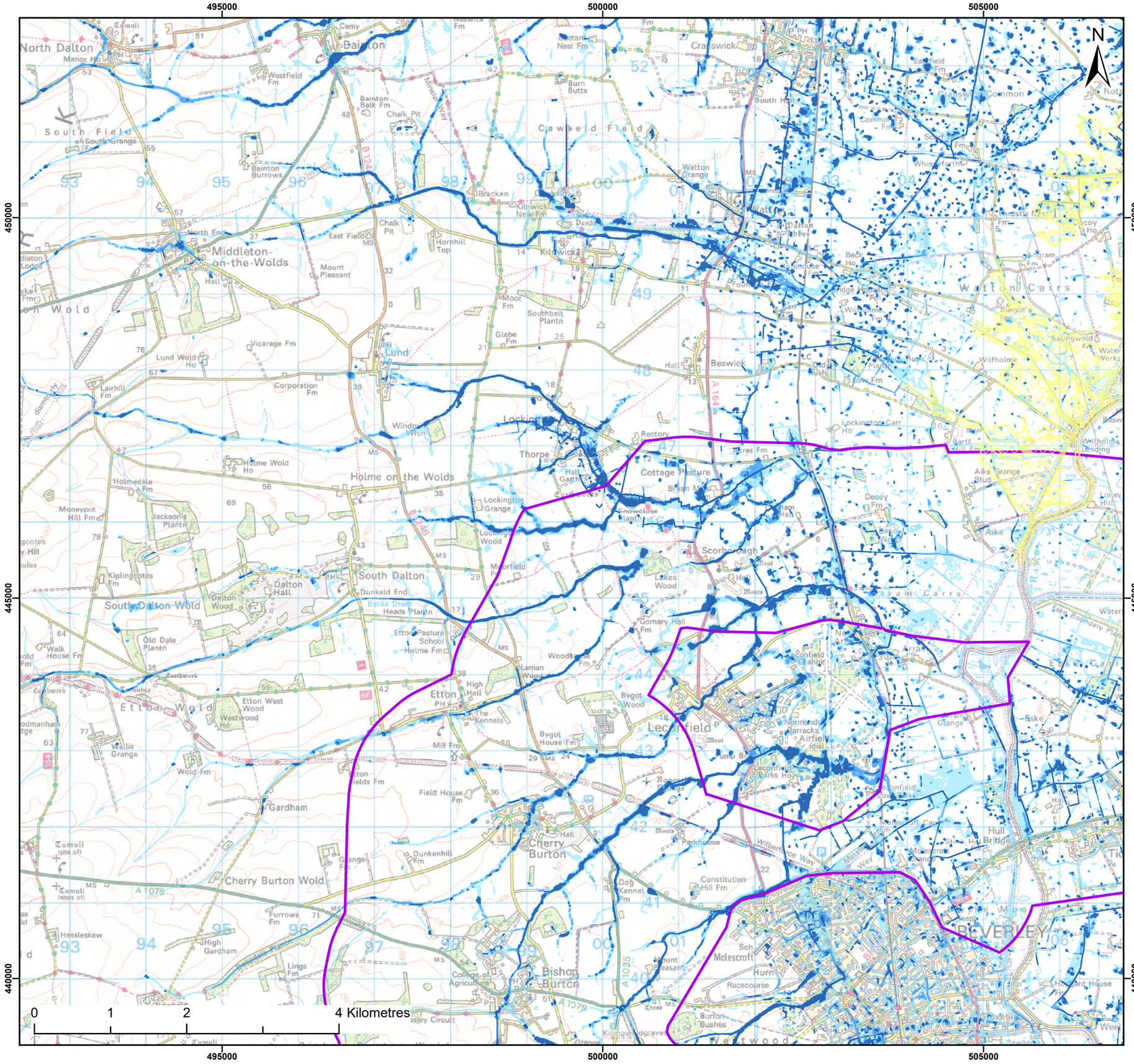
Figure: 8-13

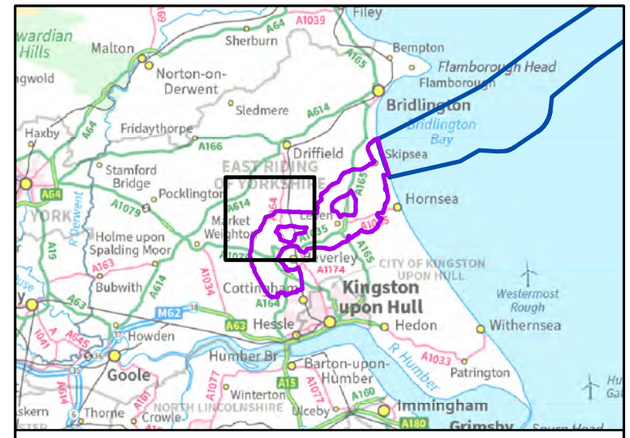
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0051

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:50,000
01	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Reservoir Flood Extents

Risk of Surface Water Flooding

- 3.3% Annual Chance
- 1% Annual Chance
- 0.1% Annual Chance

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Surface Water and Reservoir Flood Risk (Sheet 3 of 4)

Figure: 8-13

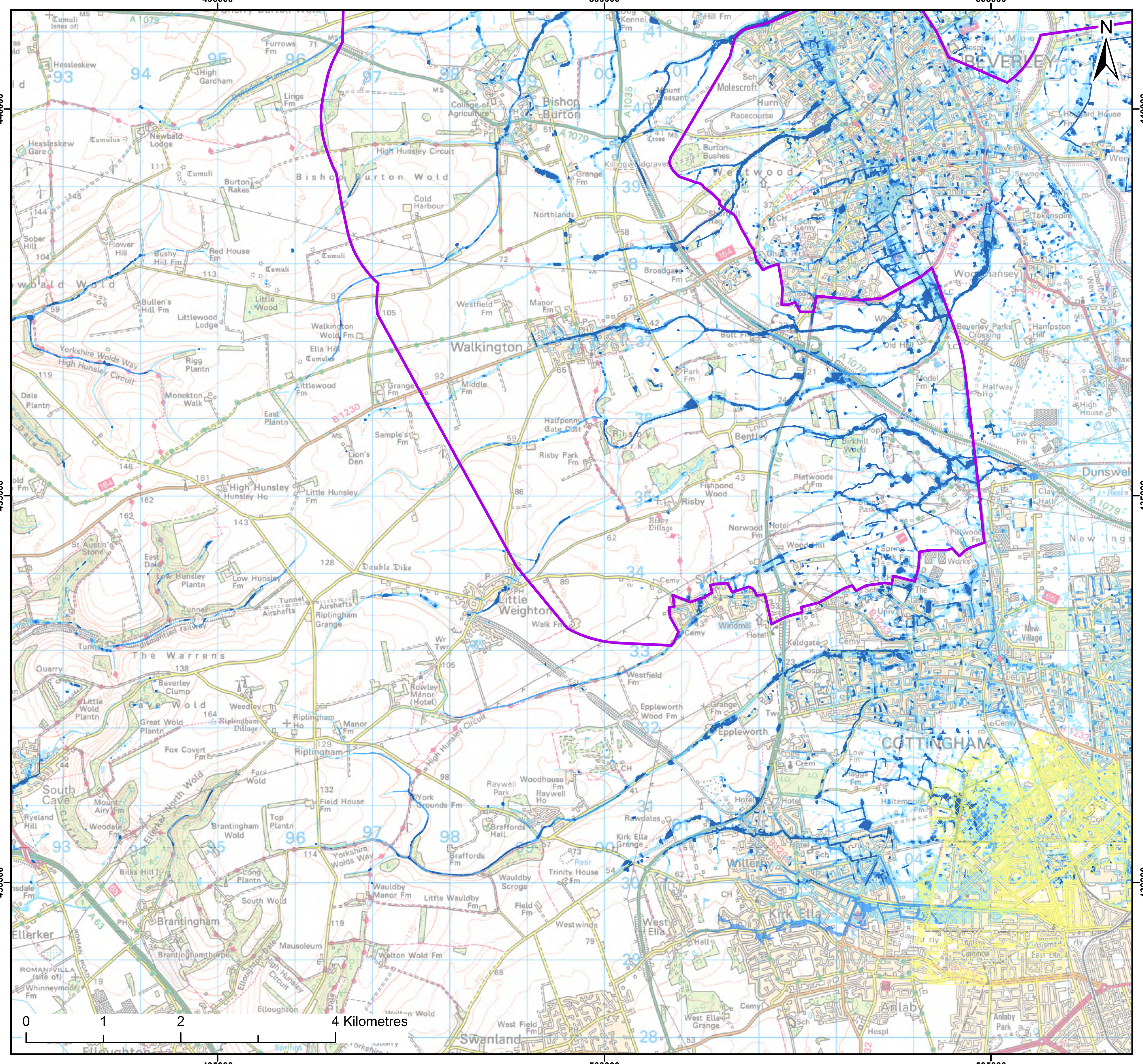
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0051

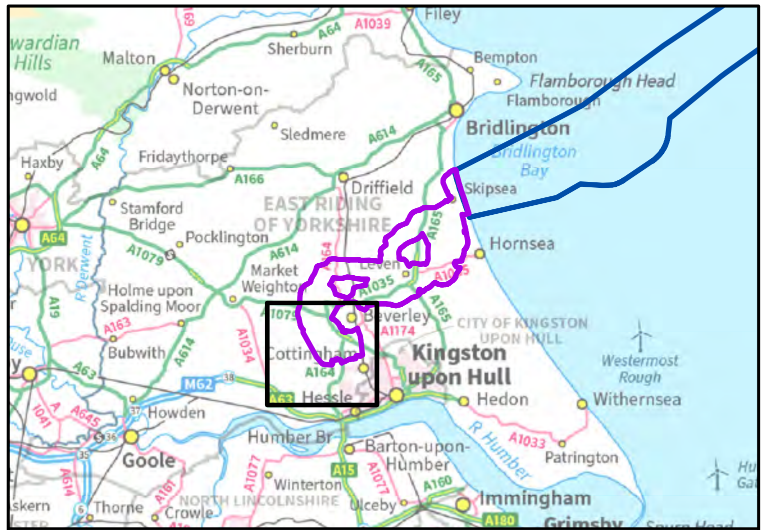
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:50,000
01	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Reservoir Flood Extents

Risk of Surface Water Flooding

- 3.3% Annual Chance
- 1% Annual Chance
- 0.1% Annual Chance

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Surface Water and Reservoir Flood Risk (Sheet 4 of 4)

Figure: 8-13	Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0051				
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	12/06/2024	JH	AB	A3	1:50,000
01	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor

8.4.3 Potential Impacts

8.4.3.1 Potential Impacts during Construction

1126. The following sections outline the potential construction impacts scoped into the EIA. No potential construction impacts have been scoped out of the EIA at this stage.

8.4.3.1.1 Direct Disturbance on Surface Water Bodies

1127. Construction activities within the Onshore Scoping Area could directly impact upon the geomorphology, hydrology, water quality and physical habitats of the identified surface water bodies. Disturbance could occur from the installation of new structures and buildings along with buried electrical cables (e.g. watercourse crossings) and associated infrastructure (e.g. temporary (haul road) access crossings over surface watercourses).

1128. Disturbance could also occur in the event of an accidental release of drilling fluid from trenchless drilling techniques (e.g. HDD where this is used as an option for trenchless crossings) used to install cables below sensitive watercourses. In addition, installation of buried infrastructure beneath watercourses and associated flood defences could potentially constrain any future upgrades to these defences. Therefore, direct disturbance on surface water bodies during construction is scoped into the EIA.

8.4.3.1.2 Increased Sediment Supply

1129. Construction activities could increase soil erosion and the supply of fine sediment (e.g. clays, silts and fine sands) to surface watercourses. This could arise from earthworks and vegetation removal to construct temporary or long-term infrastructure within the onshore ECC and OCS zone. Increased sediment supply would increase turbidity levels within the water column, resulting in greater fine sediment deposition on the channel bed. In turn this could alter local geomorphological adjustment rates and impact upon in-channel morphological features.

1130. Higher sediment loads could also smother bed habitats, reduce light penetration, and decrease temperature and dissolved oxygen levels. These impacts could adversely affect stream biota, such as fish, macroinvertebrates and macrophytes. Therefore, increased sediment supply during construction is scoped into the EIA.

8.4.3.1.3 Supply of Contaminants to Surface and Groundwater

1131. The operation of construction machinery working in or adjacent to surface watercourses has the potential to accidentally release lubricants, fuels and oils into surface water bodies. Trenchless techniques, as well as any piling and foundation construction works at the OCS zone, could also introduce contaminants to the underlying groundwaters and aquifers. Contamination could also be caused by spillages, leakage and in-wash from vehicle storage areas following rainfall, and the accidental release of construction materials, such as cement and inert drilling fluids (bentonite) at trenchless crossings. Such contaminants could enter the aquatic system and adversely affect its surface water physico-chemistry. This could have associated impacts upon stream biota. Temporary discharges during the construction phase, including treated effluent from welfare facilities could also impact upon surface and groundwater quality.

1132. Any activities that disturb the ground, such as excavation, trenchless crossings or piling, could discharge contaminants below ground and potentially adversely affect groundwater quality and quantity elements, SPZs, Principal and Secondary aquifers, and any associated licensed or unlicensed abstractions. Groundwater quality and quantity could also be affected by saline ingress in relation to sub-surface activities (e.g. trenchless crossings). Therefore, the supply of contaminants to surface and groundwater is scoped into the EIA.

8.4.3.1.4 Changes to Surface and Groundwater Flows and Flood Risk

1133. Site preparation and construction activities within the Onshore Scoping Area could lead to an increase in surface water runoff due to alterations in surface drainage patterns and surface flows. Infiltration rates could be reduced because of soil compaction by construction vehicles and surface infrastructure. Increased surface runoff could have an adverse impact on the geomorphology of surface watercourses (e.g. through associated bed and bank scour and increase in fine sediment input). Sub-surface excavations and associated dewatering of groundwater could also result in changes to sub-surface flow patterns and an increase in surface flows.

1134. Flood risk could be altered and / or increased, particularly in areas designated as Flood Zone 2 or 3. Sub-surface flow patterns could also be altered due to potential changes in infiltration rates and surface flow patterns (e.g. associated with trenchless crossings). Increased surface runoff could affect watercourses that rely on assisted pumping. Therefore, changes to surface and groundwater flows and flood risk during construction are scoped into the EIA.

8.4.3.2 Potential Impacts during Operation

1135. The following sections outline the potential operational impacts scoped into the EIA. **Section 8.4.3.2.3** includes impacts scoped out of the EIA.

8.4.3.2.1 Supply of Contaminants to Surface and Groundwater

1136. There is the potential for accidental release of contaminants to surface and groundwater during planned and unplanned operational maintenance. Activities could lead to accidental release of fine sediment, oils, fuels and lubricants to surface water bodies. This could adversely affect the geomorphology and water quality of the surface water drainage network. Accidental spillage or leakage of fuel oils or lubricants could also impact upon the surface water quality and connected groundwater quality. This in turn could impact aquatic ecology and the use of water resources (SPZs, Principal and Secondary aquifers, and any associated licensed or unlicensed abstractions). Therefore, the supply of contaminants to surface and groundwater during operation is scoped into the EIA.

8.4.3.2.2 Changes to Surface and Groundwater Flows and Flood Risk

1137. Long term onshore infrastructure (i.e. infrastructure within the OCS zone) is likely to increase the impermeable area across the surface water catchments. This could decrease infiltration rates and permanently change surface runoff pathways which may increase and / or alter flood risk. The greatest flood risk impact from these changes is likely to be in parts of the Onshore Scoping Area designated as Flood Zone 2 or 3. Increased surface runoff could impact on watercourses that rely on assisted pumping.

1138. Ground disturbance during installation of the cable trench or foundations for buildings and structures is likely to change the transmissivity of the ground which overlays the cable infrastructure after reinstatement and may therefore become a preferential corridor for sub-surface water flow. Changes to the proportion of groundwater contained in surface waters could potentially alter water chemistry and impact upon the quality of water-dependent habitats. Therefore, changes to surface and groundwater flows and flood risk during operation are scoped into the EIA.

8.4.3.2.3 Potential Impacts Scoped Out During Operation

1139. Direct disturbance of surface water bodies during operation has been scoped out of the EIA, as there will be no mechanisms by which elements of the Project could directly disturb (e.g. trenching, disturbing channel bed and banks) water bodies. This is consistent with other recent projects, such as the Dudgeon Extension and Sheringham Shoal Extension Projects (Equinor, 2019) as there is no evidence of any impact. Although increased sediment supply resulting from the disturbance of water bodies has been scoped out during operation, fine sediment supply from maintenance activities during operation is included in the supply of contaminants to surface and groundwater impact (**Section 8.4.3.2.1**).

8.4.3.3 Potential Impacts during Decommissioning

1140. It is anticipated that decommissioning impacts on water resources and flood risk receptors would be similar in nature to those of construction, although the magnitude of impact is likely to be lower.

1141. The same potential impacts identified for construction are therefore expected to be scoped in (and out) for decommissioning (as per **Table 8-7**).

8.4.4 Potential Cumulative Effects

1142. There is potential for cumulative effects to arise in which other projects or plans could act collectively with the Project to affect water resources and flood risk receptors. Therefore, cumulative effects related to water resources and flood risk are scoped into the EIA. The CEA will follow the standard approach outlined in **Chapter 5 EIA Methodology**.

1143. Potential plans and projects that would be screened for inclusion in the CEA would include other offshore wind farms, housing developments, and any other projects that have the potential for effect on hydromorphology, surface and groundwater quantity and quality, and flood risk.

8.4.5 Summary of Scoping Proposals

1144. **Table 8-7** outlines the water resources and flood risk impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities, and as additional project information and site-specific data become available.

Table 8-7 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Water Resources and Flood Risk

Potential Impact	Construction	Operation	Decommissioning
Direct disturbance of surface water bodies	✓	x	✓
Increased sediment supply	✓	x	✓
Supply of contaminants to surface and groundwater	✓	✓	✓
Changes to surface and groundwater flows and flood risk	✓	✓	✓
Cumulative impacts	✓	✓	✓

8.4.6 Approach to Data Gathering

1145. As part of the EIA process, the existing environment with respect to freshwater quality and resource will be described, including, but not limited to the following:

- The hydrology, geomorphology and quality of surface freshwater features, including rivers, canals, lakes and drainage ditches;
- The quality and quantity of groundwaters;
- Surface and groundwater abstractions;
- Designated sites with potential to be affected by changes to freshwater quality and resource; and
- Flood risk.

1146. **Table 8-8** identifies the desk-based sources that will be accessed to inform the characterisation of the existing environment.

Table 8-8 Desk-Based Data Sources for Water Resources and Flood Risk

Data Source	Date	Data Contents
Environment Agency	Updated 2022	The Catchment Data Explorer (https://environment.data.gov.uk/catchment-planning) provides information on River Basin Districts Management Catchments, Operational Catchments and water body status, objectives and classification data.
	Undated	The Flood Map for Planning showing the flood zones within the Onshore Scoping Area (https://flood-map-for-planning.service.gov.uk/).
	Undated	The long term flood risk service mapping shows the surface water and reservoir flood risk within the Onshore Scoping Area (https://check-long-term-flood-risk.service.gov.uk/map)
	Updated approximately every six months	The Water Quality Archive provides data on water samples taken at sampling points from coastal or estuarine waters, rivers, lakes, ponds, canals or groundwaters. (https://environment.data.gov.uk/water-quality/view/landing).
	Dated individually	Surface and groundwater abstraction data (available on request).
	Dated individually	Discharges to water and groundwater (https://environment.data.gov.uk/public-register/view/search-water-discharge-consents).
Lead Local Flood Authority (ERYC)	Undated	Historic flood incident information relating to high, surface water and / or drainage flooding.
ERYC and Environment Agency	Undated	Any previous site investigation data and public sewer records. Private abstraction data.
Beverley and North Holderness IDB	Undated	Information related to IDB maintained drains, historic flood incidents and wider catchment management practices.
Department for Environment, Food and Rural Affairs (Defra)	Undated	MAGIC map (www.magic.defra.gov.uk) showing aquifer designations, SPZs, Drinking Water Safeguard Zones, groundwater vulnerability mapping and NVZs.
Natural England	Undated	MAGIC map (www.magic.defra.gov.uk) showing for information on designated sites and reasons for designation.
BGS	Undated	BGS Geology Viewer – shows bedrock and superficial deposits (https://geologyviewer.bgs.ac.uk/?_ga=2.122224843.1109077595.1663076242-627234099.1663076242).

1147. A geomorphology baseline survey will also be undertaken to inform the EIA, as outlined in **Table 8-9**. A Crossing Schedule will be produced, and this will be used to identify watercourse crossings that will be surveyed. The survey will provide additional data on the watercourses which are scoped into the next stage of the EIA. This will be undertaken in accordance with best practice geomorphological walkover methodologies. Agreement on the method and scope of the survey will be obtained from the Environment Agency, IDB and Lead Local Flood Authority (LLFA) prior to undertaking the survey.

Table 8-9 Proposed Baseline Surveys for Water Resources and Flood Risk

Survey	Timing	Spatial Coverage
Geomorphology baseline	2024 (survey date to be confirmed)	The geomorphology baseline survey will collect information about the existing condition of the major watercourses within the Onshore Scoping Area. It will specifically focus on reaches where crossings of main rivers or other sensitive watercourses are proposed.

8.4.7 Approach to Assessment

1148. The EIA will focus on potential impacts on two groups of receptors:

- Water resources, including the hydrology, geomorphology and water quality of surface waters (e.g. rivers, canals, lakes and reservoirs); the quantity and quality of groundwater; abstractions from surface and groundwaters (e.g. Principal, Secondary A and Secondary Undifferentiated aquifers) and associated designated sites (e.g. SPZs, Drinking Water Protected Areas); water-dependent habitats and groundwater-dependent terrestrial ecosystems (GWDTEs), including designated sites (e.g. Special Areas of Conservation (SAC), SPA, SSSI); and water supply infrastructure (including treatment plants, pumping stations and distribution networks) and surface and foul drainage infrastructure; and

- Flood risk to the Project from all sources, including fluvial, coastal, surface water, groundwater, sewer and reservoir flooding, as well as the residual risk associated with flood risk management infrastructure. It will also consider changes in flood risk from all of the above sources resulting from the Project.

1149. Whilst there are clear links between the two groups of receptors, the assessment of receptor sensitivity and the magnitude of effect may differ. Definitions of receptor sensitivity and value and impact magnitude and significance will be developed with reference to guidance for the assessment of water resources impacts provided by the Department of Transport (2023) and the Department for Levelling Up, Housing and Communities (DLUHC) (2023).

1150. The approach to assessment will be discussed and agreed through production of a method statement and discussion with stakeholders as part of the EPP (as set out in **Chapter 6 Consultation**). Consultation will be undertaken at key stages throughout the EIA process. Following the refinement of the Onshore Development Area, further liaison with the stakeholders including the Environment Agency, Natural England, the LLFA and Yorkshire Water will be undertaken to agree the approach and methodology for data collection for EIA purposes and the specific assessment methodology.

8.4.7.1 Supporting Assessments

1151. The EIA will be supported by two additional assessments:

- A Flood Risk Assessment (FRA) undertaken in accordance with the National Planning Policy Framework (DLUHC, 2023) and the accompanying Planning Practice Guidance for Flood Risk and Coastal Change (DLUHC, 2022) to assess the flood risk both to the Project and from the Project to the surrounding areas. The FRA will consider each element of the Project individually, both during construction and once operational. This will inform the identification of any required mitigation measures; and

- A Water Environment Regulations (WER) Compliance Assessment (which includes risks to ecological status) to assess compliance with the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Initially, this would consist of three stages (screening, scoping and impact assessment), in accordance with the Planning Inspectorate's guidance (Planning Inspectorate, 2017). The WER Compliance Assessment will assess impacts on all onshore water bodies crossed by the Project, and coastal water bodies out to one nautical mile (Environment Agency, 2016).

8.4.8 Scoping Questions to Consultees

1152. The following questions are posed to consultees to help them frame and focus their response to the water resources and flood risk scoping exercise which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment?
- Have all the water resources and flood risk impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the water resources and flood risk impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

8.5 Soils and Land Use

1153. This chapter of the Scoping Report considers the potential likely effects of the Project associated with soils and land use, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the onshore ECC, including the landfall area and the OCS zone.

1154. The soils and land use assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 8.2 Geology and Ground Conditions;**
- **Chapter 8.4 Water Resources and Flood Risk;**
- **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation;**
- **Chapter 8.9 Traffic and Transport;** and
- **Chapter 9.4 Socio-Economics, Tourism and Recreation.**

8.5.1 Study Area

1155. It is assumed that impacts to soils and land use will occur wholly within the Onshore Scoping Area (see **Figure 1-2**).

8.5.2 Existing Environment

8.5.2.1 Existing Land Uses

1156. Land use within the Onshore Scoping Area is predominantly arable agricultural land in active use. A range of other land types are also present, including:

- Built-up urban areas including, but not limited to the settlements of Skipsea, Brewholme, Little Arram, Dunnington, Catfoss, Leven, Sigglesthorne, Scorborough, Cherry Burton, Bishop Burton, Tickton, Woodhill Way Travellers' Site and Walkington;
- Areas of industry including, but not limited to:
  - Acomb Engineering;
  - BP Beverley West Service Station;
  - Catfoss Industrial Estate;
  - Cottingham Parks Golf and Leisure Club;
  - Creyke Beck Substation;
  - Dogger Bank Substation A;
  - Dogger Bank Substation B;
  - Enviro Aggregates;
  - Foss Hill Quarry;
  - Imerys Minerals Quarry, Beverley;
  - Linley Hill (Beverley) Airfield;
  - Swift Group Caravan Factory; and
  - Yarrows Aggregates.

1157. Non-agricultural land such as areas of wetland, woodland, watercourses and recreational land uses (e.g. Far Grange Park and Golf Club) are also present within the Onshore Scoping Area.

1158. Multiple public rights of way (PRoW) (inclusive of both footpaths and bridleways), and cycle routes (see **Figure 8-14**) are recorded as being wholly or partially located within the Onshore Scoping Area, with the Easington to Filey Brigg section of the King Charles III England Coast Path currently approved within the Onshore Scoping Area but not yet open, and with establishment works in progress or planned. National Cycle Network (NCN) Route 164 is present in the Onshore Scoping Area between Leven and Long Riston running south-west through Tickton and further south through Walkington. NCN Route 1 is also present within the Onshore Scoping Area running through Cherry Burton towards Beverley before crossing the Onshore Scoping Area a second time south of Beverley.

1159. Two areas of land designated under the Countryside and Rights of Way Act (CRoW) are present within the Onshore Scoping Area. Both these areas are located within the vicinity of Seaton.

1160. There are 27 records of historical landfill sites and two authorised landfill sites located within the Onshore Scoping Area. These are discussed within **Chapter 8.2 Geology and Ground Conditions**.

8.5.2.2 Agricultural Land and Soil Quality

1161. The agricultural land, which comprises the majority of the Onshore Scoping Area, is classified using Natural England's Agricultural Land Classification (ALC) dataset. ALC grades agricultural land from Grade 1 (best quality) through to Grade 5 (poorest quality) based on factors including climate, nature of the soil and site-based factors. 'Best and Most Versatile' (BMV) agricultural land is defined as Grades 1, 2 and 3 (with Grade 3 split into 3a and 3b). As Grade 3 is not split within Natural England's ALC mapping dataset, at this stage it has been assumed that all Grade 3 land could be Grade 3a.

1162. The Onshore Scoping Area contains agricultural land of Grades 2 to 4 with some urban land located in the area surrounding Beverley (see **Figure 8-15**). The land within the Onshore Scoping Area is predominantly Grades 2 and 3, with Grade 3 the predominate grade within the eastern and northern areas of the Onshore Scoping Area and Grade 2 within the southern area.

8.5.2.3 Agri-Environmental Schemes

1163. There are multiple areas of land within the Onshore Scoping Area that are held under Entry Level plus Higher Level Environmental Stewardship Schemes (ESS) (Figure 8 3). These schemes are designed to encourage environmentally beneficial land management practices via financial incentives.

1164. Multiple Middle Tier and Higher Tier Countryside Stewardship Schemes (CSS) are also located throughout the Onshore Scoping Area (**Figure 8-16**). Similar to ESS, the overarching aim of CSS is to look after and improve the environment via financial incentives.

1165. Further information relating to Environmental Land Management Schemes (ELMS) will be gathered as part of the EIA process, noting that the new ELMS elements, which are comprised of the Sustainable Farming Incentive, Local Nature Recovery, and Landscape Recovery, will be launched in tranches from 2022 to 2024.

8.5.2.4 Development Proposals and the Green Belt

1166. With reference to the East Riding of Yorkshire Local Plan 2012 – 2029, adopted 2016 (ERYC, 2016) there are a number of land uses and features covered by polices in the plan, including (but not limited to):

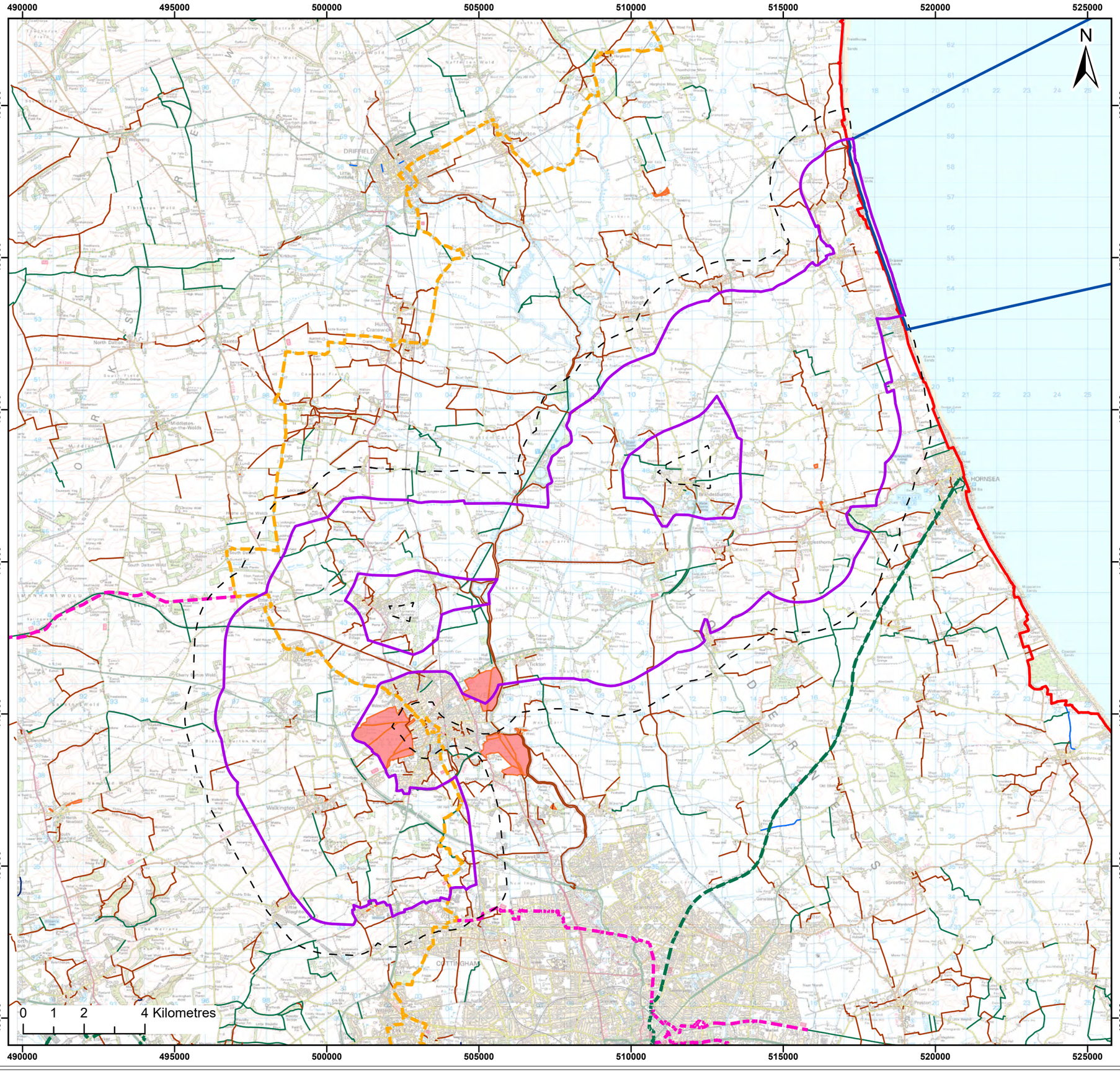
- Open Space (Policy C2);
- Mineral Safeguarding Areas (Policy EC6);
- Important Landscape Area (ENV2);
- Registered Parks and Gardens, and Scheduled Monuments (Policy ENV3);
- Local Wildlife Sites, Local Nature Reserves, Local Geological Sites and Principal Nature Designations – Special Protection Area and Site of Special Scientific Interest (Policy ENV4);
- Functional Flood Plain, Coastal Change Management Area, Military and Technical Site Consultation Zones and Strategic Aviation Consultation Zones (Policy ENV6);
- Neighbourhood Plan Areas (Policy S1); and
- Development Limits (Policy S3 and S4).

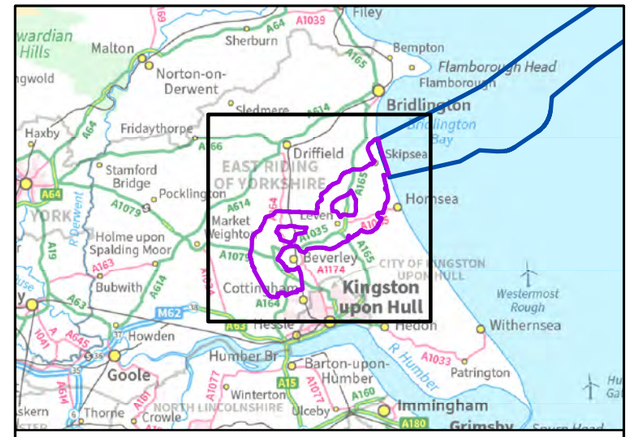
1167. An update to the East Riding of Yorkshire Local Plan is currently ongoing (East Riding of Yorkshire Local Plan Update 2020 - 2039, Draft Strategy Document Update (ERYC, 2021)). Should the updated plan be adopted prior to the submission of the DCO application, a review of the features and land uses covered by the polices in the plan will be undertaken.

1168. There are no areas of green belt land located within the Onshore Scoping Area.

8.5.2.5 Utilities

1169. It is anticipated that utilities are present within the Onshore Scoping Area. These are likely to include telecommunications, buried and above ground electricity cables, gas and public water mains. Detailed utilities data will be sought once the Onshore Development Area has been refined during the EIA process and presented in the PEIR.





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Geology and Ground Conditions Study Area Extension (Onshore Scoping Area 1km Buffer)
- Registered Common Land
- King Charles III England Coast Path

National Cycle Network

- Route 1
- Route 65
- Route 66

Public Rights of Way

- Footpath
- Bridleway
- Byway Open to All Traffic
- Restricted Byway

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

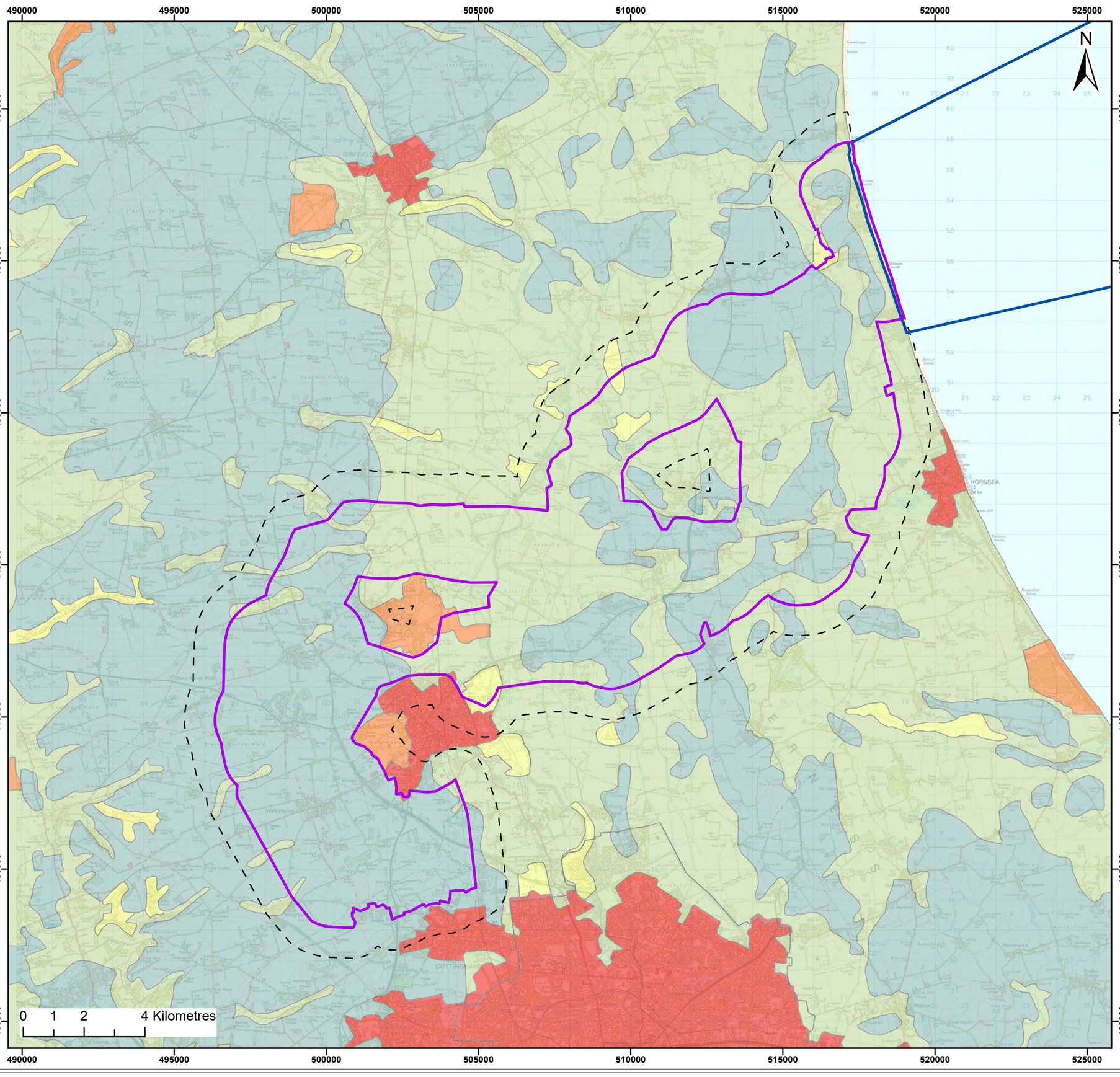
Public Rights of Way and Cycle Routes

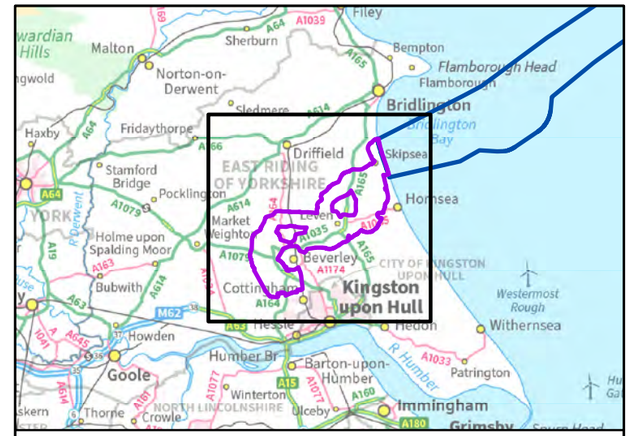
Figure:	Drawing No:				
8-14	PC3991-RHD-ON-ZZ-DR-Z-0049				
Revision:	**Date:**	**Drawn:**	**Checked:**	**Size:**	**Scale:**
01	09/06/2024	AB	GC	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Geology and Ground Conditions Study Area Extension (Onshore Scoping Area 1km Buffer)

Agricultural Land Classification

- Grade 2
- Grade 3
- Grade 4
- Non Agricultural
- Urban

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Agricultural Land Classification

Figure: 8-15

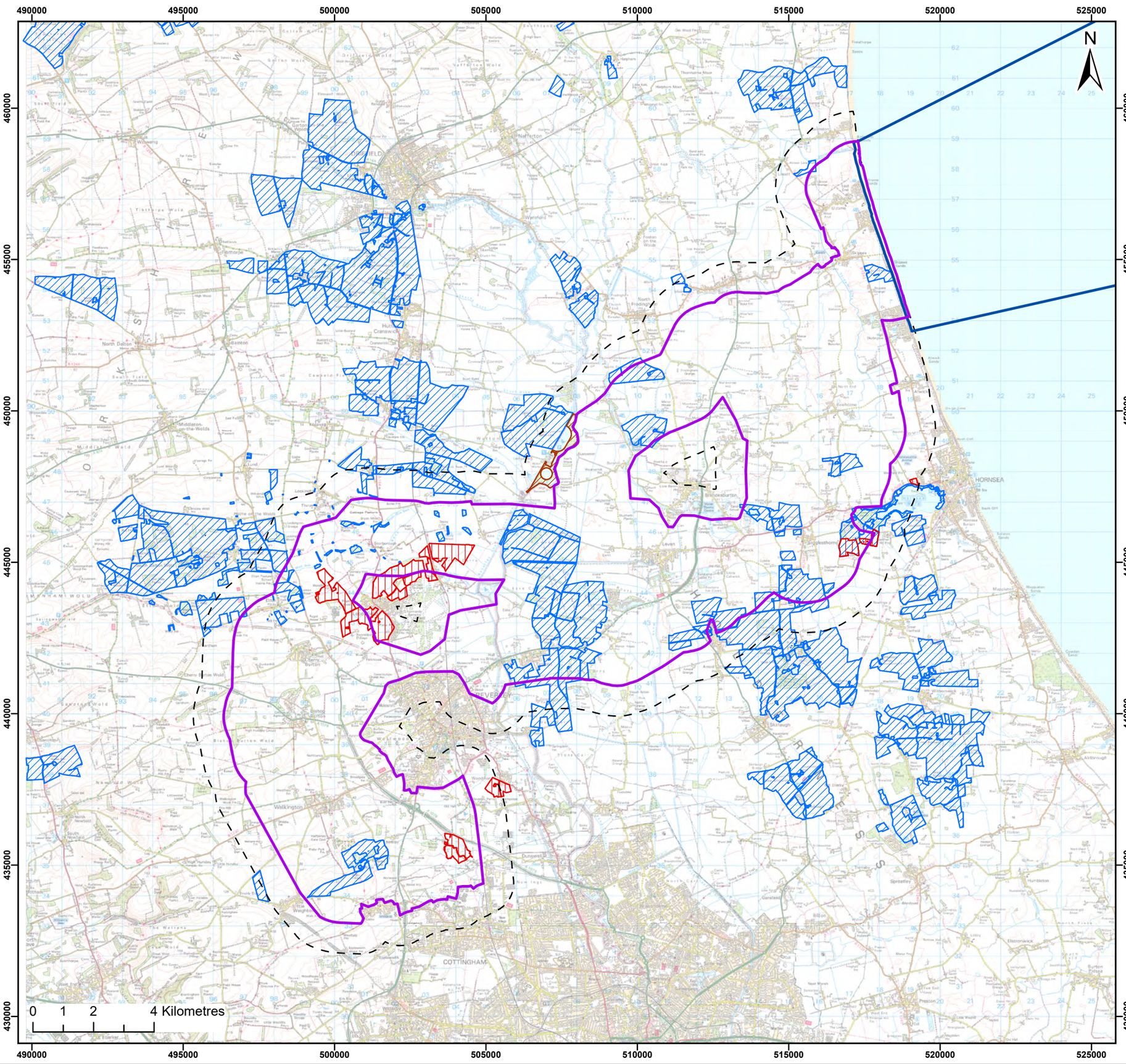
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0046

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	07/06/2024	JH	AB	A3	1:125,000
02	25/04/2024	JH	AB	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables

equinor



Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Geology and Ground Conditions Study Area Extension (Onshore Scoping Area 1km Buffer)
- Countryside Stewardship Schemes

Environmental Stewardship Schemes

- Entry Level plus Higher Level Stewardship
- Higher Level Stewardship

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Environmental and Countryside Stewardship Schemes

Figure: 8-16

Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0047

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	07/06/2024	JH	AB	A3	1:125,000
02	25/04/2024	JH	AB	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables

equinor

8.5.3 Potential Impacts

8.5.3.1 Potential Impacts during Construction

8.5.3.1.1 Agricultural Drainage

1170. The construction works have the potential to impact on both natural and artificial drainage systems within the Onshore Scoping Area. This in turn could impact on the risks associated with surface water flooding to agricultural land itself and surrounding environment. Potential impacts on drainage are also discussed in **Chapter 8.4 Water Resources and Flood Risk**. The potential impacts on agricultural drainage have therefore been scoped into the EIA.

8.5.3.1.2 Disruption to Farming Practices

1171. The majority of the Onshore Scoping Area is located within areas currently associated with agricultural production. There is potential for adverse impacts on farming and other land use practices through the temporary loss of land availability, restricted access and disruption caused by working areas and construction traffic. Impacts on farming practices are therefore scoped into the EIA.

8.5.3.1.3 Soil Degradation and Erosion

1172. There is potential for adverse impacts to soil structure and future agricultural productivity of soils impacted during the construction phase through the use of heavy machinery and disturbance associated with ground works. Changes to soils can affect biological activity and water retention leading to loss or change in agricultural productivity.

1173. There is also the potential for soil erosion to occur as a result of excavation, storage and reinstatement processes that are likely to occur during construction works. Such erosion may be due to changes in water pathways or wind derived. Due to the above mechanisms soil degradation and erosion is scoped into the EIA.

8.5.3.1.4 Stewardship and Land Management Schemes

1174. There is potential for ecological and financial impacts to areas under ESS, CSS or the emerging ELMS regime, to occur as a result of construction activities. Potential impacts on such stewardship and land management schemes will therefore be scoped into the EIA.

8.5.3.1.5 Existing Utilities

1175. During the construction phase, cable installation activity has the potential to impact on telecommunications, water, power and gas infrastructure through intrusive excavation works or associated disruption. Therefore, potential impacts on such services will be scoped into the EIA.

8.5.3.1.6 Public Rights of Way, Cycle Routes and Countryside and Rights of Way

1176. Temporary impacts on PRoWs, CRoWs, the King Charles III England Coast Path and NCN routes may occur due to construction activities, notably where construction works directly overlap such routes. Any temporary changes / re-direction of PRoWs, CRoWs, the King Charles III England Coast Path or NCN to allow construction to be undertaken may cause temporary changes to usage and opportunities for recreation and these aspects will be scoped into the EIA.

8.5.3.2 Potential Impacts during Operation

8.5.3.2.1 Agricultural Drainage

1177. Long term infrastructure and hardstanding within the OCS zone and the presence of buried cables has the potential to permanently impact upon land drainage affecting crop yield, and such potential impacts will be scoped into the EIA. Potential impacts on drainage are also discussed in **Chapter 8.4 Water Resources and Flood Risk**.

8.5.3.2.2 Disruption to Farming Practices

1178. The presence of long term above ground infrastructure within the OCS zone, plus any cable jointing bays and associated easements for access, will potentially result in the long-term loss of land, including agricultural land, and therefore also a loss in the productivity of these areas. Given the extent of BMV within the Onshore Scoping Area, there is a potential loss of BMV during the lifetime of the Project.

1179. It is not envisaged that buried cables will affect farming practices due to burial depth. This will be confirmed in the PEIR but as a precaution, and until cable burial depths can be confirmed, the potential for buried infrastructure to restrict farming practices during the operation phase will be scoped into the EIA.

1180. Buried cable systems have the potential to emit heat, therefore potentially causing impacts to soil characteristics and productivity. The electrical system will be designed to minimise heat loss to a level which is unlikely to affect crop growth. Operational cable heat emission effects will therefore be scoped out of the EIA.

8.5.3.2.3 Soil Degradation and Erosion

1181. Impacts associated with soil degradation and erosion are not anticipated to occur during the operation phase of the Project, given the careful reinstatement that will take place via implementation of the final Code of Construction Practice. Operational impacts to soil degradation and erosion will be scoped out of the EIA.

8.5.3.2.4 Stewardship and Land Management Schemes

1182. There is the potential for land associated with existing / future stewardship and land management schemes within the footprint of the OCS(s) and infrastructure within the OCS zone to be permanently taken out of use during the operation phase. This issue will be scoped into the EIA.

1183. Land located at landfall and within the onshore ECC would be reinstated following construction and will not be significantly impacted as a result of the operation phase of the Project. This issue will be scoped out of the EIA.

8.5.3.2.5 Existing Utilities

1184. Any maintenance works that may be required during the operation phase of the Project would be undertaken following consultation with potentially affected utility providers, with the location of existing services identified prior to commencement of any works. Utility crossings will be undertaken in accordance with industry standard practice as agreed with the relevant utility owners. Therefore, it is not anticipated that existing utilities will be impacted during the operation phase of the Project, and this is scoped out of the EIA.

8.5.3.2.6 Public Rights of Way, Cycle Routes and Countryside and Rights of Way

1185. There is the potential for long term diversions to PRoW and NCN in areas associated with the OCS(s) and infrastructure within the OCS zone during the lifetime of the Project. This will be scoped into the EIA.

1186. For buried infrastructure, long term diversions to PRoW, the King Charles III England Coast Path and NCNs as well as impacts to CRoW and public health are not anticipated, and this issue is scoped out of the EIA.

8.5.3.3 Potential Impacts during Decommissioning

1187. It is anticipated that the decommissioning impacts to soils and land use receptors would be similar in nature to those of construction, although the magnitude of impact is likely to be lower.

1188. The same potential impacts identified for construction will therefore be scoped in (and out) of the EIA for the decommissioning phase (as per **Table 8-10**).

8.5.4 Potential Cumulative Effects

1189. There is potential for cumulative effects to arise in which other projects or plans could act collectively with the Project to affect soils and land use receptors. The CEA will follow the standard approach outlined in **Chapter 5 EIA Methodology**.

1190. Potential cumulative impacts related to soils and land use include other nearby development projects with temporal and spatial overlaps that may interact with the same receptors such as soil resources or existing land uses.

8.5.5 Summary of Scoping Proposals

1191. **Table 8-10** outlines the soils and land use impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities, and as additional project information and site-specific data become available.

Table 8-10 Summary of Impacts Proposed to be Scoped In(✓) and Out (X) for Soils and Land Use

Potential Impact	Construction	Operation	Decommissioning
Agricultural drainage	✓	✓	✓
Disruption to farming practices (in general)	✓	✓ (buried infrastructure may be scoped out once cable burial depths are confirmed)	✓
Disruption to farming practices (soil heating)	X	X	X
Soil degradation and erosion	✓	X	✓
Stewardship and land management schemes	✓	✓	✓
Existing utilities	✓	X	✓
PRoW, cycle routes and CRoW	✓	✓ (for PRoWs and NCNs in relation to the OCS(s) and infrastructure within the OCS zone only)	✓
Cumulative impacts	✓	✓	✓

8.5.5.1 Approach to Data Gathering

1192. The existing environment will be characterised using the data sources set out in **Table 8-11.**

Table 8-11 Data Sources for Soils and Land Use

Data Source	Date	Data Contents
Natural England	2018 - 2023	• ALC maps (see **Section 8.5.5.2** below) • ESS • King Charles III England Coast Path details and mapping

Data Source	Date	Data Contents
Countryside and Rights of Way Act 2000 – Section 4 Conclusive Registered Common Land, Natural England	2023	• Common land • CRoW
ERYC	2016 (adopted local plan), 2024 (draft local plan)	• Planning policy adopted proposals maps • Definitive PRoW mapping
Ordnance Survey (OS) mapping Aerial photography	Various	• 'A' Roads • Railway lines • Urban areas
Utilities records requested from local utilities suppliers (various) and Environmental Monitoring and Assessment Programme (EMAP) website	2024	• Utilities
Any additional datasets will be identified through ongoing consultation with stakeholders. A PRoW walkover survey will be undertaken to characterise any PRoW crossings. No other surveys are proposed to inform the assessment of impacts related to soils and land use.		

8.5.5.2 Agricultural Land Classification

1193. The primary data source for the identification of BMV agricultural land within the boundary of the Project is considered to be Natural England's provisional ALC (England) dataset. The provisional ALC data allows for an initial overview of the ALC Grades present within the boundary of the Project. This overview is considered to be conservative as this dataset does not differentiate between Grades 3a (BMV) and 3b (non-BMV). As such, assessments undertaken using the provisional ALC data will assume that all Grade 3 land has the potential to be Grade 3a and so conforms to the description of BMV agricultural land. It is proposed that this provisional dataset will be utilised to assess the potential impacts of the construction, operation and decommissioning phases of the Project.

1194. Post 1988 ALC data is based on site surveys, this dataset does not have the same coverage as the provisional ALC dataset and so is only available for localised areas within England. Post 1988 ALC data allows for the differentiation of Grades 3a and 3b land, providing a more detailed overview of BMV land. Where available, this data will be utilised to inform the baseline environment within the Project boundary.

1195. As it is considered that all Grade 3 land has the potential to be Grade 3a (BMV), no agricultural land surveys are proposed prior to the submission of the DCO application.

8.5.6 Approach to Assessment

1196. The soils and land use assessment will identify and assess the likely impacts of the Project and the appropriate mitigation measures if required. The assessment will consider both direct and indirect impacts.

1197. The methodology for the assessment of the impacts on soils and land use will be informed by the following guidance:

- Design Manual for Roads and Bridges (DMRB) LA 109 Geology and Soils (Highways Agency, 2019);
- DMRB LA 112 Population and Human Health (Highways Agency, 2020);
- Department for Environment, Food and Rural Affairs (Defra) guidance including the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2018);
- Good Practice Guide for Handling Soils in Mineral Workings (Institute of Quarrying, 2021);
- A New Perspective on Land and Soil in Environmental Impact Assessment (IEMA, 2022); and
- Environmental Land Management Schemes (UK Government, 2021).

1198. Reforms to agricultural policy and spending in England as well as the introduction of ELMS are currently ongoing. Guidance associated with these reforms will be reviewed following their publication and incorporated into the assessment where appropriate.

1199. Soils and land use will be included within the EPP (as set out in **Chapter 6 Consultation**) and further liaison with key stakeholders will take place to agree the approach to data collection, and the specific assessment methods to be employed as part of the EIA as part of this process.

8.5.7 Scoping Questions to Consultees

1200. The following questions are posed to consultees to help them frame and focus their response to the soils and land use scoping exercise which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment?
- Have all the potential soils and land use impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the soils and land use impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

8.6 Onshore Ecology, Ornithology and Nature Conservation

1201. This chapter of the Scoping Report considers the potential likely effects of the Project associated with onshore ecology, ornithology and nature conservation, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the onshore ECC, landfall area, the OCS zone.

1202. The onshore ecology, ornithology and nature conservation assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 7.7 Intertidal and Offshore Ornithology;**
- **Chapter 8.2 Geology and Ground Conditions;**
- **Chapter 8.3 Onshore Air Quality and Dust;**
- **Chapter 8.4 Water Resources and Flood Risk;**
- **Chapter 8.5 Soils and Land Use;** and
- **Chapter 8.8 Onshore Noise and Vibration.**

8.6.1 Study Area

1203. For the purposes of this Scoping Report a range of buffer distances from the Onshore Scoping Area have been used to define the Onshore Study Area. This is to ensure appropriate ecological features have been considered as part of the Scoping exercise. These distances are presented in **Table 8-12**.

1204. The Onshore Scoping Area is shown within **Figure 8-17**. Buffers which extend beyond the MHWS are covered within **Chapter 7.7 Intertidal and Offshore Ornithology**.

Table 8-12 Onshore Study Area Buffer Distances from the Onshore Scoping Area

Ecological feature	Buffer distance from Onshore Scoping Area
International Statutory Designated Sites	10km
National Statutory Designated Sites	2km
Local Statutory Designated Sites	2km
Non-statutory Designated Sites	Within the Onshore Scoping Area
Priority Habitats	Within the Onshore Scoping Area
Protected and Notable Species	Within the Onshore Scoping Area

8.6.2 Existing Environment

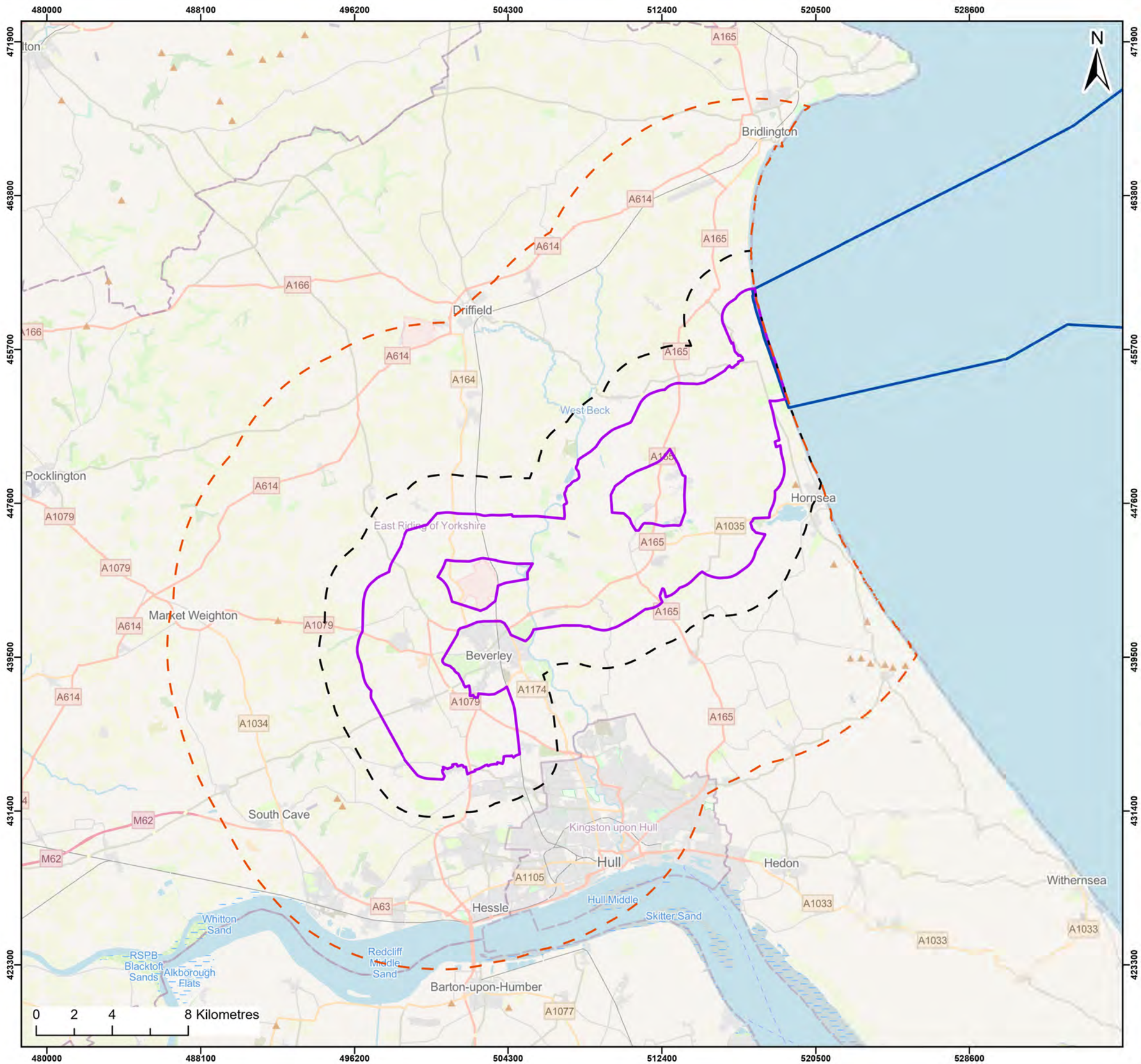
1205. The Onshore Scoping Area is dominated by agricultural land bound by hedgerows. Proportionately small areas of woodland, grassland, scrub and coastal habitats are also present. In addition, a number of waterbodies and watercourses are also present throughout the Onshore Scoping Area.

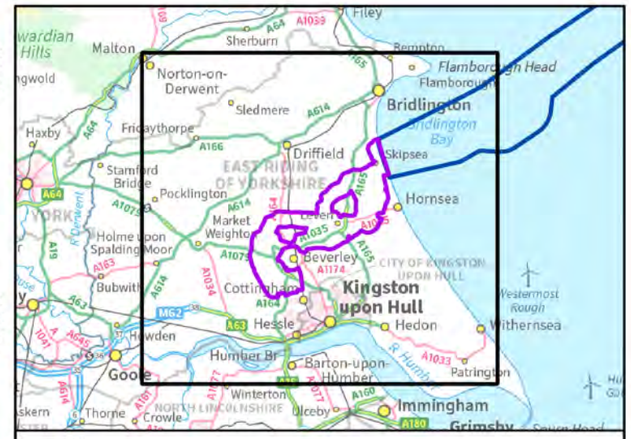
1206. The landfall is located on the Holderness coast. Habitat at the landfall comprises beaches of boulder clay with soft cliffs above and is lacking in either rocky intertidal or estuarine mudflat habitat. As outlined in **Chapter 7.7 Intertidal and Offshore Ornithology** the adjacent marine environment carries importance and statutory designations for primarily offshore habitats and species.

8.6.2.1 Designated Sites

1207. Designated sites within the Onshore Study Area are presented in **Table 8-13** and shown on **Figure 8-18**. In summary, no internationally designated statutory sites (SAC, SPA, Ramsar Sites) are located within the Onshore Scoping Area. Hornsea Mere SPA and Greater Wash SPA are located adjacent to the Onshore Scoping Area boundary. Four further internationally designated statutory sites are located within 10km from the Onshore Scoping Area. Two nationally designated statutory SSSI are located within the Onshore Scoping Area: Bryan Mills Field SSSI and Leven Canal SSSI. Two SSSIs are located adjacent to the Onshore Scoping Area boundary. A further three SSSIs are located within the 2km Study Area. One locally designated statutory site, a Local Nature Reserve (LNR), is located within the Onshore Scoping Area. Three additional LNRs are located within the Onshore Study Area. A total of 48 non-statutory designated Local Wildlife Sites (LWS) are located within the Onshore Scoping Area.

1208. It should be noted that there are a number of SSSI designated for geology with no biological qualifying / interest features. These are considered separately in **Chapter 8.2 Geology and Ground Conditions**.





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- 2km Buffer from Onshore Scoping Area for National and Local Statutory Designated Sites
- 10km Buffer from Onshore Scoping Area for International Statutory Designated Sites

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Ecology, Ornithology and Nature Conservation Study Area

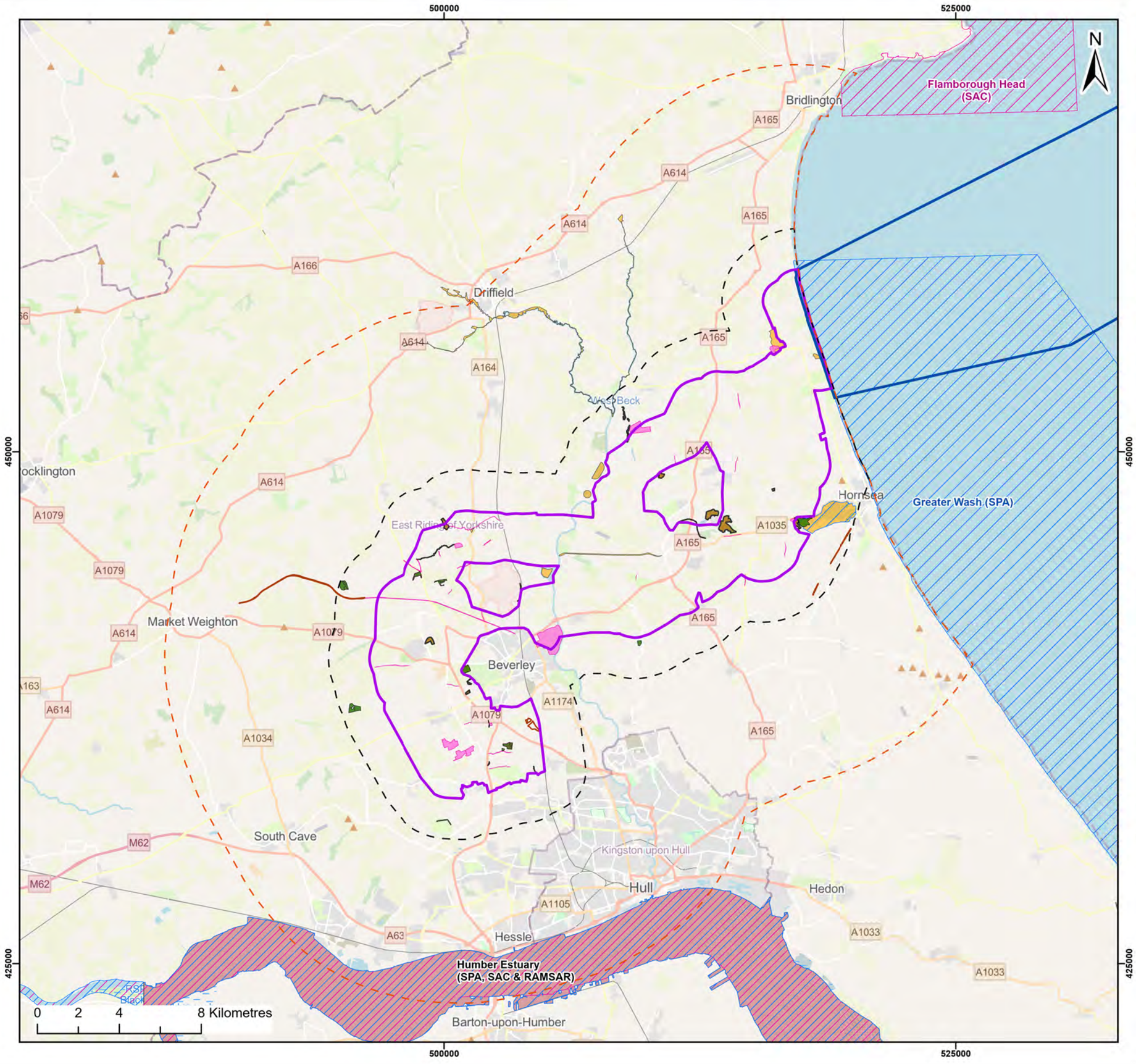
Figure: 8-17

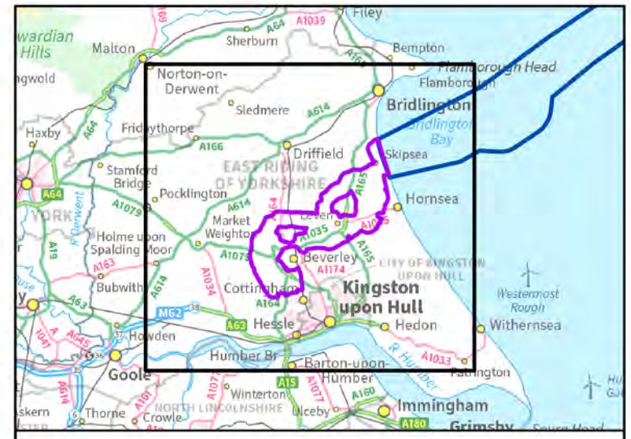
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0048

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	31/05/2024	JH	AB	A3	1:200,000
01	05/04/2023	JR	AG	A3	1:200,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Onshore Scoping Area 2km Buffer
- Onshore Scoping Area 10km Buffer
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland
- Local Nature Reserves
- candidate Local Wildlife Sites (cLWS)
- designated Local Wildlife Sites (dLWS)

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

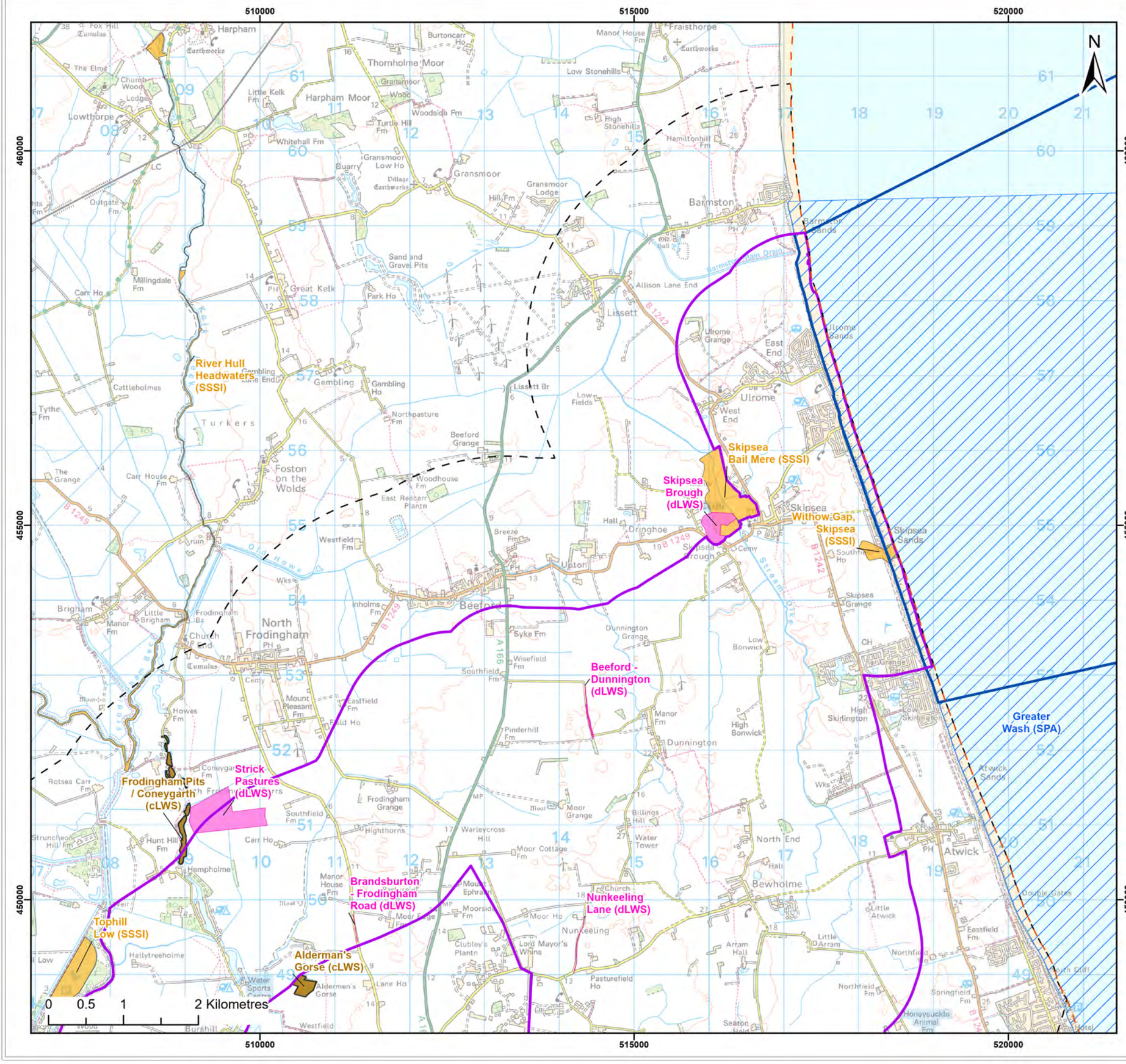
Title: Nature Conservation Areas (Sheet 1 of 5)

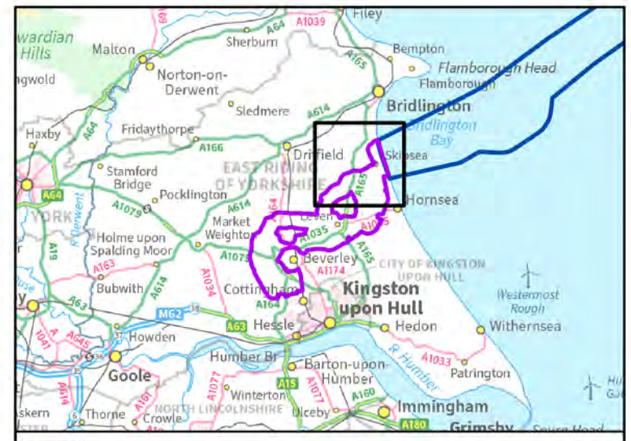
Figure: 8-18 | Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0049

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	17/06/2024	JH	AB	A3	1:185,000
02	05/04/2023	JR	AG	A3	1:185,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Onshore Scoping Area 2km Buffer
- Onshore Scoping Area 10km Buffer
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- candidate Local Wildlife Sites (cLWS)
- designated Local Wildlife Sites (dLWS)

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

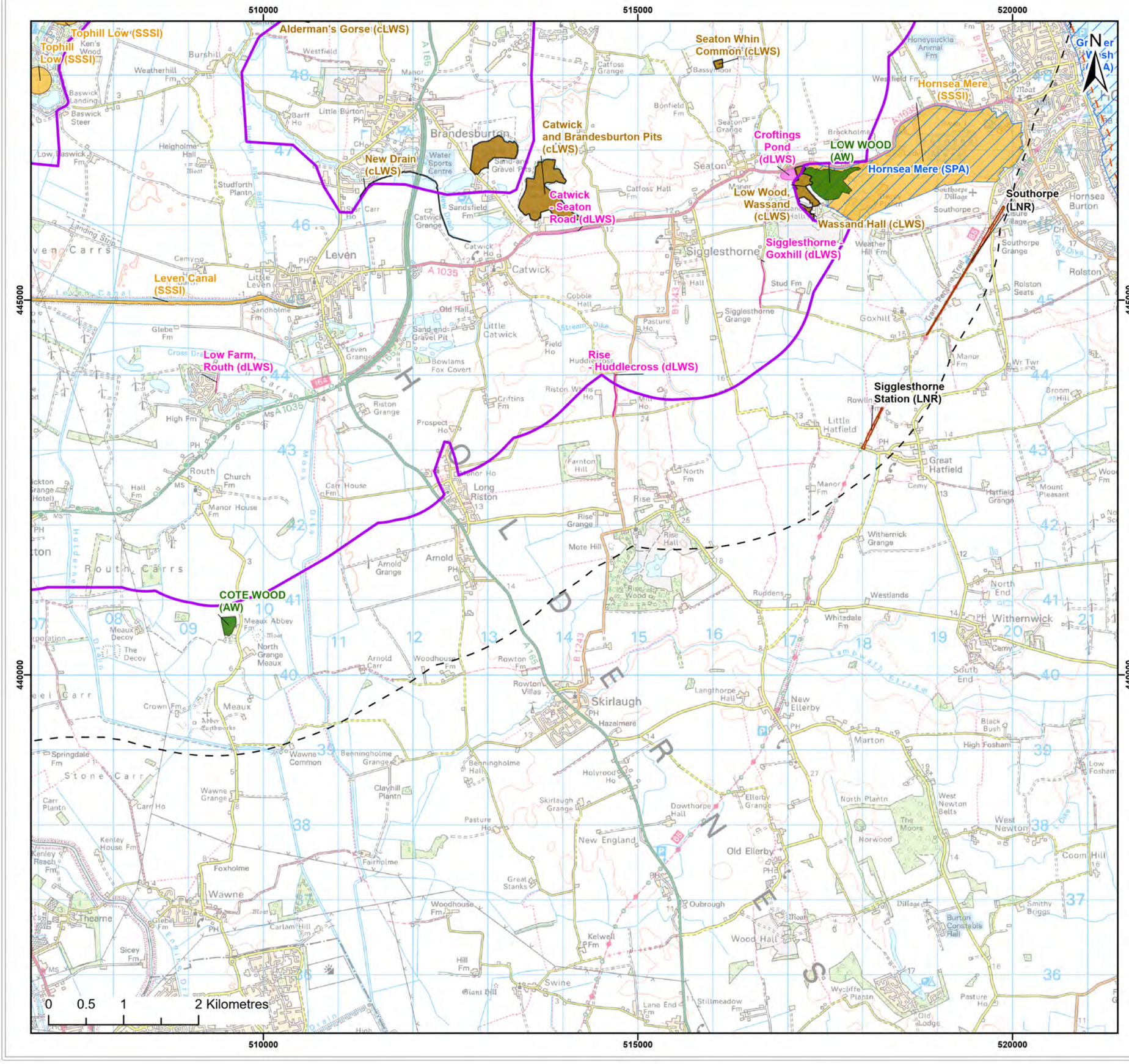
Nature Conservation Areas (Sheet 2 of 5)

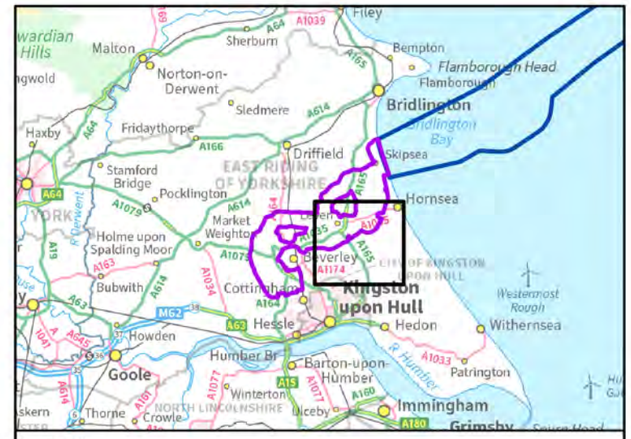
Figure: 8-18 | Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0049

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	17/06/2024	JH	AB	A3	1:50,000
02	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Onshore Scoping Area 2km Buffer
- Onshore Scoping Area 10km Buffer
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland
- Local Nature Reserves
- candidate Local Wildlife Sites (cLWS)
- designated Local Wildlife Sites (dLWS)

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

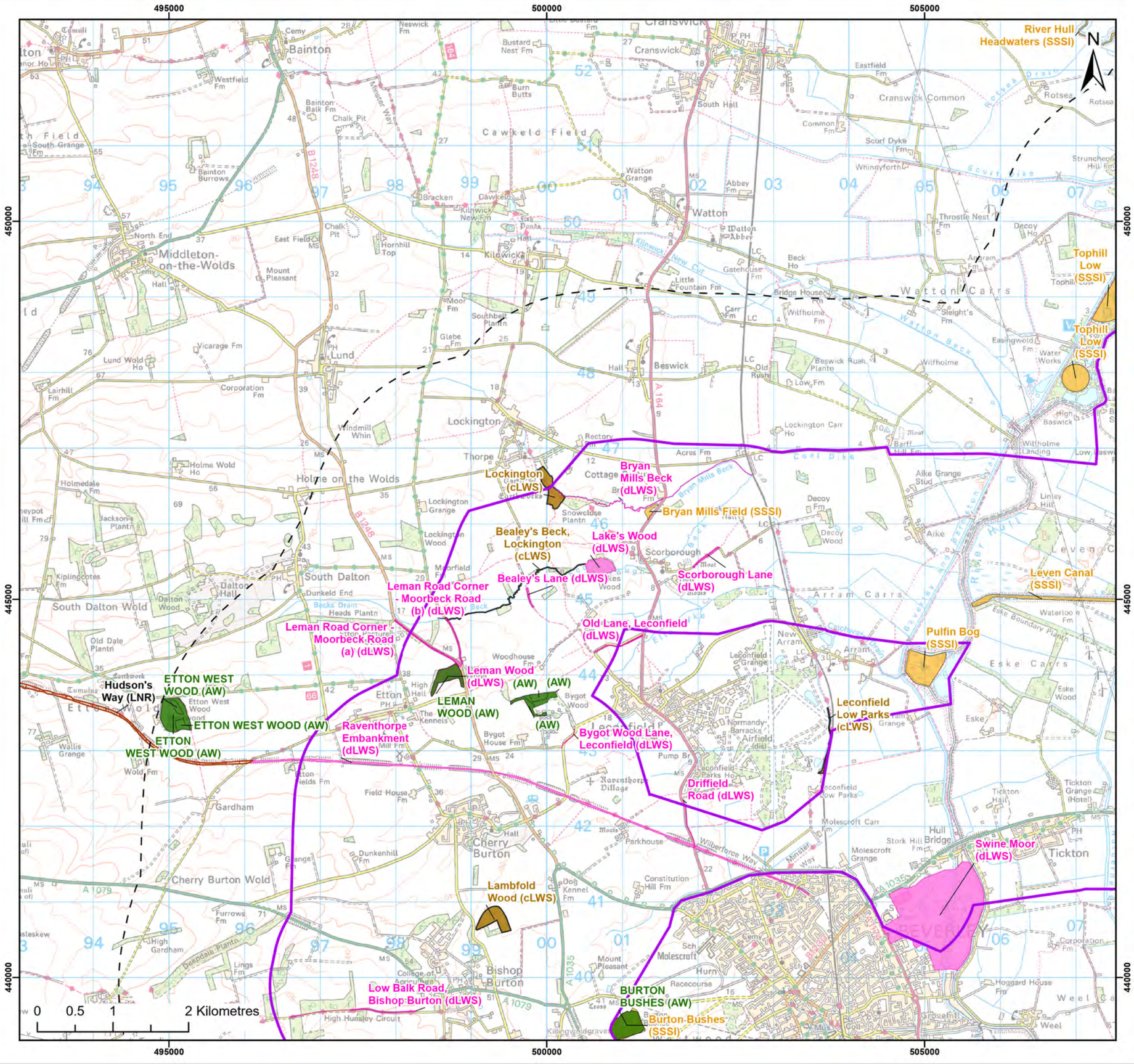
Nature Conservation Areas (Sheet 3 of 5)

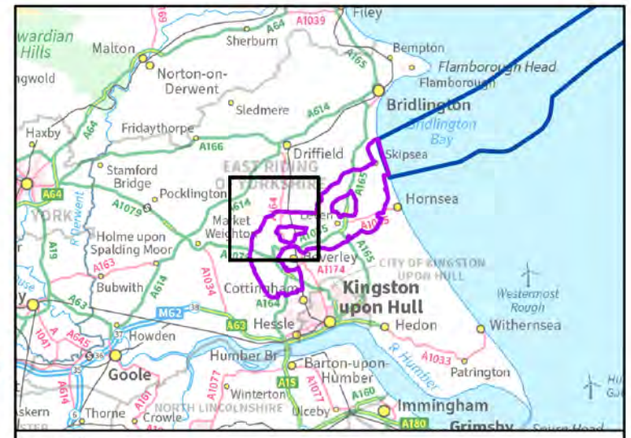
Figure: 8-18 | Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0049

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	17/06/2024	JH	AB	A3	1:50,000
02	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Onshore Scoping Area 2km Buffer
- Onshore Scoping Area 10km Buffer
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland
- Local Nature Reserves
- candidate Local Wildlife Sites (cLWS)
- designated Local Wildlife Sites (dLWS)

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Nature Conservation Areas (Sheet 4 of 5)

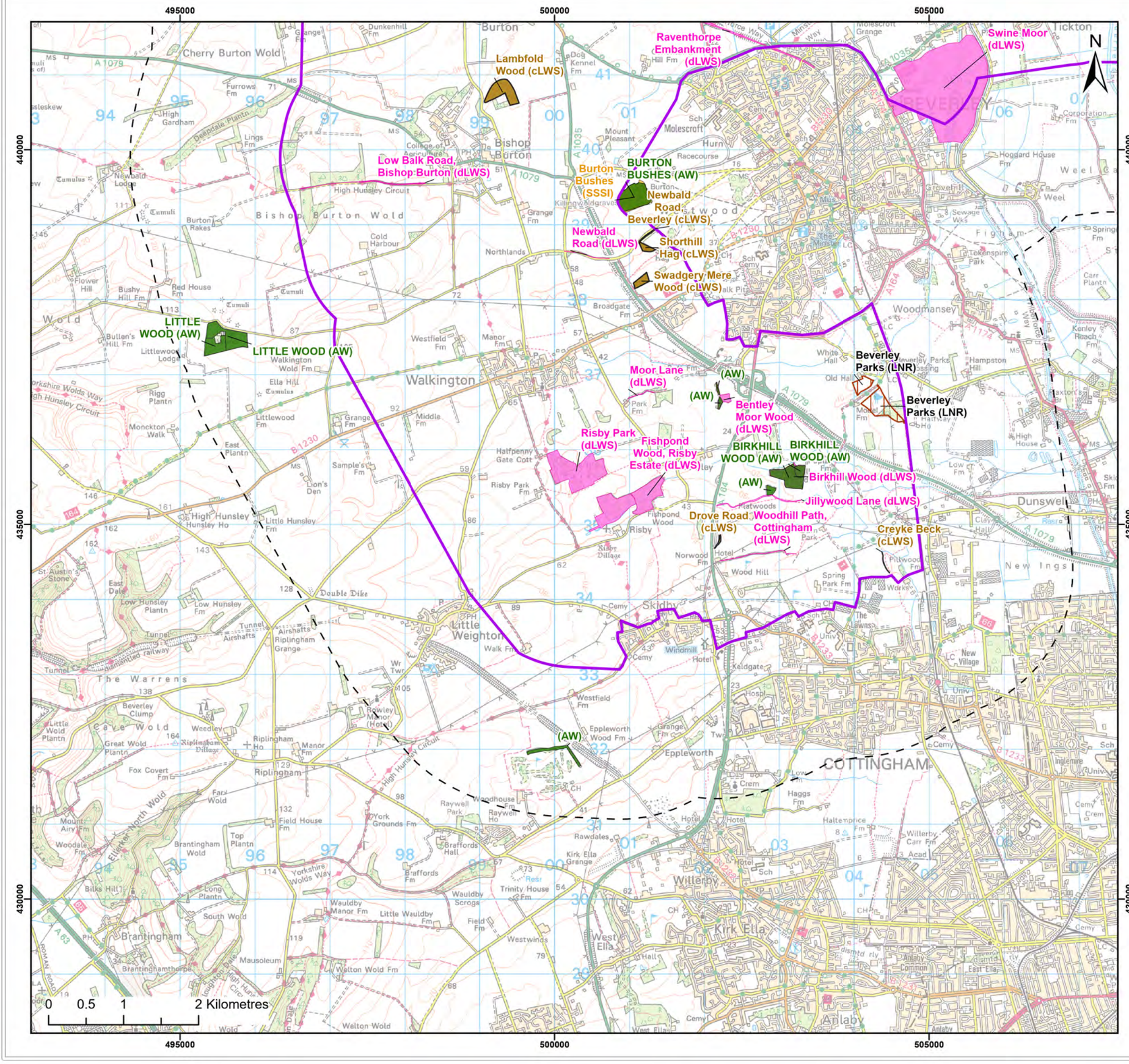
Figure: 8-18

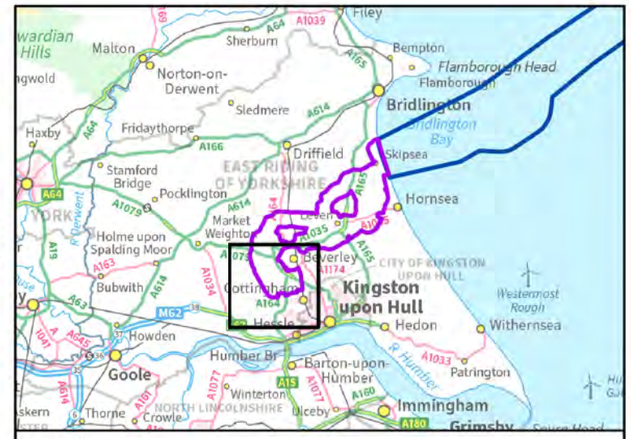
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0049

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	17/06/2024	JH	AB	A3	1:50,000
02	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor





Legend:

- Onshore Scoping Area
- Onshore Scoping Area 2km Buffer
- Onshore Scoping Area 10km Buffer
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland
- Local Nature Reserves
- candidate Local Wildlife Sites (cLWS)
- designated Local Wildlife Sites (dLWS)

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Nature Conservation Areas (Sheet 5 of 5)

Figure: 8-18 | Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0049

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	17/06/2024	JH	AB	A3	1:50,000
02	05/04/2023	JR	AG	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor

Table 8-13 Designated Sites Within the Onshore Ecology, Ornithology and Nature Conservation Study Area

Site Name and Designation	Qualifying Features(s)*	Distance from the Onshore Scoping Area Boundary
Internationally designated statutory sites (Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar Sites) (within 10km of the Onshore Scoping Area)		
Hornsea Mere SPA	• Mute swan (*Cygnus olor*), non-breeding (May-Sep) • Gadwall (*Mareca strepera*), non-breeding (Aug-Mar) (Month ranges for each qualifying feature indicate "months in which significant numbers of each mobile designated feature are most likely to be present at the site" from Natural England (2019))	Immediately adjacent
Greater Wash SPA with marine components	Qualifies under Article 4.1 of the EU Birds Directive by supporting: • Red-throated diver (*Gavia stellata)*, non-breeding (Sep- Apr) • Little gull (*Hydrocoloeus minutus)*, non-breeding (Aug-May) • Sandwich tern (*Thalasseus sandvicensis)*, breeding* (Apr-Aug) • Common tern (*Sterna hirundo)*, breeding* (Apr-Aug) • Little tern (*Sternula albifrons*), breeding* (Apr-Aug) Qualifies under Article 4.2 of the EU birds directive by supporting: • Common scoter (*Melanitta nigra*), non-breeding (Sep-Apr) (Month ranges for each qualifying feature "indicate the months in which significant numbers of each mobile designated feature are most likely to be present at the site" from Natural England (2023a))	Immediately adjacent
Humber Estuary SPA	* Designated as the species "uses the waters within the Greater Wash SPA for foraging" during the breeding season, usually within a limited distance from their breeding colony (6km for little tern, 15km for common tern, 54km for Sandwich tern) (Natural England 2023b)	Approximately 6km
	Qualifies under Article 4.1 of the EU Birds Directive by supporting: During wintering season: • Avocet (Recurvirostra avosetta) (Sep-Feb) • Bittern (Botaurus stellaris) (Oct-Feb) • Hen harrier (Circus cyaneus) (Sep-Apr) • Golden plover (Pluvialis apricaria) (Jul-Mar) • Bar-tailed godwit (Limosa lapponica) (Jul-Apr) During passage: 1209. Ruff (Philomachus pugnax) (Jul-Oct) During breeding: • Bittern (Mar-Sep) • Marsh harrier (*Circus aeruginosus*) (Mar-Oct) • Avocet (Mar-Aug) • Little tern (Apr-Sep) Qualifies under Article 4.2 of the EU Birds Directive by supporting: In wintering season: 1210. Shelduck (Tadorna tadorna) (Jan – Dec) During passage and wintering season: • Red knot (*Calidris canutus*) (Jul-May) • Dunlin (*Calidris alpina*) (Jul-May) • Black-tailed godwit (*Limosa limosa*) (Jul-Apr)	

Site Name and Designation	Qualifying Features(s)*	Distance from the Onshore Scoping Area Boundary
	• Redshank (*Tringa totanus*) (Jul-Apr) (Month ranges for each qualifying feature "indicate the months in which significant numbers of each mobile designated feature are most likely to be present at the site" from Natural England (2017)) Qualifies under Article 4.2 of the EU bird's directive as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season. In the non-breeding season, the area regularly supports 153,934 individual waterbirds (five-year peak mean 1996 /1997 to 2000 / 2001).	
Humber Estuary Ramsar site	Qualifies under the following criteria: Criterion Three: The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site (over 20km south-west of the Study Area) are the most north-easterly breeding site in Great Britain of the natterjack toad *Bufo calamita*. Criterion Five: The site regularly supports a waterfowl assemblage of international importance. The five-year peak mean in 1996/97 to 2000/01 was 153,934 waterfowl in the non-breeding season. Criterion Six: species/populations occurring at levels of international importance. • Eurasian golden plover • Red knot • Dunlin • Black-tailed godwit • Bar-tailed godwit • Redshank • Shelduck	Approximately 6km
Humber Estuary SAC	Qualifies for supporting areas of the following Annex I habitats: • Estuaries • Mudflats and sandflats not covered by seawater at low tide	Approximately 6km
	• Sandbanks which are slightly covered by sea water all the time • Coastal lagoons • Salicornia and other annuals colonizing mud and sand • Atlantic salt meadows • Embryonic shifting dunes • Shifting dues along the shoreline with *Ammophila arenaria* • Fixed coastal dunes with herbaceous vegetation • Dunes with *Hippopha rhamnoides* In addition to the following Annex II species: • Sea lamprey *Petromyzon marinus* • River lamprey *Lampetra fluviatilis* • Grey seal *Halichoerus grypus* (JNCC, 2024a)	
Flamborough Head SAC	Qualifies for supporting areas of the following Annex I habitats: • Reefs • Vegetated sea cliffs of the Atlantic and Baltic Coasts • Submerged or partially submerged sea caves (JNCC, 2024b)	Approximately 8km
Nationally designated statutory sites (SSSI) (within 2km of the Onshore Scoping Area)		
Bryan Mills Field SSSI	Low-lying and spring-fed, Bryan Mills Field supports tall fen species including lesser pond sedge, greater tussock-sedge and numerous other marsh and fen species.	Within boundary
Leven Canal SSSI	Designated for its standing open water and canals which provides a refuge for wetland plants in the surrounding drained historic marshland.	Within boundary

Site Name and Designation	Qualifying Features(s)*	Distance from the Onshore Scoping Area Boundary
	Common reed, common club rush, purple small reed, narrow small reed and other fen species show a zonation across the canal sides and banks. There is also a wide range of aquatic plant species, including arrowhead, yellow water-lily and broad-leaved pondweed.	
Hornsea Mere SSSI	Designated as it is considered a site of national ornithological importance. It consists of a large shallow eutrophic lake of about 120 hectares (300 acres), together with its associated habitats of reed swamp, fen and carr woodland. The site supports wintering populations of: • Mallard (*Anas platyrhynchos*) (3,000) • Pochard (*Aythya ferina*) (1,450) • Teal (*Anas crecca*) (1,000) • Tufted duck (*Aythya fuligula*) (500) • Goldeneye (*Bucephala clangula*) (200+) • Wigeon (*Mareca penelope*) (1,000) • Goosander (*Mergus merganser*) • Scaup (*Aythya marila*) • Long-tailed duck (*Clangula hyemalis*) Breeding species include: • Coot (*Fulica atra*) (200 pairs) • Gadwall • Pochard • Teal • Shoveler (*Spatula clypeata*) • Tufted duck • Reed warbler (*Acrocephalus scirpaceus*) • Starling (*Sturnus vulgaris*) • Hirundines • Little gull	Immediately adjacent

Site Name and Designation	Qualifying Features(s)*	Distance from the Onshore Scoping Area Boundary
Burton Bushes SSSI	Oak woodland that exceeds 200 years in age of natural origin. The undisturbed nature of the soil profile is an important feature of the SSSI. Remnants of rich herb flora with wood anemone, enchanter nightshade, bluebell and wood sorrel.	Immediately adjacent
Pulfin Bog SSSI	Last remnants of a fenland reed swamp community in the Hull valley and includes reedbed habitats which supports breeding birds such as reed bunting *Emberiza schoeniclus*, reed warbler and sedge warbler (*Acrocephalus schoenobaenus*).	Approximately 0.1km from boundary
Tophill Low SSSI	Designated as it supports nationally important concentrations of: • Gadwall • Shoveler • Mallard • Pochard • Teal • Wigeon	0.1km from boundary
River Hull Headwaters SSSI	Designated as it is the most northerly chalk stream system in Britain. The valley contains diverse breeding bird community including several waders such as lapwing (*Vanellus vanellus*), snipe (*Gallinago gallinago*), and redshank. The invertebrate fauna of the river appears to be typical of a northern chalk stream and includes many locally uncommon species of mayfly.	1.2km from boundary
Locally designated statutory sites (Local Nature Reserve (LNR)) (within 2km of the Onshore Scoping Area)		
Beverley Parks LNR	The reserves comprise of mixed broadleaf woodland, traditional parkland and non-commercial orchards.	Within boundary
Hudson's Way LNR	The reserves comprise of mixed broadleaf woodland along a cycling track.	0.6km from boundary

Site Name and Designation	Qualifying Features(s)*	Distance from the Onshore Scoping Area Boundary
Sigglesthorne Station LNR	The reserves comprise of mixed broadleaf woodland along part of an old railway line.	1.4km from boundary
Southorpe LNR	The reserve comprises a small, wildlife rich lowland hay meadow and forms part of the wider John Clare Living Landscape. Numerous bird species are found within the reserve including: • Chiffchaff (Phylloscopus collybita) • Song thrush (Turdus philomelos) • Spotted flycatcher (Muscicapa striata) • Whitethroat (Curruca communis).	1.5km from boundary
Locally designated non-statutory sites within Onshore Scoping Area boundary only (Local Wildlife Site (LWS))		
Alderman's Gorse candidate Local Wildlife Site (cLWS)	Conserving and enhancing biodiversity	Within boundary
Bealey's Beck, Lockington (cLWS)	Conserving and enhancing biodiversity	Within boundary
Bealey's Lane designated Local Wildlife Site (dLWS)	Conserving and enhancing biodiversity	Within boundary
Beeford - Dunnington dLWS	Conserving and enhancing biodiversity	Within boundary
Bentley Moor Wood dLWS	Conserving and enhancing biodiversity	Within boundary
Birkhill Wood dLWS	Conserving and enhancing biodiversity	Within boundary
Brandsburton - Frodingham Road dLWS	Conserving and enhancing biodiversity	Within boundary
Bryan Mills Beck dLWS	Conserving and enhancing biodiversity	Within boundary
Bygot Wood Lane, Leconfield dLWS	Conserving and enhancing biodiversity	Within boundary
Catwick - Seaton Road dLWS	Conserving and enhancing biodiversity	Within boundary
Catwick and Brandesburton Pits cLWS	Conserving and enhancing biodiversity	Within boundary
Creyke Beck cLWS	Conserving and enhancing biodiversity	Within boundary
Croftings Pond dLWS	Conserving and enhancing biodiversity	Within boundary
Driffield Road dLWS	Conserving and enhancing biodiversity	Within boundary
Drove Road cLWS	Conserving and enhancing biodiversity	Within boundary
Fishpond Wood, Risby Estate dLWS	Conserving and enhancing biodiversity	Within boundary
Frodingham Pits / Coneygarth cLWS	Conserving and enhancing biodiversity	Within boundary
Jillywood Lane dLWS	Conserving and enhancing biodiversity	Within boundary
Lake's Wood dLWS	Conserving and enhancing biodiversity	Within boundary
Lambfold Wood cLWS	Conserving and enhancing biodiversity	Within boundary

Site Name and Designation	Qualifying Features(s)*	Distance from the Onshore Scoping Area Boundary
Leconfield Low Parks cLWS	Conserving and enhancing biodiversity	Within boundary
Leman Road Corner - Moorbeck Road (a) dLWS	Conserving and enhancing biodiversity	Within boundary
Leman Road Corner - Moorbeck Road (b) dLWS	Conserving and enhancing biodiversity	Within boundary
Leman Wood dLWS	Conserving and enhancing biodiversity	Within boundary
Lockington cLWS	Conserving and enhancing biodiversity	Within boundary
Low Balk Road, Bishop Burton dLWS	Conserving and enhancing biodiversity	Within boundary
Low Farm, Routh dLWS	Conserving and enhancing biodiversity	Within boundary
Low Wood, Wassand cLWS	Conserving and enhancing biodiversity	Within boundary
Moor Lane dLWS	Conserving and enhancing biodiversity	Within boundary
New Drain cLWS	Conserving and enhancing biodiversity	Within boundary
Newbald Road dLWS	Conserving and enhancing biodiversity	Within boundary
Newbald Road, Beverley cLWS	Conserving and enhancing biodiversity	Within boundary
North Newbald - Beverley Road dLWS	Conserving and enhancing biodiversity	Within boundary
Nunkeeling Lane dLWS	Conserving and enhancing biodiversity	Within boundary
Old Lane, Leconfield dLWS	Conserving and enhancing biodiversity	Within boundary
Raventhorpe Embankment dLWS	Conserving and enhancing biodiversity	Within boundary
Risby Park dLWS	Conserving and enhancing biodiversity	Within boundary
Rise - Huddlecross dLWS	Conserving and enhancing biodiversity	Within boundary
Scorborough Lane dLWS	Conserving and enhancing biodiversity	Within boundary
Seaton Whin Common cLWS	Conserving and enhancing biodiversity	Within boundary
Shorthill Hag cLWS	Conserving and enhancing biodiversity	Within boundary
Sigglesthorne - Goxhill dLWS	Conserving and enhancing biodiversity	Within boundary
Skipsea Brough dLWS	Conserving and enhancing biodiversity	Within boundary
Strick Pastures dLWS	Conserving and enhancing biodiversity	Within boundary
Swadgery Mere Wood cLWS	Conserving and enhancing biodiversity	Within boundary

Site Name and Designation	Qualifying Features(s)*	Distance from the Onshore Scoping Area Boundary
Swine Moor dLWS	Conserving and enhancing biodiversity	Within boundary
Wassand Hall cLWS	Conserving and enhancing biodiversity	Within boundary
Woodhill Path, Cottingham dLWS	Conserving and enhancing biodiversity	Within boundary

*Qualifying features obtained from Natural England's Designated Site Viewer (May 2024).

8.6.2.2 Terrestrial Habitats

1211. A desk study review of the terrestrial and freshwater habitats present within the Onshore Scoping Area was carried out in April 2024. This was based upon satellite imagery captured in 2022 (ESRI, 2024). The majority of habitats present appear to comprise arable cropland habitats with a mosaic of other semi-natural and artificial habitat present. A proportion of these comprise Habitats of Principal Importance as listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006).

1212. UK Habitats of Principal Importance recorded within the Onshore Scoping Area include:

- Maritime cliff and slope;
- Coastal and floodplain grazing marsh;
- Good quality semi improved grassland;
- Lowland fens;
- Reedbeds;
- Deciduous woodland, and
- Traditional orchard.

1213. The habitats within the Onshore Scoping Area comprise a combination of habitats with biodiversity value.

8.6.2.3 Protected, Notable and Non-Native Invasive Species

1214. The desk study review by North and East Yorkshire Ecological Data Centre (NEYEDC) on 13 May 2024, as presented on **Figure 8-19**, has identified the following protected and notable species, which may be present within the study area:

- Amphibians, including great crested newt *Triturus cristatus*;
- Badger *Meles meles;*
- Bats;
- Birds (breeding, passage and over-wintering);
- Terrestrial and aquatic invertebrates;
- Water vole *Arvicola amphibius*;
- Otter *Lutra lutra*; and
- Reptiles.

1215. Invasive Non-Native Species (INNS) have also been recorded within the Onshore Scoping Area, namely American mink *Neovison vison*, Japanese knotweed *Reynoutria japonica*, Canadian waterweed *Elodea canadensis*, Nuttall's waterweed *Elodea nuttallii*, Himalayan balsam *Impatiens glandulifera*, and Japanese rose *Rosa rugosa*.

8.6.3 Potential Impacts

1216. The anticipated construction programme is provided in **Chapter 3 Project Description**, with the Project anticipated to have an operational lifetime of 35 years.

8.6.3.1 Potential Impacts during Construction

1217. The location and extent of the construction activities are yet to be detailed. However, once progressed, the design and construction information prepared for the Project will be used to inform the impact assessment and ecological mitigation measures.

8.6.3.2 Designated Sites

1218. As presented in **Table 8-13**, there are a number of sites designated for nature conservation within the Study Area.

1219. The onshore ECC refinement process will be planned to avoid and minimise impacts to statutory and non-statutory designated sites (wherever possible). Trenchless techniques may also be used, where feasible, to avoid both long-term and temporary impacts to any sites that could not be avoided.

1220. In the absence of detailed design, it is assumed long-term loss or damage to designated sites, their qualifying features or habitat that forms functionally linked land could occur during construction.

1221. Indirect impacts from lighting, noise, dust, pollution, or alternations to hydrological conditions could be caused during the construction phase.

1222. All potential impacts to designated sites during the construction phase will be assessed and are therefore scoped into the EIA. This will include potential impacts from air pollution upon designated sites up to (and not limited to) 250m from the PEIR Onshore Development Area.

8.6.3.2.1 Habitats

1223. There is likely to be long-term and / or temporary loss of habitats and biodiversity as a result of construction activities. Construction of above ground infrastructure such as within the OCS zone will cause long-term habitat loss. Construction of the onshore ECC and temporary above ground infrastructure such as access roads and fencing will cause direct temporary habitat loss, disturbance and fragmentation.

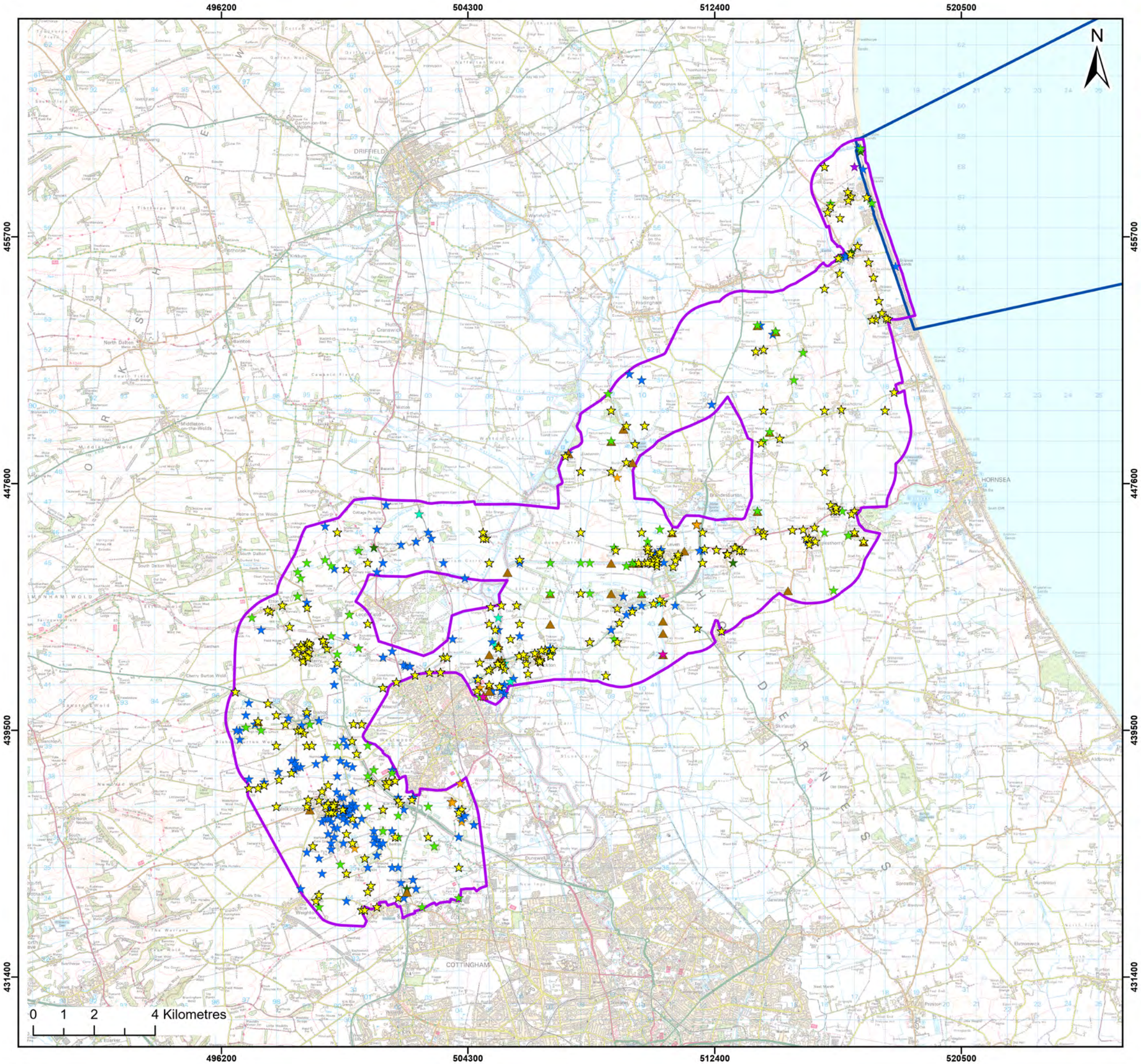
1224. The onshore ECC refinement process will be planned with due consideration of the ecological mitigation hierarchy. In doing so, where possible, priority will be given to avoiding, minimising, and, as a last resort compensating, impacts upon ecologically sensitive habitats. Sensitive habitats may include irreplaceable habitats (Defra, 2024a), Habitats of Principal Importance (NERC, 2006) or habitats of high distinctiveness (as defined within the Defra Biodiversity Metric (2024b)).

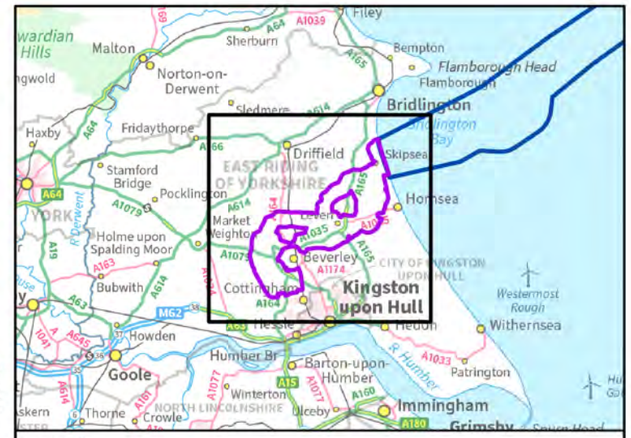
1225. Any impacts upon irreplaceable habitats (Defra, 2024a), Habitats of Principal Importance (NERC, 2006) or habitats of high distinctiveness (as defined within the Defra Biodiversity Metric (2024b)) arising from construction activities will be scoped into the EIA. This will include loss of habitats such as sections of hedgerows and other habitats that support protected and notable species.

8.6.3.2.2 Protected, Notable and Invasive Species

1226. There is a direct risk to species present in the area during the construction phase. Long-term or temporary habitat loss and fragmentation due to construction activities could impact breeding, foraging, resting or overwintering / hibernation sites of protected species. Noise and vibration may result in physical disturbance and / or displacement effects on ecological receptors including protected species. For example, vibration due to construction may result in destruction (through collapse) of setts used by badgers or burrows used by nesting birds. Visual presence and imposition may result in disturbance and displacement effects on protected species. Introduction of lighting may disrupt daily or seasonal cycles of physiology and behaviour of protected species or disrupt nocturnal foraging or courtship/breeding of protected or vulnerable species (e.g. barn owl and bats). Emissions from construction could have physiological or behavioural effects on protected species. All the above effects may result in decreased survival or reproduction, therefore increased mortality.

1227. There are indirect risks to protected and notable species where the proximity of construction activities may lead to the disturbance and / or displacement of species. Impact pathways include noise, lighting, vibration, fugitive dust and increased human presence. There have not yet been species-specific surveys undertaken to determine presence or likely absence of protected species, therefore, at this stage, protected and notable species listed within **Section 8.6.2.3** are assumed to be present within the Onshore Scoping Area and are scoped into the EIA.





Legend:

- Onshore Scoping Area
- Offshore Scoping Area

Species Record

- Amphibian
- Bird
- Fish
- Insect
- Invasive Non-Native Species (INNS)
- Marine Mammal
- Other (plant)
- Reptile
- Terrestrial Mammal

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Biological Records Map

Figure: 8-19

Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0048

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	13/06/2024	JH	AB	A3	1:125,000
02	05/04/2023	JR	AG	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables equinor

1228. There is potential for invasive non-native species to be present within the Onshore Scoping Area and the Study Area. The control (where required) of invasive species within the Study Area will be included in an Ecological Management Plan (EMP). The assessment and potential impact of invasive species has been scoped into the EIA.

8.6.3.3 Potential Impacts during Operation

1229. Noise and light from the onshore components of the Project have the potential to indirectly disturb species sensitive to noise and light, e.g. bats and birds.

1230. There are indirect risks to protected species where the proximity of operational facilities may lead to the disturbance and / or displacement of species through noise or light disturbance. There have not yet been species-specific surveys to determine presence or absence of protected species, therefore, at this stage protected and notable species listed within **Section 8.6.2.3** are assumed to be present within the Onshore Study Area and scoped into the EIA.

1231. Maintenance and inspection of the onshore components of the Project will be required periodically throughout the operation phase. Where required, these are likely to be small-scale and localised, thus involving minimal disturbance to adjacent habitats and protected species.

1232. Periodic inspections as well as potential unscheduled maintenance works may require access to buried cables, and it is likely that impacts on protected species and habitats will be proportionately similar to those during the construction phase with temporary loss and fragmentation of habitats and spread of non-native invasive species. However, the impacts are likely to be more localised, smaller scale and short term in nature during the operation phase than the construction phase. Potential impacts from ongoing maintenance are therefore scoped into the EIA.

8.6.3.4 Potential Impacts during Decommissioning

1233. It is anticipated that the decommissioning impacts to onshore ecological and ornithological receptors would be similar in nature to those of construction, although the magnitude of impact is likely to be lower.

1234. The same potential impacts identified for the construction phase of the Project are therefore scoped in for the decommissioning phase (as per **Table 8-14**).

8.6.4 Potential Cumulative Effects

1235. There is potential for cumulative effects to arise in which other projects or plans could act collectively with the Project to affect onshore ecological receptors. Therefore, cumulative effects related to onshore ecology, ornithology and nature conservation are scoped into the EIA. The CEA will follow the approach outlined in **Chapter 5 EIA Methodology**.

1236. Other projects that may act cumulatively with the Project will be identified following a review of available information and as part of consultation for the EIA.

1237. The assessment will identify the potential for any significant effects to arise from any phase of the Project interacting cumulatively with other developments that are existing, consented or in the application stage of planning.

8.6.5 Summary of Scoping Proposals

1238. **Table 8-14** outlines the onshore ecology, ornithology and nature conservation impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities, and as additional project information and site-specific data become available.

Table 8-14 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Onshore Ecology, Ornithology and Nature Conservation

Potential Impact	Construction	Operation	Decommissioning
Direct and indirect impacts to designated sites	✓	✓	✓
Direct impacts to habitats	✓	✓	✓
Direct and indirect impacts on legally protected species	✓	✓	✓
Spread of INNS	✓	✓	✓
Cumulative impacts	✓	✓	✓

8.6.6 Approach to Data Gathering

1239. **Table 8-15** identifies the desk-based sources that will be accessed to inform the characterisation of the existing environment.

Table 8-15 Desk-Based Data Sources for Onshore Ecology, Ornithology and Nature Conservation

Data Source	Data Contents
Joint Nature Conservation Committee (JNCC) information sheets (https://jncc.gov.uk)	Statutory designated sites (SPA, SAC, Ramsar sites, SSSI and LNR)
Natural England designated sites viewer (Site Search (naturalengland.org.uk)	
JNCC Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk)	UK Habitats of Principal Importance
National Biodiversity Network (NBN) website (www.nbnatlas.org) North and East Yorkshire Ecological Data Centre	Protected and Notable species

Data Source	Data Contents
The North and East Yorkshire Ecological Data Centre (NEYEDC)	All species records, local and non-statutory sites data, habitat data, and statutory site data
Yorkshire Wildlife Trust (https://www.ywt.org.uk/)	Information on Yorkshire Wildlife Trust sites

1240. Detailed survey information is also required to identify the potential effects on terrestrial ecology receptors within the areas identified for the onshore ECC, landfall area and OCS zone. This information will be gathered through a combination of habitat and protected species surveys. Surveys will follow best practice survey guidance. In the event there is any deviation from best practice sound science-based justification will be provided. Surveys will be subject to land access. Where completed, the results of surveys will be presented in the PEIR and ES.

1241. The first ecological field survey will comprise a Preliminary Ecological Appraisal (PEA). This will be carried out in accordance with the CIEEM (2017) best practice guidance. The PEA will include mapping of baseline habitats present using Version 2 of the UKHab Habitat Classification methodology (UKHab, 2023). In addition, Habitat Condition Assessment (Defra, 2024b) and identification of signs of, or potential for, protected and notable species to be present will be recorded.

1242. The UKHab results and Habitat Condition Assessments will also be used to inform an assessment of the baseline habitat biodiversity value. Values will be calculated using the Biodiversity Metric Calculator (Defra, 2024b) (or relevant prevailing metric).

1243. All proposed onshore ecology surveys will be undertaken within their optimal surveying windows, by suitably qualified ecologists, in accordance with industry accepted survey guidance (as detailed in **Table 8-16**).

1244. As part of the EIA process, impacts beyond the onshore ECC, landfall area and OCS zone will be considered. Appropriate buffer areas will be applied depending on the receptor type. For example, with regard to onshore air quality, a 250m buffer may be applied. A buffer of up to 500m will also be applied for great crested newt (GCN) desk and field surveys (as detailed in **Table 8-16**).

1245. Identification of potential sensitive receptors will be undertaken through ecological surveys and further liaison with stakeholders through the EPP.

1246. The following surveys are anticipated to be undertaken to inform the assessment. Surveys will be informed by the guidance outlined in the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018).

1247. **Table 8-16** outlines the proposed optimal baseline surveys to be carried out on relevant ecological receptors.

Table 8-16 Proposed Baseline Surveys for Onshore Ecology, Ornithology and Nature Conservation

Ecological Feature	Optimal Survey Window	Spatial Coverage
Habitats – PEA survey including UKHab and Condition Assessment	April to September	Surveys will cover the onshore ECC, landfall area, OCS zone and haul roads, plus a 50m buffer. The PEA will include mapping of baseline habitats present using Version 2 of the UKHab Habitat Classification methodology (UKHab, 2023). In addition, Habitat Condition Assessment (Defra, 2024b) and identification of signs of, or potential for, protected and notable species to be present will be recorded.
Great crested newt surveys	Habitat Suitability Index – March to end of September eDNA surveys – Mid-April to June	A District Level Licensing (DLL) enquiry to Natural England will determine whether DLL or a traditional licensing route will be taken for great crested newts. Desk studies of all ponds present within 500m of the ECC, landfall area, OCS zone and haul roads will be carried out. If required, field surveys will consist of Habitat Suitability Index (HSI) surveys of all accessible waterbodies (ponds and suitable watercourses) within a 250m buffer of the onshore ECC, landfall area, OCS zone and haul roads. Ponds within 250m to 500m may also be subject to HSI surveys if they are well connected to the Project and have potential to support large GCN populations. Where appropriate this will be followed by eDNA survey (if required) of suitable waterbodies to determine the presence or likely absence of great crested newt.
Badger surveys	Possible all year. Optimal February to April, and September to November	To extend 30m from the onshore ECC, landfall area, OCS zone and haul roads. Surveys will be carried out to identify any setts or possible setts present, determine their sett type and the activity status.
Bats - Activity Surveys (foraging and commuting)	April to October	Surveys will cover the onshore ECC, landfall area, OCS zone and haul roads. Surveys will comprise a combination of walked transect surveys and static monitoring surveys to assess baseline bat activity levels.
Bats – Preliminary Ground Level Roost Assessment	Possible all year	Surveys will cover the onshore ECC, landfall area, OCS zone and haul roads. Surveys will assess features (trees, buildings and other structures) which may provide roost features for bats.

Ecological Feature	Optimal Survey Window	Spatial Coverage
Bat emergence / re-entry surveys (roosting)	May to September	Bat emergence / re-entry surveys will be completed on potential bat roost features that may be impacted (i.e. removed, or very close to works) by the Project to assess for presence or likely absence of roosting bats.
Water vole surveys	April to September	Surveys will cover suitable aquatic habitats within the onshore ECC, landfall area, OCS zone and haul roads. Surveys may extend up to 250m up and down stream of any suitable watercourses where access permits. Surveys will assess for the presence or likely absence of water voles.
Otter surveys	Possible all year but optimal survey period in spring	Surveys will cover suitable aquatic habitats within the onshore ECC, landfall area, OCS zone and haul roads. Surveys may extend up to 250m up and down stream of any suitable watercourses where access permits. Surveys will also include terrestrial habitats adjacent to any suitable watercourse. Surveys will assess for the presence or likely absence of otter.
Reptile surveys	Possible March to October subject to local weather. Surveys during high daytime temperatures and prolonged period of wet weather will be avoided.	Surveys will cover suitable habitats within the onshore ECC, landfall area, OCS zone and haul roads. Surveys will target habitats which have the potential to support significant populations of reptiles and which may be impacted by the Project.
Breeding bird surveys	March to July	Surveys will cover suitable habitats within the onshore ECC, landfall area, OCS zone and haul roads which may be affected by the Project.
Overwintering and passage bird surveys	August to mid-May inclusive. Onshore surveys during two hours before and two hours after high tide. Landfall surveys during high tide and low tide.	Surveys will cover all habitat within the onshore ECC, landfall, OCS zone plus a 250m buffer.
Invertebrate survey (terrestrial)	Mid-April to October	This survey will cover terrestrial habitats within the onshore ECC, landfall area, OCS zone and haul roads that may be affected by the Project and that may support rare or notable invertebrates.
Invertebrate survey (aquatic)	July to September	This survey will cover aquatic habitats within the onshore ECC, landfall area, OCS zone and haul roads that may be affected by the Project and that may support rare or notable invertebrates.
Botanical surveys (such as but not limited to National Vegetation Classification)	April to August (depending on habitat type)	These surveys will cover valuable habitats that may be affected by the Project.

1248. It is proposed that for the overwintering and passage bird surveys, one winter and passage combined season (spanning August – mid-May inclusive) will be completed. This will be discussed and agreed through the EPP.

8.6.7 Approach to Assessment

1249. An Ecological Impact Assessment (EcIA) will be undertaken in accordance with the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (2022).

1250. The EcIA will assess the ecological effects of a planned development while considering any possible avoidance, mitigation, compensation and enhancement measures. The factors that affect ecological impact will be assessed in terms of their extent and magnitude, duration and reversibility and the timing and frequency.

1251. The assessment will broadly include the following steps: scoping (including habitat and species surveys), value assessments, impact assessments, mitigation, compensation, enhancement and reporting. Any European Protected Species (EPS) licencing that is required is normally completed after consent is granted for the Project.

1252. The feasibility of the Project to deliver 10% BNG alongside development will be assessed using the prevailing Biodiversity Metric from Defra (2024b). A detailed and appropriately worded biodiversity strategy or plan will be provided to assess biodiversity impacts, compensation measures which will be taken to secure a 10% BNG post development and methods or options of delivery.

1253. Onshore ecology, ornithology and nature conservation will be included within the EPP (as set out in **Chapter 6 Consultation**) and further liaison with key stakeholders will take place to agree the approach to data collection, and the specific assessment methods to be employed as part of the EIA process.

8.6.8 Scoping Questions to Consultees

1254. The following questions are posed to consultees to help them frame and focus their response to the onshore ecology, ornithology and nature conservation scoping exercise which will in turn inform the Scoping Opinion:

- Do you agree with the broad characterisation of the existing environment?
- Have all the onshore ecology, ornithology and nature conservation impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the onshore ecology, ornithology and nature conservation impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed programme of baseline surveys?
- Do you agree with the proposed assessment approach?

8.7 Onshore Archaeology and Cultural Heritage

1255. This chapter of the Scoping Report considers the potential likely effects of the Project associated with onshore archaeology and cultural heritage, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the onshore ECC, landfall area and the OCS zone.

1256. The onshore archaeology and cultural heritage assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 7.11 Offshore Archaeology and Cultural Heritage;**
- **Chapter 8.4Water Resources and Flood Risk;**
- **Chapter 8.8 Onshore Noise and Vibration;**
- **Chapter 8.9 Traffic and Transport;** and
- **Chapter 8.10 Landscape and Visual Impact**.

8.7.1 Study Area

1257. For the purpose of this Scoping Report, the initial heritage Study Areas used are the current extent of the Onshore Scoping Area.

1258. As part of the EIA process, the Study Areas for onshore archaeology and cultural heritage will be updated based on refinements to the Project, such as preferred options for the onshore ECC and the OCS zone. Once refined, the Study Areas for onshore archaeology and cultural heritage to be used in the EIA will be agreed with consultees and will be based on standard industry practices. These Study Areas are likely to include, but not be limited to the following:

- Known non-designated heritage assets within 500m of the Onshore Development Area (for PEIR);
- Potential for buried archaeological remains and previously unrecorded above ground heritage assets within 500m of the Onshore Development Area;
- Designated heritage assets within 1km of the Onshore Development Area and 5km of the OCS zone, to inform a setting assessment of heritage assets identified as potentially being affected by the Project through a change in their setting. These will be identified through both professional judgement supported by consideration of a Zone of Theoretical Visibility (ZTV) developed by Landscape and Visual Impact (LVIA) consultants.

1259. The proposed 5km buffer around the OCS zone forming part of the EIA Designated Heritage Assets Study Area may incorporate many designated assets within the town of Beverley where the proposed development would not be perceptible and no change to setting would occur. Should this be the case the exclusion of designated heritage assets that can be identified as not having the potential to be affected will be agreed with the relevant consultees. As such, a refined scope of assessment of effects arising through change to setting will be agreed through the EPP with the relevant Historic Environment Services, pending any refinement of the proposed location of the infrastructure within the OCS zone.

8.7.2 Existing Environment

1260. East Yorkshire has a rich and varied history of archaeological and geological interest, providing local distinctiveness and contribution to the area's character, culture and economy (ERYC, 2018). The navigable rivers, fertile floodplains, secure hill-tops and mineral resources have all contributed to the region's historic environment (Natural England, 2015).

1261. The earliest evidence of human occupation on the Holderness plain can be traced to the Neolithic period. At this time the area would likely have consisted of lakes, marshes, islands and woodland. The rising sea levels of the Bronze Age would have enabled the use of waterways as a communication link as far as the Pennines and via the Trent to the Midlands. Early drainage of this area occurred in medieval times and continued until the mid-18th century (Natural England, 2015).

1262. Fertile soils from glacial deposits and progressive vegetation clearance have resulted in much of the Holderness area now being under the plough. Grassland is confined largely to the wetter more poorly drained areas and woodland occurring in small plantations (East Riding of Yorkshire, 2018). These low-lying parts of the East Riding have a considerable palaeoenvironmental resource, and the study of the wetland deposits such as the peats, silts and clays can provide important information on past environments and climatic conditions.

1263. Settlement is generally concentrated on the high areas of hills and ridges and comprises larger villages, which tend to be nucleated, and smaller villages, more linear in form. The number of Conservation Areas and Listed Buildings in this part of Holderness is a testament to the quality and character of the built heritage.

1264. Within the Onshore Scoping Area, there are 165 designated heritage assets comprising:

- 36 Scheduled Monuments;
- 115 Listed Buildings, comprising nine Grade I*, two Grade I and 104 Grade II;
- 13 Conservation Areas; and
- One Registered Park and Garden.

1265. Within the Onshore Scoping Area the majority of Listed Buildings are concentrated within Conservation Areas, notably Etton, Bishop Burton and Walkington. Conservation Areas which fall outside the Onshore Scoping Area but will likely fall within the 5km designated heritage asset Study Area around the OCS zone Area of Search (in the vicinity of Birkhill Wood Substation), include Beverley and Cottingham.

1266. Nationally significant archaeological remains have been identified in the region (**Figure 8-20**), and include, but are not limited to:

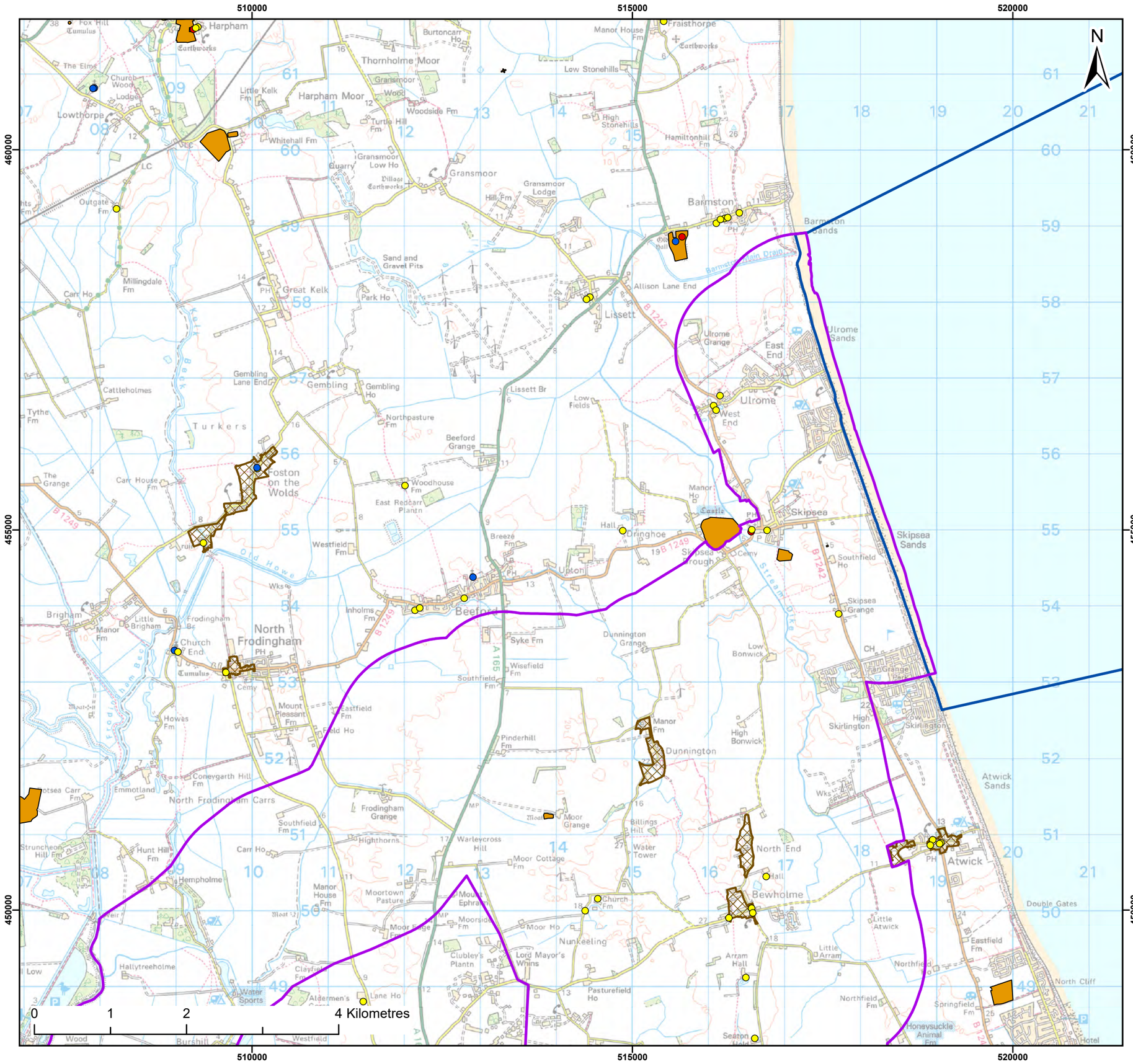
- Prehistoric settlement and funerary sites;
- Medieval moated sites; and
- Post-Medieval manorial and ecclesiastical sites.

1267. Evidence of prehistoric and Romano-British settlement can be seen through cropmark and earthwork evidence from aerial photographs (ERYC, 2018), and a scheduled Romano-British enclosure exists to the south-west of Beverley. Similarly, the scheduled remains of prehistoric square barrow cemeteries are located at Scorborough and Black Mill.

1268. Skipsea Castle, Hallgarth medieval hall and Eske medieval settlement are recorded within the Onshore Scoping area and date to the medieval period (noting the Iron Age origins of the mound Skipsea castle is positioned on). An unusually large medieval moated site is recorded at Scorborough. The site survives in good condition and affords insights into the social, economic and territorial divisions of the area during the Medieval and early post-Medieval period. The village of Scorborough retains archaeological information relating to its Medieval period of occupation.

1269. Within the wider landscape there is anticipated to be a high potential for buried archaeological remains dating from the prehistoric to modern periods, based on the results of previous archaeological work in the region. Assessment undertaken for Hornsea Project Four identified a concentration of anomalies around the Creyke Beck substation zone which likely represent Iron Age to Romano British settlement remains, in addition to a likely multi-period settlement near Fraisthorpe characterised by circular and rectilinear enclosures (Orsted 2021). Similarly, archaeological surveys undertaken for the DBS Offshore Wind Farms project identified possible Romano-British to Medieval settlement and agricultural remains (RWE, 2023). This is further supported by the results of archaeological and palaeoenvironmental surveys conducted before commencement of Dogger Bank Wind Farms A and B, which adds to the growing evidence that the Holderness plain was more extensively settled and managed in the Iron Age and Roman periods than had previously been thought (AOC, 2021).

1270. Due to the current size of the Onshore Scoping Area, data for non-designated heritage assets from the Humber Historic Environment Record (Humber HER) has not been acquired at this stage. The Humber HER data will be acquired to inform the subsequent EIA process (see **Chapter 5 EIA Methodology**).



Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Conservation Area
- Scheduled Monument

Listed Building

- Grade I
- Grade II
- Grade II*

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Designated Onshore Cultural Heritage Assets
Sheet 1 of 4

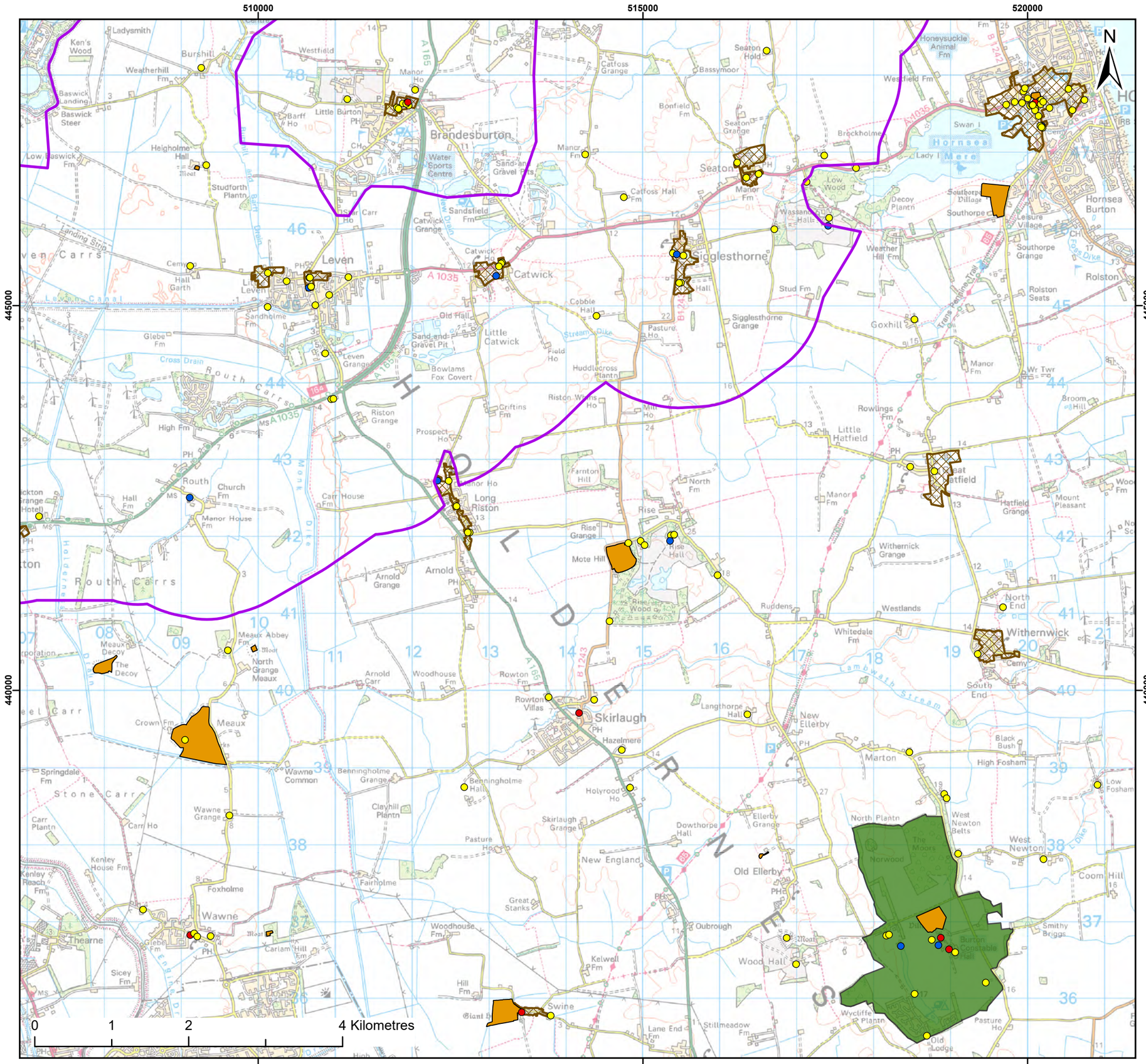
Figure:	Drawing No:
8-20	PC3991-RHD-OF-ZZ-DR-Z-0051

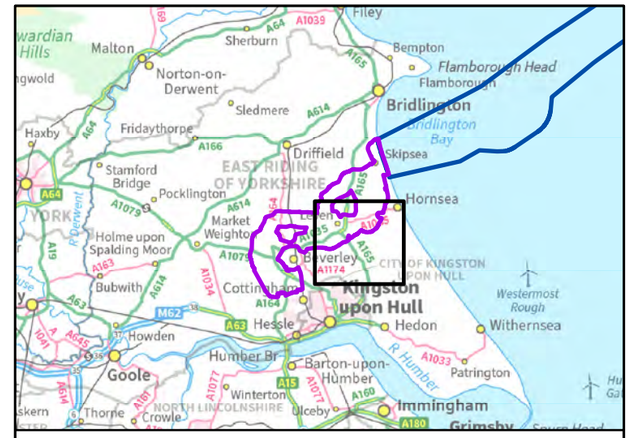
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	07/06/2024	JH	AB	A3	1:50,000
02	31/04/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Conservation Area
- Registered Park & Garden
- Scheduled Monument

Listed Building

- Grade I
- Grade II
- Grade II*

Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Designated Onshore Cultural Heritage Assets
Sheet 2 of 4

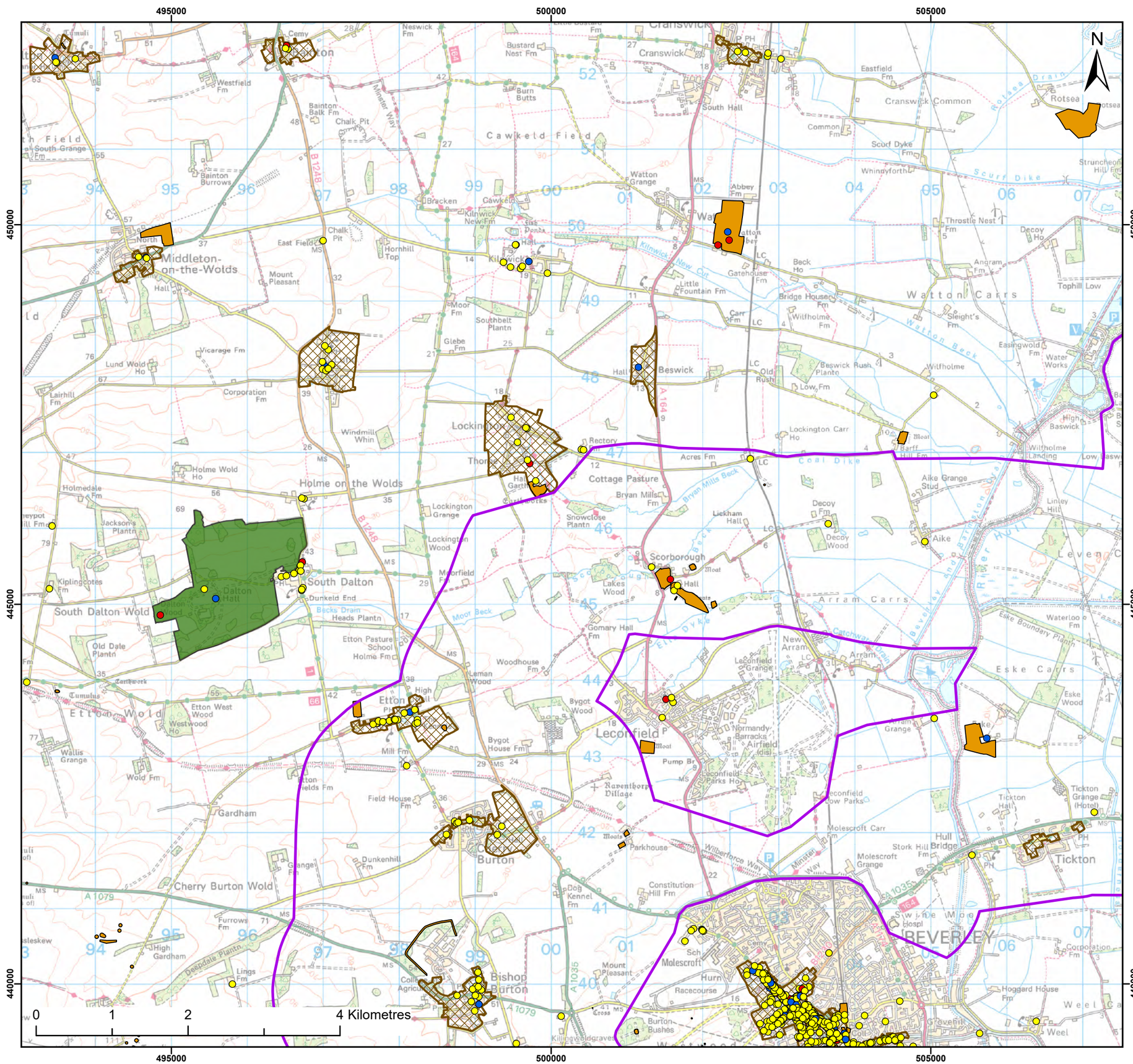
Figure:	Drawing No:
8-20	PC3991-RHD-OF-ZZ-DR-Z-0051

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	07/06/2024	JH	AB	A3	1:50,000
02	31/04/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor



Legend:

- Onshore Scoping Area
- Conservation Area
- Registered Park & Garden
- Scheduled Monument

Listed Building

- Grade I
- Grade II
- Grade II*

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Designated Onshore Cultural Heritage Assets
Sheet 3 of 4

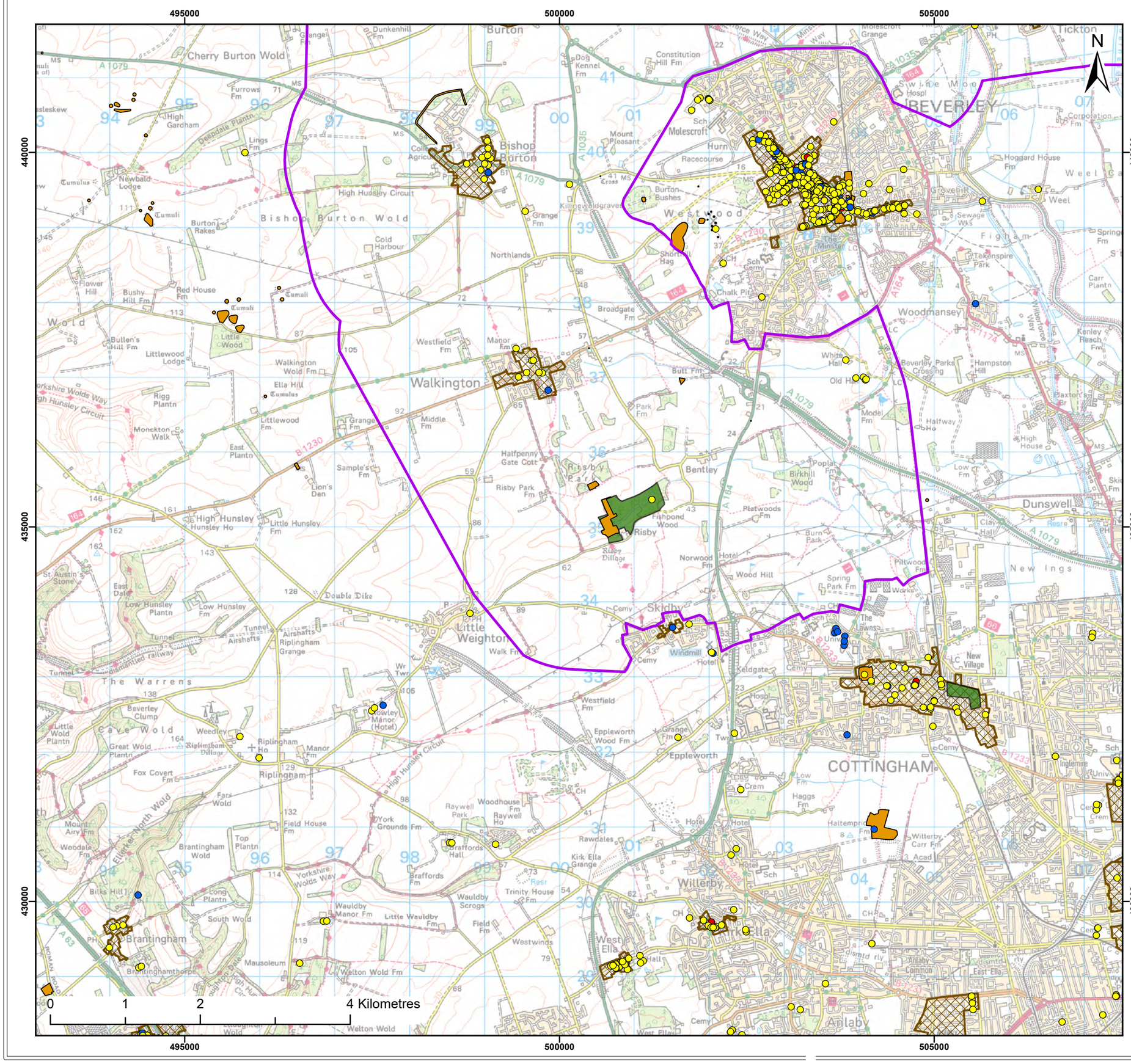
Figure:	Drawing No:
8-20	PC3991-RHD-OF-ZZ-DR-Z-0051

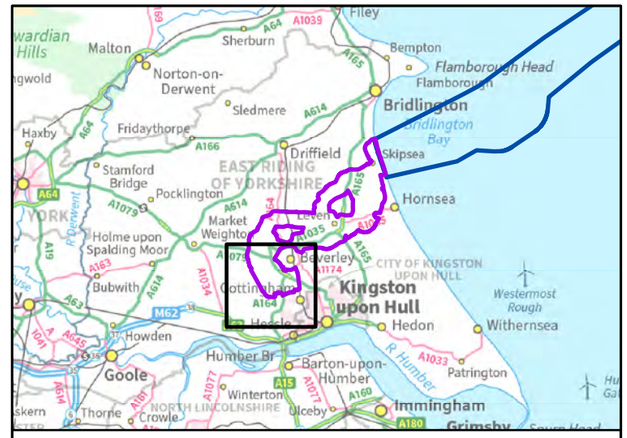
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	07/06/2024	JH	AB	A3	1:50,000
02	31/04/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Conservation Area
- Registered Park & Garden
- Scheduled Monument

Listed Building

- Grade I
- Grade II
- Grade II*

Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Designated Onshore Cultural Heritage Assets
Sheet 4 of 4

Figure: 8-20 | Drawing No: PC3991-RHD-OF-ZZ-DR-Z-0051

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	07/06/2024	JH	AB	A3	1:50,000
02	31/04/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables equinor

8.7.3 Potential Impacts

1271. Potential impacts to heritage assets (including below ground archaeological remains and previously unrecorded above ground remains) include both physical impacts, as well as impacts arising from changes in the setting of designated and non-designated heritage assets which could affect heritage significance.

1272. A physical impact is one in which construction works involved with the Project (e.g. excavations, groundworks) result in a physical change to the fabric of a heritage asset (e.g. partial or complete removal). Impacts also include hydrological changes which may cause desiccation and drying out of any wetland deposits and associated preserved waterlogged archaeological / geoarchaeological remains within or close to the site boundary. Similarly, should an area become inundated, as a result of the Project, this too can impact heritage assets.

1273. Other impacts could include vibration from construction activities affecting the fabric of a heritage asset or changes in ground conditions resulting in an effect on preservation conditions.

1274. Impacts to the significance of a heritage asset may also occur if a development changes the surroundings in which a heritage asset is located, experienced, and appreciated (i.e. its setting). Similarly, historic character may also be affected if the Project results in a change to the prevailing landscape character of the area.

8.7.3.1 Potential Impacts during Construction

1275. Due to the current size of the Onshore Scoping Area, at this stage a general assessment of potential impacts associated with the onshore elements of the construction phase on specific sensitive receptors is presented below.

1276. Construction activities which could affect heritage assets include:

- Any intrusive groundworks, such as trenchless cable installation, piling, draining, and open cut trench excavation;
- Construction of temporary works areas or long term above ground infrastructure such as for the infrastructure within the OCS zone; and
- General construction activities such as plant movement or increased traffic movements.

1277. The potential impacts during construction that will be assessed and are therefore scoped into the EIA include:

- Physical impacts to designated heritage assets;
- Physical impacts to known and unknown non-designated heritage assets;
- Change to the setting of designated heritage assets, which could affect their heritage significance;
- Change to the setting of non-designated heritage assets, which could affect their heritage significance; and
- Changes in the setting of historic landscapes which could affect their heritage significance.

8.7.3.2 Potential Impacts during Operation

1278. Where the Project's onshore infrastructure is buried sub-surface (i.e. infrastructure associated with the buried cable systems), there will be limited potential for further impacts to below ground heritage assets during the operation phase. This is because such loss would have occurred during the construction phase. Physical impacts to heritage assets during operation are therefore scoped out of the EIA.

1279. Activity which could have an ongoing impact to onshore archaeology and cultural heritage includes the presence of infrastructure within the OCS zone. Any long term above ground infrastructure has the potential to result in a change to the setting of heritage assets, which could affect heritage significance.

1280. Impacts could arise from the visual intrusion of the Project's onshore infrastructure, which would change views towards and away from heritage assets. Impacts could also occur from a perceptible change in noise and lighting, which would change the way heritage assets are experienced. The impacts could be both adverse and beneficial, depending on the heritage asset, its location, the contribution of the setting to the value of the asset. There is a potential, therefore, for the operation of the Project to result in a significant effect (both adverse and beneficial).

1281. The potential impacts during operation that will be assessed and are therefore scoped into the EIA include:

- Change to the setting of designated heritage assets, which could affect their heritage significance;
- Change to the setting of non-designated heritage assets, which could affect their heritage significance;
- Change to the setting of historic landscapes, which could affect their heritage significance.

1282. As all physical impacts will be associated with construction works (as described above (see **Section 8.7.3.1**)), it is proposed that physical impacts to heritage assets during operation are scoped out of the EIA.

8.7.3.3 Potential Impacts during Decommissioning

1283. There will be limited potential for further physical impacts to the onshore heritage assets during the decommissioning phase as these impacts would have occurred during the construction phase. The same is anticipated for changes to the setting of historic landscapes. Physical impacts to heritage assets and changes to the setting of historic landscapes during decommissioning are therefore scoped out of the EIA.

1284. Impacts to the setting of heritage assets which could affect their heritage significance during decommissioning are expected to be similar in nature to those anticipated during construction but of smaller magnitude.

8.7.4 Potential Cumulative Effects

1285. There is potential for cumulative effects to arise in which other projects or plans could act collectively with the Project to affect onshore archaeology and cultural heritage receptors. Therefore, cumulative effects related to onshore archaeology and cultural heritage are scoped into the EIA. The CEA will follow the standard approach outlined in **Chapter 5 EIA Methodology**.

1286. The Project could interact cumulatively with other projects, which also have the potential for impacts associated with the onshore archaeology and cultural heritage resource. These cumulative impacts are considered primarily as:

- Physical impact to the archaeological resource of the immediate and wider area / region; and
- Change in the setting of designated and / or non-designated heritage assets which could affect their heritage significance.

1287. Where these impacts occur because of the Project, in combination with other developments in the area with similar associated impacts, there is the potential for the impacts to be of greater significance than when assessed individually. It is therefore proposed that cumulative effects on heritage assets are scoped into the EIA.

8.7.5 Summary of Scoping Proposals

1288. **Table 8-17** outlines the onshore archaeology and cultural heritage impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities and as additional project information and site-specific data become available.

Table 8-17 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Archaeology and Cultural Heritage

Potential Impact	Construction	Operation	Decommissioning
Physical impacts to designated heritage assets	✓	X	X
Physical impacts to known and unknown non-designated heritage assets	✓	X	X
Changes to the setting of designated heritage assets, which could affect their heritage significance.	✓	✓	✓
Changes to the setting of non-designated heritage assets, which could affect their heritage significance.	✓	✓	✓
Change to the setting of historic landscapes, which could affect their heritage significance.	✓	✓	X
Cumulative impacts	✓	✓	✓

8.7.6 Approach to Data Gathering

1289. The data sources that will be accessed to characterise the existing historic environment with respect to onshore archaeology and cultural heritage are presented in **Table 8-18**.

Table 8-18 Desk-Based Data Sources for Onshore Archaeology and Cultural Heritage

Data Source	Data Contents
BGS	Historic borehole logs and the wider geological background for the region.
Coastal and Intertidal Zone Archaeological Network (CITiZAN) data	Database highlighting archaeological remains which are threatened by coastal erosion. The dataset covers all time periods and includes findspots along coastal regions.
NHLE	Data on all designated heritage assets within England, maintained by Historic England. GIS data for all Scheduled Monuments, Listed Buildings, Registered Parks and Gardens and Registered Battlefields.

Data Source	Data Contents
Humber HER	Contains data on all recorded non-designated heritage assets. The data includes archaeological, historic landscape character and historic building information. Information on previous events (archaeological surveys and investigations) will also be obtained.
National Mapping Project (NMP) data maintained by Historic England	NMP data forms a national dataset of potential archaeological sites and landscapes discovered by aerial photographs. The Humber HER hold limited NMP data and have advised the remaining data is acquired from Historic England, who hold the full dataset.
Heritage records maintained by Historic England	Other records maintained by Historic England containing information derived from the former National Buildings Record and National Archaeological Record.
ERYC [Heritage] Conservation Areas	Conservation Areas within the East Riding of Yorkshire
ZTV Model	Any ZTV produced by the LVIA team will be assessed to help inform settings assessment. Heritage specific viewpoints and subsequent photomontages will also be requested and coordinated through the LVIA team, as the settings assessment progresses.
Existing archaeological studies and published sources	Background information on the archaeology of the area, including the results of previous archaeological assessments, evaluation and investigations, where available.
Humber HER, Historic England Archive, other regional and local records offices.	Aerial Photographs, LiDAR data and historic maps to assist in the detection and assessment of archaeological remains.
Portable Antiquities Scheme (PAS)	Database holding records of archaeological finds made by the general public. It is suggested that HERO level access will be requested as this offers more flexibility with sharing data than most other levels. Appropriate consideration will be given to maintaining confidentiality of records in consultation with PAS.

1290. **Table 8-19** presents the surveys that may be undertaken as part of a staged programme of archaeological investigation in 2024 and 2025 to inform the assessment in accordance with industry guidelines and in line with an investigative strategy to be agreed in advance with the relevant historic environment stakeholders.

Table 8-19 Proposed Baseline Surveys for Onshore Archaeology and Cultural Heritage

Survey	Provisional Timing	Spatial Coverage
Walkover Survey	To support the Preliminary Environmental Information Report (PEIR)	Targeted areas identified through desk-based baseline collation will be visited to identify current land use and any potential unrecorded non-designated heritage assets, as well as ground truthing of certain designated and non-designated assets.
Setting Assessment Site Visits	To support PEIR	Heritage assets identified as potentially being affected by the Project (through a change in their setting impacting heritage significance) will be visited to inform the setting assessment.
Priority (then further / full) Geophysical Survey	To support PEIR	Priority (PEIR) then full (or as close to full as possible) coverage in the ES - Initially targeted / prioritised areas for geophysical survey, identified through desk-based baseline collation and assessment activity, e.g. aerial photographic and LiDAR analysis. These are to include sample areas of seemingly 'blank' land, if / where no features were identified in the desk-based assessment. Techniques proposed for this survey include magnetometry, and any other techniques deemed as required (appropriate and proportionate) following the findings of the desk-based assessment. As far as possible full coverage geophysics should then be captured for the ES / DCO application stage.
Geoarchaeological desk-based assessment	To support PEIR	Based on the refined onshore development area. Will determine the scope of any required bespoke approaches to onsite monitoring of engineering-led site investigation (SI) / ground investigation (GI) work and whether any further bespoke approaches would be required.
Archaeological and Geoarchaeological elements to any engineering-led SI / GI work	To support PEIR / ES if required (based on initial baseline surveys and geoarchaeological desk-based assessment)	Bespoke approaches, including the possibility of onsite monitoring and watching brief associated with any engineering-led SI / GI work or equivalent, if / when applicable e.g. test pits, boreholes, etc.

Survey	Provisional Timing	Spatial Coverage
		This initial approach will inform the requirement for any bespoke geoarchaeological investigation.
Targeted Trial Trenching and geoarchaeological investigation (if required and where land access available under the terms of licence agreements pre-application)	To support PEIR / ES if required (based on initial baseline surveys and geoarchaeological desk-based assessment)	Targeted locations to be informed by desk-based approaches and priority geophysical survey. Generally carried out to inform ES stage, if / where land access is achievable, we would look to undertake an initial programme pre-application (e.g. targeting areas of likely archaeology and project-related pinch-points).

1291. Following these initial baseline surveys, the requirement for initial targeted archaeological evaluation (e.g. trial trenching) will be considered and discussed with consultees as part of the EPP. If targeted trial trenching is required it will be undertaken at areas where the baseline surveys and geophysical surveys have identified a high potential for buried archaeological remains to be present, and / or at key areas of onshore project infrastructure such as infrastructure within the OCS zone and landfall and / or at other project-related pinch-points.

8.7.7 Approach to Assessment

1292. Assessment of the onshore archaeology and cultural heritage will be an iterative and ongoing process that will be combined with ongoing site selection work to refine the Project's onshore ECC and OCS zone locations.

1293. The impact assessment upon the onshore archaeology and cultural heritage will follow a heritage significance-based approach to historic environment decision-making.

1294. A search of the Humber HER will be undertaken once the Onshore Scoping Area has been further refined. The data will also form the basis of the PEIR / ES non-designated baseline data set. Further research will also be undertaken to inform the baseline data, including assessment of archaeological archive reports, published archaeological articles, monographs and other sources.

1295. Once refined, the Study Areas for onshore archaeology and cultural heritage to be used in the EIA, will be agreed with consultees and based on standard industry practices. These Study Areas are likely to include, but not be limited to the following:

- Designated heritage assets within 1km of the onshore ECC and 5km of the infrastructure within the OCS zone;
- A setting assessment of heritage assets identified as potentially being affected by the Project through changes to their setting; and
- Known non-designated heritage assets within 500m of the onshore ECC and the infrastructure within the OCS zone.

1296. Identification of heritage assets potentially affected by the Project will be undertaken through spatial analysis of the heritage data within a Geographic Information Systems (GIS) framework.

1297. Initial consideration of the setting of heritage assets and any potential for impact upon heritage significance will be undertaken as part of the setting assessment. This will be informed by walkover surveys and site visits. A full consideration of, and conclusions regarding, setting impacts will be made in the final ES following finalisation of the Project's design.

1298. Identification of any areas, which will potentially be subject to intrusive archaeological evaluation as part of the EIA process, would be decided through consideration of the baseline data and non-intrusive surveys and would be discussed and agreed in consultation with Historic England and Humber Archaeological Partnership as part of the EPP.

1299. The EIA will be undertaken with reference to and / or in accordance with the following primary legislation, policy, standards and guidance:

- Ancient Monuments and Archaeological Areas Act 1979. (c.46);
- Planning (Listed Buildings and Conservations Areas) Act (1990). (c.9);
- Overarching NPS for Energy (EN-1) (DESNZ 2023a);
- NPS for Renewable Energy Infrastructure (EN-3) (DESNZ 2023b);
- NPS for Electricity Networks Infrastructure (EN-5) (DESNZ 2023c);
- NPPF, Section 16: conserving and enhancing the historic environment (Ministry of Housing, Communities and Local Government (MHCLG), 2023);
- PPG: Historic Environment (MHCLG, 2019);
- The Historic Environment in Local Plans: Historic Environment Good Practice Advice in Planning 1 (Historic England, 2015a);
- Managing Significance in Decision-Taking in the Historic Environment: Historic Environment Good Practice Advice in Planning 2 (Historic England, 2015b);
- The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning 3 (Historic England, 2017);
- Standard and guidance for historic environment desk-based assessment (CIfA 2020); Code of Conduct (CIfA, 2022); and
- Principles of Cultural Heritage Impact Assessment in the UK (IEMA), Institute of Historic Building Conservation (IHBC) and CIfA, 2021).

1300. The assessment will be supported by a series of related technical reports, annexes and appendices. As a minimum these will include an onshore ADBA, undertaken to identify the currently recorded designated and non-designated heritage assets within defined Study Areas.

1301. The ADBA will include assessment of aerial photography, LiDAR analysis and review of cartographic sources. This will include a historic map regression exercise of the onshore project area and / or targeted parts of the landfall, onshore ECC and infrastructure within the OCS zone.

1302. The map regression exercise will be undertaken to identify changes in land use throughout history and will provide further information on potential heritage assets.

1303. Other technical reports to be produced which will inform the baseline environment and ultimately inform assessment (see **Table 8-19**), may include:

- Priority (then full / further) geophysical survey;
- Initial targeted intrusive evaluation (trial trenching), if required, relevant and undertaken pre-application. This will be confirmed through progression of the iterative approach to survey work and ongoing consultation with the Humber Archaeology Partnership); and
- Any archaeological and geoarchaeological approaches to be applied to engineering-led ground / site investigation, if / when applicable and undertaken (to be determined by the geoarchaeological desk-based assessment) (e.g. monitoring and / or watching briefs).

1304. An initial settings assessment will also be undertaken as part of the PEIR, which will identify heritage assets and their associated heritage significance which could be affected by change in setting due to the Project. This will follow the Historic England five-step approach (Historic England, 2017).

1305. Technical consultation with Historic England and Humber Archaeology Partnership will be included as part of the EPP (see **Chapter 6 Consultation**). This will help to identify and agree the primary methodologies, present initial findings and ensure potential historic environment issues and risk are identified and considered during the EIA.

8.7.8 Scoping Questions to Consultees

1306. The following questions are posed to consultees to help them frame and focus their response to the onshore archaeology and cultural heritage scoping exercise which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment?
- Have all the onshore archaeology and cultural heritage impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the onshore archaeology and cultural heritage impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

8.8 Onshore Noise and Vibration

1307. This chapter of the Scoping Report considers the potential likely effects of the Project associated with onshore noise and vibration, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the onshore ECC, landfall area and the OCS zone.

1308. The onshore noise and vibration assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation;**
- **Chapter 8.9 Traffic and Transport;** and
- **Chapter 9.2 Human Health.**

8.8.1 Study Area

1309. This section sets out how the Onshore Noise and Vibration Study Area (hereafter referred to as 'the Study Area') will be defined for the consideration of potential noise and vibration effects in the EIA (notably at the PEIR stage). The Study Area at the scoping stage is based on the Onshore Scoping Area, as shown on **Figure 1-1** and defined in **Chapter 1 Introduction**, and the nearby noise and vibration sensitive receptors (NVSR) up to a maximum distance as specified below.

1310. A list of potential NSVR types which will be considered in the noise and vibration assessment is provided in **Table 8-20**. The receptors are classified according to their sensitivity, using professional judgement based on the potential for noise and vibration level changes to cause significant disruption.

Table 8-20 Definition of the Different Noise and Vibration Sensitive Receptor Types and Sensitivity Levels

Sensitivity	Definition	Definitions and Classification Type
Very high	Receptors where noise or vibration level changes may significantly affect their usage.	Certain hospital wards (e.g. operating theatres or high dependency units), auditoria, laboratories with highly vibration sensitive equipment or buildings which are structurally unsound or identified as requiring special protection by cultural specialists (e.g. some historical / listed buildings or scheduled monuments).
High	Receptors where noise and / or vibration level changes may cause disturbance, protection is required but some tolerance is expected.	Residential accommodation, private gardens, hospital wards, care homes, schools, universities, research facilities and national parks (during the day).
Medium	Receptors where noise and / or vibration level changes may cause some distraction or disturbance.	Offices, shops (including cafes), outdoor amenity areas during the day (including recreation, public amenity space / play areas), long distance footpaths (including Public Rights of Way (PRoW) (including footpaths and bridleways), dog walking routes, bird watching areas, footpaths and other walking routes, holiday parks / caravans, visitor attractions, cycling routes including rural roads), doctor's surgeries, sports facilities and places of worship.
Low	Receptors where noise and / or vibration level changes are not expected to be detrimental.	Warehouses, light industry, car parks, and agricultural land.

1311. The Project may result in noise and vibration effects at ecological receptors. These aspects are considered in **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation**.

1312. The study areas will extend from the Onshore Development Area (PEIR stage) to the closest NVSRs within the following distances:

- Construction Noise Study Area – in accordance with the guidance in the Design Manual for Roads and Bridges (DMRB) LA111 Noise and Vibration Rev 2 (2020), construction noise impacts would only be assessed at NVSRs which are no further than 300m from the Onshore Development Area;
- Construction Vibration Study Area – in accordance with the DMRB LA111, construction vibration impacts would only be assessed at NVSRs which are no further than 100m from the Onshore Development Area;
- Operation Noise Study Area – to ensure potential operational noise impacts are assessed, the proposed OCS(s) has been assumed to have the potential to emit audible levels of operational noise. There is no applicable guidance on an appropriate study area for the assessment of operational noise impacts; this depends on sound emission levels from the OCS(s) plant, which are not known at this stage. A sufficient onshore noise and vibration Study Area for operational effects, to capture all NVSRs with the potential to experience significant effects, will be determined and consultation undertaken with relevant stakeholders once plant sound emissions data are available.
- Onshore Traffic Noise Study Area – defined in relation to the assessment of impacts due to changes in road traffic noise levels. In accordance with the DMRB, it incorporates the closest NVSRs (which are no more than 50m away) to the roads on which the Project traffic is anticipated to result in noise level changes of at least 1 A-weighted decibel (dB(A)). These road links will be identified once the required traffic data are available.

1313. **Figure 8-21** shows the maximum potential size of the Construction Noise and Construction Vibration Study Areas, assuming that the onshore development is at the outer edge of the Onshore Scoping Area. These study areas will be refined for the PEIR using the available information on the locations of the onshore development.

8.8.2 Existing Environment

1314. This section provides a summary of baseline conditions in respect of noise and vibration. At this stage in the EIA process, it was not deemed necessary to identify NVSRs in the Study Areas, this will be done as part of the assessment provided in the PEIR.

1315. The Construction Noise Study Area has been reviewed and the following have been identified:

- Potential sources of elevated baseline noise levels;
- Road traffic Noise Important Areas (NIA) - locations where the highest 1% of road traffic noise levels have been predicted, according to the Round 3 strategic noise mapping undertaken by the Defra as part of its obligations under the Environmental Noise Directive (END) (2002/49/EC) (European Parliament, 2002), implemented in England by the Environmental Noise (England) Regulations 2006 (as amended) (UK Government, 2010); and
- Areas prized for their recreational and amenity value due to tranquillity, and therefore considered to require protection from noise impacts, in accordance with the NPPF Section 15, Paragraph 185 aim (b) 'identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason…'.

1316. The Construction Noise Study Area includes locations in the administrative area of ERYC.

1317. The Construction Noise Study Area is predominantly rural, comprising largely of arable agricultural land in active use, where ambient noise levels are expected to be low.

1318. Based on a review of publicly available satellite imagery for the Construction Noise Study Area, there is the potential for baseline noise levels to be elevated in proximity to the following identified sound sources, as shown on **Figure 8-21:**

- Major roads, in particular A1035, A164, A165, and A1079;
- Aircraft flying into or out of Linley Hill (Beverley) Airfield; and
- Trains, primarily on the Yorkshire Coast Line.

1319. Based on the strategic noise mapping data published by Defra (published on www.extrium.co.uk), NIAs have been identified in the Construction Noise Study Area. Those with ID 6533, 6534, 6536, 6537 and 10441 are located on the A1035, while ID 10152 is located on the A165 and ID 10189 is located on the A1079, the asset owner for all being ERYC. These NIAs are shown on **Figure 8-21**.

1320. Based on a review of publicly available satellite imagery for the Construction Noise Study Area, no National Parks or other areas prized for their recreational and amenity value have been identified. Other sources of noise potentially contributing to the baseline could include industrial areas or quarries, these will be identified as part of the EIA process as required.

1321. Baseline noise conditions are specific to individual locations and therefore not identified on a Project wide basis. Potential Impacts

8.8.2.1 Potential Impacts during Construction

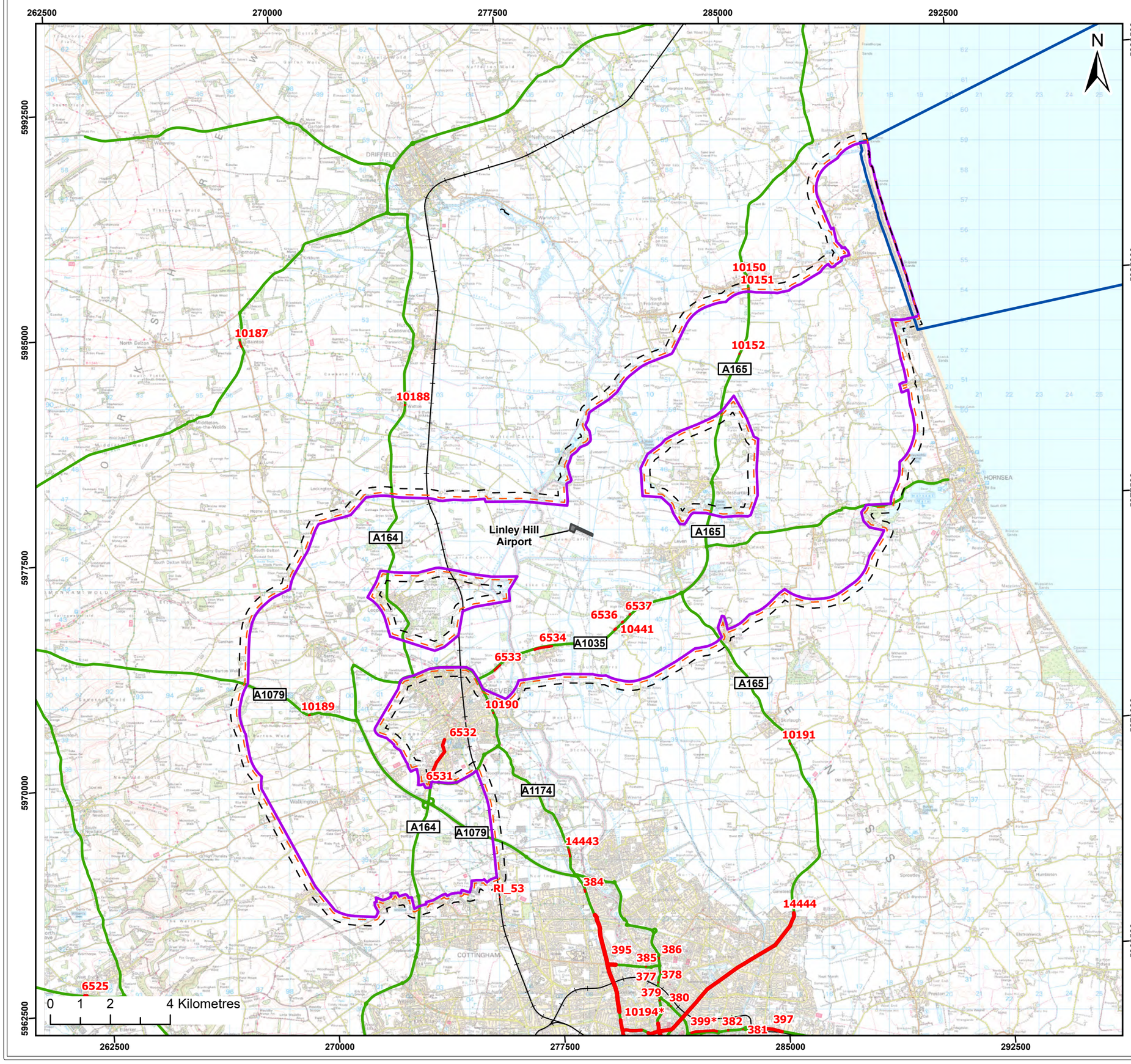
8.8.2.1.1 Construction Noise

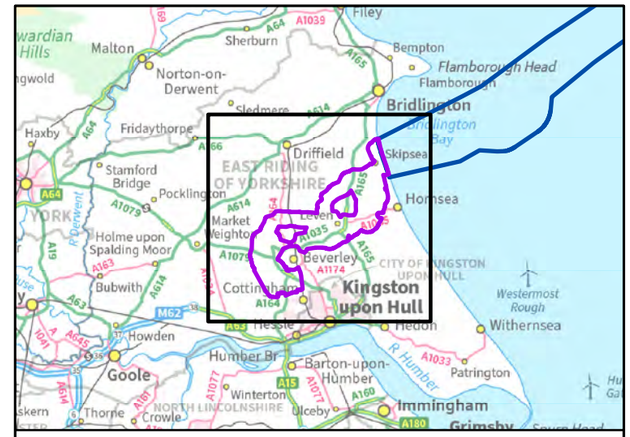
1322. The construction phase of the Project may emit noise with the potential to result in disturbance-related impacts at NVSRs. Noise impacts are anticipated due to the following construction activities:

- Earthworks;
- HDD or other trenchless crossing works for major obstacles;
- Trenched crossing works for minor obstacles;
- Onshore export cable installation and joint bay installation;
- Landfall works using HDD or other trenchless techniques and transition joint bay (TJB) installation;
- Sub-surface excavation, earth moving and landscaping;
- Piling (if required);
- Construction of above ground infrastructure at the OCS(s);
- Nearshore works such as cable laying; and
- Other general onshore construction activities such as establishment of temporary construction compounds and on-site plant operations.

1323. Construction noise impacts will be temporary and will vary both spatially and temporally in nature across the Construction Noise Study Area. The magnitude of the noise impacts is likely to depend on the ambient sound levels at the NVSRs, their proximity to the Project's construction activities and the duration and intensity of the works.

1324. Where the Project includes proposed construction activities with the potential to emit high noise levels at NVSRs inside the Construction Noise Study Area, these impacts are scoped into the EIA.





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Potential maximum Construction Vibration Study Area boundary (Onshore Scoping Area 100m buffer)
- Potential maximum Construction Noise Study Area boundary (Onshore Scoping Area 300m buffer)
- Road traffic Noise Important Areas

Baseline Sound Sources

- Aircraft - Linley Hill Airfield
- Hull to Scarborough Railway Line
- A Road

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Noise and Vibration Baseline Conditions

Figure: 8-21

Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0052

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	14/06/2024	JH	AG	A3	1:125,000
01	05/04/2023	JR	AG	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables

equinor

8.8.2.1.2 Construction Vibration

1325. Potential construction vibration impacts include disturbance and structural damage. These will be assessed for all activities which are a potentially significant source of vibration, such as piling (if required), HDD or other trenchless techniques and vibratory rollers / compactors, where proposed within 100m of NVSRs.

1326. As with construction noise, vibration impacts will be temporary and will vary both spatially and temporally. The magnitude of the vibration impacts is likely to depend on the proximity of NVSRs to the Project's construction activities and the duration and intensity of the works.

1327. Where the Project includes proposed construction activities with the potential to emit high vibration levels at NVSRs inside the Construction Vibration Study Area, these impacts are scoped into the EIA.

8.8.2.1.3 Construction Traffic Noise

1328. Construction of the Project may also result in increased traffic flows on nearby roads, thereby causing impacts due to increases in road traffic noise levels at NVSRs. This impact is also scoped into the EIA.

8.8.2.1.4 Construction Traffic Vibration

1329. The primary mechanism for heavy vehicles to give rise to vibration is the movement of the vehicles over irregularities in the road surface. The DMRB states that "a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant adverse effects.". For those roads which are currently in good condition, there would be no pathway for the increase in traffic flows on public roads associated with the construction of the Project to increase vibration levels at sensitive receptors.

1330. If the construction traffic associated with the Project uses roads with existing surface irregularities, HGVs passing over these irregularities could generate vibration which is perceptible in nearby buildings. However, the additional HGVs introduced by the Project construction will generate vibration which is at a similar level to that caused by HGVs currently using the road. Whilst the additional HGVs would increase the frequency of pass-bys, and therefore the frequency of potential exposure to perceptible vibration, vibration levels are not calculated cumulatively. The impact assessment criteria for both annoyance and building damage are based on exceedance of a fixed limit (specified in peak particle velocity (PPV)) by one event (in this case, one HGV pass-by). The number of HGVs passing a property would therefore not affect the PPV experienced at a receptor in the way that it does for noise. Research undertaken by the Transport and Road Research Laboratory (TRRL Report 246) concludes that "Overall, fewer people are bothered by vibration from traffic than by traffic noise. However, the proportion of residents seriously bothered by vibration (8%) is similar to the percentage seriously bothered by noise (9%)" and hence, annoyance impacts due to vibration associated with construction traffic will be no worse than those due to noise. In accordance with best practice in the UK acoustics industry, the assessment therefore focusses on the potential for annoyance due to change in noise levels caused by construction traffic, and vibration effects due to construction traffic are scoped out of the assessment.

8.8.2.1.5 Offshore Construction

1331. As discussed in **Chapter 7.15 Offshore Airborne Noise**, construction activities in any part of the Offshore Scoping Area have the potential to increase noise and vibration levels in the vicinity. However, the closest distance from the nearest offshore infrastructure to shore is around 210km. At this distance, the noise and vibration emissions will not be perceptible at the onshore NVSRs; therefore, these impacts are scoped out of the EIA.

8.8.2.2 Potential Impacts during Operation

8.8.2.2.1 Operational Onshore Converter Station(s) and Infrastructure within the OCS Zone Noise

1332. Operational noise from the OCS(s) and infrastructure within the OCS zone has the potential to disturb occupants of nearby NVSRs.

1333. The magnitude of impact will depend on baseline noise levels at the NVSRs, their proximity to the OCS(s) and infrastructure within the OCS zone and the plant sound emission levels. It will also depend on the acoustic characteristics of the OCS(s) and infrastructure within the OCS zone noise emissions, particularly whether they are likely to attract corrections for tonality, intermittency or impulsivity. Operational effects due to noise from the OCS(s) and infrastructure within the OCS zone have been scoped into the EIA.

1334. There are no operational noise impacts anticipated from the buried infrastructure at the landfall site and along the onshore ECC, therefore this is scoped out of the EIA.

8.8.2.2.2 Operational Traffic Noise

1335. **Chapter 8.9 Traffic and Transport, Section 8.9.1.3** describes the anticipated operational traffic movements for the Project. Operation phase traffic impacts associated with the OCS(s) and infrastructure within the OCS zone are scoped into the EIA for the traffic and transport chapter; therefore, operational traffic noise impacts are also scoped into the EIA.

8.8.2.2.3 Operational Onshore Converter Station(s) and Infrastructure within the OCS Zone Vibration

1336. The proposed OCS(s) and infrastructure within the OCS zone may include plant with the potential to be sources of vibration. However, in accordance with good industry practice, all onshore plant with the potential to emit high levels of vibration will be isolated from the ground using flexible connectors and resilient mounts, in addition to being mounted to a concrete slab of substantial mass; therefore, any vibration transmitted into the ground is likely to be negligible. It is also the case that, once the vibration attenuation due to isolation and propagation with distance is accounted for, any ground-borne vibration which could be perceptible at receptors would cause damage to the plant emitting it; hence, such vibration issues will be controlled through site maintenance. As the vibration level would be negligible at source, it would be orders of magnitude less than what would be expected to give rise to significant effects at an NVSR. Therefore, operational effects due to vibration have been scoped out of the EIA.

8.8.2.2.4 Operational Traffic Vibration

1337. For the reasons discussed in **Section 8.8.2.1.4**, vibration due to operation phase traffic is not anticipated to have the potential to result in significant effects and is therefore scoped out of the EIA.

8.8.3 Potential Impacts during Decommissioning

1338. It is anticipated that decommissioning impacts on NVSR would be similar in nature to those of construction, although the magnitude of impact is likely to be lower.

1339. The same potential impacts noted for construction are therefore expected to be scoped in (and out) for decommissioning (as per **Table 8-21**).

8.8.4 Potential Cumulative Effects

1340. Onshore cumulative effects will be considered as part of the EIA process. Any other project with the potential to result in noise and vibration impacts that may act cumulatively with the Project will be identified during consultation and following a review of available information. Therefore, cumulative effects related to onshore noise and vibration are scoped into the EIA. These projects would then be included in the CEA. The CEA will follow the standard approach outlined in **Chapter 5 EIA Methodology**.

1341. The assessment will consider the potential for significant cumulative effects to arise due to the construction, operation and decommissioning of the Project, including the onshore ECC and OCS(s) and associated infrastructure, in the context of other developments that are existing, consented or at application stage.

8.8.5 Summary of Scoping Proposals

1342. **Table 8-21** outlines the onshore noise and vibration impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities, and as additional Project information and site-specific data become available.

Table 8-21 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Onshore Noise and Vibration

Potential Impact	Construction	Operation	Decommissioning
Noise affecting NVSRs	✓	✓ (OCS(s) and associated infrastructure only)	✓
Vibration affecting NVSRs	✓	X	✓
Road traffic noise affecting NVSRs	✓	✓	✓
Road traffic vibration affecting NVSRs	X	X	X
Cumulative impacts	✓	✓	✓

8.8.6 Approach to Data Gathering

1343. The approach to data gathering will be discussed and agreed as part of the EPP prior to commencement of the assessment. This will include the proposed survey locations and methodology.

1344. The existing environment will be characterised using the data sources set out in **Table 8-22**.

Table 8-22 Desk-Based Data Sources for Onshore Noise and Vibration

Data Source	Data Contents
Aerial Photography (Google Earth / Streetview)	Location of noise sources and NVSRs within the Onshore Noise and Vibration Study Areas
Local Authority Local Plans	Local policy relevant to noise and vibration and any areas designated for development which could introduce new NVSRs
Environment Agency LiDAR Data (Open Licence)	Topographical data
Ordnance Survey Mapping	Ordnance Survey data, including locations of NVSRs
Department for Environment, Food and Rural Affairs (Defra) Strategic noise mapping	Strategic mapping of baseline road traffic and railway noise levels
Local Authority Planning Portal	Baseline noise level data gathered as part of noise assessments to support other planning applications

1345. As mentioned in **Table 8-23**, baseline noise surveys are proposed at locations representative of the potentially most affected noise sensitive receptors, which in the first instance will be residential locations closest to the assessed noise sources, where applicable for all scoped-in construction and operational noise assessments. Receptors will be considered for baseline noise level surveys where either of the following are anticipated – construction noise impacts lasting at least one month, or long-term operational noise impacts.

1346. Baseline attended and unattended noise surveys, to determine existing noise levels, will be conducted in accordance with current guidance, including British Standard (BS) 7445:1991 'Description and measurement of environmental noise Part 2: Guide to the acquisition of data pertinent to land use' and BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

1347. Traceable calibrated sound level meters will be used for all measurements during the survey. Measurements will capture the following noise level parameters in 15-minute intervals: L_{Aeq}, L_{Amax}, L_{A90} and L_{A10}. Third-octave band sound levels will also be measured. The sound level meters will be calibrated before and after the survey using a portable sound pressure level calibrator.

1348. Record of the meteorological conditions during the survey will be made and measurements will not be considered valid during periods of rain or when average wind speeds exceed 5m/s.

1349. Data collection will likely comprise a combination of short term attended and longer term (up to a week) unattended measurements. A weather station would also be deployed to identify site-specific meteorological conditions during the surveys.

1350. The ERYC planning portal will be reviewed to identify baseline data contained within noise assessments undertaken to support planning applications for other developments.

1351. The criteria adopted to assess construction vibration impacts are independent of vibration levels; therefore, a baseline vibration survey is not proposed to inform the construction vibration impact assessment.

Table 8-23 Proposed Baseline Surveys for Onshore Noise and Vibration

Survey	Spatial Coverage
Baseline noise survey	Survey locations representative of nearest noise sensitive receptors closest to noise sources during construction and operation. Surveys informing construction noise assessments (i.e. around proposed compounds, along trenchless crossings, construction of OCS(s) and associated infrastructure etc.) will typically be 24 hours unattended weekday, or be shorter and attended. Surveys for operational noise assessments (the OCS(s) and associated infrastructure) will generally be unattended and include a weekend and weekday as minimum.

8.8.7 Approach to Assessment

1352. The noise and vibration assessment will be undertaken in accordance with the following standards and guidance (or the latest published version thereof):

- BS 61672-1:2013 Electroacoustics. Sound level meters. Specifications;
- BS 4142:2014+A1:2019 – Methods for Rating and Assessing Industrial and Commercial Sound;
- BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise;
- BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration;
- BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings;
- BS 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures;
- BS 7445-2:1991 Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use;
- Calculation of Road Traffic Noise (CRTN) (Department for Transport, 1988);
- Design Manual for Roads and Bridges (DMRB), LA111 Noise and Vibration, Revision 2 (2020);
- World Health Organisation (WHO) (1999) Guidelines for Community Noise;
- WHO (2009) Night Noise Guidelines for Europe; and
- WHO (2018) Environmental Noise Guidelines for the European Region.

1353. Onshore construction noise and vibration impacts will be assessed using the guidance contained in BS 5228:2009+A1:2014 ‘Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise’ and Part 2: Vibration’. This guidance defines the accepted prediction methods and source data for various construction plant and activities.

1354. Construction traffic noise impacts will be calculated using the Basic Noise Level (BNL) methodology detailed in the CRTN (Department for Transport, 1988). The assessment will compare the calculated BNLs with and without the construction traffic. Any changes in day or night-time noise BNLs due to the Project will be assessed using short term impact magnitude criteria taken from the Design Manual for Roads and Bridges (DMRB).

1355. Operational noise impacts will be assessed using BS 4142:2014+A1:2019. This is the accepted UK standard for rating and assessing the impact of sound of an industrial and / or commercial nature. The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a residential dwelling upon which sound is incident.

1356. Following refinement of the Onshore Scoping Area, consultation with ERYC and other relevant stakeholders (where necessary) will be undertaken. Onshore noise and vibration will be included within the EPP (as set out in **Chapter 6 Consultation**) and further liaison with key stakeholders will take place to agree the approach to data collection, and the specific assessment methods to be employed as part of the EIA as part of this process.

8.8.8 Scoping Questions to Consultees

1357. The following questions are posed to consultees to help them frame and focus their response to the onshore noise and vibration scoping exercise which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment?
- Have all the onshore noise and vibration impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the onshore noise and vibration impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

8.9 Traffic and Transport

1358. This chapter of the Scoping Report considers the potential likely effects of the Project associated with traffic and transport, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the onshore ECC, landfall area and the OCS zone.

1359. The traffic and transport assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 8.3 Onshore Air Quality and Dust;**
- **Chapter 8.5 Soils and Land Use;**
- **Chapter 8.8 Onshore Noise and Vibration;**
- **Chapter 9.2 Human Health;** and
- **Chapter 9.4 Climate Change**.

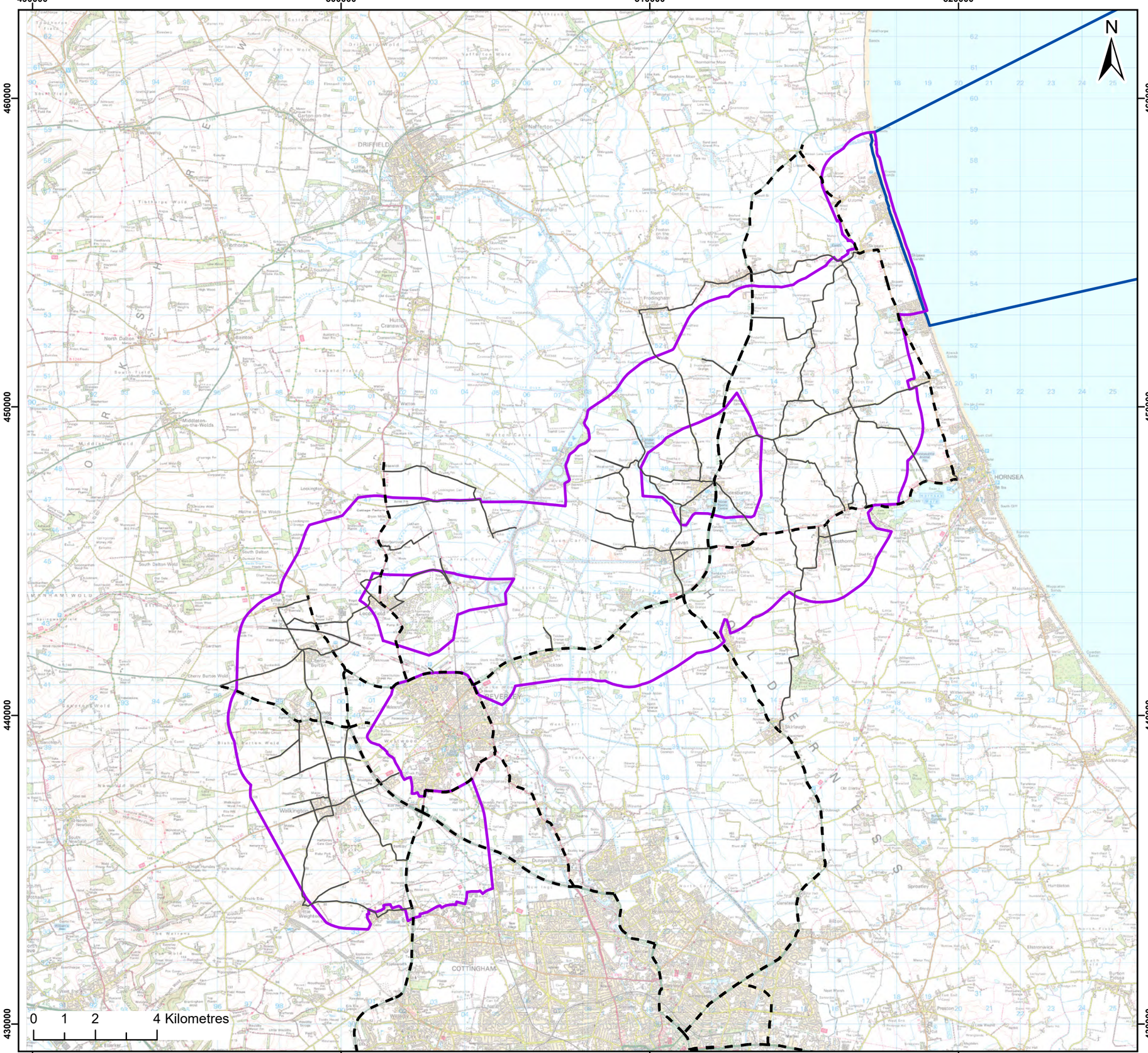
8.9.1 Study Area and Access Strategy

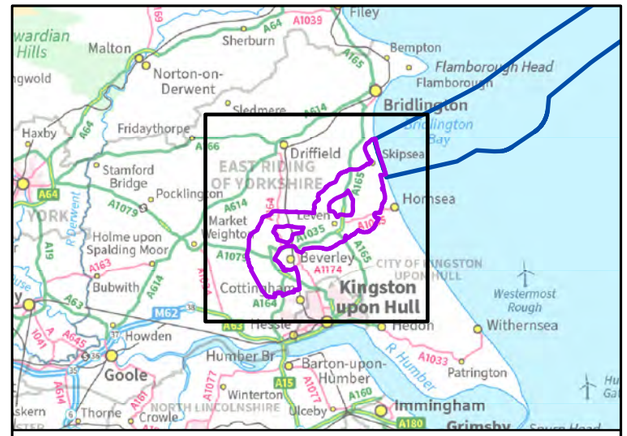
8.9.1.1 Study Area

1360. A broad Traffic and Transport Study Area (herein 'the Study Area') has been established encompassing the Onshore Scoping Area (see **Figure 1-2**).

1361. The Study Area is shown on **Figure 8-22**. The Study Area contains the highway network of two local highway authorities (ERYC and Hull City Council) and the National Highways Strategic Road Network.

1362. The Study Area is effectively a worst-case containing all the potential landfall, onshore ECC and the OCS zones that could conceivably be utilised by the Project. The Study Area will be refined as the Project design develops and the preferred route and location of the onshore infrastructure and associated access locations are finalised. This will, in turn, inform traffic assignments giving greater certainty of highway network routing.





Legend:

- Onshore Scoping Area
- Offshore Scoping Area

Transport routes

- Major road
- Minor road

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Traffic and Transport Study Area

Figure: 8-22

Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0032

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	31/05/2024	JH	AB	A3	1:125,000
01	10/05/2024	JH	AB	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables

equinor

8.9.1.2 Access Strategy

1363. All roads within the Study Area are to be assessed to establish those areas where increases in construction traffic could potentially have an adverse environmental impact upon local communities and highway users. An initial high-level assessment is to be undertaken, supplemented by site observations. The following desk-based sources will be utilised:

- Google street view;
- The East Riding of Yorkshire HGV Freight Route map (ERYC, 2012);
- Transport Asset Management Plan 2019 – 2029 (ERYC, 2023); and
- Highway Infrastructure Asset Management Plan (Hull City Council, 2021).

1364. An Access Strategy will be developed to inform the PEIR and identify the need to engage with associated stakeholders / interested parties.

1365. Potential access points to the landfall, Onshore EEC, and potential OCS zone will be identified by assessing the following parameters:

- Route geometry;
- Access constraints; and
- Sensitive receptors.

1366. The Access Strategy parameters are explained in further detail as follows:

8.9.1.2.1 Route Geometry

1367. Based upon previous experience of similar offshore wind farm projects it has been assumed that the quantum and frequency of Heavy Goods Vehicle (HGV) traffic could be such that the delivery routes would need to accommodate two-way HGV movements. An appraisal of the highway network within the Study Area is to be undertaken to establish those roads that would be most appropriate to accommodate the Project's two-way HGV construction traffic and Light Goods Vehicle (LGV) traffic movements. The assessment will consider any mandatory restrictions such as weight and height limits.

8.9.1.2.2 Access Constraints

1368. To establish those locations where access from the highway to the landfall, onshore ECC and the potential OCS zone may be appropriate, a high level review of all roads which cross the proposed onshore ECC and adjacent to the landfall and OCS zone will be undertaken. Features which would constitute a significant constraint such as watercourses, woodlands and proximity to existing junctions will be identified.

8.9.1.2.3 Sensitive Receptors

1369. Details of the approach to identifying concentrations of sensitive receptors are set out in **Section 8.9.9.1**.

1370. To inform the access strategy, the concentration of sensitive receptors will be overlayed on the Study Area and each of the access routes assigned a level of sensitivity (from low to high). The sensitivity assessment would be informed by site observations to include (but not limited to) a review of the following parameters:

- Audit of footpaths (adjacent to roads), pedestrian crossings and Public Rights of Way (PRoW) (footpaths and bridleways);
- Residential frontage; and
- Locations of schools, sports and recreational facilities, hospitals, doctors surgeries, public houses and retirement facilities.

8.9.1.3 Existing Environment

1371. The following section provides a review of the existing environment in relation to the Study Area.

8.9.1.3.1 Strategic Road Network

1372. The Strategic Road Network within the Study Area comprises of the A63. The A63 could provide a key route for employees and HGV trips.

1373. The A63 provides the main route towards the city of Hull from the east (via the M62) as well as providing a strategic link between the ports of Hull and the wider region / UK. The A63 is a dual carriageway. National Highways are currently (May 2024) undertaking improvement works to the A63 known as the 'A63 Castle Street Junction Improvements'. National Highways identify that these improvements will improve access to the ports, congestion, safety and connections between the city centre and tourist and recreational facilities. The A63 Castle Street Junction Improvements works are currently scheduled to be complete by Spring 2025 prior to commencement of the Project's construction. Engagement with National Highways will be undertaken pre-submission of the PEIR. This engagement will look to seek the latest status of the A63 Castle Street Junction Improvements works and how best to present representative impacts on existing baseline traffic conditions.

8.9.1.3.2 Local Highway Network (Main Distributors)

1374. Within the Study Area, there is an extensive network of A and B main distributor roads managed by ERYC and Hull City Council. It is considered that these routes would provide links for vehicles to directly access the onshore infrastructure (landfall, onshore ECC and OCS zone).

1375. The A164 intersects with the A63 to the west of Hull and provides the main north south link towards Beverley where it intersects with the A1079. To the north of the A1079 the A164 provides a southern bypass of Beverley linking to the A1174. The A164 comprises of both single and dual carriageway.

1376. ERYC has proposed improvements to the A164 as part of the 'Jocks Lodge Improvement Scheme' that will widen the A164 to the south of its junction with the A1079 and improve capacity at this junction. The main works commenced in January 2024 and is expected to be completed by the end of 2026.

1377. The A1079 offers a southern route bypassing Beverley, connecting to the A164 (south of Beverley) and A1033 (north of Hull). Additionally, the A1079 serves as a broader regional link heading west toward York. This road includes both single and dual carriageway sections.

1378. West of Beverley, the A1079 intersects with the A1035, which provides a generally north-east route from Beverley to Leven. The A1035 meets the A165 south of Leven, except for a short dual carriageway section east of Leven.

1379. The A165 intersects with the A1035 south of Leven and continues northward to Bridlington. Heading south from Leven, the A165 connects to Hull, linking with the A1033 and A63. North of the A1033, the A165 remains a single carriageway road.

1380. To the east of Leven, the A1035 offers a single carriageway link toward Hornsea.

1381. South of the A1035, the A165 is initially a single carriageway managed by ERYC. As it approaches Hull, the road transitions to a dual carriageway and falls under the management of Hull City Council.

1382. The B1249 and B1242 provide connections from the A165 toward a potential landfall location near Skipsea. These roads, managed by ERYC, are single carriageway routes.

1383. The B1230 links the A1034 to the west and Beverley to the east. Managed by ERYC, the B1230 is a single carriageway road.

1384. Within the Study Area, two main A roads fall within Hull City Council's administration area. These routes play a crucial role in connecting employees within Hull and facilitating material deliveries from the ports.

1385. The A1033 provides a main link through the centre of Hull heading north from its junctions with the A63 and the ports of Hull towards the A1079 to the south of Beverley. The A1033 comprises of both single and dual carriageway.

1386. The A165 provides a route north-east from the city of Hull towards the northern extents of the onshore Study Area. The A165 is a dual carriageway.

8.9.1.3.3 Local Highway Network (Minor Roads)

1387. Within the Study Area, there are numerous minor / unclassified highway routes serving smaller communities. The prerequisite for the construction Access Strategy (detailed in **Section 8.9.1.2**) will be to minimise the impact on the minor highway routes by routeing traffic demand via the main distributors. However, at some remote locations, it will be necessary to utilise short lengths of minor routes to access the onshore infrastructure. **Section 8.9.9.2** details the process to assess the suitability of the minor routes to accept the Project's construction traffic.

8.9.1.4 Background Traffic Flows

1388. To inform the assessment, the traffic count data will be obtained from the Department for Transport (DfT) to provide classified Annual Average Daily Traffic (AADT) traffic count data. It is proposed to update the majority of DfT traffic flow data to 2023 flows once they are published by the DfT in July 2024.

1389. It is proposed that 2019 traffic flow data will be used for:

- Roads (see **Section 8.9.1.3.1**) that have been adversely impacted by the A63 Castle Street Improvement works; and
- Roads where the latest available data was recorded in 2021 and 2022 during the coronavirus pandemic (COVID-19).

1390. **Table 8-24** presents the proposed DfT traffic counts and AADT flows to be utilised. **Figure 8-23** presents the data graphically.

Table 8-24 DfT Background Traffic Flows

Highway Authority	Road Name	Traffic Count Ref ID	Year	AADT	
				All Vehicles	Percentage of HGV
National Highways	A63 (East of the A15)	16592	2022	48,856	12.7%
	A63 (West of the A1079)	48331	2019*	50,413	11.1%
	A63 (East of the A1079)	27932	2019*	49,741	10.9%
	A63 (West of the A15)	73464	2022	54,493	11.3%
	A63 (Adjacent to St Andrews Dock)	28361	2019*	55,728	9.5%
	A63 (West of Marfleet Avenue)	89143	2022	35,448	12.3%
	A1033	7482	2022	31,557	10.4%
Hull City Council	A165 (Within Hull City Council area)	26732	2022	18,157	5.9%
	A165	46741	2022	23,269	2.6%
	A165	6713	2022	13,246	6.3%
	A1165	70046	2022	22,376	7.7%
	A1033 (West of Staithes Road)	73710	2022	31,557	10.4%
	A1033 (South of Mount Pleasant)	89147	2019	8,500	6.5%

Highway Authority	Road Name	Traffic Count Ref ID	Year	AADT	
				All Vehicles	Percentage of HGV
East Riding of Yorkshire	A1033 (North of the A63)	38670	2022	20,194	7.23%
	A1033 (John Newtown Way Roundabout)	70047	2022	17,318	4.3%
	A1033 (Within Hull City Council area)	77641	2022	19,223	4.3%
	A164 (North of the A15)	7979	2022	19,004	6.9%
	A164 (South of the A1079)	56571	2022	33,201	4.5%
	A164 (North of the A1079)	77576	2019	21,991	4.3%
	A164 (East of Ward Way)	92095	2022	11,683	4.6%
	A164 (South of the A1035)	92094	2022	15,855	4.6%
	A165 (West of Barmston)	81500	2019**	10,651	5.0%
	A165 (North of Brandesburton)	94169	2022	10,138	7.3%
	A165 (North of Skirlaugh)	16700	2022	8,478	6.7%
	A1035 (West of the A165)	37558	2022	17,366	5.5%
	A1035 (North-east of the A165)	36752	2022	18,008	6.7%
	A1035 (North of Beverley)	80461	2022	11,951	6.3%
	A1035 (East of the B1248)	94172	2022	9,045	10.3%
	A1035 (South of the B1248)	80459	2019**	14,672	6.6%
	A1035 (Seaton)	84009	2022	6,937	3.5%
	A1079 (West of the A1033)	89284	2022	18,260	5.5%
	A1079 (West of the A164)	89313	2022	20,331	6.3%
	A1174 (South of A164)	92096	2022	14,586	3.8%
	B1248 (East of Elton)	966502	2009***	6,099	5.6%
	Beswick Road ((East of Lockington)	801809	2022	36	11.1%
	East Lane (Sigglesthorne)	809369	2022	298	11.7%
	Highgate (West of Cherry Burton)	949201	2019	1,258	2.4%
	Skidby Row	931518	2009***	2,516	2.7%
	Station Road (East of Lockington)	800660	2022	251	3.9%
	Manor House Lane	801818	2019	641	1.7%
	Old Road (North of Leconfield)	949184	2008***	2,288	0.7%

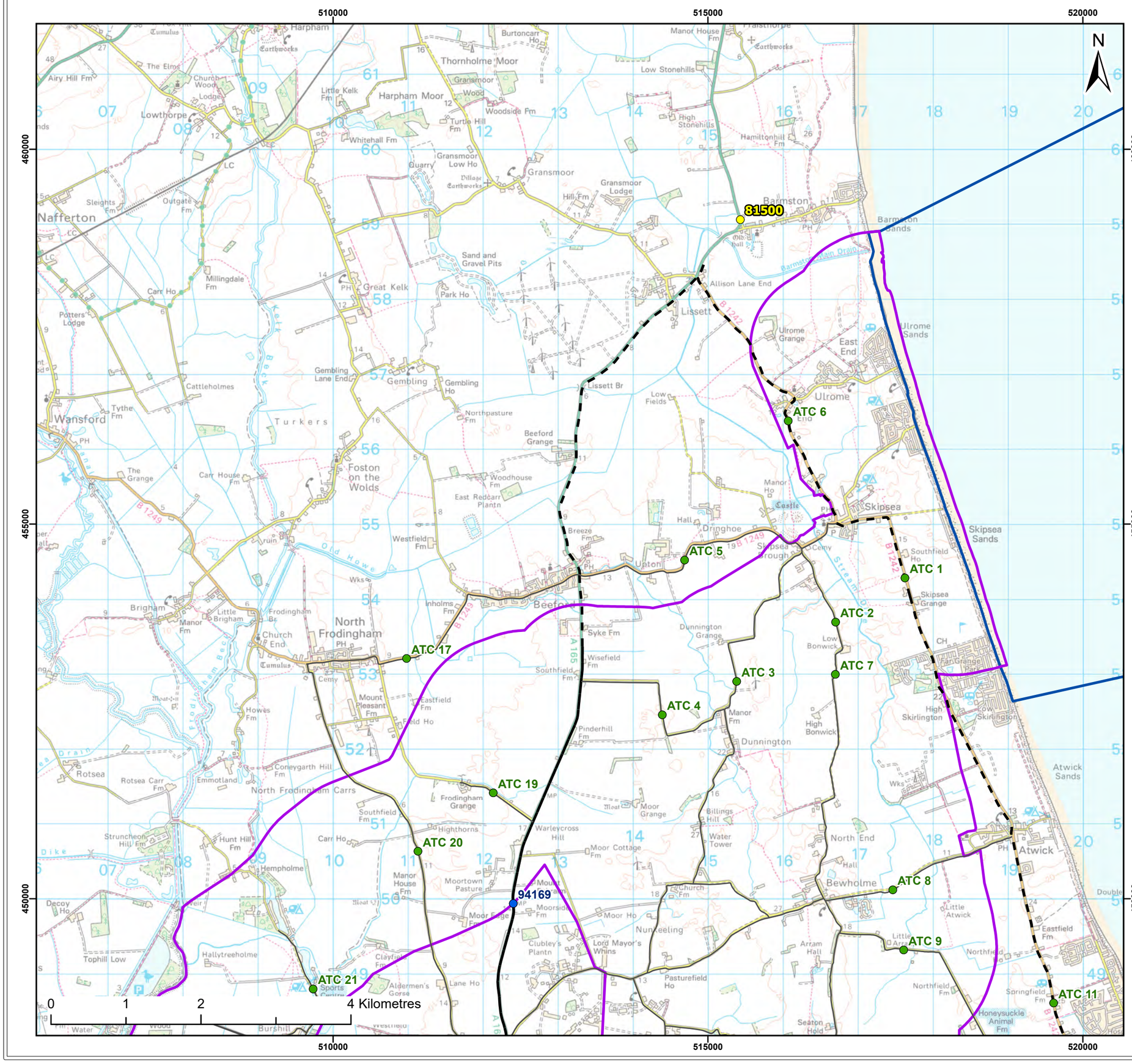
Notes:

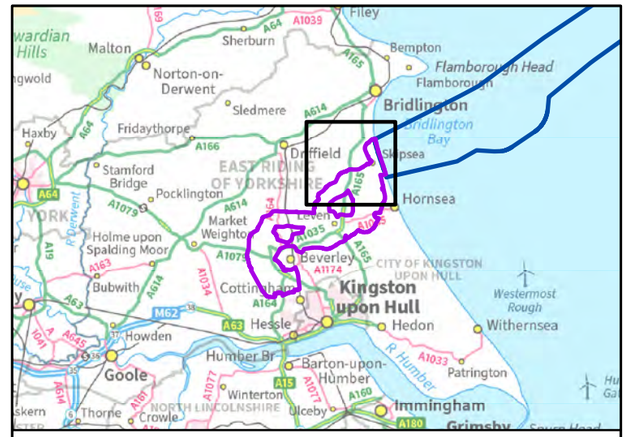
Data sourced from the Department for Transport Road Traffic Statistics (http://roadtraffic.dfc.gov.uk)

* 2019 data proposed to mitigate the impacts on existing baseline data of the A63 Castle Street improvement works.

**2019 data proposed to mitigate the latest available DfT data undertaken in 2020 and 2021 to mitigate flows recorded during the coronavirus pandemic (COVID-19).

*** Data considered too old for PEIR assessment purposes. New Automatic Traffic Counts (ATCs) are to be installed to obtain latest data.





Legend:

- Onshore Scoping Area
- Offshore Scoping Area

Transport routes

- Major road
- Minor road
- Proposed ATCs - June 2024

Traffic Counts

- DfT Traffic Counts 2021

Traffic Counts

- DfT Traffic Counts 2022

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Proposed Baseline Traffic Counts Location Plan
Sheet 1 of 5

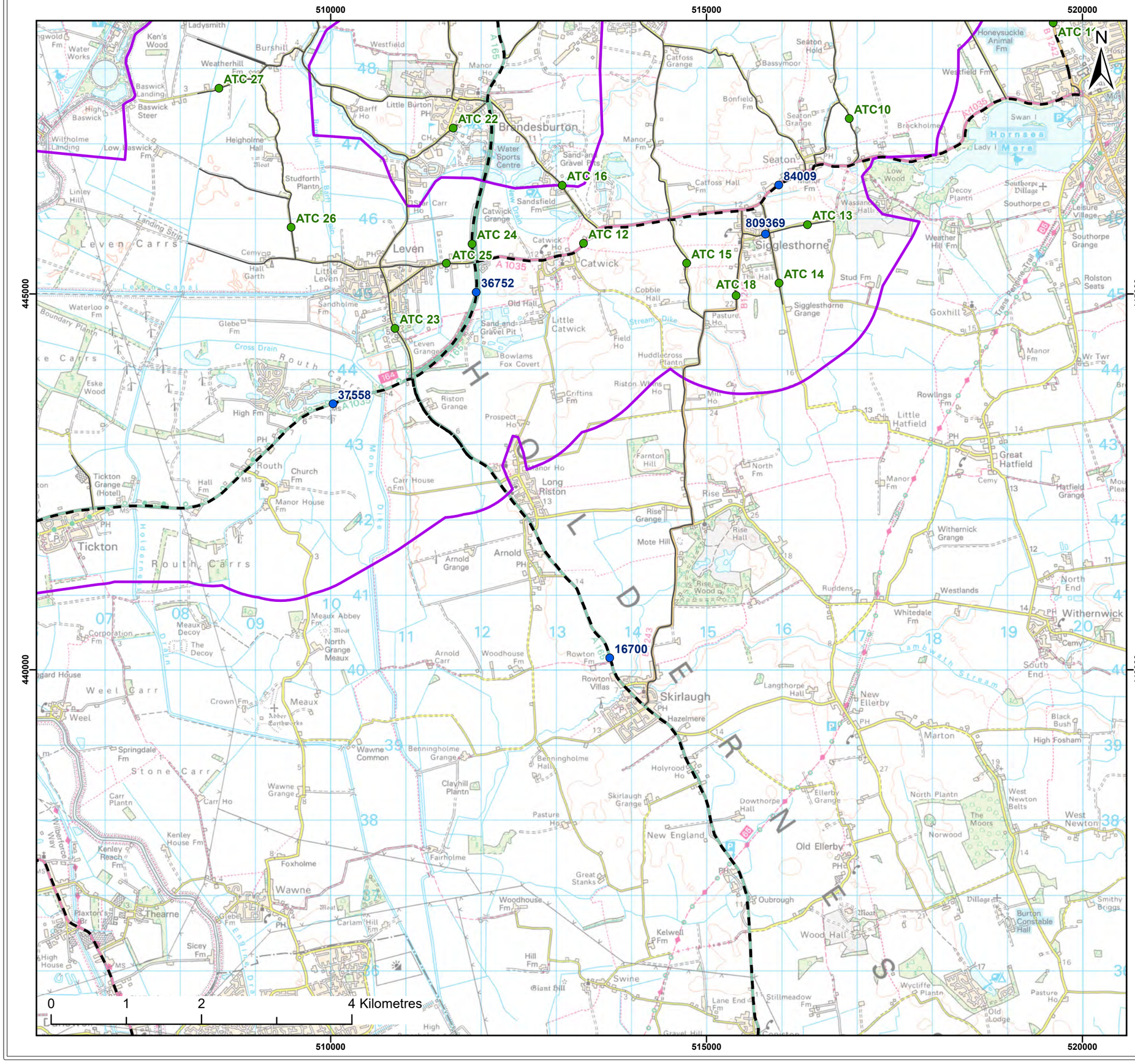
Figure:	Drawing No:
8-23	PC3991-RHD-ON-ZZ-DR-Z-0034

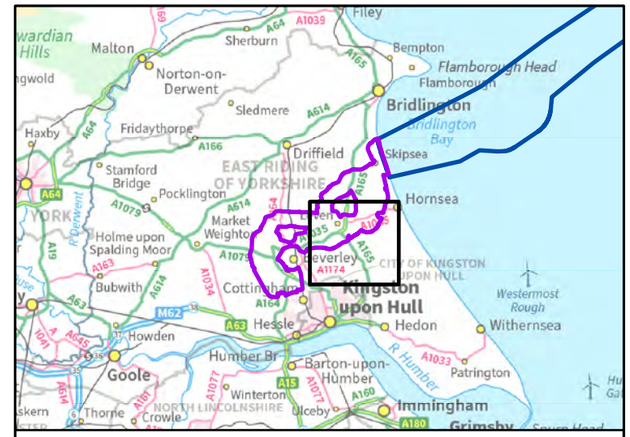
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	07/06/2024	JH	AB	A3	1:50,000
01	10/05/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Offshore Scoping Area

Transport routes

- Major road
- Minor road
- Proposed ATCs - June 2024

Traffic Counts

- DfT Traffic Counts 2022

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Proposed Baseline Traffic Counts Location Plan
Sheet 2 of 5

Figure: 8-23

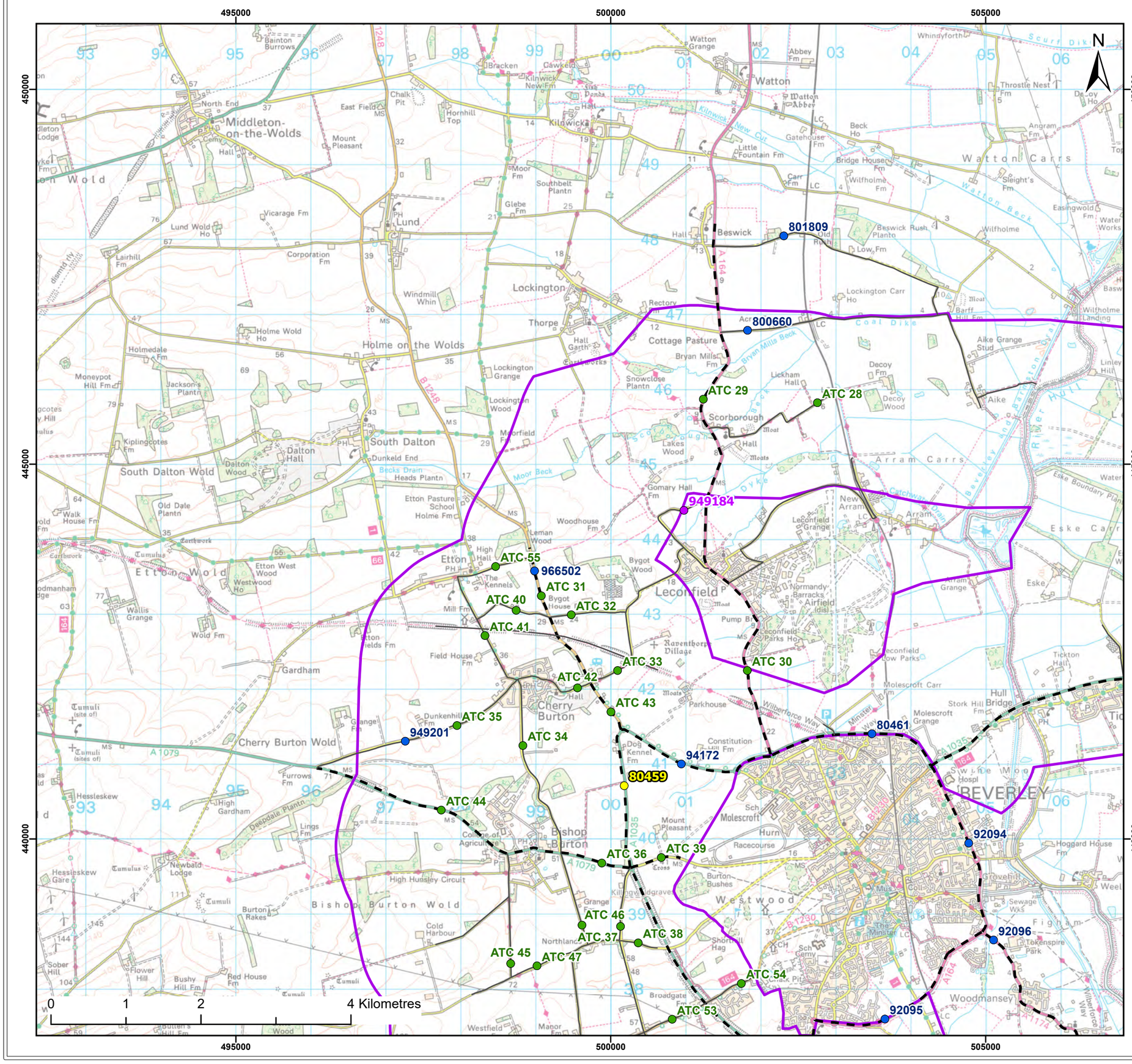
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0034

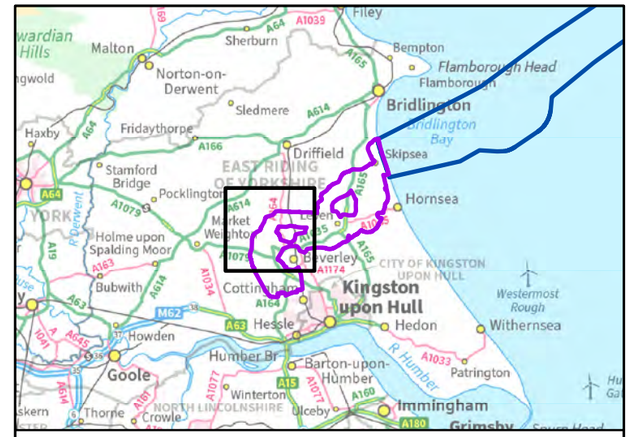
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	07/06/2024	JH	AB	A3	1:50,000
01	10/05/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Offshore Scoping Area

Transport routes

- Major road
- Minor road
- Proposed ATCs - June 2024

Traffic Counts

- DfT Traffic Counts 2008
- DfT Traffic Counts 2021

Traffic Counts

- DfT Traffic Counts 2022

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Proposed Baseline Traffic Counts Location Plan
Sheet 3 of 5

Figure: 8-23

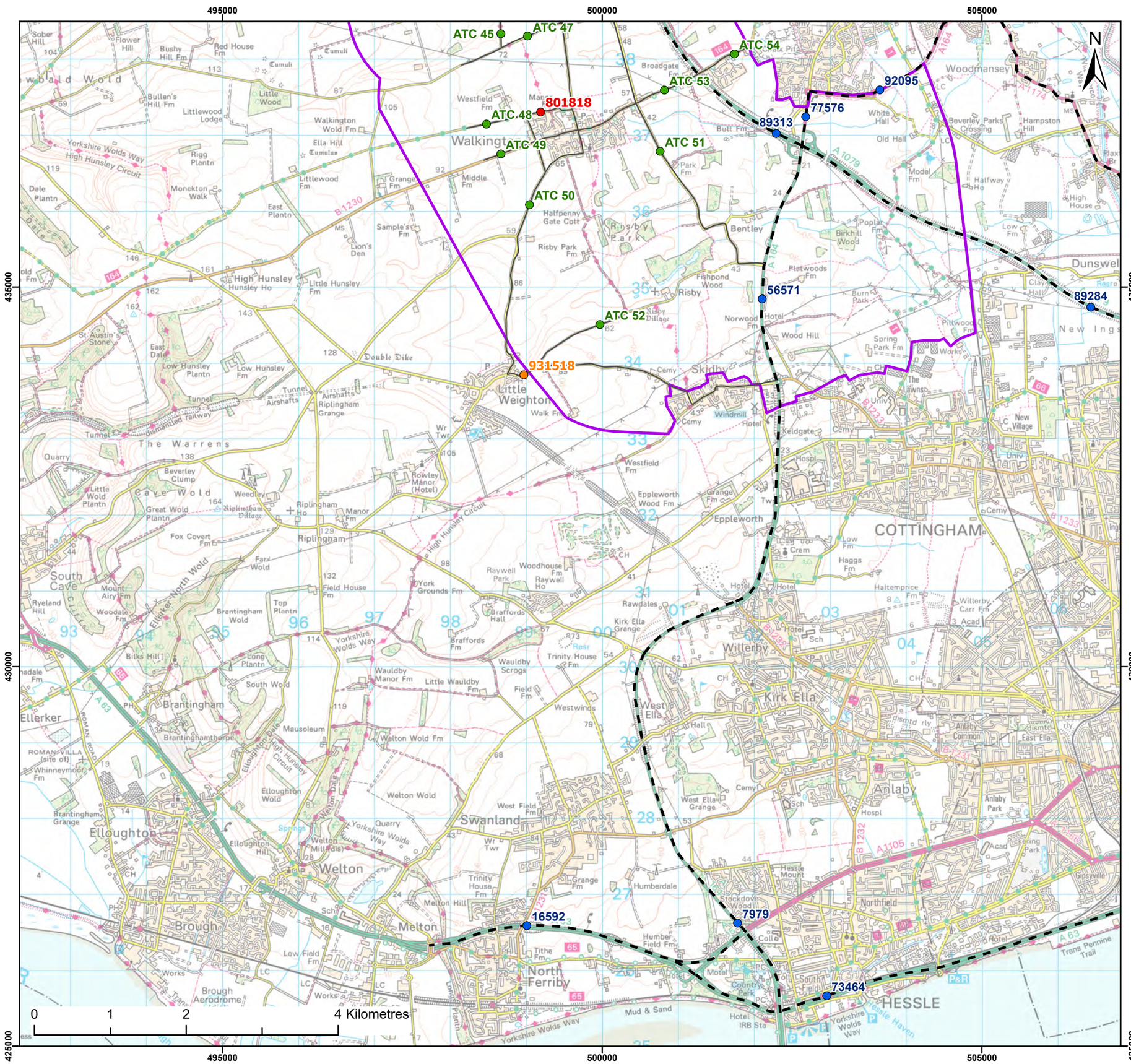
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0034

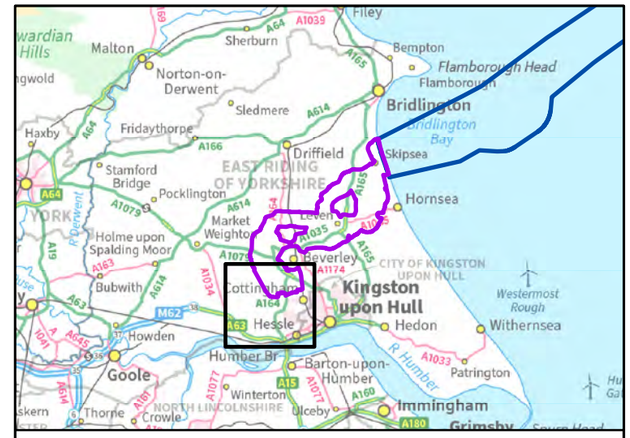
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	07/06/2024	JH	AB	A3	1:50,000
01	10/05/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor





Legend:

- Onshore Scoping Area
- Offshore Scoping Area

Transport routes

- Major road
- Minor road
- Proposed ATCs - June 2024

Traffic Counts

- DfT Traffic Counts 2009
- DfT Traffic Counts 2019

Traffic Counts

- DfT Traffic Counts 2022

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Proposed Baseline Traffic Counts Location Plan
Sheet 4 of 5

Figure: 8-23

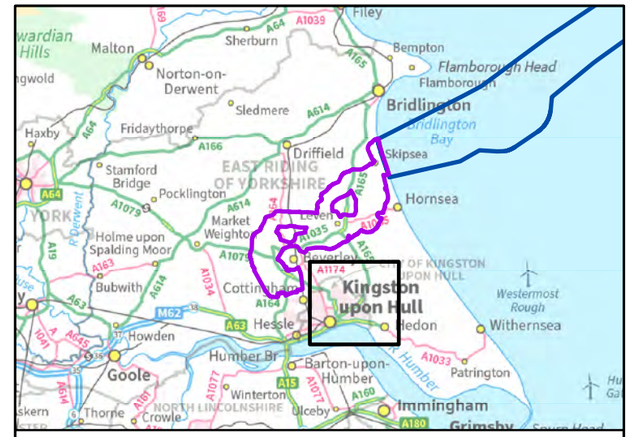
Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0034

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	07/06/2024	JH	AB	A3	1:50,000
01	10/05/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor



Legend:

- Onshore Scoping Area
- Offshore Scoping Area

Transport routes

- Major road
- Minor road

Traffic Counts

- DfT Traffic Counts 2019

Traffic Counts

- DfT Traffic Counts 2022

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Proposed Baseline Traffic Counts Location Plan
Sheet 5 of 5

Figure: 8-23

Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0034

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	07/06/2024	JH	AB	A3	1:50,000
01	10/05/2024	JH	AB	A3	1:50,000

Co-ordinate system: British National Grid

sse Renewables

equinor

1391. Early engagement with Hull City Council indicated that a different traffic flow baseline would apply from 2025 onwards, following completion of the A63 Castle Street Junction Improvements works. It is proposed to engage with Hull City Council at the PEIR / ES stages to agree the appropriate baseline data used for the proportionate assessment of the A63.

1392. New Automatic Traffic Counts (ATCs) are to be commissioned at locations where open source data does not exist or where data available is considered too old (typically over three years unless otherwise agreed). Surveys would be representative of typical 'neutral' conditions in accordance with TAG Unit 2.1 (DfT, 2020) e.g. outside of school holidays and would record data for 24 hours per day, for a period of seven days. It is proposed that any new ATCs would be undertaken in 2024. The proposed locations of the ATCs are shown in **Table 8-25** and presented graphically on **Figure 8-23**.

Table 8-25 Proposed Automatic Traffic Surveys

Highway Authority	Road Name	Traffic Count Ref ID	Notes
East Riding of Yorkshire	B1242 (Hornsea Road)	ATC 1	Traffic Sensitive (Flow) Weekends from 09:30 to 14:30
	Bewholme Lane	ATC 2	No sensitivities
	Skipsea Lane	ATC 3	
	Dunnington Lane	ATC 4	
	Beeford Road	ATC 5	
	Skipsea Lane (Ulrome)	ATC 6	Traffic Sensitive (Flow) Weekends from 09:30 to 14:30
	Skipsea Road	ATC 7	No sensitivities
	Atwick Road	ATC 8	
	Bewholme Lane	ATC 9	
	Mill Lane	ATC 10	
	B1242 (Atwick Road)	ATC 11	Traffic Sensitive (Flow) Weekends from 09:30 to 14:30
	A1035 (Main Street)	ATC 12	Traffic Sensitive (Flow) Everyday from 00:00 to 00:00
	Wassand Balk	ATC 13	No sensitivities
	Great Hatfield Road	ATC 14	
	Catwick Heads	ATC 15	
	Catwick Lane	ATC 16	
	Bridlington Balk	ATC 17	
	B1243 (Rise Road)	ATC 18	
	Grange Road	ATC 19	
	Frodingham Road	ATC 20	
	Hepholme Road	ATC 21	
	New Road	ATC 22	
	Berverley Road (Leven)	ATC 23	
	A165 (Leven Bypass)	ATC 24	Traffic Sensitive (Flow) Everyday from 07:00 to 09:00 and 17:00 to 19:00
	Hornsea Road (Leven)	ATC 25	No sensitivities
	Heigholme Lane	ATC 26	
	Burshill Carr Road	ATC 27	
	Scorborough Lane	ATC 28	
	A164 (Driffield Road)	ATC 29	Traffic Sensitive (Flow) Everyday from 12:00 to 18:00
	A164 (Driffield Road)	ATC 30	Traffic Sensitive (Flow) Everyday from 12:00 to 18:00
	B1248 (Malton Road)	ATC 31	No sensitivities
	Rootas Lane (East of B1248)	ATC 32	
	Leconfield Road	ATC 33	
	Bishop Burton Road	ATC 34	
	Highgate	ATC 35	
	A1079 (Beverley Road)	ATC 36	Protected Street and Traffic Sensitive (Flow) Everyday from 00:00 to 00:00

Highway Authority	Road Name	Traffic Count Ref ID	Notes
	Killingworldsgraves Lane	ATC 37	No sensitivities
	Newbald Road	ATC 38	
	York Road	ATC 39	Traffic Sensitive (Flow / Critical Junction) Everyday from 00:00 to 00:00
	Rootas Lane (West of B1248)	ATC 40	No sensitivities
	Etton Road	ATC 41	
	Main Street (Cherry Burton)	ATC 42	
	B1248 (Malton Road)	ATC 43	
	A1079 (York Road)	ATC 44	Protected Street and Traffic Sensitive (Flow) Everyday from 00:00 to 00:00
	Dale Gate	ATC 45	No sensitivities
	Finchcroft Lane	ATC 46	
	Walkington Heads	ATC 47	
	Middlehowe Road	ATC 48	
	B1210 (Hunsley Road)	ATC 49	
	Little Weighton Road	ATC 50	
	Bentley Lane	ATC 51	
	Risby Road	ATC 52	
	B1230 (Beverley Road)	ATC 53	
	B1230 (Broadgate)	ATC 54	
	Main Street	ATC 55	
	A165 (Beverley Road)	ATC 56	Traffic Sensitive (Flow) Everyday from 07:00 to 09:00 and 17:00 to 19:00

8.9.1.4.1 Future Year Growth Factors

1393. Future year traffic forecasts for peak construction assessment of the Project would be derived by applying TEMPro growth factors.

1394. It is proposed that TEMPro factors will be used commensurate to the geographical areas' characteristics. TEMPro growth factors will utilise the latest DfT's National Transport Model (NTM) dataset and calculated using the adjusted local growth figures. Further details of the characteristics to be used for each Highway Authority are detailed in **Table 8-26**.

Table 8-26 TEMPro Parameters

Highway Authority	TEMPro Geographical Area Definition	TEMPro NTM Area Type	TEMPro NTM Road Types
Hull City Council	Kingston upon Hull, City of	Urban	Principal
National Highways SRN	Kingston upon Hull, City of	Urban	Trunk
ERYC	East Riding of Yorkshire	Rural	Trunk Principal Minor

1395. As the Onshore Development Area develops, the derived TEMPro growth factors for all road links in the final chosen Study Area will be presented to the relevant highway authorities for agreement ahead of inclusion into the PEIR.

8.9.1.4.2 Seasonality

1396. National Highways have previously stated that for any Driver Delay assessment on the SRN, seasonality factoring should not be included.

1397. For the local highway network, it is proposed that for any agreed junction capacity (Driver Delay) assessments, seasonality effects would be considered in the assessment. This will allow for the Project's construction and operation traffic to be assessed against peak hour baseline network flows during the busiest months.

1398. For all other assessments, the neutral AADT flows will be used with no seasonality factored in noting that introducing seasonality factors could inflate the baseline traffic flows reducing the impacts of the Project's construction / operation traffic flows.

8.9.1.5 Public Rights of Way and Cycling

1399. There is an extensive network of PRoWs within the Study Area and cycling routes within Hull. In addition, there are two National Cycle Routes (NCR) within the Onshore Scoping Area as described within **Chapter 8.5 Soils and Land Use**, and a further two within this chapter's Study Area as shown on **Figure 8-22**.

1400. NCR1 runs north from Hull past the existing electricity transmission network substation at Creyke Beck to Beverley (where it intersects with NCR164) then onwards towards Driffield.

1401. NCR 164 heads north-west from Beverley towards Leven (following the A1035) and south-west from Beverley towards Walkington following the alignment of the B1230.

1402. NCR 65 runs east to west through Hull, linking to NCR 1 to the west of Hull and NCR 66 to the east of Hull. NCR 65 also heads north-east from Hull to Hornsea.

1403. NCR 66 runs from Cottingham in the west (where it intersects with NC R1) east towards the centre of Hull where it connects to NCR 65 which continues towards Hornsea.

1404. Impacts to PRoW and NCRs are covered within **Chapter 8.5 Soils and Land Use**.

8.9.1.6 Rail and Sea

1405. To the south of the Study Area, there are existing port and rail freight terminals alongside the Humber Estuary that can be accessed from the A63 and A1033 (as shown on **Figure 8-22**). These facilities could provide the potential for the import / export of Project cargoes to the wider Study Area by road.

1406. No other suitable ports or rail freight facilities have been identified within the Study Area.

1407. A number of rail infrastructure sites, such as level crossings have been identified that may be required to be crossed over by construction vehicles. Early engagement with Network Rail will be undertaken to understand the likely impacts to such infrastructure.

8.9.2 Potential Impacts

1408. The principal guidelines for the assessment of the environmental impacts of road traffic associated with new developments are the 'Environmental Assessment of Traffic and Movement (EATM)' (EATM, July 2023) published by the Institute of Environmental Management Assessment.

1409. The scope of the EATM is to provide the basis for consistent and comprehensive coverage of the traffic and movement impacts for a wide range of projects. These guidelines have been applied when determining potential impacts for construction, operation and decommissioning.

8.9.2.1 Severance, Amenity and Fear and Intimidation

1410. It is proposed to follow the methodology as prescribed within the EATM utilising baseline traffic flows (as described in **Section 8.9.1.4**) to determine the magnitude of impact when applying the Project's traffic demand.

8.9.2.2 Road Safety and Hazardous Loads

1411. It is proposed to collect the latest full three years of STATS19 collision data for all links within the Study Area, excluding the period of COVID-19 restrictions (March 2020 to July 2021).

1412. The STATS19 data will be reviewed to establish areas with collision rates higher than national averages and / or concentration of collisions with similar patterns (termed collision clusters). It is proposed to apply thresholds established by recent planning precedent in the region as follows:

- Examining the rate of collisions per length of road in miles ('collision rates') and comparing this to a national average for comparable roads; and
- Examining defined clusters of four or more collisions within three years (or three in a single year), ('collision clusters').

1413. Collisions records obtained for the A63 Castle Street scheme will be materially influenced by the revised junction layouts being implemented. As such, it will be difficult to assess the specific safety record associated with the proposed highway arrangement. Notwithstanding, the new road layouts will be designed to the highest safety standards and subject to Road Safety Audits. It is therefore assumed that there will not be inherent road safety sensitivity and is therefore scoped out.

1414. EATM notes that some developments may involve the transportation of dangerous or hazardous loads by road and that any traffic and movement assessment should clearly outline the estimated number and composition of such loads. Where the number of movements is considered to be significant, the assessment should include a risk or catastrophe analysis to illustrate the potential for an accident to happen and the likely effect of such an event.

1415. It is not envisaged that there would be a significant number of movements of hazardous loads and that such loads would likely comprise of fuel deliveries for plant as well as batteries (or other ESBI technology, as required). EATM notes that the extent of the risk analysis should reflect the nature of the product being distributed, noting that for instance, much more detail would be required for a scheme that involved the transportation of nuclear products than for one that involved the delivery of petroleum.

1416. To present a proportionate assessment, it is proposed that rather than undertaking a discrete assessment of hazardous loads, the road safety assessment would include detailed analysis of the types of vehicles historically involved in collisions to understand if there are areas where vehicles transporting hazardous loads may be at greater risk, i.e. where there is a pattern of collisions involving HGVs.

1417. Relevant mitigation measures (such as suitable potential alternative hazardous load routes if required) would be suggested to ensure the effects from hazardous loads would be managed and reduced to a minimum.

8.9.2.3 Driver Delay (Capacity)

1418. It is proposed to provide AM and PM construction and operational peak hour turning count diagrams within the PEIR chapter. These diagrams will aid further discussions with stakeholders to identify the likely impacts to network peak hours and the potential junctions requiring further assessment within the defined traffic and transport Study Area. All junctions with a predicted rise of 30 two-way construction peak hour movements will be highlighted as a starting point for the further discussions with highway stakeholders and the scope of detailed assessments to inform the DCO application.

8.9.2.4 Driver Delay (Highway Constraints)

1419. A review of local highway routes will be undertaken to establish highway geometry constraints (pinch points). Potential mitigation measures could include passing places, junction widening, escorting vehicles and traffic marshals.

1420. Another category of highway constraint could include delays induced by road works where the onshore EEC crosses the public highway. These crossings may require open cut methodology which will involve implementation of traffic signals (single lane closure) or diversions routes (road closure). A review of the volume and type of road users are to be examined to determine a sensitivity value. To inform a judgement regarding the magnitude of impact, the assessment will consider the required length and duration of a detour that may be required to divert or additional delay of vehicles waiting at traffic lights.

8.9.2.5 Abnormal Loads

1421. Abnormal load is a generic term that covers a broad range of vehicles, ranging from limited load projections permitted for standard vehicles to Special Order Vehicles designed specifically for the purpose of moving loads well in excess of standard vehicle parameters.

1422. Loads that require Special Type Vehicles are defined as Abnormal Indivisible Loads (AIL) in The Road Vehicles (Authorisation of Special Types) (General) Order 2003. The Road Vehicles (Authorisation of Special Types) (General) Order 2003 limits gross weight of an AIL to 150 tonnes, axle weight to 16,500kg, length to 30m and / or width to 6.1m, above which a Special Order is required from National Highways (who manage approval on behalf of the Secretary of State for Transport).

1423. The transformers for the Project's OCS(s) will require Special Order AIL. In addition, there may also be a requirement for non-Special Order abnormal loads associated with large items of plant, cable drums, etc.

1424. To ensure that potential impacts associated with the transportation of all AIL are managed and coordinated, a commitment would be contained within an Outline Construction Traffic Management Plan (OCTMP) to be submitted at DCO application stage that, prior to the movement of any abnormal loads, the contractor would be required to submit notifications to the relevant authorities (police, highway authorities and bridge / structure owners) through the Electronic Service Delivery for Abnormal Loads[10] (ESDAL). The ESDAL process would detail which proposed routes would be used and ensure the timings would be co-ordinated to ensure potential effects would not be significant.

8.9.2.6 Potential Impacts during Construction

1425. **Table 8-27** sets out the potential construction traffic impacts and the likely user groups that would be affected.

Table 8-27 Potential Construction Traffic Impacts

Potential Impact	Potential Impact of Construction Traffic	Affected User Groups
Severance	Increases in traffic impacting upon non-motorised users of the public highway including users of the Public Rights of Way (PRoW) network, NCRs and local networks	Local communities and visitors in the area.
Amenity		
Fear and Intimidation		
Road Safety (including Hazardous Loads)	Construction traffic impacting upon sites with a record of collisions and / or the introduction of new risks associated with the formation of new construction accesses.	Commuters, visitors, and business users.
Driver Delay (Capacity)	Increases in traffic leading to delays at junctions.	Commuters, visitors, and business users.
Driver Delay (Highway Constraints)	Construction traffic using narrow roads resulting in increased delays.	Local communities and visitors in the area.
Abnormal Loads	Increases in large vehicle movements leading to delays to traffic and the suitability of the delivery routes to accommodate abnormal load deliveries	Commuters, visitors, and business users.

8.9.3 Assessment Methodology

8.9.3.1 Other Impacts

1426. Traffic borne impacts upon air quality and dust and noise and vibration are considered separately in **Chapter 8.3 Onshore Air Quality and Dust** and **Chapter 8.8 Onshore Noise and Vibration** respectively. Impacts to cycle routes and PRoWs are considered separately in **Chapter 8.5 Soils and Land Use, Chapter 8.10 Landscape and Visual Impacts** and **Chapter 9.2 Human Health.** The cumulative interactions of all transport effects will be considered within **Chapter 9.2 Human Health**.

[10] ESDAL is a Government system designed to facilitate the transportation of abnormal loads on the highway network. The ESDAL process aids in planning routes and notifying authorities within statutory timeframes.

8.9.4 Potential Impacts during Operation

1427. Any inspections / maintenance of the onshore export cables will be infrequent and subject to very low vehicle demand.

1428. The infrastructure within the OCS zone may either be manned (by around two operatives) or unmanned, in both cases there will be other (minimal) staff periodically visiting to carry out routine checks and maintenance. Most annual maintenance will be short, but, if necessary, some campaigns may be longer.

1429. Considering the activities above, no significant traffic and transport effects are anticipated during the operation phase associated with the O&M of the onshore export cables and are to be scoped out of any future assessment.

1430. This is with the exception of potential infrequent replacement of batteries (or other ESBI technology, where required) which is scoped into the assessment in relation to road safety and the movement of hazardous loads.

8.9.5 Potential Impacts during Decommissioning

1431. No decision has been made regarding the final decommissioning policy for the infrastructure within the OCS zone, as it is recognised that industry best practice, rules and legislation change over time.

1432. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the relevant stakeholders / regulator.

1433. It is anticipated that decommissioning impacts would be similar in nature to those of construction. It is likely that the magnitude of the effects from decommissioning will be lower than that of construction impacts. Therefore, it is proposed that the construction phase assessment serves as a 'proxy' for the decommissioning phase and no additional assessment is undertaken.

8.9.6 Potential Cumulative Effects

1434. There is the potential for cumulative effects to arise in which other projects or plans could act collectively with the Project to affect traffic and transport receptors. Therefore, cumulative effects related to onshore traffic and transport are scoped into the EIA. The CEA will follow the standard approach outlined in **Chapter 5 EIA Methodology**.

1435. Onshore cumulative effects will be considered as part of the EIA process. Any other project with the potential to result in impacts that may act cumulatively with the Project will be identified. Consultation with the relevant highway authorities will seek to identify any significant developments that could have a cumulative effect with the Project, e.g. major road improvement schemes, other NSIP, etc.

1436. The assessment will consider the potential for significant cumulative effects to arise because of the construction of the Project in the context of other developments that are existing, consented or at the application stage.

1437. The preferred base port (or ports) for the offshore construction of the Project is not known and any decision would not be expected until post-consent. Such facilities would typically be provided or brought into operation by means of one or more planning applications or as port operations with permitted development rights.

1438. No decision has been made on a preferred base port for the offshore O&M of the Project. Therefore, it is proposed to scope out of the EIA the onshore traffic and transport impacts of offshore O&M activities.

8.9.7 Summary of Scoping Proposals

1439. **Table 8-28** outlines the traffic and transport impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities, and as additional project information and site-specific data become available.

1440. All impacts related to offshore construction, operation and maintenance and decommissioning are scoped out of any further assessment (although not captured in **Table 8-28**).

Table 8-28 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Traffic and Transport

Potential Impact	Construction	Operation	Decommissioning (by proxy)
Severance	✓	X	✓
Amenity	✓	X	✓
Fear and Intimidation	✓	X	✓
Road safety (including consideration of hazardous loads)	✓	✓ (Related to ESBI only)	✓
Driver delay (capacity)	✓	X	✓
Driver delay (highway constraints)	✓	X	✓
Abnormal loads	✓	X	✓
Hazardous loads	X	X	X
Cumulative impacts	✓	X	✓

8.9.8 Approach to Data Gathering

1441. To date, the existing environment has been characterised using the following desk-based data sources set out in **Table 8-29**.

Table 8-29 Desk Based Data Sources for Traffic and Transport

Data Source	Date	Data Contents
Department for Transport's road traffic statistics (https://roadtraffic.dft.gov.uk)	24.04.2024	Annual average 2022 traffic counts for all main 'A' roads
Google Maps, Bing Maps, etc.	2024	Online mapping
Sustrans (https://www.sustrans.org.uk/nationalcycle-network)	2024	Details of NCRs

1442. To facilitate the impact assessment, the following additional data will also be obtained:

- Baseline traffic flow data for all roads within the refined traffic and transport Study Area via commissioned traffic surveys and / or existing traffic data held by DfT and local authorities;
- Details of sensitive receptors (as defined within **Section 8.9.9.1**);
- Collision data for the latest five-year period for all roads within the refined traffic and transport Study Area;
- Existing pedestrian / cycle / bus routes; and
- Projects trip generation, including number and type of construction and employee trips.

8.9.9 Approach to Assessment

1443. The EATM guidance provides a framework for the assessment of traffic borne environmental impacts and will be supplemented by the technical transport guidance outlined in **Table 8-30.**

Table 8-30 Supplementary Technical Transport Guidance

Document	Purpose / Application
Planning Policy Guidance (PPG) - Travel Plans, Transport Assessment and Statements (Ministry of Housing Communities and Local Government (MHCLG), 2014)	Provides overarching guidance upon the structure of transport assessments and travel plans.
Design Manual for Roads and Bridges (DMRB) CD 123 - Geometric design of at-grade priority and signal - controlled junctions (National Highways, 2021)	Provides the standards for the design of new points of access.
Manual for Streets (DfT, 2007)	Guidance to inform the visibility requirements for junctions where measured speeds are below 40mph.
Manual for Streets 2 (Chartered Institute of Highways and Transportation, 2010)	
Traffic Signs Manual Chapter 8 Traffic Safety Measures and Signs for Road Works and Temporary Situations Part 1: Design (DfT, 2009)	Provides guidance upon temporary traffic management that will be used to inform the assessment of driver delay impacts related to temporary traffic management and road closures.
Strategic Road Network and the Delivery of Sustainable Development (DfT, 2022)	Sets out the way in which National highways will engage with the development industry, public bodies and communities to assist the delivery of sustainable development which may result in any traffic impact on the Strategic Road Network.

1444. EATM suggests application of the following rules to define the extent and scale of the assessment required:

- Rule 1: Include highway links where traffic flows will increase by more than 30% (or where the number of HGVs will increase by more than 30%); and
- Rule 2: Include highway links of high sensitivity where traffic flows have increased by 10% or more.

1445. In justifying these rules EATM examines the science of traffic forecasting and states:

"*Traffic forecasting is not an exact science, and the accuracy of projections is open to debate. It is generally accepted that accuracies greater than 10% are not achievable. It should also be noted that the day-to-day variation of traffic on a road is frequently at least + or -10%. At a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact.*"

1446. Therefore, changes in traffic flows below the EATM Rules (thresholds) are assumed to result in no discernible or negligible environmental effects and therefore would not be assessed further as part of the assessment.

1447. EATM however notes that the Rule 1 and Rule 2 'criteria' process may not be appropriate for some impacts, and it is generally accepted by regulators and practitioners that it should not be applied to assessments of road safety and driver delay. These impacts can be potentially significant for lower changes in traffic flow when high baseline traffic flows are evident. Full details of the methodology adopted for these effects are set out later in this section.

1448. Following initial screening, EATM, sets out considerations and, in some cases, thresholds in respect of changes in the volume and composition of traffic to facilitate a subjective judgement of traffic effect and significance.

8.9.9.1 Identification of Sensitive Receptors

1449. The sensitivity of a road can be defined by the type of user groups who may use it. EATM identifies that it is necessary to identify particular groups ('receptors') and associated locations, which may be sensitive to changes in traffic and transport conditions. and provides a checklist of sensitive locations and groups. However, the list is not exhaustive and can be added to by the assessor. **Figure 8-24** identifies the locations of concentrations of sensitive receptors.

1450. Applying the EATM principles, **Table 8-31** provides broad definitions of the different sensitivity levels that would be adopted for the assessment.

Table 8-31 Example Definitions of the Different Sensitivity Levels

Sensitivity	Severance and Amenity	Road Safety	Driver Delay (Capacity)	Driver Delay (Highway Constraints)
High	High concentrations of sensitive receptors (e.g. hospitals, schools, residential dwellings areas with high footfall) and limited separation provided by the highway environment; or a Low concentration of sensitive receptors and no separation from traffic provided by the highway environment.	Links with collision rates above national averages and / or collisions clusters with emerging patterns of collisions.	Junctions operating at or over capacity.	Roads less than 5.5m wide with no passing places provided.
Medium	A low concentration of sensitive receptors (e.g. residential dwellings, pedestrian desire lines, etc.) and some separation from traffic provided by the highway environment.	Links with collision rates close to national averages and / or collision clusters.	Junctions or links operating close to capacity.	Roads less than 5.5m wide but with passing places provided.
Low	Few sensitive receptors.			
Negligible	Links that fall below EATM Rule 1 and 2 screening thresholds and major 'A' roads or motorways with no pedestrian, cycle or equestrian environment; or a highway environment that can accommodate substantial changes in volumes of traffic.	Links with collision rates lower than national averages and / or no collision clusters.	Junctions or links with spare capacity.	Roads in excess of 5.5m in width.

8.9.9.2 Impact Assessment Process

1451. The construction phase will result in a requirement for the import / export of materials and plant. However, at this stage, no information is available for construction traffic demand or intermodal delivery strategies. In order to consider a worst-case, it would be assumed that the majority of construction traffic would be by road, albeit, potentially originating from one of the existing ports or rail freight facilities (identified in **Section 8.9.2.3**).

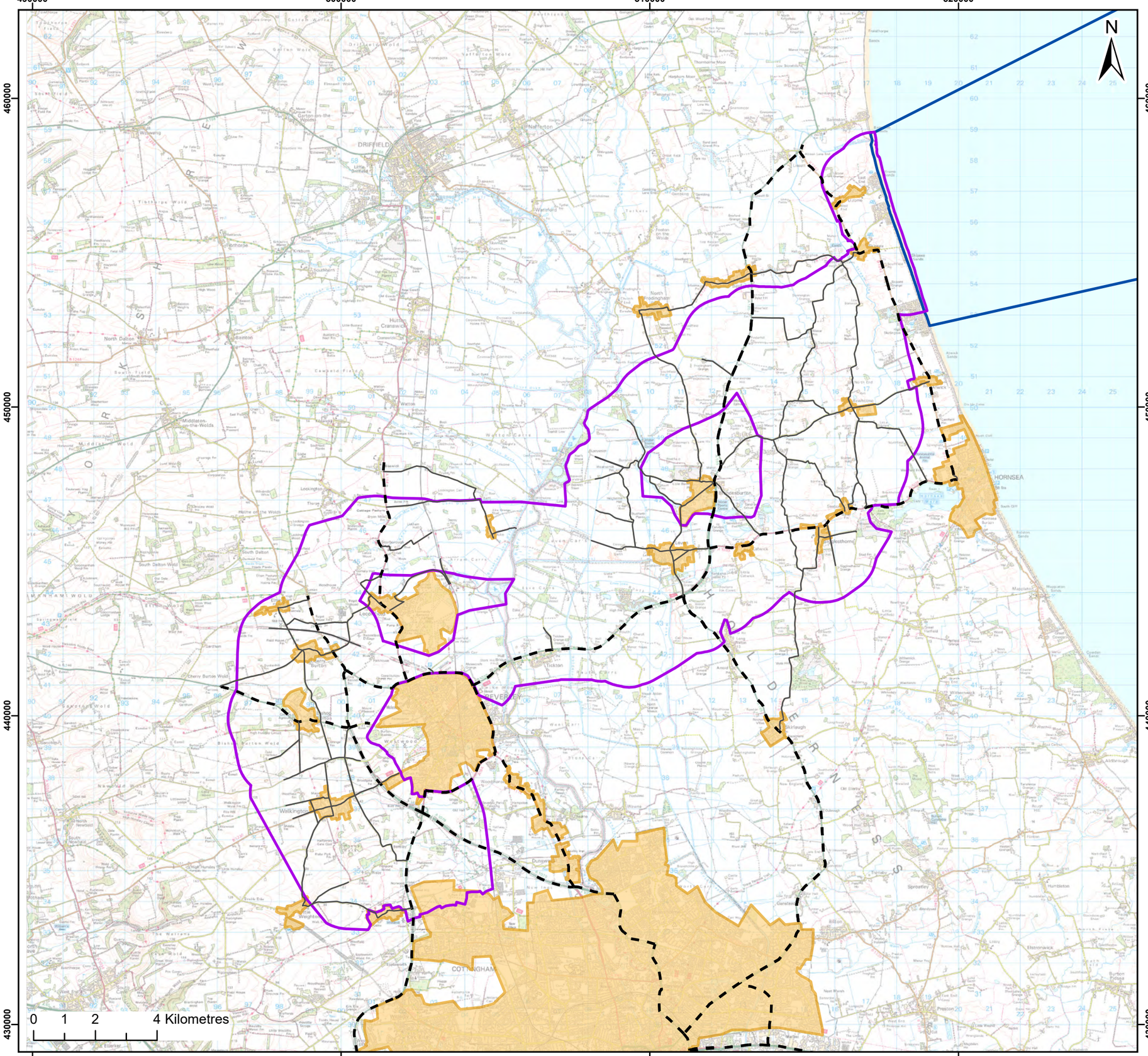
1452. The 'first principles' assumptions that will underpin the calculation of traffic demand will be developed with input from the Applicant's engineering team and augmented with experience gained through the construction of previous projects of a similar nature and scale. **Table 8-32** details the assessment parameters and the methodology to be used for construction traffic derivation.

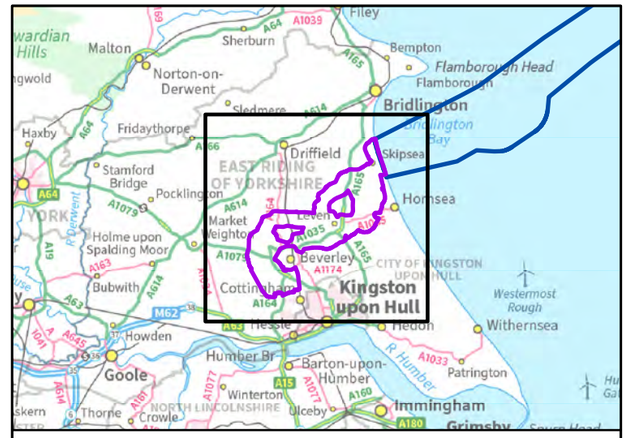
Table 8-32 Construction Traffic Demand and Distribution

Parameter	Methodology
HGV Demand	Informed by forecast of likely material quantities aligned to a construction programme.
Employee Demand	Informed by a review of likely resourcing requirements
HGV Distribution	Informed by a review of potential local supply chain, ports, quarries etc.
Construction Employee Distribution	Informed by socio-economics data for the availability of local labour and rented accommodation for non-local labour.

1453. It is typical for construction projects that employees will travel to work together and in contractor provided vehicles. However, for the purposes of considering a worst-case, no reduction for car-sharing will be applied.

1454. The Project's traffic demand would be assigned to the highway links within the traffic and transport Study Area and the increase in traffic flow to baseline conditions determined. This would facilitate refinement of the traffic and transport Study Area and an assessment of the magnitude of impact by applying the thresholds in **Table 8-33** to inform a detailed evaluation of potential effects.





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- Areas with concentrations of sensitive receptors

Transport routes

- Major road
- Minor road

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Areas with Concentrations of Sensitive Receptors

Figure: 8-24

Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0033

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	07/06/2024	JH	AB	A3	1:125,000
01	10/05/2023	JR	AG	A3	1:125,000

Co-ordinate system: British National Grid

sse Renewables

equinor

Table 8-33 Magnitude of Impact Thresholds

Impact	Magnitude of Impact			
	Negligible	**Low**	**Medium**	**High**
Severance	Change in total traffic flow of less than 30%.	Change in total traffic flow of 30 to 60%.	Change in total traffic flow of 60 to 90%.	Change in total traffic flows of over 90%.
Amenity	Change in traffic flow (or HGV component less than 100%).		Greater than 100% increase in traffic (or HGV component) and a review based upon the quantum of vehicles, vehicle speed and pedestrian footfall.	
Fear and Intimidation	No change in step changes	One step change in level, with <400 veh increase in average 18hr AV two-way all vehicle flow; and / or <500 HGV increases in total 18hr HGV flow.	One step change in level, with >400 veh increase in average 18hr AV two-way all vehicle flow; and / or >500 HGV increases in total 18hr HGV flow.	Two step changes in level.
Road Safety	Informed by a review of existing collision records from within the traffic and transport Study Area and the forecast increase in traffic.			
Driver Delay (Capacity)	Informed by a review of the potential increase in peak hour traffic through sensitive junctions.			
Driver Delay (Highway Constraints)	Informed by a review of the potential increase in peak hour traffic through links and pinch-points on the local highway network.			
Abnormal Loads	Informed by an assessment of the suitability of the access routes to accommodate abnormal loads.			

1455. The magnitude of impact (**Table 8-33**) would then be combined with the receptor sensitivity (**Table 8-31**) to determine the overall effect of the Project's traffic in accordance with the effect assessment matrix (**Chapter 5 EIA Methodology**).

8.9.10 Scoping Questions to Consultees

1456. The following questions are posed to consultees to help them frame and focus their response to the traffic and transport scoping exercise which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment?
- Have all the traffic and transport impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the traffic and transport impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

8.10 Landscape and Visual Impact

1457. This chapter of the Scoping Report considers the potential likely effects of the Project associated with landscape and visual impact, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the onshore ECC, landfall area and the OCS zone.

1458. The landscape and visual impact assessment (LVIA) will consider all landscape and visual receptors landward of MHWS, as well as seaward receptors where there is the potential for them to be significantly affected by the onshore works, including intertidal and nearshore works at the landfall. Impacts on offshore seascape, landscape and visual receptors from the offshore components of the Project are considered within **Chapter 7.12 Seascape, Landscape and Visual Impacts**.

1459. The LVIA is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 7.12 Seascape, Landscape and Visual Impacts;**
- **Chapter 8.5 Soils and Land Use;**
- **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation;**
- **Chapter 8.7 Onshore Archaeology and Cultural Heritage;**
- **Chapter 8.9 Traffic and Transport;** and
- **Chapter 9.3 Socio-economics, Tourism, and Recreation.**

8.10.1 Study Area

1460. For the purposes of scoping, this chapter considers the Onshore Scoping Area, as shown on **Figure 1-1** and defined in **Chapter 1 Introduction**.

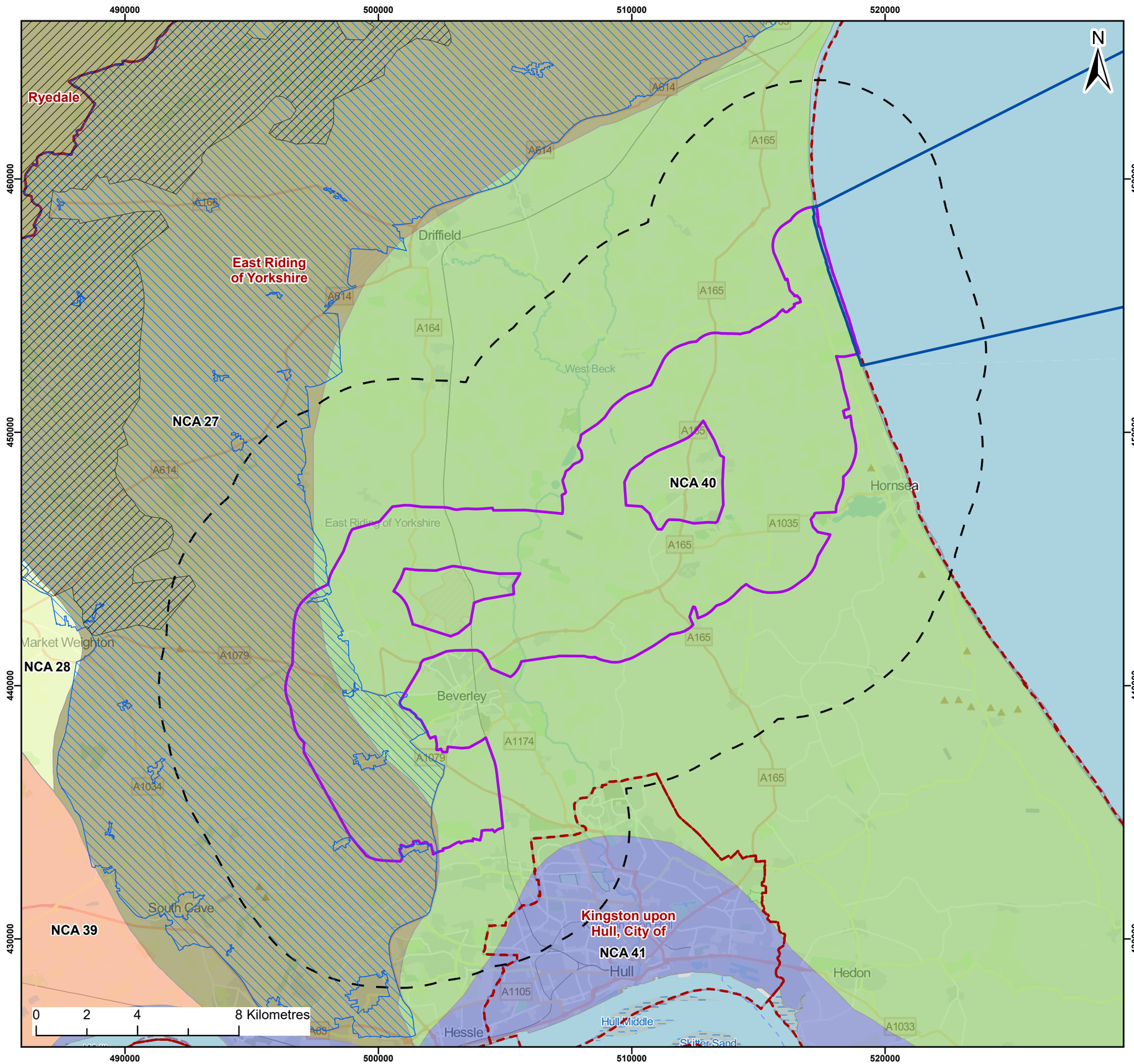
1461. For the purpose of the LVIA, a study area for the final location of the proposed infrastructure will be defined, and through use of Zone of Theoretical Visibility (ZTV) mapping. It is considered that significant effects on landscape and visual receptors are unlikely to occur beyond 5km from the permanent above ground elements of the Project. Agreement will be sought on this through the EPP, once the worst-case parameters are known and the ZTV have been identified. Likely significant effects of buried infrastructure will be more restricted. The Study Area is likely to be a 5km radius around the OCS(s) and infrastructure within the OCS zone. The onshore ECC and landfall will require a smaller study area, which is likely to be a 1km radius, as any effects will be temporary in nature and unlikely to be significant (as demonstrated through the PEIR for Hornsea Project Four (Ørsted, 2019)). The Onshore Scoping Area, with a 5km buffer indicating the likely maximum potential extent of the Landscape and Visual Impact Study Area, is shown on **Figure 8-25**.

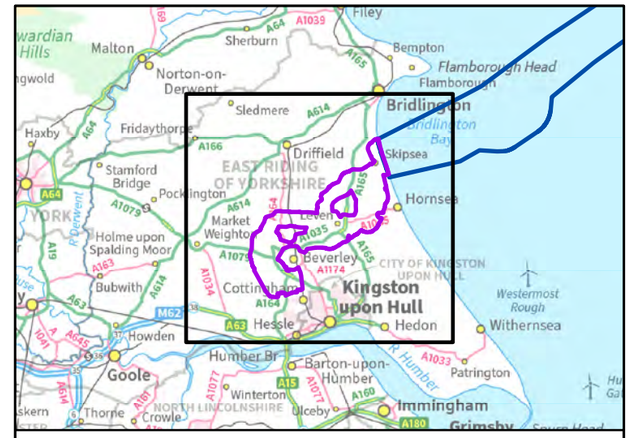
8.10.2 Existing Environment

1462. The onshore existing environment is described for the Onshore Scoping Area, which is within the East Riding of Yorkshire local authority area (see **Figure 8-25**). The Onshore Scoping Area extends inland from the landfall area (see **Figure 8-25**).

1463. Most of the Onshore Scoping Area is in the Holderness National Character Area (NCA). The most westerly parts of the Onshore Scoping Area are within the Yorkshire Wolds NCA, as illustrated on **Figure 8-25**. Local landscape character is described in the East Riding of Yorkshire Landscape Character Assessment (AECOM, 2018). The Onshore Scoping Area is located within the following landscape character areas:

- 13b – Bishop Burton Estate Farmland;
- 13c – South Wolds Rolling Farmland;
- 16c – Beverley Westwood;
- 16e – Lund Sloping Farmland;
- 16f – Beverley Parks Farmland;
- 17b – North Cottingham Farmland;
- 18a – River Hull Corridor;
- 18b – Quarry Farmland;
- 18c – Catfoss Dyke;
- 18d – Hornsea Mere;
- 18f – Figham and Swine Moor Common;
- 19c – North Holderness Open Farmland;
- 19d – Central Holderness Open Farmland; and
- 20c – Bridlington to Hornsea Coast.





Legend:

- Onshore Scoping Area
- Offshore Scoping Area
- LVIA Study Area Maximum Potential Extent (Onshore Scoping Area 5km Buffer)
- Local Authority Boundary
- Important Landscape Areas
- Yorkshire Wolds AONB candidate area

National Character Area (NCA)

- NCA 27: Yorkshire Wolds
- NCA 28: Vale of York
- NCA 39: Humberhead Levels
- NCA 40: Holderness
- NCA 41: Humber Estuary

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Landscape and Visual Impact Study Area

Figure: 8-25

Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0034

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	10/06/2024	JH	AB	A3	1:150,000
01	22/02/2023	JR	EH	A3	1:150,000

Co-ordinate system: British National Grid

sse Renewables

equinor

1464. There are no national-level designations within, or adjacent to, the Onshore Scoping Area. ERYC has identified the Yorkshire Wolds as an Important Landscape Area (ERYC, 2016), and the Onshore Scoping Area extends into this to the west of Beverley (as shown on **Figure 8-25)**. The Yorkshire Wolds is being considered by Natural England for designation as an AONB. In August 2023 the proposed candidate AONB boundary was published (Natural England, 2024). This candidate boundary is located approximately 5.5km to the north-west of the Onshore Scoping Area and so will not be considered further (see **Figure 8-25)**.

1465. Visual receptors within the Onshore Scoping Area are primarily residential receptors within small villages and scattered properties throughout the area. Other receptors include those travelling on the A1079, A164, A1035, A165, B1230, B1248, B1243, B1242, B1249 and other minor roads. Public Rights of Way (PRoW) are present throughout the Onshore Scoping Area which are likely to attract recreational receptors. People also visit the coast for recreational purposes, including beaches, caravan parks and the King Charles III England Coast Path, once open.

8.10.3 Potential Impacts

8.10.3.1 Potential Impacts during Construction

8.10.3.1.1 Landscape Character and Designations

1466. During construction, the presence of construction activity and partially completed structures has the potential to locally impact landscape character and designated landscapes. Impacts on landscape receptors arising from onshore export cable installation works will be short term and localised.

1467. Construction of the OCS(s) and infrastructure within the OCS zone will involve longer term disturbance due to the greater complexity and scale of works anticipated. Established good practice measures will be applied to minimise disturbance and to ensure rapid reinstatement. The construction impacts of the OCS(s) and infrastructure within the OCS zone on landscape receptors are scoped into the LVIA.

1468. It is expected that there will be a limited extent of disturbance arising from the construction of the onshore ECC. The PEIR and ES will give consideration to the loss of hedgerows and vegetation along the onshore ECC during construction, and the reinstatement or replacement of these as part of the mitigation for the construction works. Effects arising from the construction of the onshore ECC and landfall will be scoped into the LVIA.

8.10.3.1.2 Visual Receptors

1469. During construction the presence of construction activity and partially completed structures has the potential to locally impact visual amenity. Impacts on visual receptors arising from onshore ECC installation works will be short term and localised. Construction of the OCS(s) and infrastructure within the OCS zone will involve longer term disturbance due to the greater complexity and scale of works anticipated. Established good practice measures will be applied to minimise disturbance and to ensure rapid reinstatement. The construction impacts of the OCS(s) and infrastructure within the OCS zone on visual receptors and assessment viewpoints within the Study Area are scoped into the LVIA.

1470. It is expected that there will be a limited extent of disturbance arising from the construction of the onshore ECC and landfall. The ES will give consideration to the loss of hedgerows and vegetation along the onshore ECC, and the reinstatement or replacement of these as part of the mitigation for the construction works. Effects on visual receptors (both on land and at sea where there is potential for significant effects) arising from the construction of the onshore ECC and landfall, including effects arising from lighting, will be scoped into the LVIA. However, it is not proposed that the LVIA will provide a ZTV or assessment viewpoints for the construction of these elements due to their temporary nature.

8.10.3.2 Potential Impacts during Operation

8.10.3.2.1 Landscape Character and Designations

1471. Following installation and restoration of the ground, below ground cables would not significantly impact landscape receptors. Operational impacts on the landscape resulting from the landfall and onshore ECC are therefore scoped out of the LVIA.

1472. The potential for the operation of the OCS(s) to significantly impact landscape character and designated landscapes (e.g. Yorkshire Wolds Important Landscape Area) will vary depending on the exact siting and design of onshore assets. However, it is expected that the OCS(s) will include large structures with the potential to impact on the local landscape. Therefore, it is proposed that landscape impacts associated with operation of the OCS(s) and infrastructure within the OCS zone will be scoped into the LVIA.

8.10.3.2.2 Visual Receptors

1473. Following installation and restoration of the ground, below ground cables would not significantly impact visual receptors. Operational impacts on visual receptors resulting from the landfall and onshore ECC are therefore scoped out of the LVIA.

1474. The potential for the operation of the OCS(s) to significantly impact visual receptors (people) will vary depending on the exact siting and design of onshore infrastructure assets. Where visible, views of the OCS(s) and infrastructure within the OCS zone may affect visual receptors such as residents and recreational users, who have high susceptibility to change, and road users who have lower susceptibility to change. Therefore, impacts on visual receptors resulting from operation of the OCS(s) are proposed to be scoped into the LVIA.

1475. A list of assessment viewpoints identifying representative views towards the OCS(s) will be developed and agreed as the basis for examination of visual effects. Where appropriate, the assessment of effects will consider opportunities for mitigation to help reduce the residual significance of landscape and visual effects. For example, mitigation may include planting of new landscape features (e.g. trees and hedgerows) or provision of bunding around the OCS(s). Mitigation will be further expanded on at PEIR stage and in the ES.

8.10.3.3 Potential Impacts during Decommissioning

1476. It is anticipated that the decommissioning impacts on landscape and visual receptors would be similar in nature to those of construction, although the magnitude of impact is likely to be lower.

1477. It is assumed that, at decommissioning, the onshore export cables will be left in the ground or removed without the need for re-excavation, e.g. pulled through from the ducts. On this basis, impacts during the temporary decommissioning of the landfall and onshore export cables will be scoped out of the LVIA. Impacts of decommissioning of the OCS(s) and infrastructure within the OCS zone will be similar to those identified at construction stage, and therefore will be scoped into the LVIA (as per **Table 8-34**).

8.10.4 Potential Cumulative Effects

1478. There is potential for cumulative effects to arise in which other projects could act collectively with the Project to affect landscape and visual receptors. The CEA will follow the standard approach outlined in **Chapter 5 EIA Methodology**.

1479. There is potential for cumulative impacts to arise from the presence of the OCS(s) and infrastructure within the OCS zone alongside other similar types of projects such as substations, solar farms etc. The potential for other projects to give rise to cumulative effects has therefore been scoped into the LVIA at this stage. The scope of the cumulative LVIA will be agreed with stakeholders at a later date through the EPP.

1480. Cumulative impacts of the landfall and onshore export cables will be scoped into the EIA. There is potential for construction to overlap with other projects in the area. Although these construction effects would be short term and localised, the potential for significant effects on landscape and visual receptors will be examined based on likely timescales of other projects in the area.

8.10.5 Summary of Scoping Proposals

1481. **Table 8-34** outlines the landscape and visual impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities and as additional project information and site-specific data become available.

Table 8-34 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Landscape and Visual Impact

Potential Impact	Construction	Operation	Decommissioning
Landscape character and designated landscapes (resulting from the landfall and onshore export cables)	✓	X	X
Landscape character and designated landscapes (resulting from the OCS(s) and infrastructure within the OCS zone)	✓	✓	✓
Visual receptors (resulting from the landfall and onshore export cables)	✓	X	X
Visual receptors (resulting from the OCS(s) and infrastructure within the OCS zone)	✓	✓	✓
Cumulative impacts (resulting from the landfall and onshore export cables)	✓	X	X
Cumulative impacts (resulting from the OCS(s) and infrastructure within the OCS zone)	✓	✓	✓

8.10.6 Approach to Data Gathering

1482. **Table 8-35** identifies the desk-based sources that will be accessed to inform the characterisation of the existing environment.

Table 8-35 Desk-Based Data Sources for Landscape and Visual Impact

Data Source	Date	Data Contents
Natural England	2014	NCA Profiles
ERYC	2018	East Riding of Yorkshire Landscape Character Assessment
Ordnance Survey	2024	Mapping and digital terrain models
Various (Google, Bing, PastMap)	Various	Aerial and street-level photography available online

1483. These data sources will be augmented with field surveys across the Study Area (to be defined and agreed through the EPP).

1484. **Table 8-36** outlines the proposed baseline surveys to be carried out.

Table 8-36 Proposed Baseline Surveys for Landscape and Visual Impact

Survey	Timing	Spatial Coverage
Site survey for viewpoint photography.	Not seasonally dependent, however, to capture the worst-case visibility, photography will be taken when trees are not in leaf (in winter conditions).	Agreed viewpoint locations
Site survey to understand baseline conditions	Not seasonally dependent	Entire Landscape and Visual Impact Study Area

8.10.7 Approach to Assessment

1485. The LVIA will be undertaken by experienced Chartered Landscape Architects (Chartered Members of the Landscape Institute), and in accordance with relevant good practice documents.

1486. The LVIA will be undertaken in accordance with Guidelines for Landscape and Visual Impact Assessment Third Edition (GLVIA3) (Landscape Institute and IEMA, 2013). Landscape and visual effects will be considered separately. GLVIA3 states that the nature of landscape and visual receptors, commonly referred to as their sensitivity, should be assessed in terms of the susceptibility of the receptor to change and the value attached to the existing landscape or views. The nature of the effect, commonly referred to as the magnitude of change, should be assessed in terms of the size and scale, geographical extent, duration and reversibility of the effect. These aspects will all be considered together, to form a judgement regarding the overall significance of landscape and visual effects.

8.10.7.1 Approach to Assessment of Landscape Effects

1487. Predicted changes to the physical landscape of the Onshore Development Area (for the PEIR and ES stages) and landscape character within the Study Area (as defined and agreed through the EPP) will be identified. The assessment of landscape effects will take account of the sensitivity of the landscape, and any value placed on the landscape through formal designation or other indicators. The significance of landscape effects will be determined in relation to the magnitude of change to the landscape.

8.10.7.2 Approach to Assessment of Visual Effects

1488. Visual effects are experienced by people (visual receptors) at different locations across the Study Area (as defined and agreed through the EPP), including at static locations (for example from settlements or promoted viewpoints) and transitional locations (such as sequential views experienced from routes, including roads, footpaths, cycle routes, etc.). Visual receptors are the people who will be affected by changes in views at these places, and they are usually grouped by what they are doing at those locations (for example residents, motorists, recreational users, etc.). Assessment viewpoints will be identified and agreed with stakeholders to represent the key groups of sensitive visual receptors that may be affected by the Project.

1489. Visual effects resulting from the Project will be considered within the context of the existing baseline conditions, including operational and under construction developments where relevant. The assessment of visual effects arising from the introduction of the onshore infrastructure assets will be informed by analysis of ZTVs, field studies and consideration of changes in views from representative viewpoints. Visualisations will be prepared to illustrate the potential changes in view from representative viewpoints, in accordance with guidance (Landscape Institute, 2019b).

1490. Effects on the closest residential properties may need to be considered in terms of potential to affect residential visual amenity in accordance with Landscape Institute guidance (Landscape Institute, 2019a) on Residential Visual Amenity Assessment (RVAA).

8.10.7.3 Site-Specific Surveys

1491. Site visits will be carried out to obtain photography and to undertake survey work, which will include visits to the assessment viewpoints, designated landscapes, and extensive travel around the Study Area (as defined and agreed through the EPP) to consider potential impacts on landscape and coastal character and on experiences of views seen from specific viewpoints, settlements and routes.

8.10.8 Scoping Questions to Consultees

1492. The following questions are posed to consultees to help them frame and focus their response to the landscape and visual impact scoping exercise which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment?
- Have all the landscape and visual impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the landscape and visual impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

9 Project-Wide Topics

9.1 Introduction

1493. This part of the Scoping Report presents the existing project wide environment within the Project Scoping Area (**Figure 1-1**) and the potential likely effects of the construction, operation and decommissioning of the Project on the environment in relation to Human Health, Socio-economics and Tourism, Climate Change, Major Accidents and Disasters, Inter-relationships and Transboundary Impacts. The proposed approach to data collection and assessment are also detailed within the chapter. Each chapter outlines which impacts are proposed to be scoped into or out of the EIA.

1494. It should be noted that topic-specific study areas are defined in the chapters below based on the spatial, temporal and technical considerations of the impacts on relevant receptors and are intended to cover the area within which an effect can reasonably be expected.

1495. A description of the Project's onshore infrastructure is provided in **Chapter 3 Project Description**.

9.2 Human Health

1496. This chapter of the Scoping Report considers the potential likely effects of the Project associated with human health, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the Array Area, the offshore ECC, landfall area, the onshore ECC and the OCS zone.

1497. The human health assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 7.3 Marine Water and Sediment Quality;**
- **Chapter 8.3 Onshore Air Quality and Dust;**
- **Chapter 8.4 Water Resources and Flood Risk;**
- **Chapter 8.8 Onshore Noise and Vibration;**
- **Chapter 8.9 Traffic and Transport;**
- **Chapter 8.10 Landscape and Visual Impact;**
- **Chapter 9.3 Socio-Economics, Tourism and Recreation;**
- **Chapter 9.4 Climate Change;** and
- **Chapter 9.5 Major Accident and Disasters.**

9.2.1 Study Areas

1498. The human health assessment will be informed by the study areas, zones of influence and receptors impacted or potentially impacted by other EIA chapters. This will enable the effects on human health to be better understood. It is noted that the study areas for these topics do not necessarily define the boundaries of potential population health effects. As such, the human health assessment also defines Human Health Study Areas in order to characterise representative population groups. As the relevant population varies depending on the determinant of health discussed, a range of areas is required (as shown on **Figure 9-1**):

- The site-specific population is defined using the following wards:
  - E05001695 East Wolds and Coastal and E05001703 North Holderness (for the expected landfall area), including LSOA East Riding of Yorkshire 010A (40% most deprived – landfall site) and 006D (20% most deprived – adjoining more deprived area);
  - E05001687 Beverley Rural and E05001701 Mid Holderness, including LSOA East Riding of Yorkshire 017A (20% most deprived – central Beverley) and 014D (50% least deprived – rural corridor) in relation to the index of multiple deprivation. Noting the location of East Riding Community Hospital as a sensitive receptor; and
  - E05001693 Dale, E05001705 St Mary's and E05001702 Minster and Woodmansey including LSOA East Riding of Yorkshire 024B (which has higher health and environment deprivation than other surrounding LSOAs).
- Local Health Study Area: East Riding of Yorkshire;
- Regional Health Study Area: Yorkshire and the Humber;
- National Health Study Areas: England and wider United Kingdom; and
- International Health Study Area: Global population.

1499. For offshore activities relating to the construction, operation and decommissioning of the wind farm infrastructure, the likely significant population health effects relate to the port activities required to support the wider offshore activities and the beneficial effects of the generation aspects of the Project. As a specific port location to support construction, operation and decommissioning has not currently been identified, this is indicatively the Regional Health Study Areas of Yorkshire and the Humber.

1500. National and international populations are included to consider the wider climate change and renewable electricity generation implications of the Project for public health.

1501. The wider determinants of health and health inequalities are key considerations when undertaking an assessment of human health as part of the EIA. The following population groups are present and will be considered:

- The ‘general population’, including residents, workers, service providers and service users; and
- The ‘vulnerable group population’, including potential vulnerability due to young age, older age, low income, poor health status, social disadvantage, restricted access or geographic proximity to the Project.

9.2.2 Existing Environment

9.2.2.1 General Health

1502. The following section discusses key public heath indicators that may be associated with differential effects to the Study Area population due to the Project. These are set out in **Table 9-1**. The indicators show the general state of health and the extent to which there are already pressures on the population’s health. The indicators at the ward level are compared against the regional and national averages. The data is from the Office for Health Improvement and Disparities (OHID) Fingertips Local Health data tool and the Office for National Statistics accessed on 23 April 2024. At this stage, baseline indicators have been selected to provide a general coverage of the wider determinants of health. The PEIR and ES will report on further data.

1503. The seven wards in **Table 9-1** and **Table 9-2** are defined using the site-specific population of E05001695 East Wolds and Coastal, E05001703 North Holderness, E05001687 Beverley Rural, E05001701 Mid Holderness, E05001693 Dale, E05001705 St Mary's and E05001702 Minster and Woodmansey within the Onshore Scoping Area.

1504. Self-reported health status is an indicator of a population's general health. The seven ward site-specific area has:

- A proportion of people who reported to be in good to very good health of 81.9% which is slightly higher than the regional average of 80.5% and slightly lower than the national average of 82.2%;
- A proportion of people who reported to be in fair health of 13.5% which is similar to the regional average of 13.7% and slightly higher than the national average of 12.7%; and
- A population of 4.6% who reported to be in bad to very bad health which is lower than the regional average of 5.8% and the national average of 5.2%.

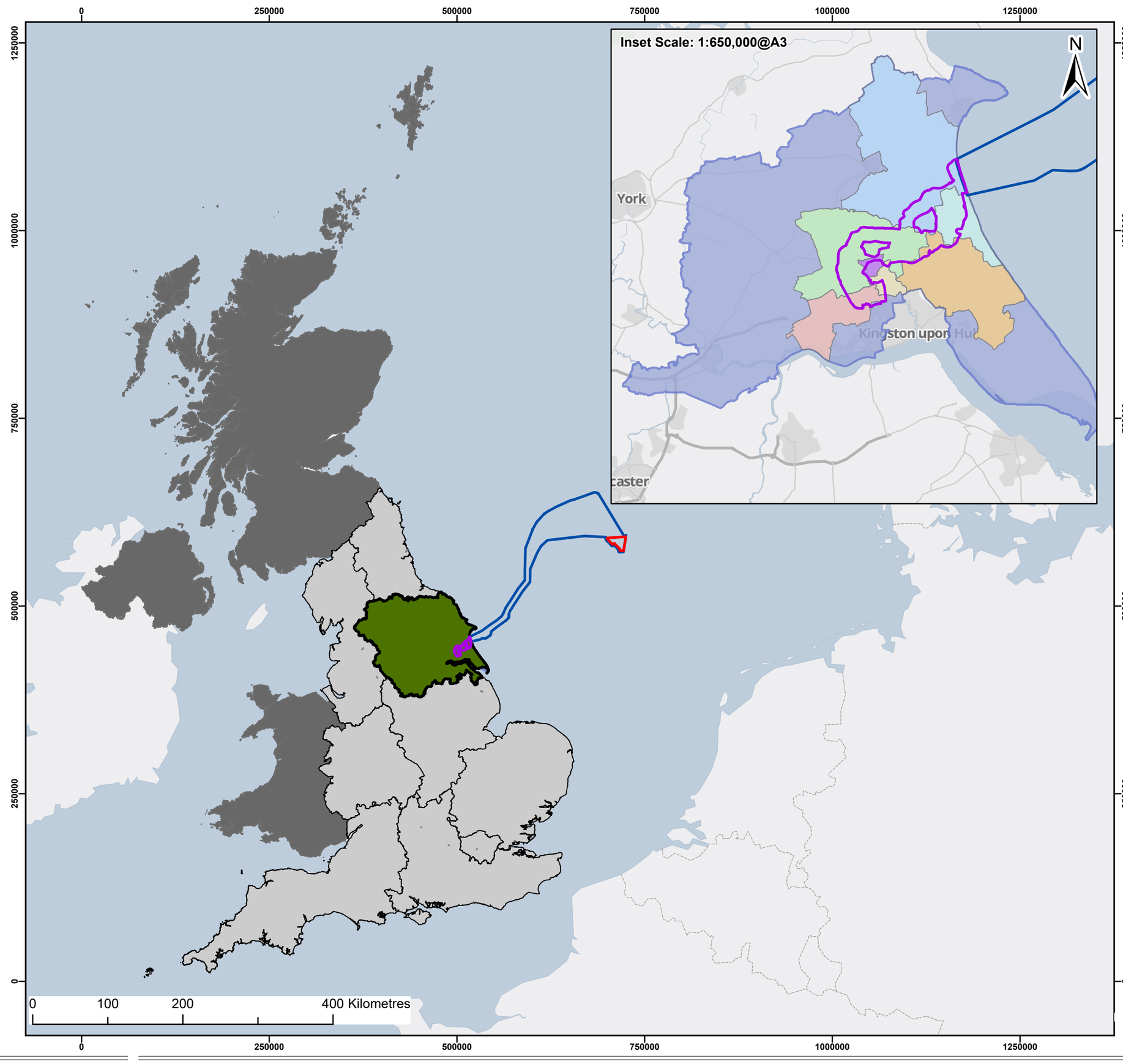
1505. Overall health can be informed by life expectancy indicators. The seven ward site-specific area has:

- A healthy life expectancy of 66.7 years for males which is higher (better) than the regional average of 61.1 years and the national average of 63.1 years; and
- A healthy life expectancy of 68.0 years for females which is higher (better) than the regional average of 62.1 years and the national average of 63.9 years.

1506. The under 75 year old mortality rate from all causes that are considered preventable is an indicator that demonstrates the potential extent to which public health interventions could improve population health outcomes. The site-specific area has an under 75 mortality rate from all causes considered preventable of 67.2 per 100,000 people which is lower than the regional average of 113.5 per 100,000 people and the national average of 100.0 per 100,000 people.

Table 9-1 Health Baseline (OHID, 2023)

Indicators	Site-Specific (Wards)	Local	Regional	National
	Seven Wards	East Riding of Yorkshire	Yorkshire and Humber	England
General Health				
Very good or good health %	81.9	80.3	80.5	82.2
Fair health %	13.5	14.4	13.7	12.7
Very bad or bad health %	4.6	5.4	5.8	5.2
Life Expectancy				
Healthy Life expectancy at birth for males (year)	66.7	65.3	61.1	63.1
Healthy Life expectancy at birth for females (year)	68.0	67.9	62.1	63.9
Preventable Mortality				
Under 75 mortality rate for all causes considered preventable (per 100, 000) (3 year range)	67.2	82.6	113.5	100.0



Legend:

- Dogger Bank D Array Area
- Offshore Scoping Area
- Onshore Scoping Area

Regional Health Study Area

- Yorkshire and The Humber

National Health Study Area

- England
- Wider United Kingdom

Local Health Study Area

- East Riding of Yorkshire

Site-Specific Health Study Areas

- Beverley Rural Ward
- Dale Ward
- East Wolds and Coastal Ward
- Mid Holderness Ward
- Minster and Woodmansey Ward
- North Holderness Ward
- St. Mary's Ward

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Human Health Study Areas

Figure: 9-1

Drawing No: PC3991-RHD-ON-ZZ-DR-Z-0037

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	17/06/2024	JH	AB	A3	1:5,000,000
01	06/04/2023	JR	AG	A3	1:5,000,000

Co-ordinate system: British National Grid

sse Renewables

equinor

9.2.2.2 Vulnerable Groups Including Social Disadvantage Equality Considerations

1507. Relevant protected characteristics and social disadvantage indicators are listed in **Table 9-2** to consider the potential for any disproportionate effects that may arise due to the distribution of such characteristics within the population. Protected characteristics not shown in **Table 9-2** have been reviewed and are not considered to have relevant links to health outcomes that may be influenced by this Project.

1508. In terms of population age profile, compared to the national average, there are fewer young people and working age people and more older people in the site specific Study Area compared to the regional and national averages. The seven ward site-specific area has a proportion of 15.2% of children and young people aged 0-15 years which is lower than the regional average of 18.6% and the national average of 18.5%. For the population aged 16-64, the seven ward site-specific area has a proportion of 58.1% which is lower than the regional average of 62.4% and the national average of 62.9%. An opposite trend is observed in the elderly population; the seven ward site-specific area has a proportion of 26.8% of people who are aged 65 and over which is higher than the regional average of 19.0% and the national average of 18.6%.

1509. Considering disability and limiting conditions, the seven ward site-specific area has a proportion of people who are limited in their day-to-day activities of 17.6% which is lower than the regional average of 18.6% and similar to the national average of 17.3%. Of those who are not disabled but reported a long-term condition which does not limit them, the seven ward site-specific area has a proportion of 8.1% which is higher than the regional average of 6.9% and the national average of 6.8%. The majority of the population across the Study Area reported no disability or limiting condition. The seven ward site-specific area has a proportion of 74.4% of people who do not have a disability or limiting condition which is similar to the regional average of 74.4% and slightly lower than the national average of 75.9%.

1510. Income deprivation is notably lower in the site-specific wards and the local authority of East Riding and Yorkshire as compared to the national average. The seven ward site-specific area has a proportion of people in income deprivation of 7.6% which is lower than the regional average of 14.6% and the national average of 12.9%. East Riding of Yorkshire district has a proportion of people in income deprivation of 9.6% which is also lower than the regional and national averages.

1511. Considering language proficiency, the seven wards have a proportion of the population who cannot speak English well or at all of 0.2% which is significantly lower (better) than the regional average of 1.6% and the national average of 1.7%.

1512. The majority of the site-specific Study Area population report their ethnicity as white, consistent with the regional and national averages. The seven ward site-specific area has a proportion of people who report their ethnicity as white of 97.5% which is higher than the regional average of 85.4% and the national average of 81.0%. The proportion of people who report their ethnicity as Asian in the seven wards is 1.0% which is significantly lower than the regional average of 8.9% and the national average of 9.6%. The seven ward site-specific area has 0.3% of people who report their ethnicity as black which is lower than the regional average of 2.1% and the national average of 4.2%.

1513. The groups listed in **Table 9-2** will be considered in the assessment including the potential for social disadvantage.

Table 9-2 Vulnerable groups and relevant social disadvantage indicators (OHID, 2023)

Indicators	Site-Specific (Wards)	Local	Regional	National
	Seven Wards	East Riding of Yorkshire	Yorkshire and Humber	England
Sex				
Male %	48.8	49.0	49.1	51.0
Female %	51.2	51.0	50.9	49.0
Age				
% age 0 to 15	15.2	15.8	18.6	18.5
% age 16 to 64	58.1	57.8	62.4	62.9
% aged 65 and over	26.8	26.4	19.0	18.6
Long term health problem or disability				
Disabled under the Equality Act: Day-to-day activities limited a lot or little %	17.6	18.6	18.6	17.3
Not disabled under the Equality Act: Has long term physical or mental health condition but day-to-day activities are not limited %	8.1	7.7	6.9	6.8
Not disabled under the Equality Act: No long term physical or mental health conditions %	74.4	73.7	74.4	75.9
Lower Income				
Income Deprivation (%)	7.6	9.6	14.6	12.9
Language proficiency				
Population who cannot speak English well or at all (%)	0.2	0.4	1.6	1.7
Ethnicity				

Indicators	Site-Specific (Wards)	Local	Regional	National
	Seven Wards	East Riding of Yorkshire	Yorkshire and Humber	England
Asian, Asian British or Asian Welsh %	1.0	1.1	8.9	9.6
Black, Black British, Black Welsh, Caribbean or African %	0.3	0.3	2.1	4.2
Mixed or Multiple Ethnic groups %	0.9	0.9	2.1	3.0
White %	97.5	97.4	85.4	81.0
Other ethnic group %	0.3	0.4	1.4	2.2

9.2.2.3 Baseline Healthcare Capacity

1514. An indicative reference point (postcode: HU17 5LT) from which workers, whilst at work, may access healthcare services has been selected. This is situated within the central section of the Onshore Scoping Area and is used as a conservative approach to analysing primary healthcare capacity, i.e. gives a catchment with fewer services. If measured from the site boundaries, work compounds or access roads, the distance to GP practices in the vicinity will be shorter, and a larger number of practices would likely be included in the catchment area.

1515. Both local context and the scientific literature (Santos *et al.,* 2017) are informative in determining appropriate distances over which to assess primary healthcare capacity. The 2017 study by (Santos *et al.,* 2017) based in the East Midlands of England, found that 91.5% of those in urban areas choose a GP practice within 3km (1.9 mile) and 91.9% of residents in rural areas choose a practice within 7km (4.3 mile). The difference reflected patient choices and preferences, including driven by clinical quality.

1516. The National Health Service (NHS) Digital General Practice Workforce March 2024 (NHS Digital, 2024) data release provides information on existing capacity. There are four GP practices within both the 3km and 7km distances as identified by (Santos *et al*., 2017), all are within 7km of the aforementioned location. All four are currently accepting new patients and all are within the recommended patient to GP ratio of 1,800 patients per FTE GP (a commonly applied benchmark that is indicative but often exceeded in practice (HUDU, 2019).

1517. It is noted that North Beverley Medical Centre is above this ratio and that GP to patient ratios may not always reflect particular local context in terms of capacity. The data does however give a broad indication of sensitivity to any changes in demand. It is also noted that patient ratios may not always reflect particular local context in terms of capacity, however, the data does give a broad indication of sensitivity to any changes in demand.

1518. **Table 9-3** provides an overview of GP primary care capacity close to the Project. Whilst the Project does not rely on local primary care capacity, the data suggests that 7,292 additional patients could be registered before reaching the 1,800 patients per GP ratio benchmark across these four practices.

Table 9-3 GP primary care capacity close to the Project– March 2024 data release

GP Practice	Patients	GP FTE	GP Patient ratio	Distance (km)	Accepting new patients?
Greengates Medical Group[11]	23,235	13	1,778.2	6.8	Yes
Leven & Beeford Medical Practice	11,407	7	1,728.3	4.7	Yes
North Beverley Medical Centre	6,486	2	3,860.7	6.1	Yes
Manor Road Surgery	13,620	13	1,038.1	7.0	Yes
Total	54,748	34	1,588.4	NA	All
In total 7,292 additional patients could be accepted across the four GPs in the vicinity of the indicative reference point					

[11] This includes the Greengates Medical Group surgeries within 3-7km of the Project site that are Beverley & Molescroft Surgery, Greenwood Avenue Surgery and Walkergate Surgery.

9.2.3 Potential Impacts

1519. Consideration has been given to how population health, including the potential for health inequalities, may be affected by changes in health-related behaviours, the social environment, the economic environment, the bio-physical environment and the institutional and built environment. Details of the determinants of health and population groups considered are set out in the IEMA guide: 'Effective Scoping of Human Health in Environmental Impact Assessment' (2022). In accordance with keeping a proportionate focus on the likely significant effects of the Project, any health determinants considered unlikely to have the potential for significant population health effects are scoped out of the EIA.

9.2.3.1 Potential Impacts during Construction

1520. This section considers the potential for likely and significant population health effects from the Project's construction activities. Construction details are set out in **Chapter 3 Project Description**, but broadly relate to:

- Offshore works in the DBD Array Area, including wind turbine foundations, assembly and commissioning;
- Offshore electrical infrastructure, including Offshore Platform(s) foundations, assembly and commissioning and laying of inter-array cables and offshore export cables in the construction cable corridor;
- Landfall electrical infrastructure, including trenchless techniques for the offshore export cables, construction of the TJB and associated construction compound;
- Onshore export cables, including cables which bring electricity from the TJB at landfall to the OCS(s); and
- Construction of infrastructure within the OCS zone.

9.2.3.2 Social Environment: Housing

1521. Offshore and Onshore: No new housing is proposed. The workforce will have housing requirements, but it is expected that a high proportion will be residents in the regional area or would be based aboard their vessels unless traveling to their usual place of residence. Any temporary accommodation requirements would be met through usual capacity for such activities around ports and the regional Study Area. It is not considered to be the potential for a likely significant population health effect associated with changes in the availability of housing. Therefore, this issue is scoped out of the EIA.

1522. Onshore: The onshore infrastructure locations and built form are considered to have limited potential for any widespread adverse effect on housing value or affordability that could affect public health. This issue is scoped out of the EIA.

9.2.3.2.1 Social Environment: Open Space, Leisure and Play

1523. Offshore: Consideration has been given to the influences on nearshore recreation, leisure and play, e.g. sailing and other water sports. It is considered unlikely that shipping or port activities associated with the Project would affect such activities to an extent where there could be significant implications for public health. These issues are scoped out of the EIA.

1524. Onshore works may lead to temporary disruption of public open spaces (including beaches) and PRoW (e.g. footpaths along the coast or through green space), potentially affecting recreational activities. Temporary construction disruption to green open space access (e.g. publicly accessible woods and fields) and blue open space (e.g. publicly accessible beaches or surface water bodies) is scoped into the EIA. This includes consideration for any temporary or permanent provision for alternative space or access.

9.2.3.2.2 Social Environment: Transport Modes, Access and Connections

1525. Offshore: Although a project port has not been determined, it is considered reasonable to assume that an existing major port would be selected with appropriate existing consents that have taken transport, noise and air quality impacts into account. Port expansion is not part of the Project being proposed. Environmental port impacts are scoped out of the EIA.

1526. Onshore: There may be onshore effects to active travel due to temporary diversions of pedestrian pavements, PRoWs and cycle lanes that run along public highways during construction and this impact is scoped into the EIA. This issue will be informed by the findings of the traffic and transport assessment, for example diversions may be required. There is the potential that construction works may also disrupt local vehicle traffic (private and public transport). Informed by the traffic and transport assessment, the human health assessment will consider the potential for significant population health effects due to changes in routine or emergency health related journey travel times and road safety. This issue is scoped in.

9.2.3.2.3 Social Environment: Community Safety

1527. Offshore and Onshore: The offshore workforce is not expected to spend extended periods within port, or other UK, communities. The port workforces are assumed to be predominantly existing residents within the regional area, commuting to work and returning home between shifts. The wind farm construction would require a skilled professional workforce, many of whom are expected to be existing residents within the regional area. There are not anticipated to be community safety or security issues associated with worker behaviour in ports or communities. The Project would operate appropriate safeguarding and modern slavery policies. The potential for widespread actual or perceived crime, or issues linked to risk taking behaviour, that could affect population health is unlikely. These issues are scoped out of the EIA.

9.2.3.2.4 Social Environment: Community Identity, Culture, Resilience and Influence

1528. Offshore visual impacts of the Project are not expected due to the distance of the wind turbines to shore being, at its closest, approximately 210km. Demographic changes that could affect community identity are not anticipated, as there would not be a large in-migration or out-migration of workers to local communities. These issues are scoped out of the EIA.

1529. Onshore: Temporary construction of onshore infrastructure, including landfall trenchless techniques, the TJB and infrastructure within the OCS zone, are not expected to be of a scale of visual impact that could affect population health outcomes. Transient effects along the onshore ECC, e.g. due to temporary lighting and temporary changes in views, are not expected to influence community identity or disrupt community gatherings. These issues are scoped out of the EIA.

9.2.3.2.5 Economic Environment: Education and Training

1530. Offshore and Onshore: Project activities have the potential for educational opportunities and support, leading to increases in socio-economic status and other outcomes influential for physical and mental health. The benefits extend to the local population, particularly young adults commencing employment.

1531. Construction of the offshore and onshore infrastructure for the Project would support sizable workforces with upskilling and career development opportunities. Such opportunities may include apprenticeships and adult learning, with transferable skills between the construction and operation phases. Such impacts are scoped into the EIA to consider how opportunities could be targeted for local and vulnerable groups to increase the public health benefit.

9.2.3.2.6 Economic Environment: Employment and Income

1532. Offshore and Onshore, project activities have the potential to cause changes in direct and indirect jobs and economic activity, with good quality employment (including wage, working conditions and job stability) providing more health supporting resources. The opportunities would relate to people of working age and their dependants.

1533. Construction related to the Project's offshore and onshore infrastructure will provide opportunities for employment during construction. The human health assessment will consider the potential population health effects of direct and indirectly employment, including opportunities to enhance benefits for local and vulnerable groups, therefore this is scoped into the EIA.

1534. Offshore: It is not anticipated that significant unemployment or adverse economic implications will occur during the construction phase, and this includes any potential adverse effects to commercial fisheries. Noting that consultation with key stakeholder groups will take place through best practice such as the Fisheries Liaison with Offshore Wind and Wet Renewables group (FLOWW) Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds. Therefore, such issues are scoped out of the EIA.

9.2.3.2.7 Bio-Physical Environment: Climate Change and Adaptation

1535. Offshore and Onshore: The issue of construction stage GHG emissions and climate change resilience is discussed in **Chapter 9.4 Climate Change**. For the purpose of the Human Health assessment, this issue is scoped out. Whilst there would be GHG emissions from project activities during construction (such as emissions from the manufacturing, transport and assembly of infrastructure components), these would not be of a scale to have the potential for population level effects on national or global health inequalities associated with climate change. The Project would implement best practice mitigation measures to manage, and where possible reduce, GHG emissions, which will be reviewed and identified in the GHG assessment and secured through management plans. In line with proportionate assessment, construction climate change effects are scoped out of the health chapter as not having the potential for a likely and significant effect on population health.

9.2.3.2.8 Bio-Physical Environment: Water Quality or Availability

1536. Offshore pollutant spills are unlikely to affect coastal bathing water quality. All vessels will comply with MARPOL 73/78. A Project Environmental Management Plan (PEMP) (or similar) will be put in place to ensure all works are undertaken in line with best practice for working in the marine environment. The PEMP (or similar) would include Project specific measures and commitments including planning for accidental spills, address all potential contaminant releases and include key emergency contact details. It will also set out industry good practice and International Maritime Organisation (IMO) and MARPOL guidelines for preventing pollution at sea. This issue is scoped out of the EIA on the basis of the anticipated effectiveness of such measures. Temporary increases in non-harmful suspended sediment are scoped out as not having the potential for a likely and significant effect on population health.

1537. Onshore: A number of water impacts from onshore works are set out in **Chapter 8.4 Water Resources and Flood Risk** impacts associated with contamination of surface and groundwater are scoped in, therefore this is also scoped in of the health assessment within the EIA.

9.2.3.2.9 Bio-Physical Environment: Land Quality

1538. Offshore and Onshore: Offshore works would not affect land quality for onshore populations. As discussed in **Chapter 7.3 Marine Water and Sediment Quality**, site-specific sediment sampling was undertaken in 2023 within the DBD Array Area and the southern offshore ECC (Fugro, 2023). Due to a negligible level of contaminants present within the sediment surveyed, there is no risk of seabed historic contaminants affecting land quality. Port activities are unlikely to result in public exposures to contaminated soils. Any new or historic contamination that may be mobilised by construction activities will be managed by standard best practice contamination avoidance and response measures secured through management plans, including to mitigate against dust and aerosol exposure pathways. Ground condition and soil effects are scoped out of the EIA. Risks of new or historic pollutant mobilisation, including direct exposure and food contamination, are highly likely to be addressed by standard good practice mitigation measures that would be secured through management plans. This topic is scoped out of the EIA.

1539. Onshore: Whilst **Chapter 8.2 Geology and Ground Conditions** considers impacts from contamination sources to the construction workforce, the human health chapter considers potential exposure to contamination sources to the wider community. Any public health exposure to the community would be through water and air and therefore these are considered under these relevant topics in the Bio-Physical Environment: Water Quality or Availability and Bio-Physical Environment: Air Quality sections respectively and also in **Chapter 8.4 Water Resources and Flood Risk** and **Chapter 8.3 Onshore Air Quality and Dust**. A land quality assessment of likely significant effects is scoped out of the EIA Human Health chapter; however, the EIA Human Health chapter will cross-refer to the Air Quality and Water Resources and Flood Risk assessments to confirm that the relevant pollution pathways for community health risks are appropriately avoided, i.e. such that population health effects are unlikely.

9.2.3.2.10 Bio-Physical Environment: Air Quality

1540. Offshore: Due to the distance from a population receptor, offshore air quality effects to human health during construction are scoped out of the EIA, as per **Chapter 7.14 Offshore Air Quality**. Port activities would generate air pollutants, but this is not expected to be of a scale, timing or character that differs from existing consented operational port levels.

1541. Onshore: Project construction activities have the potential to cause changes in air pollutants (particularly nitrogen dioxide (NO_2), particulate matter (PM), including PM2.5 and PM10), which may affect respiratory and cardio-metabolic outcomes. This potential impact could affect residents and long-term occupiers of nearby properties and community buildings. The health impacts from changes to onshore air quality during the construction phase, including dust, are scoped into the EIA. The human health chapter will be informed by **Chapter 8.3 Onshore Air Quality and Dust**. UK statutory limits, i.e. health protection standards, will be used as a benchmark. The potential for non-threshold health effects of some air pollutants will be discussed and taken into account.

9.2.3.2.11 Bio-Physical Environment: Noise and Vibration

1542. Offshore: Due to the distance from a receptor population, offshore noise effects to human health during construction are scoped out of the EIA, as per **Chapter 7.15 Offshore Airborne Noise**. Port activities would generate noise, but this is not expected to be of a scale, timing or character that differs from existing consented operational port levels.

1543. Onshore: Project activities have the potential to generate noise from construction activities and vehicle movements, which may affect mental wellbeing, sleep disturbance and educational outcomes. This potential impact could affect residents and long-term occupiers of nearby properties and community buildings. The human health assessment will be informed by the noise and vibration assessment of changes to daytime and night-time noise (further information provided in **Chapter 8.8 Onshore Noise and Vibration**). Consideration will be given to population health effects, for example related to annoyance and sleep disturbance. Noise associated with construction of the onshore infrastructure is scoped into the EIA.

9.2.3.2.12 Bio-Physical Environment: Radiation / Electro-Magnetic Field

1544. Offshore and Onshore: Works would not include using, or making changes to, active major electrical infrastructure producing EMF. Relevant public and occupational safeguards, secured through management plans, would be followed for the temporary electrical equipment used. Electric and magnetic fields strengths reduce rapidly with distance, often requiring only a few meters separation between the source and receptor, to reach background levels. No ionising radiation sources are proposed. These issues are scoped out of the EIA.

9.2.3.2.13 Institutional and Built Environment: Health and Social Care Services

1545. Offshore and Onshore: The offshore project workforce is assumed to include specialist international suppliers and fabricators to the offshore renewable energy industry as well as subcontractors who are resident in the regional area. The majority of the onshore workforce would be skilled roles from Yorkshire and the Humber region, with a minority of specialist international suppliers and fabricators. Specialist international suppliers and fabricators are assumed to have appropriate insurances or would pay for their healthcare directly where required. The UK workforce would access healthcare under their existing NHS entitlements.

1546. The expectation is that the great majority of healthcare needs of the workforce will be met either by occupational provision aboard their vessel or by their usual healthcare provider when they return to their usual place of residence during rotation. The Project programme and workforce assumptions that will be set out in the Human Health Chapter within the ES would support routine healthcare service planning. No large influx of workers to the local area is anticipated, nor other changes that could cause a step-change in NHS demand. The Project will operate appropriate occupational health services.

1547. As shown in the Baseline Healthcare Capacity section and **Table 9-3**, data suggests that an additional 7,292 patients could be registered before reaching the 1,800 patients per GP ratio benchmark across the four GP practices. The expected workforce has not been established at this stage, however, DBS Offshore Wind Farm, a project in a similar location, had a maximum expected construction workforce of 1,240 jobs across Yorkshire and the Humber region. The Project is not relying on new GP registrations, as existing NHS registrations would largely apply or alternative shipboard medical support would be provided. However, as a sensitivity test, even in a cumulative scenario with DBS where all construction workers required new local GP registrations, the combined workforces are expected to be substantially lower than the 7,292 additional patients that could still be registered across the four GPs identified in **Table 9-3**. On this basis, there would not be the potential for significant population health effects from changes in temporary demand for healthcare capacity and so, such effects are scoped out of the EIA.

9.2.3.2.14 Institutional and Built Environment: Built Environment

1548. Offshore utilities disruption is unlikely, and any crossing of existing power or communications cables would be managed to avoid interruption. Appropriate waste management practices would be used, including regard to the MARPOL regulations on waste at sea. Significant population health implications are not anticipated. This issue is scoped out of the EIA.

1549. Onshore: The potential for the Project to affect existing features of the built environment, such as utilities, that are supportive of population health has been considered and scoped out. The Project would have relatively low impact, including due to the use of trenchless techniques to avoid surface disruption at sensitive features such as road crossings. Where trenching techniques and other surface excavations are undertaken these would be within controlled work areas. The position of existing features such as water and sewer systems will be taken into account in planning the export cable corridor and techniques used. Appropriate diversions would occur to avoid disruption to such services. Disruption to such services on a scale that could affect population health is therefore scoped out.

9.2.3.2.15 Wider Societal Infrastructure and Resources

1550. Offshore and Onshore: The Project's energy infrastructure would not generate public health benefits at this stage. This issue is scoped out.

9.2.3.3 Potential Impacts during Operation

1551. This section has considered the potential for likely and significant population health effects from the Project's O&M activities. Details are set out in **Chapter 3 Project Description**, but broadly relate to:

- Offshore maintenance of the wind turbines and of the offshore electrical infrastructure, including the Offshore Platform(s);
- Offshore renewable electricity generation from the wind turbines;
- Onshore O&M activities associated with onshore electrical infrastructure including the infrastructure within the OCS zone.

9.2.3.3.1 Social Environment: Housing

1552. Offshore and Onshore: During operation, the impacts associated with housing are considered to be scoped out for the same reasoning as that set out for Social Environment: Housing of the construction phase.

9.2.3.3.2 Social Environment: Open Space, Leisure and Play

1553. Offshore: During operation, the impacts associated with nearshore recreation, leisure and play, e.g. sailing and other water sports are considered to be scoped out for the same reasoning as that set out for Social Environment: Open Space, Leisure and Play of the construction phase.

1554. Onshore: Land take for onshore infrastructure, (including the TJB and OCS(s)) are not anticipated to be within, or adjoining, land that is publicly accessible and used for recreation, leisure or play. Therefore, the Project is unlikely to significantly affect physical, mental or social health aspects of community recreation. This issue is scoped out of the EIA.

9.2.3.3.3 Social Environment: Transport Modes, Access and Connections

1555. Offshore: During operation, port impacts are considered to be scoped out for the same reasoning as that set out for Social Environment: Transport Modes, Access and Connections of the construction phase.

1556. Onshore: The onshore infrastructure is expected to have minimal implications for road transport, with activity limited to checks and maintenance. It is unlikely that there would be the potential for significant population health effects due to changes in routine or emergency health related journey travel times, access to health promoting goods and services, community severance or road safety.

9.2.3.3.4 Social Environment: Community Safety

1557. Offshore and Onshore: During operation, the impacts associated with community safety are considered to be scoped out for the same reasoning as that set out for Social Environment: Community Safety of the construction phase.

9.2.3.3.5 Social Environment: Community Identity, Culture, Resilience and Influence

1558. Offshore: During operation, the impacts associated with offshore visual impacts and community identity are considered to be scoped out for the same reasoning as that set out for Social Environment: Community Identity, Culture, Resilience and Influence of the construction phase.

1559. Onshore infrastructure, **Chapter 8.10 Landscape and Visual Impact** scopes in views of the OCS(s) and infrastructure within the OCS zone, whilst the potential for a scale of visual impact that could affect population health outcomes is considered limited, effects of the OCS(s) and infrastructure within the OCS zone on community identity are scoped in, including to consider the potential for cumulative effects with other projects.

9.2.3.3.6 Economic Environment: Education and Training

1560. Offshore: O&M activities associated with the offshore infrastructure for the Project would support sizable workforces with upskilling and career development opportunities. This may include apprenticeships and adult learning, with transferable skills between construction and operation and maintenance phases. Such impacts are scoped into the EIA to consider how opportunities could be targeted for local and vulnerable groups to increase the public health benefit.

1561. Onshore: Operation of the OCS(s) will involve long term good quality green economy upskilling and career development opportunities. The opportunity to target these to the local community will be explored to enhance the population health benefit, including for dependants, therefore this is scoped into the EIA.

9.2.3.3.7 Economic Environment: Employment and Income

1562. Offshore: O&M activities associated with the offshore infrastructure for the Project will provide opportunities for good quality employment (including wage, working conditions and job stability). The human health assessment will consider the potential population health effects of direct and indirect employment, including opportunities to enhance benefits for local and vulnerable groups, therefore this impact is scoped into the EIA.

1563. Onshore: The operation of the OCS(s) will involve long term good quality green economy jobs. This includes direct, indirect and induced employment. The opportunity to target these to the local community will be explored to enhance the population health benefit, including for dependants, therefore this is scoped into the EIA.

1564. Offshore: It is not anticipated that significant unemployment or adverse economic implications will occur during the operation phase, and this includes any potential adverse effects to commercial fisheries. Noting that consultation with key stakeholder groups will take place through best practice such as the FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds. Therefore, such issues are scoped out of the EIA.

1565. During operation, the impacts associated unemployment or adverse economic implications are considered to be scoped out for the same reasoning as that set out for Economic Environment: Employment and Income of the construction phase.

9.2.3.3.8 Bio-Physical Environment: Climate Change and Adaptation

1566. Offshore and Onshore: The Project would produce renewable energy during the operation of the wind farm, which contributes to avoided emissions from the displacement of more GHG-intensive forms of electricity generation. This is relevant to population health, which is influenced by temperature, crop yields, productivity and disease prevalence. The effects would extend to the international global population, particularly deprived populations in low- and middle-income countries.

1567. The Project would be a part of a wider energy sector transition that reduces the severity of climate change. The offshore electrical generation would allow for renewable electricity provision to the UK grid with wider decarbonisation benefits and therefore mitigating climate change. The benefits to population health will be discussed, including reducing adverse physical and mental health effects of climate change for deprived populations, particularly in low- and middle-income countries globally. This will be informed by the outcome of the climate change assessments (further information provided within **Chapter 9.4 Climate Change**). Therefore, health benefits associated with climate change and adaptation are scoped into the EIA. In line with proportionate assessment this topic area will be combined with the assessment of with Wider Societal Infrastructure and Resources.

9.2.3.3.9 Bio-Physical Environment: Air Quality

1568. Offshore: During operation, the impacts associated with offshore air quality are considered to be scoped out for the same reasoning as that set out for Bio-Physical Environment: Air Quality of the construction phase.

1569. Onshore: Operational nearshore and onshore air quality effects (e.g. maintenance vehicle emissions) are not anticipated to be of a scale, even accounting for non-threshold effects, that could affect population health. This reflects limited onshore maintenance requirements. This issue is scoped out.

9.2.3.3.10 Bio-Physical Environment: Water Quality or Availability

1570. Offshore: During operation, the impacts associated with offshore pollutant spills affecting coastal bathing water are considered to be scoped out for the same reasoning as that set out for Bio-Physical Environment: Water Quality or Availability of the construction phase.

1571. Onshore: Checks and maintenance activities are unlikely to result in any water related risks to public health. Any risks would be managed through standard best practice spill avoidance and response measures that would be secured through management plans. This issue is scoped out.

9.2.3.3.11 Bio-Physical Environment: Land Quality

1572. Offshore and Onshore: During operation, the impacts associated with land quality are considered to be scoped out for the same reasoning as that set out for Bio-Physical Environment: Land Quality of the construction phase.

9.2.3.3.12 Bio-Physical Environment: Noise and Vibration

1573. Offshore: During operation, the impacts associated with offshore noise are considered to be scoped out for the same reasoning as that set out for Bio-Physical Environment: Noise and Vibration of the construction phase

1574. Onshore: The potential operational noise impacts of the infrastructure within the OCS zone are scoped into the EIA to consider the potential for a population health effect. The health 0 will be informed by the noise and vibration assessment (**Chapter 8.8 Onshore Noise and Vibration**). UK regulatory standards will be used as a benchmark.

9.2.3.3.13 Bio-Physical Environment: Radiation / Electro-Magnetic Field

1575. Offshore electrical infrastructure, including the Offshore Platform(s), are not located in proximity to communities. Relevant occupational safeguards would be followed. No EMF risk is therefore likely for offshore aspects of the Project.

1576. Onshore: For onshore electrical infrastructure, including the TJB, OCS(s) and ESBI, the ‘actual EMF’ risks are scoped out of the EIA on the basis that the Project would adopt the International Commission on Non-ionizing Radiation Protection (ICNIRP) guidelines (ICNIRP, 1998, 2010) and Government Voluntary Code of Practice on EMF public exposure (Department for Energy Security and Net Zero, 2012). Such considerations are inherent to the detailed engineering considerations, including cable specification and routeing. Relevant public EMF exposure guideline limits are noted in NPS for Electricity Networks Infrastructure (EN-5) and would be complied with by the Project. These guidelines are long standing and have a high safety margin. The levels of exposure that they require would not pose a risk to public health. In addition, no ionising radiation sources are proposed. Actual physical health risks of non-ionising EMF effects are scoped out of the EIA.

1577. Onshore: In addition to the actual physical health risk, project activities would introduce electrical equipment, which may lead to concern about field strength or ESBI risks affecting mental health for some residents in the local community, particularly those living in close proximity to new electrical infrastructure. The Project will engage with the local community surrounding the OCS(s) and ESBI providing information on the EMF generated during the operation of the facility and how other risks (e.g. fire risks) are appropriately mitigated and managed. Information on the controls put in place to achieve appropriate health protection standards, will be provided in a timely and non-technical format, describing how actual health risks are mitigated. Therefore, public understanding of the risk in relation to operational EMF is proposed to be scoped into the EIA.

9.2.3.3.14 Institutional and Built Environment: Health and Social Care Services

1578. Offshore and Onshore: During operation, the impacts associated with health and social care services are considered to be scoped out for the same reasoning as that set out for Institutional and Built Environment: Health and Social Care Services of the construction phase.

9.2.3.3.15 Institutional and Built Environment: Built Environment

1579. Offshore: The distance offshore means there is very limited direct impacts on human receptors from marine infrastructure. Offshore operational activities are not considered to have waste management, land use or infrastructure use implications on a scale that could affect population health. Therefore, offshore effects on the built environment during operation are scoped out of the EIA.

1580. Onshore: In relation to the OCS(s) and ESBI, appropriate buffer zones would be maintained between infrastructure and communities and the design would be resilient to accidents and disasters. The ESBI would include appropriate design, mitigation and management measures related to risks to population health, which will be outlined within the PEIR and / or ES as appropriate. This issue is scoped in further to these details being finalised.

1581. The health assessment coverage will include appropriate signposting, including to the Major Accidents and Disasters chapter. However, in line with IEMA guide: Effective Scoping of Human Health in Environmental Impact Assessment (Pyper *et al.,* 2022a) paragraph 5.5, issues of emergency planning of the ESBI are scoped out as being covered by other potential future permitting requirements and / or risk management processes. This is consistent with Overarching National Policy Statement for Energy EN-1 paragraph 4.4.7, which confirms that matters subject to separate regulation will generally constitute sufficient mitigation in relation to their potential health effects.

9.2.3.3.16 Wider Societal Infrastructure and Resources

1582. Offshore: During operations, the generating aspects of the Project would provide energy infrastructure that supports many aspects of public health. A reliable supply of electricity is required in relation to health-supportive factors including, population food safety, thermal comfort, healthcare, learning, income generation and social support. This issue is scoped in.

1583. Onshore: The onshore electrical infrastructure facilitates the benefits accrued from the renewable energy generating assets. This issue is assessed under offshore operational and maintenance phase wider societal infrastructure and resources. To avoid double counting this is not separately assessed and is scoped out for onshore.

9.2.4 Potential Impacts during Decommissioning

1584. It is anticipated that the decommissioning impacts on population health would be similar in nature to those of construction, although the magnitude of impact is likely to be lower.

1585. The same potential impacts identified for construction are therefore expected to be scoped in (and out) of the EIA for decommissioning (as per **Table 9-4**).

9.2.5 Potential Cumulative Effects

1586. There is potential for cumulative effects to arise in which other projects or plans could act collectively with the Project to affect population health. Therefore, cumulative effects related to human health are scoped into the EIA. The CEA will follow the standard approach outlined in **Chapter 5 EIA Methodology**.

1587. Combined effects of the Project with other reasonably foreseeable projects will be considered. This will include other wind farms and other offshore works that may affect transport, visual impacts, employment and energy generation. It will also include onshore projects that strongly influence the demographics of the site-specific Study Areas, such as large new residential developments. Consideration will also be given to projects that due to their scale, timing and location may cumulatively affect access to services or amenities, e.g. due to increased vehicle transport. To support consistency and avoid duplication, the human health assessment will be informed by cumulative assessments undertaken by other EIA topic chapters.

1588. There will also be a consideration of the intra-related effects of the Project. The latter will consider how the same population may be affected by a change in more than one health determinant, for example the combined effects of changes in air quality and noise on a population's health outcomes.

1589. Where proportionate, the need for further mitigation and / or monitoring will be considered, including relevant governance.

9.2.6 Potential Transboundary Effects

1590. There is not considered to be the potential for likely significant transboundary population health effects due to the Project's construction, operation or decommissioning activities. For example, although there will be international elements to the supply chain of each phase and potentially also the workforces, these changes, including use of ports in other jurisdictions, would be small and have diffuse effects in the context of those national level markets. International ports, if used, can reasonably be assumed to be operating within their own consented levels of activity and associated permits. Any activity outside of such existing consents would be subject to separate applications that are not within the scope of the EIA.

1591. In relation to direct and indirect employment through the Project's supply chain, the Project would operate appropriate policies in accordance with current regulation and good practice, including in relation to general employment and avoiding issues of discrimination. Appropriate policies and standards are expected for contractors, including in transboundary contexts. On this basis there are unlikely to be likely significant transboundary population health effects.

1592. The international scope of climate change impacts on the health of global populations is noted within the assessment of operational impacts, and this will not be discussed as a separate transboundary issue. Therefore, transboundary effects related to human health are scoped out of the EIA.

9.2.7 Summary of Scoping Proposals

1593. **Table 9-4** outlines the human health impacts which are proposed to be scoped in or out of the EIA. These may be refined through consultation, and as additional project information and site-specific data become available.

1594. In **Table 9-4**, 'Offshore' relates to effects associated with the wind farm and nearshore / port activities, while 'Onshore' relates to the onshore infrastructure. The list of potential impacts aligns with the determinants of health set out in IEMA guide: Effective Scoping of Human Health in Environmental Impact Assessment (Pyper *et al.,* 2022a).

Table 9-4 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Human Health

Potential Impact	Project Element	Construction	Operation	Decommissioning
Social Environment				
Housing	Offshore and Onshore	X	X	X
Open space, leisure and play	Offshore	X	X	X
	Onshore	✓	X	✓
Transport modes, access and connections	Offshore	X	X	X
	Onshore	✓	X	✓
Community safety	Offshore and Onshore	X	X	X
Community identity, culture, resilience and influence	Offshore	X	X	X
	Onshore	X	✓	X
Economic Environment				
Education and training	Offshore and Onshore	✓	✓	✓
Employment and income	Offshore and Onshore	✓	✓	✓
Unemployment or Adverse Economic Implications	Offshore and Onshore	X	X	X
Bio-Physical Environment				
Climate change and adaptation	Offshore	X	✓	X
	Onshore	X	✓	X
Air quality	Offshore	X	X	X
	Onshore	✓	X	✓
Water quality or availability	Offshore	X	X	X
	Onshore	✓	X	✓
Land quality	Offshore and Onshore	X	X	X
Noise and vibration	Offshore	X	X	X
	Onshore	✓	✓	✓
Radiation (actual EMF risk)	Offshore	X	X	X
	Onshore	X	X	X
Radiation (public understanding of EMF risk)	Offshore	X	X	X
	Onshore	X	✓	X
Institutional and Built Environment				
Health and social care services	Offshore and Onshore	X	X	X
Built environment	Offshore	X	X	X
	Onshore	X	✓	X

Potential Impact	Project Element	Construction	Operation	Decommissioning
Cumulative and Transboundary Impacts				
Cumulative impacts	Offshore and Onshore	✓	✓	✓
Transboundary impacts	Offshore and Onshore	x	x	x

9.2.8 Approach to Data Gathering

1595. The following information has been considered during the production of this Scoping Report and will be considered further within the PEIR / ES where relevant matters are scoped into the EIA process.

1596. The health receptors for the assessment are populations based onshore. The assessment will focus on the onshore elements of the Project and on the local population within the Human Health Study Areas most likely to be affected.

1597. At PEIR, additional data on health-related statistics will be sought to highlight key sensitivities at the local authority level and for representative wards. The health baseline will be used to characterise the sensitivity of the relevant populations rather than to delineate the extent of particular effects. This is appropriate given that, for example, mental health effects may extend well beyond the actual area of environmental change or socio-economic benefit.

1598. Key data sources for the PEIR and ES human health assessment are set out in **Table 9-5**. Relevant Local Joint Strategic Needs Assessment and Health and Wellbeing Strategy data will also be reviewed.

Table 9-5 Desk-Based Data Sources for Human Health

Data Source	Date	Data Contents
OHID Fingertip's resource	2011 to 2023	Public Health Outcomes Framework, England
Ministry for Housing, Communities and Local Government (MHCLG)	2019	Lower layer super output area (LSOA) resolution data on community deprivation)
Office of National Statistics (ONS) and official labour market statistics (NOMIS) statistics.	2011 to 2021	Census data
East Riding Health and Wellbeing Strategy 2023 – 2028	2023 to 2028	Health and wellbeing priorities for the local authority
The East Riding Joint Strategic Needs Assessment (JSNA)	2024	Local authority priority vulnerable groups

1599. No baseline human health surveys are proposed to be undertaken as part of the assessment. The human health assessment will bring together the conclusions of the assessments made in other relevant chapters of the EIA and explain their implications for public health.

9.2.9 Approach to Assessment

1600. The wider determinants of health and health inequalities are key considerations when undertaking an assessment of human health as part of EIA.

1601. A population health approach will be taken, informed by discussion of receptors within other EIA chapters. For each determinant of health, the human health chapter will identify relevant inequalities through consideration of disproportionate or differential effects between the 'general population' of the Study Area and effects to the 'vulnerable population group' of that study area.

1602. The chapter will use the WHO's definition of health, which states that health is a: 'state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity' (WHO, 1948).

1603. The chapter will also use the WHO's definition for mental health, which states that mental health is a: 'state in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community' (WHO, 2007).

1604. The human health assessment steps and method will align with the IEMA 2022 guidance on Determining Significance for Human Health in Environmental Impact Assessment. (Pyper *et al.,* 2022b)

1605. Liaison with key stakeholders on Human Health will take place to agree the scope and the specific assessment methods of the Human Health chapter.

9.2.9.1 Policy and Legislation

1606. The following key policy documents relevant to human health will be considered within the assessment process:

- Overarching NPS for Energy (NPS EN-1) which sets out the UK Government's policy for the delivery of major energy infrastructure (Department for Energy Security and Net Zero, 2023a);
- NPS for Renewable Energy Infrastructure (NPS EN-3) (Department for Energy Security and Net Zero, 2023c); and
- NPS for Electricity Networks Infrastructure (NPS EN-5) (Department for Energy Security and Net Zero, 2023b).
- National Planning Policy Framework (Department for Levelling Up, Housing & Communities, 2023) sets out government's planning policies for England;

- East Inshore and East Offshore Marine Plan June 2021 (Marine Management Organisation, 2021) provides a framework that will shape and inform decisions over how the areas' waters are developed, protected and improved over the next 20 years.

- East Riding Local Plan (2012-2029) a policy framework which guides and shapes development in East Riding of Yorkshire and sets the parameters for growth.

1607. The following key legislation relevant to human health will be considered within the assessment process:

- The Environment Act 2021 (HM Government, 2021): The Environment Act 2021 established The Office for Environmental Protection (OEP) as a public body in England and Northern Ireland. The OEP sets targets and takes enforcement action to prevent, or mitigate, serious damage to the natural environment or to human health. This includes reducing adverse impacts on public health. The OEP objective (OEP, 2022) is for environmental law (including EIA legislation) and its implementation to be well designed and delivered, so that positive outcomes for the environment and people's health and wellbeing are achieved.

- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations 2017) (HM Government, 2017): set out the requirement for population and human health to be included in the list of topics to be considered in an EIA.

- The Air Quality Standards Regulations 2016 (HM Government, 2016): set out statutory health protection standards on ambient air quality.

- The Health and Social Care Act 2012: outline the responsibilities of Local Authorities regarding public health duties and the involvement of Integrated Care Boards (ICBs) in planning local healthcare services (HM Government, 2012).

- The Environment Act 1995 (HM Government, 1995): sets provisions for protecting certain environmental conditions of relevance to health in the UK.

- The Environmental Protection Act 1990 (HM Government, 1990): covers contaminated land and the control of emissions (including dust, noise and light) that may be prejudicial to health or a nuisance.

- The Public Health (Control of Disease) Act 1984 (HM Government, 1974): relates to disease control and establishing of port health authorities.

- Health and Safety at Work Act 1974 (HM Government, 1974): is a primary piece of legislation covering occupational health and safety in Great Britain.

- International Convention for the Prevention of Pollution from Ships (MARPOL) 1973 (International Maritime Organisation, 1973): set out regulations aimed at preventing and minimising pollution from ships.

- Bathing Water Regulations 2013: Safeguards public health and clean bathing waters (UK Statutory Instruments, 2013).

- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017: The WFD sets out a commitment to protecting water bodies, including bodies of water designated as recreational waters (The Secretary of State and the Welsh Ministers, 2017).

9.2.9.2 Guidance

1608. The following key guidance relevant to human health will be considered within the assessment process:

- IEMA 2022 guidance on health in EIA series, effective scoping (Pyper, Lamming, *et al.,* 2022) and determining significance (Pyper, Waples, *et al.,* 2022). This is practitioner guidance on the coverage of human health in EIA for England, Wales, Scotland, Northern Ireland and the Republic of Ireland. This includes methods for determining population health sensitivity, magnitude and significance. This is the key methods citation.

- Institute of Public Health, Guidance, Standalone Health Impact Assessment and health in environmental assessment (Pyper *et al.,* 2021) sets current good practice for the assessment of human health in EIA, including assessment methods.

- International Association for Impact Assessment and European Public Health Association. A reference paper on addressing human health in EIA (Cave *et al.,* 2020)

- International Association for Impact Assessment. Health Impact Assessment International Best Practice Principles, (Winkler *et al.,* 2021) confirms the application of HIA principles when undertaking health in EIA.

- Public Health England (PHE), Health Impact Assessment in spatial planning (Public Health England, 2020). The guidance confirms that where EIA is undertaken the requirements for HIA should be met through the EIA health chapter.

- PHE, Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning (NSIP) Regime (PHE, 2021). Guidance to assist applicants preparing an ES as part of their NSIP submission.

- Defra Environmental Improvement Plan 2023 (Defra, 2023) amends the national PM2.5 standards.

9.2.9.3 Local Health Priorities

1609. The following key local health strategies relevant to human health will be considered within the assessment process:

- The East Riding Health and Wellbeing Strategy 2023 – 2028 (East Riding Health and Wellbeing Board, 2023) which identifies the health and wellbeing priorities for the district; and

- The East Riding Joint Strategic Needs Assessment (JSNA) (East Riding Health and Wellbeing Board, 2024) which identifies priority vulnerable groups in the district.

9.2.10 Scoping Questions to Consultees

1610. The following questions are posed to consultees to help them frame and focus their response to the human health scoping exercise, which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment and population?
- Have all the likely and potentially significant impacts on population health resulting from the Project been identified in the Scoping Report?
- Do you agree with the determinants of health and population groups that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

9.3 Socio-Economics, Tourism and Recreation

1611. This chapter of the Scoping Report considers the potential likely effects of the Project associated with socio-economics, tourism and recreation, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the Array Area, the offshore ECC, landfall area, the onshore ECC and the OCS zone.

1612. The socio-economics, tourism and recreation assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 7.8 Commercial Fisheries;**
- **Chapter 7.9 Shipping and Navigation;**
- **Chapter 7.12 Seascape, Landscape and Visual Impact;**
- **Chapter 7.13 Other Marine Users;**
- **Chapter 8.5 Soils and Land Use;**
- **Chapter 8.7 Onshore Archaeology and Cultural Heritage;**
- **Chapter 8.8Onshore Noise and Vibration;**
- **Chapter 8.9 Traffic and Transport;**
- **Chapter 8.10 Landscape and Visual Impact;** and
- **Chapter 9.2 Human Health.**

9.3.1 Study Area

1613. Socio-economic impacts, including employment supported and any potential tourism and recreation effects, are less constrained by geography than other environmental impacts, such as noise or ecology.

1614. The Study Areas for the assessment of socio-economic impacts have been defined in line with the guidance on identification of 'local areas' for offshore developments published by the Scottish Government (2022). Although this guidance will not apply in England, the principles for identifying the areas are universal and can be applied anywhere. The core principle of this guidance is that the 'local areas' identified should be specific to the socio-economic impact identified. Therefore, the Study Areas used for the assessment of economic impacts, such as employment and Gross Value Added (GVA), are different from those used to assess the impacts on tourism and recreational assets.

1615. The Socio-Economic Study Areas are defined based on the following six principles:

- **Principle 1 (Dual Geographies)** - The local area for the supply chain and investment impacts should be separate from the local area(s) for wider socio-economic impacts, including tourism and recreation;
- **Principle 2 (Appropriate Impacts)** - The appropriate impacts to be considered for assessment should be identified before defining the local areas;
- **Principle 3 (Epicentres)** - The local areas should include all the epicentres of the appropriate impacts, where an epicentre is defined as an onshore location where major activities occur such as a port, supply chain cluster or the location of onshore infrastructure;
- **Principle 4 (Accountability)** - The local areas used in the assessment should comprise of pre-existing economic or political geographies (parish and town councils, local authorities, development agencies) to enhance accountability;
- **Principle 5 (Understandable)** - The local areas should be defined in such a way that they are understandable to the communities they describe; and
- **Principle 6 (Connected Geography)** - The local area for the supply chain and investment impacts should consist of connected (including coastal) pre-existing economic or political geographies.

1616. The ports that will be used during the construction and operation phases have not been decided yet, however the location of the Onshore Scoping Area is known and this has been used to define the Study Areas. To ensure that the geographies for the socio-economic impact assessment are accountable through their elected representatives and understandable, local authorities have been used as the building blocks of the Socio-Economic Study Areas. It is proposed three Study Areas are included within the assessment of economic impacts to capture local, regional and national impacts.

1617. Based on the guidance on local areas for offshore developments, the following Study Areas will be considered with respect to socio-economic impacts (**Plate 9-1**):

- The Local Socio-Economic Study Area, including:
  - East Riding of Yorkshire; and
  - Kingston upon Hull.
- The Regional Study Area, including:
  - East Midlands;
  - North East of England; and
  - Yorkshire and the Humber.
- The UK.

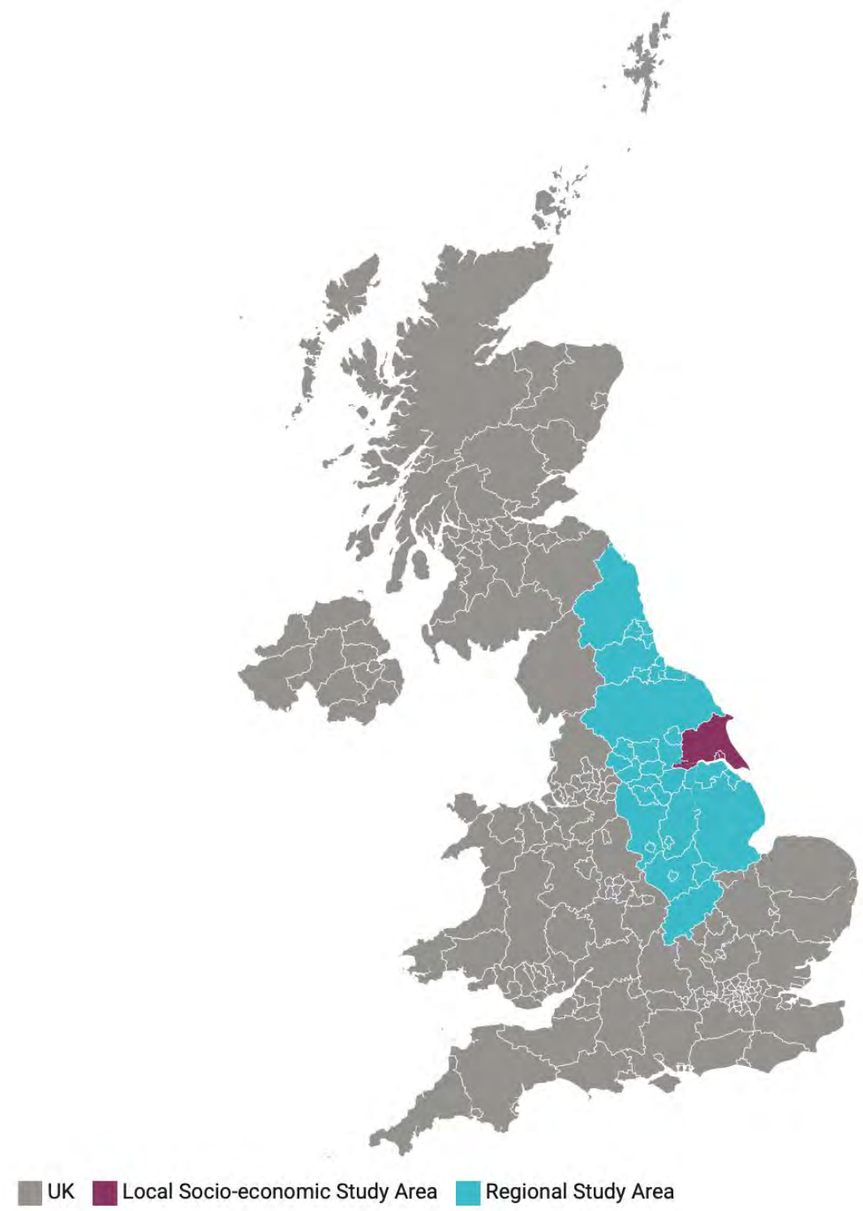


Plate 9-1 Socio-Economic Study Area

1618. Note that all impacts will be considered inclusively, for example the impacts in the UK will include those within the Regional Study Area.

1619. The Regional Study Area will allow consideration of wider impacts from construction activity. Including the UK as a Study Area makes it possible to appraise the full scope of the economic impacts associated with the Project and will align the assessment with future economic analysis of the Project, such as potential CfD Supply Chain Plans.

1620. Were the primary construction port location not to be within the Regional Study Area, the Study Areas will be redefined to take this into account.

1621. For the purposes of the tourism and recreation assessment, the Study Area identified is more localised and has been defined by aggregating the electoral wards covered by the Onshore Scoping Boundary. On this basis, the Tourism and Recreation Study Area includes:

- Beverley Rural;
- Cottingham North;
- Cottingham South;
- Dale;
- East Wolds and Coastal;
- Mid Holderness;
- Minster and Woodmansey;
- North Holderness; and
- St Mary's.

9.3.2 Existing Environment

9.3.2.1 Tourism and Recreation Study Area

1622. The Tourism and Recreation Study Area has a population of 122,163 people and is within East Riding of Yorkshire (Office of National Statistics (ONS), 2024a).

1623. Of the population in the Tourism and Recreation Study Area, 58% are aged between 16 and 64, compared to the UK average of 63% (ONS, 2023a) and the number of working age people in the area has decreased by 6% since 2011. The largest employment sectors are manufacturing, which accounts for 17% of the workforce, human health and social work activities (16%), and wholesale and retail trade (14%). Accommodation and food service activities, usually associated with the tourism sector, account for % of employment in the area. (ONS, 2023b).

9.3.2.2 Socio-Economic Study Areas

1624. The Local Socio-Economic Study Area has a population of 615,200 people, accounting for around 5% of the total population of the Regional Study Area (12,470,500).

1625. Of the population living in the Local Socio-Economic Study Area, 61% are aged between 16 and 64 years of age. This is a lower share than across the Regional Study Area (62%) and the UK (63%). The share of the working age population that is economically active, the economic activity rate, in the Local Socio-Economic Study Area is 79% and the unemployment rate is 2% (ONS, 2024b). In the Regional Study Area, the economic activity rate is 77% and the unemployment rate is 4%. Across the UK, the economic activity rate and unemployment rate are 79% and 4%, respectively.

1626. Based on their share of total employment among people of working age, the largest sectors in the Local Socio-Economic Study Area are manufacturing (16%), wholesale and retail trade (15%), and human health and social work activities (14%). While employment in wholesale and retail is similar across the UK, the relative share of employment in manufacturing across the Local Socio-Economic Study Area is double the UK average (8%). Employment in manufacturing is also above average in the Regional Study Area (11%) where the highest share of employment is in wholesale and retail trade (15%) and human health and social work activities (14%).

9.3.3 Potential Impacts

9.3.3.1 Potential Impacts during Construction

1627. The construction of offshore wind farm projects can have beneficial socio-economic effects in terms of providing employment and continuing to develop the wind energy market at a national level (i.e. encouraging wind energy manufacturers to be based in the UK). However, there are potential adverse impacts on social infrastructure where the Project's components and activities to construct it have an impact on specific receptors, unless they are identified and avoided through micro-siting and mitigation measures.

1628. Construction activity on offshore and onshore infrastructure associated with the Project is associated with the following potential impacts:

- Direct economic benefit (supply chain);
- Increased employment;
- Loss of, disruption to or pressure on local infrastructure and services;
- Disturbance (noise, air, visual and traffic) to social infrastructure;
- Disruption to recreational activities; and
- Disruption to the tourism industry.

1629. The Project is expected to generate direct economic benefit through its supply chain, including spending on goods and services in the Socio-Economic Study Areas.

1630. The Project is also expected to have an impact through increased employment as well as potential changes to demographics due to national migration and immigration. Employment impacts and considerations surrounding temporary migration will likely influence recruitment strategies.

1631. Effects on onshore and offshore activities which contribute to the existing social and economic characteristics of the Study Area for tourism and recreation will also be considered and assessed. This may include disturbance from potential air quality, noise, visual and traffic impacts on social infrastructure.

1632. Construction of the Project could also have potential impacts on tourism and recreation assets. This may include activity near the primary construction port, along the cable route and infrastructure within the OCS zone as well as impacts on recreational marine activities.

1633. All potential construction impacts identified above are scoped into the EIA.

9.3.3.2 Potential Impacts during Operation

1634. The impacts assessed for the operation phase of the Project will be as described above for construction. However, it is anticipated that any impacts to the local economy will be more marked during the construction phase, with fewer adverse impacts being predicted on the local economy during the operation phase. There will be ongoing operational impacts associated with the infrastructure within the OCS zone and these will be scoped into the EIA.

1635. The impact of economic benefits and increased employment during the operation phase associated with both onshore and offshore infrastructure are scoped into the EIA.

1636. Impacts on tourism and recreation assets and social infrastructure as a result of the presence of the Project will be scoped into the EIA for the onshore infrastructure. The offshore infrastructure is more than 200km from the coast and therefore it is proposed that impacts associated with tourism and recreation and social infrastructure are scoped out of the EIA for the offshore infrastructure.

1637. The impacts associated with the loss of, disruption to or pressure on local infrastructure and services during the operation phase are also based on demographic changes as a result of employment impacts. Employment impacts during the operational phase are less than the impacts during the construction phase, typically measured in hundreds rather than thousands. The demographic changes would exclude those people who secure employment locally. The demographic changes during the operational phase will likely be negligible compared to the overall population of the Local Economic Study Area and are therefore scoped out of the EIA.

9.3.3.3 Potential Impacts during Decommissioning

1638. It is anticipated that the decommissioning impacts on socio-economics, tourism and recreation receptors would be similar in nature to those of construction, although the magnitude of impact is likely to be lower.

1639. The same potential impacts identified for construction are therefore expected to be scoped in (and out) for decommissioning (as per **Table 9-6**).

9.3.4 Potential Cumulative Effects

1640. There is potential for cumulative effects to arise in which other projects or plans could act collectively with the Project to affect socio-economics, tourism and recreation receptors. Therefore, cumulative effects related to socio-economics, tourism and recreation are scoped into the EIA. The CEA will follow the standard approach outlined in **Chapter 5 EIA Methodology**.

1641. Potential cumulative impacts related to socio-economics include clustering effects with other offshore wind developments in the region to potentially boost the local skill-base. Conversely, there is also potential to cumulatively impact on other industries negatively due to displacement of workers currently employed in those industries. This will be considered further in the EIA.

1642. The assessment will also consider any potential cumulative impacts on tourism and recreation assets.

9.3.5 Potential Transboundary Effects

1643. The potential transboundary effects from the Project are likely to be limited to supply chain opportunities for businesses based outside of the UK. Since such impacts would be beneficial in nature, transboundary effects associated with socio-economics, tourism and recreation are scoped out of the EIA.

9.3.6 Summary of Scoping Proposals

1644. **Table 9-6** outlines the socio-economics, tourism and recreation impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities, and as additional project information and site-specific data become available.

Table 9-6 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Socio-Economics, Tourism and Recreation

Potential Impact	Construction	Operation	Decommissioning
Direct economic benefit (supply chain)	✓	✓	✓
Increased employment	✓	✓	✓
Loss of, disruption to or pressure on local infrastructure and services	✓	X	✓
Disturbance (noise, air, visual and traffic) to social infrastructure	✓	✓ (Related to onshore infrastructure only)	✓
Disruption to recreational activities	✓	✓ (Related to onshore infrastructure only)	✓
Disruption to the tourism industry	✓	✓ (Related to onshore infrastructure only)	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	X	X	X

9.3.7 Approach to Data Gathering

1645. As part of the EIA process, the existing environment with respect to socio-economics will be described, including, but not limited to the following:

- Regional and local labour market and trends;
- Overview of temporary and rented accommodation supply and trends;
- Current workforce;
- Local and regional population and trends;
- Local and regional employment and trends;
- Education (including qualifications of residents and education provision in the area)); and
- Skills within the Socio-Economic Study Areas.

1646. The data gathering exercise will also include consideration of social infrastructure, including housing and education provision. This will inform the assessment of relative sensitivity of the different Study Areas to changes in their population with the potential to affect public service provision.

1647. Identification of potential sensitive receptors will be undertaken through a desktop review of tourism and recreational assets within the Tourism and Recreation Study Area.

1648. **Table 9-7** identifies the desk-based sources that will be accessed to inform the characterisation of the existing environment.

Table 9-7 Desk-Based Data Sources for Socio-Economics, Tourism and Recreation

Data Source	Date	Data Contents
BiGGAR Economics, East Anglia One North and East Anglia Two Offshore Wind Farms: Tourism Impact Review	2019	Study of the impact on tourism of two offshore wind farms near the Suffolk Coast Area
East Riding Coast and Countryside, Walking the Riding	2024	Data on recreational trails in the LTRA
Kantar TNS, Great Britain Day Visitor Survey 2019	2020	Data on visitor numbers and spending of day visitors
Kantar TNS, Great Britain Tourism Survey 2019	2020	Data on visitor numbers and spending of overnight visitors
ONS Business Register and Employment Survey	2023	Data on sectoral employment
ONS, Annual Business Survey	2023	Data on sectoral turnover and GVA
Offshore Wind Industry Council, Offshore Wind Skills Intelligence Report	2023	Current skills and future workforce requirements for offshore wind
Offshore Wind Industry Council, People Skills Survey 2021 - 2026	2021	Available skills to fulfil offshore wind contracts
Offshore Wind Industry Council, Collaborating for Growth: Strategies for Expanding the UK Offshore Wind Supply Chain	2020	Approaches to maximising opportunities from the offshore wind supply chain
Oxford Brookes University, Guidance on assessing the socio-economic impacts of offshore wind farms	2020	Guidance on the socio-economic impacts from offshore wind farms
ORE Catapult, Offshore Wind Operations and Maintenance a £9 billion per year opportunity by 2030 for the UK to seize	2020	Evidence on operations and maintenance contracts and opportunities from them
BVG Associates, Guide to an Offshore Wind Farm	2019	Data on offshore wind supply chain
ONS, House Price Statistics for Small Areas (HPSSA)	2023	Data on house prices
ONS, Private rental affordability, England	2023	Data on rental affordability from private sector providers
ONS, Annual Population Survey	2024	Data on economic activity and unemployment rates
ONS, Population Estimates	2024	Population estimates, inclusive of breakdown by year of age
Visit England, Places to Visit in East Riding of Yorkshire	2024	Data on tourism assets within the LTRA

9.3.8 Approach to Assessment

1649. The Overarching NPS for Energy (EN-1) states that where a project is likely to have an impact on socio-economics at a local or national scale the assessment should consider all relevant impacts (DESNZ), 2023.

9.3.8.1 Economic Impacts

1650. The economic impacts which will be considered in the assessment will be reported in terms of:

- GVA - this is a measure of economic value added by an organisation or industry and is typically estimated by subtracting the non-staff operational costs from the revenues of an organisation;
- Years of Employment - this is a measure of employment which is equivalent to one person being employed for an entire year and is typically used when considering short term employment impacts, such as those associated with the construction phase of a project; and
- Jobs - this is a measure of employment which considers the headcount employment in an organisation or industry. This measure is used when considering long term impacts such as the jobs supported during the operation phase of a project.

1651. The economic impacts associated with the supply chain will be assessed in line with the approach considered in the UK Offshore Wind Sector Deal (UK Government, 2019). The focus of the assessments will be the direct and indirect (supply chain) effects. In addition to this, the assessment shall consider the effects of staff spending and the economic impact that this subsequent increase in demand stimulates (the induced effect).

1652. It is acknowledged that at the time of writing, the exact levels of expenditure are unknown by the Applicant. This expenditure is what shall drive the positive economic impacts. The socio-economic assessment shall therefore consider the worst-case scenario of the lowest, realistic levels of expenditure associated with the Project. This value may change between the production of the PEIR and ES to reflect any agreements reached between the Applicant and potential suppliers and any changes in the market that could impact on prices.

1653. The analysis will cover the three stages of the Project, namely:

- The construction stage;
- The operation stage; and
- The decommissioning stage.

1654. The impacts during the construction phase will be based on the actual expenditure on development that has occurred to date as well as the planned expenditure associated with construction activity. In addition to the total impact over the period, the assessment will consider the timings of impacts during these stages to understand the peaks and troughs of this activity.

1655. The impacts during the operation phase of the Project will be based on projected operational expenditure.

1656. In instances where impacts are expected to occur over several years, such as the operation phase, a discount rate will be applied. This allows impacts that occur sooner to be valued more highly than impacts that occur in the future, a concept known as time preference. In this instance a discount rate of 3.5% will be chosen, which is in line with the UK Government's Green Book (UK Government, 2020).

9.3.8.2 Tourism and Recreation Impacts

1657. There is no formal legislation or guidance on the methods that should be used to assess the effects that wind farm developments may have on tourism. The link between wind energy developments and the tourism sector is a well-researched subject and the most recent research has not found any link between the performance of the general tourism economy and wind energy developments.

1658. The tourism assessment shall consider the baseline assessment of the tourism economy in the Tourism and Recreation Study Area. This will consider the key drivers of the tourism economy in this area and consider how the Project will affect these drivers.

1659. The assessment will consider the potential effects that the Project could have on specific tourism attractions, recreational assets and local accommodation providers within the Tourism and Recreation Study Area. The assessment of the magnitude of impacts, both positive and negative, will build on the evidence available on behavioural changes from similar developments.

1660. The tourism assessment will also consider the potential impact of temporary workers using holiday accommodation, displacing demand on tourism activities.

1661. The assessment of marine recreational boating / sailing and recreational fishing will also comply with the following guidance documents where they are specific to this topic:

- Department for Levelling Up, Housing and Communities guidance notes; and
- The Planning Inspectorate Advice Notes, specifically Nationally Significant Infrastructure Projects – Advice Note Eleven, Annex B – Marine Management Organisation (Planning Inspectorate, 2012).

9.3.8.3 Demographic and Social Impacts

1662. The demographic and social impacts assessment shall follow on from the economic impact assessment, which shall identify the number of workers that are likely to travel into the area to work.

1663. This will then consider the capacity of the Socio-Economic Study Areas and the UK, and the service provision within, to accommodate this temporary increase in population. In particular, it shall consider:

- The likely demand for accommodation and the ability of the market to meet this demand; and
- The demand on services such as education and the ability of the local providers to meet this demand.

1664. The change in demand as a result of the Project will be assessed against the baseline demand for these services in the Study Areas. This will allow the magnitude of impact and sensitivity of each receptor to be identified. The significance of each impact will then be assessed in line with the general approach outlined in **Chapter 5 EIA Methodology**.

1665. The impact on community infrastructure because of environmental factors, such as noise or transport, shall be considered within the relevant PEIR / ES chapters.

1666. The assessment will only consider the development and construction phase, as the activity during the operation phase will be a smaller magnitude.

1667. Socio-economics, tourism and recreation will be included within the EPP (as set out in **Chapter 6 Consultation**) and further liaison with key stakeholders will take place to agree the approach to data collection, and the specific assessment methods to be employed as part of the EIA as part of this process.

9.3.9 Scoping Questions to Consultees

1668. The following questions are posed to consultees to help them frame and focus their response to the socio-economics, tourism and recreation scoping exercise, which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment?
- Have all the socio-economics, tourism and recreation impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the socio-economics, tourism and recreation impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

9.4 Climate Change

1669. This chapter of the Scoping Report considers the potential likely effects of the Project associated with climate change, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the Array Area, the offshore ECC, the onshore ECC and the OCS(s).

1670. One of the principal aims of the Project is to make a contribution to tackling climate change by generating secure, low carbon and renewable electricity, helping decarbonise the power sector and other sectors in the UK. Refer to **Chapter 2 Policy and Legislative Context** for further background on the need for the Project.

1671. Climate change was included as a required topic in the EIA Directive 2014/52/EU, which was transposed into UK EIA Regulations in 2017. The climate change chapter of the ES will include considerations of both the Project's impacts on climate change and the impacts of climate change on the Project. Therefore, the climate change chapter will comprise two separate assessments, and this scoping exercise has also been undertaken separately:

1672. A whole-life GHG assessment (**Section 9.4.1**) which considers the GHG emissions released over the Project's lifecycle and the avoided emissions as a result of the Project's operations; and

1673. A Climate Change Resilience (CCR) assessment (**Section 9.4.2**) which considers future trends in climate change impacts and the Project's vulnerability and resilience to such changes.

1674. No inter-relationships are identified for the GHG assessment, as no other environmental effects arising from the Project have the potential to influence the Earth's climate.

1675. The CCR assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 7.2 Marine Physical Processes;**
- **Chapter 8.2 Geology and Ground Conditions;**
- **Chapter 8.4 Water Resources and Flood Risk;**
- **Chapter 9.2 Human Health;** and
- **Chapter 9.5 Major Accidents and Disasters.**

9.4.1 Greenhouse Gas Assessment

9.4.1.1 Study Area

1676. All GHG emissions will affect the same receptor, the global atmosphere, as opposed to directly affecting any specific local receptor. Emissions which are released or avoided due to the Project will have the same effect on atmospheric GHG concentrations and its net effect on climate change, regardless of where they occur. Therefore, the Study Area for the GHG assessment is not geographically defined (IEMA, 2022).

1677. The scope of the GHG assessment will be limited to quantifying GHG emissions from the Project over its lifecycle: construction (including pre-construction activities and upstream embodied carbon), operation and decommissioning. The assessment will also account for avoided emissions from the Project's operations, including the provision of renewable energy generated by the wind farm to the UK grid and other potential carbon benefits enabled by the OHA and ESBI.

1678. Therefore, the Study Area for the assessment will encompass all associated GHG emitting activities and carbon benefits beyond the infrastructure system. Emission sources which will be considered in the GHG assessment are detailed under **Section 9.4.1.3**.

9.4.1.2 Existing Environment

1679. To contextualise the GHG assessment, existing and emerging national carbon budgets, net zero policies and targets will be reviewed and compared against the Project's predicted GHG impacts. The baseline review will also cover national and local emission statistics, as well as the emission contribution and decarbonisation trajectory of the power sector.

1680. In 2015, the UK signed the Paris Agreement, an international climate treaty committing all parties to the goal of limiting global warming to well below 2°C, and preferably below 1.5°C, compared to pre-industrial levels. All parties are required to submit national climate action plans every five years, which are known as Nationally Determined Contributions (NDC). The most recent NDC commits the UK to at least 68% reduction in GHG emissions by 2030 compared to 1990 levels (BEIS, 2022a).

1681. The Climate Change Act 2008 provides a framework for the UK to decarbonise and meet its long-term goal of achieving net zero emissions. The CCC sets a series of legally binding carbon budgets, which establish a limit on the total amount of GHG emissions that can be emitted within the UK over five-year periods until 2050. Following the Paris Agreement, the 2050 Target Amendment Order 2019 revised the previous long-term target from 80% to 100% reduction in GHG emissions by 2050 compared to 1990 levels.

1682. Six carbon budgets have been set to date, as shown in **Table 9-8,** which demonstrates a phased reduction in future permissible GHG emissions. Any emission source will have an increasing impact on the UK's ability to meet its carbon budget, the further they are in the future. The UK is currently in the fourth carbon budget period (2023 to 2027).

Table 9-8 UK Carbon Budgets

Budget Period	Carbon Budget (Mt of carbon dioxide equivalents (CO_2e))	Reduction Below 1990 Levels
First Carbon Budget (2008 to 2012)	3,018	26%
Second Carbon Budget (2013 to 2017)	2,782	32%
Third Carbon Budget (2018 to 2022)	2,544	38%
Fourth Carbon Budget (2023 to 2027)	1,950	52%
Fifth Carbon Budget (2028 to 2032)	1,725	58%
Sixth Carbon Budget (2033 to 2037)	965	78%
Seventh Carbon Budget (2038 to 2042)	To be set in 2025.	-
Net Zero Target (by 2050)		**100%**

1683. The UK Government has outlined its intention to decarbonise all sectors of the UK economy, including the power sector, within the Clean Growth Strategy (BEIS, 2017). Reaffirmation of this ambition was provided as a commitment within the Offshore Wind Sector Deal to advance offshore wind generation as an integral part of a future low-cost, low-carbon and flexible grid system (BEIS, 2019). The most recent offshore wind capacity target is 50GW by 2030, as announced in the BESS (BEIS, 2022b).

1684. To determine avoided emissions from offshore wind generation during the operation phase, a baseline scenario ("Do Nothing" scenario) will be established which assumes the Project is not developed. UK grid electricity is currently generated using several energy sources with varying GHG intensities, including fossil fuels, nuclear, renewables and bioenergy. The uptake of renewable energy, coupled with a transition away from fossil fuel-based generation, is therefore critical to achieving the UK's net zero targets.

1685. The GHG assessment will assume that the renewable energy supplied by the wind farm would replace an equivalent amount of grid electricity that would have otherwise been generated using non-renewable fuel sources. Although there is uncertainty on which form of conventional electricity generation the Project will replace, this assumption is in line with national energy policies, specifically NPS EN-1 (DESNZ, 2023a), which support the replacement of fossil fuel-based generation with renewables and other low carbon alternatives. In addition, this approach is advocated for use by offshore wind farms by RenewableUK (2023).

9.4.1.3 Potential Impacts

1686. **Table 9-9** identifies emission sources over the Project's lifecycle which are included / excluded from the GHG assessment and is presented in accordance with the PAS2080:2023 modules (BSI, 2023). PAS 2080:2023 is a specification for whole-life carbon management when delivering infrastructure projects. The scope of the assessment will be revisited at later stages to align with the most up-to-date project design and are subject to information availability.

Table 9-9 Potential Emission Sources Included / Excluded from the Greenhouse Gas Assessment

Phase	PAS2080 Module	Rationale for Inclusion (✓) / Exclusion (X)	
Construction	A0: Preliminary Studies, Design and Engineering	✓	Emissions from design and engineering activities are unlikely to be significant. It is anticipated that most works will be office-based. However, pre-construction surveys and activities (e.g. geotechnical surveys, seabed preparation and enabling works) will be considered where possible.
	A1: Raw Materials Supply A2: Transport to Manufacturing Facility A3: Manufacturing	✓	Embodied carbon in materials used to construct the Project (e.g. wind turbines and offshore and onshore export cables) is likely to contribute to lifecycle emissions.
	A4: Transport to / from Site	✓	Fuel consumption from the movement of materials, plant and equipment, waste and personnel to / from the construction site is likely to contribute to lifecycle emissions. This will include marine vessels travelling from their origin location to the construction port(s) and between the port(s) and the offshore construction site, as well as road vehicle and helicopter movements.
	A5: Construction	✓	Fuel and electricity consumption associated with plant and equipment use during construction activities is likely to contribute to lifecycle emissions. Land use change emissions from vegetation and soil disturbance during construction will be considered. Habitats with high carbon sequestration potential (e.g. peatlands) will identified based on ecology surveying.

Phase	PAS2080 Module	Rationale for Inclusion (✓) / Exclusion (X)	
Operation	B1: Use	✓	Fugitive emissions such as sulphur hexafluoride (SF_6) leakages from transmission assets and electrical equipment within the OCS(s) will be considered. Ongoing land use change emissions from vegetation and soil loss or degradation over the operational lifetime will be considered. Habitats with high carbon sequestration potential (e.g. peatlands) will identified based on ecology surveying.
	B2: Maintenance B3: Repair B4: Replacement	✓	Fuel and electricity consumption associated with transport and plant and equipment use during operation and maintenance activities is likely to contribute to lifecycle emissions. In addition, embodied carbon in materials used for spare parts during repair and replacement events is likely to contribute to lifecycle emissions.
	B5: Refurbishment	X	The Project is unlikely to undergo refurbishment during its operational lifetime, therefore this emission source is not relevant.
	B6: Operational Energy Use B7: Operational Water Use B8: Other Operational Processes	X	The Project's operational energy requirements are likely to be minimal and are assumed to be delivered entirely by its own electricity generation. Emissions from operational water use and other operational processes (e.g. waste management) are likely to be negligible.
	B9: User's Utilisation of Infrastructure	X	Although end users will use the renewable energy provided by the Project, they will not directly interact with the infrastructure. Therefore, user emissions are not relevant.
	D: Benefits and Loads beyond the Infrastructure System	✓	Avoided emissions from the provision of renewable energy generated by the wind farm to the UK grid and other potential carbon benefits enabled by the OHA and ESBI will be considered.
Decommissioning	C1: Deconstruction C2: Transport to / from Site C3: Waste Processing for Recovery C4: Disposal	✓	End-of-life emissions associated with the deinstallation of infrastructure, transport to landfill or other end destinations and the treatment and processing for reuse, recycling or disposal are likely to contribute to lifecycle emissions.

9.4.1.4 Potential Cumulative Effects

1687. As the receptor is the global atmosphere, it is not relevant to individually assess the cumulative effects of GHG emissions arising from other developments. GHG emissions, wherever they occur, have the potential to contribute to climate change, and therefore their effects are global and cumulative by nature. In line with guidance (IEMA, 2022), cumulative effects are scoped out of the GHG assessment, as there is no basis for selecting any particular project to assess cumulatively over any other.

9.4.1.5 Potential Transboundary Effects

1688. GHG emissions are transboundary by nature. Emissions considered in the GHG assessment will be contextualised using the UK carbon budgets and net zero policies and targets, which have been established in accordance with international climate commitments such as the Paris Agreement. As such, no additional consideration of transboundary effects is required for the GHG assessment.

9.4.1.6 Approach to Data Gathering

1689. Desk-based sources used to characterise the existing environment and inform the GHG assessment will consist primarily of publicly available datasets and reports from government and industry sources. No baseline surveys are proposed for the GHG assessment. **Table 9-10** identifies desk-based sources for the GHG assessment, which will be updated throughout the EIA process.

Table 9-10 Desk-Based Data Sources for the Greenhouse Gas Assessment

Data Source	Year(s)	Data Contents
Greenhouse Gas Reporting Conversion Factors (DESNZ, 2023b)	2023 (or latest at time of assessment)	Emission factors for UK-based operations for various activities such as fuel consumption.
Digest of UK Energy Statistics (DESNZ, 2023c)	2023 (or latest at time of assessment)	Up-to-date statistics for the UK power sector, including the operational GHG intensity of each generation source.
UK Territorial (DENSZ, 2023d) and Local Authority and Regional (DESNZ, 2023e) Greenhouse Gas Emissions National Statistics	2023 (or latest at time of assessment)	Up-to-date statistics for national, regional and local GHG emissions.
Treasury Green Book Supplementary Guidance: Valuation of Energy Use and Greenhouse Gas Emissions for Appraisal (DESNZ, 2023f)	2023 (or latest at time of assessment)	Current and projected operational GHG intensity of grid electricity.
UK Carbon Budgets	Various	National carbon budgets set in line with a decarbonisation trajectory towards net zero.

Data Source	Year(s)	Data Contents
Reducing the UK Carbon Footprint Report (CCC, 2013)	2013	Estimated lifecycle carbon intensities of various forms of electricity generation.
Inventory of Carbon and Energy (ICE) Database v3.0 (Jones and Hammond, 2019)	2019	Emission factors for embodied carbon in materials.
Carbon Storage and Sequestration by Habitat NERR094 (Natural England, 2022)	2022	Carbon sequestration potential for various land use types in the UK.
Life Cycle Greenhouse Gas Emissions of Utility Scale Wind Power (Dolan and Heath, 2012)	2012	Industry benchmarks for offshore wind projects to inform assumptions used in the GHG assessment regarding the likely contribution of emission sources to the Project's GHG footprint.

9.4.1.7 Approach to Assessment

1690. The GHG assessment will be undertaken in accordance with the following guidance documents:

- Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022);
- The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (WRI and WBCSD, 2015);
- PAS2080:2023 Carbon Management in Buildings and Infrastructure (BSI, 2023); and
- Port Emissions Toolkit (GloMEEP, 2018).

1691. GHG emissions will be quantified using a calculation-based methodology, which involves multiplying project-specific activity data with representative emission factors, and where applicable, calorific, load and global warming potential (GWP) factors. GWP factors will be obtained from the most recent Intergovernmental Panel on Climate Change's (IPCC) Assessment Report 100-year estimates.

1692. Industry benchmarks and assumptions based on professional judgment will be used where data gaps exist. Subject to information availability, end-of-life emissions during decommissioning and embodied carbon from spare parts during operation will be estimated using benchmarks from GHG footprinting of previous offshore wind projects.

1693. Avoided emissions from offshore wind generation will be estimated based on the "Do Nothing" scenario (see **Section 9.4.1.2**). The annual electricity generated by the Project will be calculated using the installed capacity, annual operating hours and capacity factor, and the lifetime electricity generation will account for the Project's operational lifetime. Avoided emissions will be estimated based on the GHG intensity of grid electricity replaced by the Project, which is assumed to be generated using non-renewable fuel sources (RenewableUK, 2023). This assumption is in line with NPS EN-1 (DESNZ, 2023a), which requires a step change in the decarbonisation of the UK's energy system, and to "dramatically increase the energy supplied from low carbon sources" to replace fossil fuel-based generation. In addition, a literature review of other potential carbon benefits enabled by the OHA and ESBI and their alignment with national energy policies will be undertaken, with avoided emissions estimated where possible.

1694. Given the severe consequences of climate change and the cumulative contributions of all GHG emissions, the sensitivity of the global atmosphere as a receptor will be defined as high. Any emission reductions will support decarbonisation efforts in line with international and national climate commitments (IEMA, 2022).

1695. The magnitude of impact is not defined, as the significance of effect for the GHG assessment is not determined by the magnitude of emissions alone (IEMA, 2022). However, GHG emissions released and avoided by the Project will be calculated and reported in tonnes of CO_2e to account for differences in GWP between GHGs. GHG emissions will be presented by emission source, project phase and combined over the whole lifecycle.

1696. Significance criteria will be adapted from IEMA's guidance (2022) which recognises that: *"when evaluating significance, all new GHG emissions contribute to a negative environmental effect. However, some projects will replace existing development or baseline activity that have higher GHG profiles. The significance of a project's emissions should therefore be based on its net impacts, which may be positive, negative or negligible*."

1697. IEMA's guidance (2022) provides relative significance descriptions to assist assessments of GHG emissions in an EIA context. Section VI of the guidance describes five distinct levels of significance (major adverse, moderate adverse, minor adverse, negligible and beneficial), which are not based solely on whether a project emits GHG emissions, but on how a project's emissions align with a net zero compatible trajectory. For EIA purposes, major adverse, moderate adverse and beneficial effects are considered to be significant.

1698. Mitigation measures to reduce the Project's GHG emissions will be considered throughout the assessment. IEMA's guidance (2022) highlights the importance of the GHG Management Hierarchy (eliminate, reduce, substitute and compensate) in minimising a project's emissions and considers the scale of mitigation efforts when assigning significance descriptions. The GHG assessment will identify opportunities for further emission reduction where practicable, especially during construction, and best practice carbon management measures based on the PAS2080 standard (BSI, 2023). This is in line with the NPS EN-1 requirements (DESNZ, 2023a), which note that energy infrastructure projects should drive down GHG emissions at every stage.

1699. The effect significance of the Project's GHG emissions will be evaluated by project phase, and overall significance will be determined by considering the net emissions, or whole lifecycle emissions minus the avoided emissions. To assist in evaluating effect significance, comparisons to the UK carbon budgets, net zero policies and targets and power sector decarbonisation plans will be undertaken. Additional parameters will also be calculated to contextualise the Project's predicted carbon benefits, including the lifecycle GHG intensity of electricity generated by the wind farm and the GHG payback period (RenewableUK, 2023). The GHG assessment will conclude whether and how the Project contributes to or undermines the UK's decarbonisation efforts and trajectory towards net zero.

9.4.2 Climate Change Resilience Assessment

9.4.2.1 Study Area

1700. The scope of the CCR assessment will be limited to evaluating the vulnerability and resilience of the Project and its receptors to the effects of climate change. Therefore, the Study Area for the CCR assessment is geographically bounded and will be defined within the Offshore Scoping Area (**Figure 1-1**) and Onshore Scoping Area (**Figure 1-2**).

- The temporal boundary of the CCR assessment will be defined by the project phases:
- The construction phase is assumed to start at the earliest in 2029 and last up to six years;
- The operational lifetime is assumed to be around 35 years; and
- The decommissioning phase is assumed to start at the end of the operational lifetime, and its duration will depend on the Project's end-of-life strategy. For EIA purposes, this is assumed to be similar in timescales as the construction period.

9.4.2.2 Existing Environment

1701. The CCR assessment will be informed by historical climate observations and future climate projections. The spatial resolution of the baseline data collected will provide representative coverage of climate conditions within the Study Area and the wider region.

1702. The current baseline climate will be defined using historical climate data maintained by the Met Office. Climate averages for the 1991 to 2020 period will be obtained from the nearest onshore climate stations to the Study Area (**Figure 9-2**) for temperature, precipitation and wind variables. Bridlington MRSC will be used for coastal areas and Leconfield Sar for inland areas within the Onshore Scoping Area.

1703. This will be supplemented with regional climate characteristics based on observations between 1981 and 2010 for Eastern England. For offshore areas, baseline information from the Offshore Energy SEA4 (BEIS, 2022c) will be reviewed, which provides meteorological conditions at sea for various offshore regions around the UK. The Offshore Scoping Area lies within Regional Seas 1 and 2 (**Figure 9-2**).

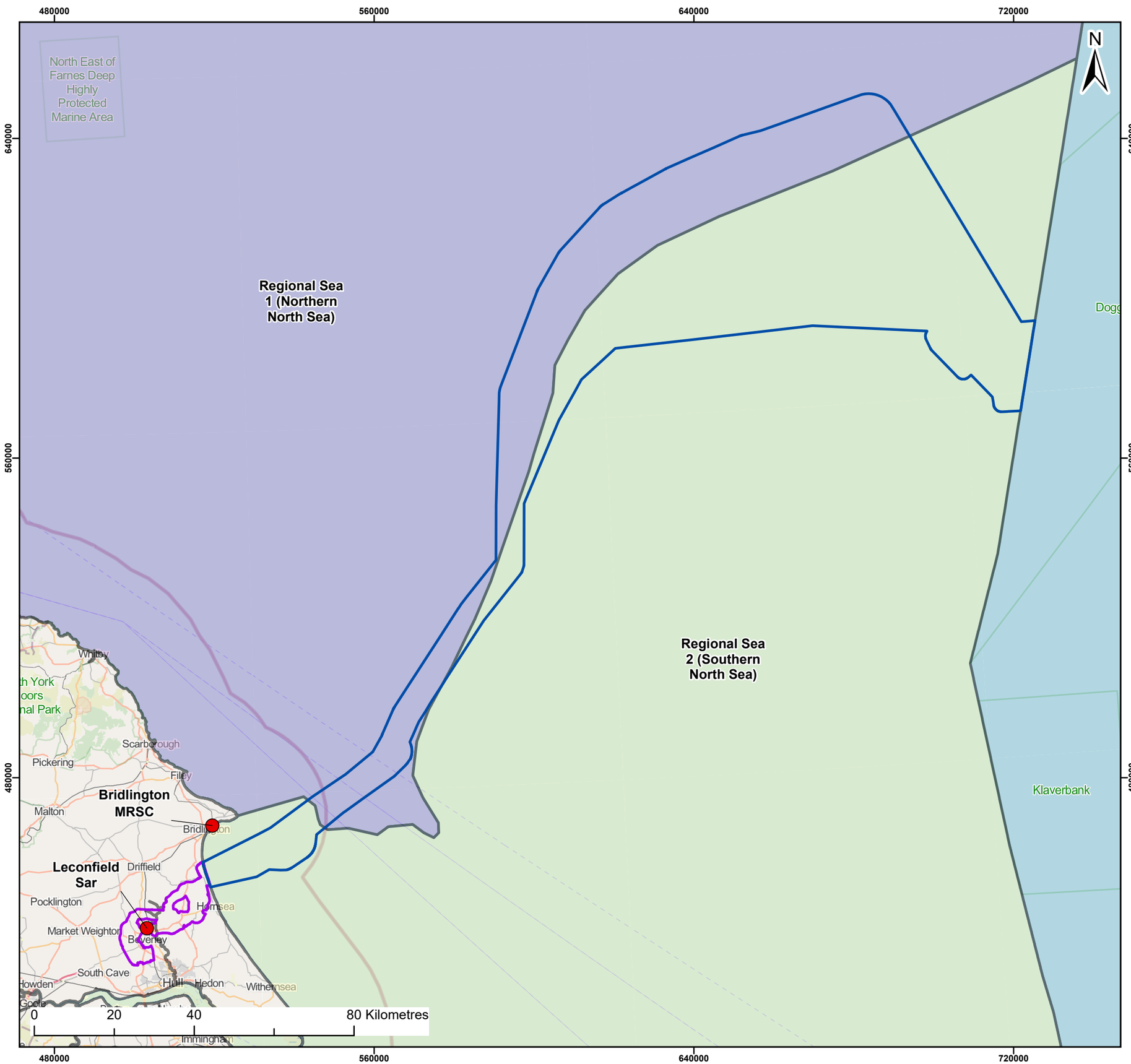
1704. To characterise the future baseline climate, representative time slices will be identified in alignment with the construction, operation and decommissioning phases. Climate projection data will be presented for each time slice to reflect increases in climate change severity over time and capture the likely climate conditions at each project phase.

1705. The Met Office's UK Climate Projection (UKCP) database provides probabilistic climate change projections for the UK at a spatial resolution of 25km grid squares, covering the period of 1961 to 2100. Probabilistic projections provide a broad range of possible climate outcomes and account for uncertainties in climate models.

1706. UKCP data uses Representative Concentration Pathways (RCP) which depict future atmospheric GHG concentration based on various emission reduction scenarios. For the CCR assessment, projection data will be obtained for RCP4.5 (intermediate scenario) and RCP8.5 (worst-case scenario) and presented at the 10th, 50th and 90th percentile where applicable. This approach is in line with best practice (IEMA, 2020) and NPS EN-1 requirements (DESNZ, 2023a) and provide a robust overview of the future baseline climate.

1707. To describe projected changes in air temperature, precipitation and wind variables at the local scale, it is assumed that projections for the grid square(s) closest to the Onshore and Offshore Scoping Areas would be broadly representative. It should be noted that the majority of UKCP data is land-based and thus do not provide direct coverage of offshore areas. Marine climate change projections, such as changes in sea temperature, sea level, tides and storm surges will be obtained from the Met Office's UKCP Marine Projections and other literature sources.

1708. Climate change projections are commonly provided as time series data. For the CCR assessment, data will be presented as anomaly change, or the change in climate averages relative to a baseline period of 1981 to 2010. The Project's construction, operation and decommissioning phases will be segmented into multi-year time slices (typically 20 to 30 year periods), depending on data availability, to illustrate differences in short-term, medium-term and long-term climate change.



Legend:

- Offshore Scoping Area
- Onshore Scoping Area
- The Met Office's Onshore Climate Stations

UK Offshore Energy Strategic Environmental Assessment 4's Regional Seas (Defra, 2022)

- Regional Sea 1 (Northern North Sea)
- Regional Sea 2 (Southern North Sea)

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Climate Stations and Regional Seas within the Climate Change Resilience Study Area

Figure:	Drawing No:				
9-2	PC3991-RHD-ON-ZZ-DR-Z-0034				
Revision:	**Date:**	**Drawn:**	**Checked:**	**Size:**	**Scale:**
01	10/06/2024	JH	AB	A3	1:950,000

Co-ordinate system: British National Grid

sse Renewables equinor

9.4.2.3 Potential Impacts

1709. The following key terms will be adopted for the CCR assessment, which are defined as follows:

- Climate variable: a measurable, monitorable aspect of the weather or climate such as temperature;
- Climate hazard: a weather or climate-related event or trend in the climate variable, such as storms, which has potential to adversely affect receptors; and
- Climate change impact: an impact from a climate hazard, such as asset damage, which results in harm to the receptor or hinders its ability to maintain its function or purpose.

1710. Receptors considered in the CCR assessment include:

- Infrastructure receptors such as offshore platforms, OCS(s) and other built assets, equipment and temporary structures;
- Human receptors such as site personnel; and
- Environmental receptors such as habitats associated with any ecological and landscaping mitigation and enhancement measures.

1711. **Table 9-11** identifies climate hazards, selected from the C40 Climate Hazard Taxonomy (2018) and the UK Climate Change Risk Assessment 3 (Jaroszweski *et al.* 2021), and potential climate change impacts which are included / excluded from the CCR assessment. Potential impacts can arise from both extreme weather events and chronic climatic changes.

Table 9-11 Potential Climate Hazards Included / Excluded from the Climate Change Resilience Assessment

Climate Hazard	Type of Climate Hazard	Rationale for Inclusion (✓) / Exclusion (X)	
Extreme precipitation (e.g. rain, snow)	Extreme weather event	✓	These climate hazards may result in likely significant effects to the Project. Potential climate change impacts include: • Delays to programme such as inability to undertake construction or maintenance activities; • Physical damage to built assets, equipment and temporary structures; • Increased maintenance, repair and replacement requirements due to faster asset deterioration;
Wind, lightning, fog (e.g. storm surges, thunderstorms)	Extreme weather event	✓	
Extreme temperatures (e.g. cold and heat waves)	Extreme weather event	✓	
Flooding (e.g. surface water, groundwater, coastal and river flooding)	Extreme weather event	✓	
Wildfires	Extreme weather event	✓	
Changes in climate norms and extreme weather events	Chronic climatic change	✓	• Reduced wind farm generation and electrical transmission efficiency and functioning from operational downtime; and • Occupational health and safety impacts to project personnel.
Sea level rise	Chronic climatic change	✓	
Changes in sea conditions (e.g. waves, salinity, acidity)	Chronic climatic change	✓	
Land changes (e.g. coastal erosion, subsidence)	Chronic climatic change	✓	
Mass movements (e.g. earthquakes, tsunamis)	Extreme weather event	X	The UK Continental Shelf does not sit on a major fault line between tectonic plates and primarily experiences low magnitude earthquakes annually, with moderate earthquakes as rare occurrences (BGS, 2024). It is unlikely that climate change will exacerbate the frequency or severity of earthquakes in the UK.
Water stress (e.g. drought, desertification)	Chronic climatic change	X	Project infrastructure does not rely heavily on a regular water supply. Therefore, this climate hazard is unlikely to result in a climate change impact to the Project.

9.4.2.4 Potential Cumulative Effects

1712. There is potential for cumulative effects to arise in which other projects or plans could act collectively to exacerbate the Project's vulnerability to climate change impacts. For instance, other projects may give rise to increased flood risk within the area. A high-level review of direct interdependencies with other critical infrastructure or activities, such as the UK electricity transmission network, will also be undertaken to identify the potential for cascading impacts and their combined effects on the Project's climate change resilience. Therefore, cumulative impacts are scoped into the CCR assessment.

9.4.2.5 Potential Transboundary Effects

1713. It is not relevant to assess transboundary effects relating to climate change resilience, as the assessment. focuses on the effects of climate change on the Project. Therefore, transboundary impacts are scoped out of the CCR assessment.

9.4.2.6 Approach to Data Gathering

1714. Desk-based sources used to characterise the existing environment and inform the CCR assessment will consist primarily of publicly available datasets and reports from government and industry sources. No baseline surveys are proposed for the CCR assessment**. Table 9-12** identifies desk-based sources for the CCR assessment, which will be updated throughout the EIA process.

Table 9-12 Desk-Based Data Sources for the Climate Change Resilience Assessment

Data Source	Year(s)	Data Contents
The Met Office's Land, Marine and GeoClimate UK Climate Projection (UKCP) and Supporting Reports	Various	Climate change projection data and summaries for the UK for various climate variables.
The Met Office's UK Climate Averages and Regional Climate Summaries	Various	Historical climate observations and recent weather records in the UK.
IPCC Sixth Assessment Report	Various	Current state of knowledge on climate science and possible climate futures.
Marine Climate Change Impacts Partnership (MCCIP) Reports	Various	A collection of evidence reviews and summary reports on climate change effects in the marine environment.
Offshore Energy SEA4 (BEIS, 2022c)	2022	Observed meteorological conditions at seas around the UK.
Offshore Wind Climate Adaptation and Resiliency Study (Weisenfeld *et al*. 2021)	2021	Review of key climate factors to the offshore wind sector and opportunities for climate resilience.
CCC's Independent Assessment of UK Climate Risk	Various	A collection of research outputs informing the UK Government's national Climate Change Risk Assessment.

9.4.2.7 Approach to Assessment

1715. A four-step methodology (**Plate 9-2**) will be adopted for the CCR assessment based on the IEMA's "Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation" (2020) and the European Commission's "Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021 – 2027" (2021).

1716. The initial stages of the assessment will involve a screening exercise of climate hazards which the Project may be vulnerable to and are likely to result in climate change impacts. If deemed necessary, a detailed risk assessment will be undertaken on impacts which are material to the Project to evaluate likely significant effects with respect to climate change resilience.

1717. It is anticipated that the potential for likely significant effects from climate change impacts would be highest over the Project's operational lifetime, given its duration and alignment with longer-term climate change. Therefore, the focus of the CCR assessment will be on the operation phase. Given the short duration of the construction and decommissioning phases and low potential for likely significant effects, a high-level CCR assessment will be undertaken only.

1718. The design of offshore wind farms and occupational health and safety requirements provide an inherent degree of climate change readiness and resilience. The CCR assessment will account for the Project's technical and design requirements and operational strategy, which are built upon best practice engineering codes and standards in the offshore wind sector, and standard health and safety procedures outlined in relevant management plans.

1719. Where likely significant effects are predicted, additional mitigation will be identified from available literature sources and in collaboration with the engineering team to ensure the Project's resilience. Accounting for uncertainties in longer-term climate change projections and their implications for the Project, monitoring and adaptive management measures will also be reviewed in line with IEMA's guidance (2020) to ensure mitigation is implemented where and when appropriate.

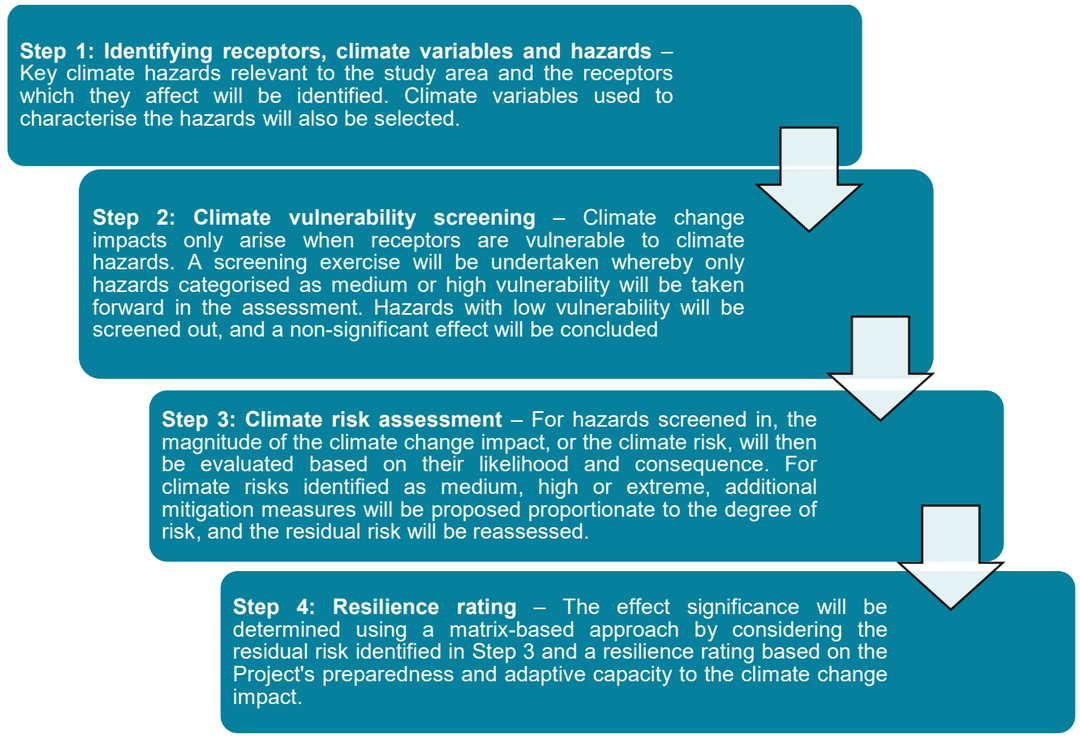


Plate 9-2 Climate Change Resilience Assessment Flowchart

9.4.3 Summary of Scoping Proposals

1720. **Table 9-13** outlines the climate change impacts which are proposed to be scoped in / out of the EIA. These may be refined through targeted consultation activities and as additional project information and site-specific data become available.

Table 9-13 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Climate Change

Potential Impact	Construction	Operation	Decommissioning
GHG Assessment			
Whole lifecycle GHG emissions	✓	✓	✓
Avoided emissions from the Project's operations	X	✓	X
Net contribution to the UK's trajectory towards net zero	✓	✓	✓
Cumulative effects	X	X	X
Transboundary effects	✓	✓	✓
CCR Assessment			
Vulnerability and resilience to climate change impacts	✓	✓	✓
Cumulative effects	✓	✓	✓
Transboundary effects	X	X	X

9.4.4 Scoping Questions to Consultees

1721. The following questions are posed to consultees to help them frame and focus their response to the climate change exercise, which will in turn inform the Scoping Opinion:

- Do you agree with the Study Area definitions and the characterisation of the existing environment?
- Have all receptors and potential impacts been identified in the Scoping Report?
- Do you agree with the GHG emission sources that have been scoped in / out of the GHG assessment?
- Do you agree with the climate hazards that have been scoped in / out of the CCR assessment?
- Have all relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

9.5 Major Accidents and Disasters

1722. This chapter of the Scoping Report considers the potential likely effects of the Project associated with major accidents and disasters, specifically in relation to the construction, operation and decommissioning of the Project. This includes all infrastructure within the Array Area, the offshore ECC, the onshore ECC and the OCS zone.

1723. Following guidance published by the IEMA on Major Accidents and Disasters in EIA (IEMA, 2020), it is proposed that consideration of major accidents and disasters within the EIA process is based on assessments conducted within individual technical chapters where this can be adequately covered by the scope of these chapters.

1724. The exception to this approach relates to the potential for the ESBI, which is part of the infrastructure within the OCS zone, where the specific nature of the ESBI infrastructure forms the basis of the major accidents and disasters assessment, and therefore, the ESBI is the focus of the rest of the chapter. This chapter of the Scoping Report is based upon the combined worst-case scenario as set out in **Chapter 3 Project Description**.

1725. With regards to the Offshore Scoping Area, in-line with the IEMA guidance (IEMA, 2020), the following potential accident / disasters will be considered within in their respective topic chapters, and no separate major accidents and disasters assessment will be considered in the PEIR and ES with regards to offshore infrastructure. These topic chapters include:

- Vessel collision and allision is considered within **Chapter 7.9 Shipping and Navigation**;
- Aviation safety is considered within **Chapter 7.10 Aviation, Radar and Military**;
- Exposed cables leading to vessel snagging is considered within **Chapter 7.8 Commercial Fisheries** and **Chapter 7.9 Shipping and Navigation;**
- Accidental pollution is considered within **Chapter 7.3 Marine Water and Sediment Quality**, **Chapter 8.2 Geology and Ground Conditions**, **Chapter 8.4 Water Resources and Flood Risk** and **Chapter 9.2 Human Health**; and
- Coastal erosion and flood risk is considered within **Chapter 7.2 Marine Physical Processes**, **Chapter 8.4 Water Resources and Flood Risk** and **Chapter 9.4 Climate Change**.

1726. The major accidents and disasters assessment is likely to have key inter-relationships with the following topics, which will be considered appropriately where relevant in the EIA:

- **Chapter 8.2 Geology and Ground Conditions;**
- **Chapter 8.3 Onshore Air Quality and Dust;**
- **Chapter 8.4 Water Resources and Flood Risk;**
- **Chapter 9.2 Traffic and Transport;** and
- **Chapter 9.4 Climate Change.**

9.5.1 Study Area

1727. The Major Accidents and Disaster Study Area (hereafter referred to as 'the Study Area') includes the Onshore Scoping Area (**Figure 1-2**), and the ESBI element of the OCS zone. Any major incidents, accidents or disasters which may arise have the potential to cause serious consequences within and beyond the boundaries of the infrastructure locations.

1728. The ESBI (as part of the OCS zone) will be located within the East Riding of Yorkshire. Therefore, the Study Area will consider potential infrastructure, human and sensitive ecological receptors within this area, and in particular those existing major accident hazard installations and properties in closest proximity to the ESBI up to 1km.

9.5.2 Existing Environment

1729. The baseline in respect of major accidents and disasters is defined based on the major accident hazard risks presented by existing operational installations, and external natural and anthropogenic factors (such as the vulnerability of the Project to natural disasters or to future climate change) which may give rise to effects on the Project.

1730. There are a number of establishments within the East Riding of Yorkshire which are regulated under the Control of Major Accident Hazards (COMAH) regime, as either 'Upper' or 'Lower Tier' Establishments.

1731. The sites are defined as such under Directive 2012/18/EU (the 'Seveso III' Directive), as transposed in the UK by the Control of Major Accident Hazards (COMAH) Regulations 2015. The regulations apply where there is a controlled quantity of a substance stored and / or used, and requirements include the preparation of a COMAH Safety Report, which must include a Major Accident Prevention Policy (MAPP), preparation and testing an on-site emergency plan, and making available relevant information to authorities and the public.

1732. The storage capacity of these establishments also usually requires that a Hazardous Substances Consent (HZSC) is in place, which is granted by the Hazardous Substances Authority (ERoY). In some cases, the same and other installations are also regulated under the Environmental Permitting regulatory regime and operate a prescribed activity according to permit conditions which, inter alia, require the application of 'best available techniques' (BAT) in the design technology and management systems, so as to prevent or minimise emissions.

1733. The potential risks to the ESBI associated with the operation of these existing regulated industries will be reviewed.

1734. The ESBI would not be located within an area generally known for natural disasters such as hurricanes, tornadoes, volcanic eruptions, earthquakes or tsunamis. The risk of flooding is most relevant, and such incidents and flooding and climate change trends will be identified from the flood risk assessment and CCR assessment.

9.5.3 Potential Impacts

9.5.3.1 Potential Impacts during Construction

1735. Health and safety during the construction phase within the Study Area will be subject to relevant legislation (e.g. the Construction Design and Management (CDM) Regulations 2023), and best practice. An Outline Code of Construction Practice (CoCP), which will be determined at the PEIR stage, will include the mitigation required for the construction phase.

1736. The potential environmental impacts associated with a major accident or disaster during construction are likely to be negligible.

1737. The ESBI element of the OCS zone will enter a commissioning phase and for the purposes of the EIA, these activities will be considered as part of the operation phase assessment.

1738. Impacts of major accidents and disasters during the construction phase of the Project is therefore proposed to be scoped out of the EIA.

9.5.4 Potential Impacts during Operation

1739. Potential accidents and environmental effects associated with the ESBI commissioning and operation phases may arise either from incidents on-site (e.g. overheating, accidental ignition and battery failure, all of which can lead to thermal runaway), incidents at other off-site installations which might affect the site, or from the vulnerability of the Project to the potential risks related to natural disasters. Accident or incident consequences could include damage to the ESBI element of the OCS zone, or infrastructure within the OCS zone and thereby fire and explosion hazards.

1740. Other potentially hazardous materials stored on the site, plus fire water, may be released, albeit in limited quantities which may impact the soils and groundwater if suitable containment and drainage infrastructure is not adequate. Off-site incidents may cause consequential damage to the ESBI element of the OCS zone, although this risk will depend on distance separation of the facility to any other major hazard installations in the vicinity.

1741. Potential operational risks from major accidents and disasters to / from the ESBI element of the OCS zone will be scoped into the EIA for further consideration.

9.5.5 Potential Impacts during Decommissioning

1742. It is anticipated that the decommissioning impacts would be similar in nature to those of construction, although the magnitude of impact has the potential to be higher. Decommissioning of the ESBI and infrastructure within the OCS zone will require the prior full removal of the batteries to an appropriately regulated waste facility. As stated above for the construction phase of the ESBI, relevant prevailing statutory health and safety requirements will be applied.

1743. The removal of the ESBI element of the OCS zone will require detailed consideration of environmental controls and management during decommissioning and that the closed site will present no future environmental risk.

1744. Potential decommissioning risks from major accidents and disasters to / from the ESBI element of the OCS zone will be scoped into the EIA for further consideration.

9.5.6 Potential Cumulative Effects

1745. There is potential for cumulative effects to arise in which other projects or plans could act collectively with the Project to affect major accidents and disaster receptors. Therefore, cumulative effects related to major accidents and disasters are scoped into the EIA. The CEA will follow the standard approach outlined in **Chapter 5 EIA Methodology**.

9.5.7 Potential Transboundary Effects

1746. The Study Area for this topic will adequately consider relevant off-site impacts and environmental effects, and any potential incidents are likely to affect only the surrounding industrial, commercial and residential communities and sensitive ecological sites. The likelihood of effects beyond the jurisdiction of East Riding of Yorkshire and therefore the UK is negligible.

1747. Therefore, there is no potential for transboundary effects upon major accidents and disaster receptors due to the Project's construction, O&M and decommissioning activities, and all transboundary impacts are scoped out of the EIA.

9.5.8 Summary of Scoping Proposals

1748. **Table 9-14** outlines the major accidents and disasters impacts which are proposed to be scoped in or out of the EIA. These may be refined through the EPP and other consultation activities, and as additional Project information and site-specific data become available.

Table 9-14 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Major Accidents and Disasters

Potential Impact	Construction	Operation	Decommissioning
Major accident or disaster impact arising from the ESBI element of the OCS zone upon the Project site, human or ecological receptors	X	✓ (Including commissioning activities)	✓
Impact of an incident associated with an existing major accident hazard risk on the ESBI element of the OCS zone	X	✓ (Including commissioning activities)	✓

Potential Impact	Construction	Operation	Decommissioning
Impact of natural hazards on the ESBI element of the OCS zone	X	✓ (Including commissioning activities)	✓
Cumulative impacts	X	✓ (Including commissioning activities)	✓
Transboundary impacts	X	X	X

9.5.9 Approach to Data Gathering

1749. Identification of potential sensitive receptors will be undertaken and will comprise existing major accident hazard facilities, residential settlements and sensitive ecological sites. The consideration of natural events, and evidence that the development of the Project itself will be resilient to climate change and flooding, will largely be drawn from conclusions of other relevant ES chapters as previously set out.

1750. Information will be sourced from the COMAH 2015 Public Information Search (HSE, 2024) and the Environment Agency's public register (Environment Agency, 2024). Other relevant information will be available from the National Risk Register (2023), aerial photography and publicly available mapping websites (e.g. Defra Magic Map, Environment Agency Flood Risk for Planning).

9.5.10 Approach to Assessment

1751. The main procedural guidelines of IEMA's 'Major Accidents and Disasters in EIA' Primer will be followed (IEMA, 2020). *Where safety is scoped into an EIA, the Guidance states that: 'even in circumstances when the topic is scoped into the assessment, it is likely that it can be limited to specific elements of the development or the baseline environment and therefore remain limited in scope'*.

1752. Major accidents and disasters will not be included within the EPP (as set out in **Chapter 6 Consultation**). However, liaison with key stakeholders, including the HSE, Environment Agency and Fire & Rescue Service, can be established to agree the approach to data collection, and the specific assessment methods to be employed as part of the EIA as part of this process if required.

9.5.11 Scoping Questions to Consultees

1753. The following questions are posed to consultees to help them frame and focus their response to the major accidents and disasters scoping exercise, which will in turn inform the Scoping Opinion:

- Do you agree with the characterisation of the existing environment?
- Have all the major accidents and disasters impacts resulting from the Project been identified in the Scoping Report?
- Do you agree with the major accidents and disasters impacts that have been scoped in for / out from further consideration within the EIA?
- Have all the relevant data sources been identified in the Scoping Report?
- Do you agree with the proposed assessment approach?

10 Inter-Relationships

1754. The EIA will identify and assess inter-relationships between the different receptors that are likely to arise from the construction, operation and decommissioning of the Project. Inter-relationships relevant to the Project are outlined in **Table 10-1**, which will be considered further in the relevant EIA topic chapter as the assessment is undertaken. The objective of the consideration of inter-relationships will be to identify where there are multiple residual impacts on a single receptor. Where a relationship between multiple impacts is identified, the need for amended or additional mitigation will be considered. It should be noted that the assessment inter-relationships will only consider impacts associated with the Project rather than those from other projects which will be covered within the CEA.

Table 10-1 Summary of Inter-Relationships

EIA Topic	Inter-Relationships
Offshore Topics	
Marine Physical Processes	Chapter 7.3 Marine Water and Sediment Quality; Chapter 7.4 Benthic and Intertidal Ecology; Chapter 7.5 Fish and Shellfish Ecology; and Chapter 7.11 Offshore Archaeology and Cultural Heritage.
Marine Water and Sediment Quality	Chapter 7.2 Marine Physical Processes; Chapter 7.4 Benthic and Intertidal Ecology; Chapter 7.5 Fish and Shellfish Ecology; Chapter 7.6 Marine Mammals; and Chapter 7.7 Intertidal and Offshore Ornithology.
Benthic and Intertidal Ecology	Chapter 7.2 Marine Physical Processes; Chapter 7.3 Marine Water and Sediment Quality; and Chapter 7.5 Fish and Shellfish Ecology.
Fish and Shellfish Ecology	Chapter 7.2 Marine Physical Processes; Chapter 7.3 Marine Water and Sediment Quality; Chapter 7.4 Benthic and Intertidal Ecology; Chapter 7.6 Marine Mammal; Chapter 7.7 Intertidal and Offshore Ornithology; and Chapter 7.8 Commercial Fisheries.
Marine Mammals	Chapter 7.2 Marine Physical Processes; Chapter 7.3 Marine Water and Sediment Quality; Chapter 7.4 Benthic and Intertidal Ecology; Chapter 7.5 Fish and Shellfish Ecology; Chapter 7.87.8 Commercial Fisheries; and Chapter 7.9Shipping and Navigation.
Intertidal and Offshore Ornithology	Chapter 7.2 Marine Physical Processes; Chapter 7.3 Marine Water and Sediment Quality; Chapter 7.4 Benthic and Intertidal Ecology; Chapter 7.5 Fish and Shellfish Ecology; Chapter 7.9 Shipping and Navigation; Chapter 7.13 Other Marine Users; and Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation.
Commercial Fisheries	Chapter 7.5 Fish and Shellfish Ecology; Chapter 7.9 Shipping and Navigation; Chapter 7.13 Other Marine Users.
Shipping and Navigation	Chapter 7.8 Commercial Fisheries; and Chapter 7.13 Other Marine Users.
Aviation, Radar and Military	Chapter 7.7 Intertidal and Offshore Ornithology; Chapter 7.9 Shipping and Navigation; Chapter 7.12 Seascape, Landscape and Visual Impact; and Chapter 7.13 Other Marine Users.
Offshore Archaeology and Cultural Heritage	Chapter 7.2 Marine Physical Processes; and Chapter 8.7 Onshore Archaeology and Cultural Heritage.
Seascape, Landscape and Visual Impact	Chapter 7.11 Offshore Archaeology and Cultural Heritage; Chapter 7.13 Other Marine Users; and Chapter 8.10 Landscape and Visual Impact.
Other Marine Users	Chapter 7.8 Commercial Fisheries; Chapter 7.9 Shipping and Navigation; and Chapter 7.10 Aviation, Radar and Military.
Offshore Air Quality	All offshore airborne impacts associated with the Project, including inter-relationships, are scoped out of the EIA.
Offshore Airborne Noise	All offshore airborne impacts associated with the Project, including inter-relationships, are scoped out of the EIA.

EIA Topic	Inter-Relationships
Onshore Topics	
Geology and Ground Conditions	Chapter 8.4 Water Resources and Flood Risk; Chapter 8.5 Soils and Land Use; and Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation.
Onshore Air Quality and Dust	Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation; Chapter 8.9 Traffic and Transport; and Chapter 9.2 Human Health.
Water Resources and Flood Risk	Chapter 8.2 Geology and Ground Conditions; Chapter 8.5 Soils and Land Use; Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation; and Chapter 9.4 Climate Change.
Soils and Land Use	Chapter 8.2 Geology and Ground Conditions; Chapter 8.4 Water Resources and Flood Risk; Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation; Chapter 8.9 Traffic and Transport; and Chapter 9.3 Socio-Economics, Tourism and Recreation.
Onshore Ecology, Ornithology and Nature Conservation	Chapter 7.7 Intertidal and Offshore Ornithology; Chapter 8.2 Geology and Ground Conditions; Chapter 8.3 Onshore Air Quality and Dust; Chapter 8.4 Water Resources and Flood Risk; Chapter 8.5 Soils and Land Use; and Chapter 8.8 Onshore Noise and Vibration.
Onshore Archaeology and Cultural Heritage	Chapter 7.11 Offshore Archaeology and Cultural Heritage; Chapter 8.4 Water Resources and Flood Risk; Chapter 8.8 Onshore Noise and Vibration; Chapter 8.9 Traffic and Transport; and Chapter 8.10 Landscape and Visual Impact.
Onshore Noise and Vibration	Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation; Chapter 8.9 Traffic and Transport; and Chapter 9.2 Human Health.
Traffic and Transport	Chapter 8.3 Onshore Air Quality and Dust;
	Chapter 8.5 Soils and Land Use; Chapter 8.8 Onshore Noise and Vibration; Chapter 9.2 Human Health; and Chapter 9.4 Climate Change.
Landscape and Visual Impact	Chapter 7.12 Seascape, Landscape and Visual Impact; Chapter 8.5 Soils and Land Use; Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation; Chapter 8.7 Onshore Archaeology and Cultural Heritage; Chapter 8.9 Traffic and Transport; and Chapter 9.3 Socio-economics, Tourism, and Recreation.
Project-Wide Topics	
Human Health	Chapter 7.3 Marine Water and Sediment Quality; Chapter 8.3 Onshore Air Quality and Dust; Chapter 8.4 Water Resources and Flood Risk; Chapter 8.8 Onshore Noise and Vibration; Chapter 8.9 Traffic and Transport; Chapter 8.10 Landscape and Visual Impact; Chapter 9.3 Socio-Economics, Tourism and Recreation; Chapter 9.4 Climate Change; and Chapter 9.4 Major Accidents and Disasters.
Socio-Economics, Tourism and Recreation	Chapter 7.8 Commercial Fisheries; Chapter 7.9 Shipping and Navigation; Chapter 7.12 Seascape, Landscape and Visual Impact; Chapter 7.13 Other Marine Users; Chapter 8.5 Soils and Land Use; Chapter 8.7 Onshore Archaeology and Cultural Heritage; Chapter 8.8 Onshore Noise and Vibration; Chapter 8.9 Traffic and Transport; Chapter 8.10 Landscape and Visual Impact; and Chapter 9.2 Human Health.
Climate Change	No inter-relationships have been identified for the GHG assessment. For the CCR assessment, the following inter-relationship applies: Chapter 7.2 Marine Physical Processes;

EIA Topic	Inter-Relationships
	Chapter 8.2 Geology and Ground Conditions; Chapter 8.4 Water Resources and Flood Risk; Chapter 9.2 Human Health; and Chapter 9.5 Major Accidents and Disasters.
Major Accidents and Disasters	Chapter 8.2 Geology and Ground Conditions; Chapter 8.3 Onshore Air Quality and Dust; Chapter 8.4 Water Resources and Flood Risk; Chapter 8.9 Traffic and Transport; and Chapter 9.4 Climate Change.

11 Transboundary Impacts

1755. The EIA will identify and assess transboundary effects that are likely to arise from the construction, operation and decommissioning of the Project. **Table 11-1** outlines the EIA topics in which transboundary impacts have been scoped in for / out from further consideration within the EIA.

Table 11-1 Summary of Transboundary Impacts Proposed to be Scoped In (✓) and Out (X)

EIA Topic	Construction	Operation	Decommissioning
Offshore Topics			
Marine Physical Processes	X	✓	X
Marine Water and Sediment Quality	X	X	X
Benthic and Intertidal Ecology	✓	✓	✓
Fish and Shellfish Ecology	✓	✓	✓
Marine Mammals	✓	✓	✓
Intertidal and Offshore Ornithology	✓	✓	✓
Commercial Fisheries	✓	✓	✓
Shipping and Navigation	✓	✓	✓
Aviation, Radar and Military	✓	✓	✓
Offshore Archaeology and Cultural Heritage	✓	✓	✓
Seascape, Landscape and Visual Impact	X	X	X
Other Marine Users	✓	✓	✓
Offshore Air Quality	X	X	X
Offshore Airborne Noise	X	X	X
Onshore Topics			
Transboundary effects are not considered to be relevant to onshore environmental topics, due to the distance of the impact source from the international boundaries of other European Economic Area (EEA) Member States.			
Project Wide Topics			
Human Health	X	X	X
Socio-Economics, Tourism and Recreation	X	X	X
Climate Change	✓ (GHG Assessment only)	✓ (GHG Assessment only)	✓ (GHG Assessment only)
Major Accidents and Disasters	X	X	X

12 Summary and Conclusions

1756. The information set out in this Scoping Report identifies the potential impacts that are likely to arise from the construction, operation and decommissioning of the Project. The scoping exercise undertaken is based on an understanding of the environmental conditions likely to be encountered within the relevant study areas and the anticipated nature of potential impacts, utilising publicly available data sources and expert judgment.

1757. **Table 12-1** summarises the potential impacts related to the Project that have been scoped in for further consideration within the EIA. All impacts that have been scoped in are considered to represent potential likely significant effects under Regulation 10 of the Infrastructure Planning (EIA) Regulations 2017. Where potential impacts have been scoped out, justification has been provided within the relevant chapter:

- **Chapter 7.2 Marine Physical Processes;**
- **Chapter 7.3 Marine Water and Sediment Quality;**
- **Chapter 7.4 Benthic and Intertidal Ecology;**
- **Chapter 7.5 Fish and Shellfish Ecology;**
- **Chapter 7.6 Marine Mammals;**
- **Chapter 7.7 Offshore and Intertidal Ornithology;**
- **Chapter 7.8 Commercial Fisheries;**
- **Chapter 7.9 Shipping and Navigation;**
- **Chapter 7.10 Aviation, Radar and Military;**
- **Chapter 7.11 Offshore Archaeology and Cultural Heritage;**
- **Chapter 7.12 Seascape, Landscape and Visual Impacts;**
- **Chapter 7.13 Other Marine Users;**
- **Chapter 7.14 Offshore Air Quality;**
- **Chapter 7.15 Offshore Airborne Noise;**
- **Chapter 8.2 Geology and Ground Conditions;**
- **Chapter 8.4 Water Resources and Flood Risk;**
- **Chapter 8.5 Soils and Land Use;**
- **Chapter 8.6 Onshore Ecology, Ornithology and Nature Conservation;**
- **Chapter 8.7 Onshore Archaeology and Cultural Heritage;**
- **Chapter 8.8 Onshore Noise and Vibration;**
- **Chapter 8.9 Traffic and Transport;**
- **Chapter 8.10 Landscape and Visual Impacts;**
- **Chapter 9.2 Human Health;**
- **Chapter 9.3 Socio-Economics, Tourism and Recreation;**
- **Chapter 9.4 Climate Change;** and
- **Chapter 9.5 Major Accidents and Disasters.**

1758. Consultees are invited to consider all of the information provided in the Scoping Report and provide comments on the proposed scope and approach for each EIA topic related to the Project. Guiding questions for consultees are provided at the end of each topic chapter, which have been designed to focus the review on the key elements of each topic and seek agreement on their conclusions.

Table 12-1 Summary of Potential Impacts Associated with the Project

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Offshore Topics			
Marine Physical Processes			
Impacts on waves and tidal currents	X	✓	X
Impacts on bedload sediment transport at the landfall	✓	✓	✓
Impacts on bedload sediment transport and seabed morphological change offshore	✓	✓	✓
Impacts on suspended sediment concentrations	✓	✓	✓
Indentations on the seabed due to installation vessels	✓	✓	✓
Indentations on the seabed due to repair and maintenance vessels	X	✓	X

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Impacts on water circulation (Flamborough Front)	X	✓	X
Cumulative impacts	✓	✓	✓
Transboundary impacts	X	✓	X
Marine Water and Sediment Quality			
Remobilisation of existing contaminated sediments – Array Area	X	X	X
Remobilisation of existing contaminated sediments – Offshore ECC	✓	X	X
Accidental pollution	X	X	X
Cumulative impacts	X	X	X
Transboundary impacts	X	X	X
Benthic and Intertidal Ecology			
Temporary habitat loss / physical disturbance	✓	✓	✓
Long-term habitat loss / alteration	X	✓	✓
Increased suspended sediments and sediment re-deposition	✓	✓	✓
Remobilisation of contaminated sediments (DBD Array Area)	X	X	X
Remobilisation of contaminated sediments if present (offshore ECC)	✓	X	✓
Pollution events resulting from the accidental release of pollutants	X	X	X

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Underwater noise and vibration	✓	X	✓
Interactions of EMF, including potential cumulative EMF effects	X	✓	X
Introduction of marine INNS from vessel traffic	X	X	X
Sediment heating from export cables	X	X	X
Colonisation of introduced substrate	X	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	✓	✓	✓
Fish and Shellfish Ecology			
Accidental release of pollutants	X	X	X
Temporary habitat loss / physical disturbance	✓	✓	✓
Habitat loss / alteration	X	✓	✓
Increased suspended sediment and sediment-redeposition	✓	✓	✓
Remobilisation of contaminated sediments if present (array area)	X	X	X
Remobilisation of contaminated sediments if present (offshore ECC only)	✓	X	X
Underwater noise and vibration	✓	✓	✓
Changes in fishing pressure	✓	✓	✓

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
EMF effects	X	✓	X
Sediment heating from export cables	X	X	X
Introduction of hard substrate	X	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	✓	✓	✓
Marine Mammals			
Underwater noise: physical and auditory injury resulting from impact piling during construction	✓	X	X
Underwater noise: behavioural impacts resulting from impact piling during construction	✓	X	X
Underwater noise: physical and auditory injury resulting from operational wind turbine noise	X	✓	X
Underwater noise: behavioural impacts resulting from operational wind turbine noise	X	✓	X
Underwater noise: physical and auditory injury resulting from noise associated with other construction and maintenance activities (such as dredging and rock placement) and vessel noise	✓	✓	✓

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Underwater noise: behavioural impacts resulting from other construction and maintenance activities (such as dredging and rock placement), and vessel noise (including disturbance to foraging areas)	✓	✓	✓
Underwater noise: barrier effects	✓	✓	✓
Disturbance at seal haul-out sites	✓	✓	✓
Vessel interaction (increase in risk of collision)	✓	✓	✓
Changes to prey resource	✓	✓	✓
Changes to water quality (sediment bound contaminants) in the Array Area	X	X	X
Changes to water quality (sediment bound contaminants) in the ECC	✓	X	X
Physical barrier effect	X	✓	X
Effects from EMF	X	X	X
Cumulative impacts	✓	✓	✓
Transboundary impacts	✓	✓	✓
Offshore and Intertidal Ornithology			

Potential Impact		Scoped in (✓) or out (X)		
		Construction	Operation	Decommissioning
Direct disturbance and displacement due to work activity in the Array Area, offshore ECC or landfall	Intertidal and Offshore	✓	✓	✓
Direct disturbance and displacement due to presence of wind turbines and other offshore infrastructure	Offshore (red-throated diver, gannet, auks)	✓	✓	✓
Barrier effect due to presence of wind turbines and other offshore infrastructure	Offshore (including migratory non-seabirds)	x	✓	x
Accidental pollution		x	x	x
Indirect Impacts via Habitats or Prey Availability	Intertidal and Offshore	✓	✓	✓
Collision risk	Offshore (gulls, skuas, gannet, migratory non-seabirds)	x	✓	x

Potential Impact		Scoped in (✓) or out (X)		
		Construction	Operation	Decommissioning
Cumulative impacts	Intertidal and Offshore	✓	✓	✓
Transboundary impacts	Offshore	✓	✓	✓
Commercial Fisheries				
Reduction in access to, or exclusion from established fishing grounds	Mobile gear fleets in the Dogger Bank byelaw area	**x**	**x**	**x**
	All other fleets	✓	✓	✓
Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	All fleets	✓	✓	✓
Displacement or disruption of commercially important fish and shellfish resources	All fleets	✓	✓	✓

Potential Impact		Scoped in (✓) or out (X)		
		Construction	Operation	Decommissioning
Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity	All fleets	✓	✓	✓
Additional steaming to alternative fishing grounds	Mobile gear fleets in the Dogger Bank byelaw area	X	X	X
	All other fleets	✓	✓	✓
Physical presence infrastructure leading to gear snagging	Mobile gear fleets in the Dogger Bank byelaw area	X	X	X
	All other fleets	X	✓	✓
Cumulative impacts	All fleets	✓	✓	✓
Transboundary impacts	All fleets	✓	✓	✓
Shipping and Navigation				
Vessel displacement due to construction activities or the presence of the Project		✓	✓	✓
Increased vessel to vessel collision risk between third-party vessels due to vessel displacement		✓	✓	✓
Vessel to vessel collision between a third-party vessel and a project vessel		✓	✓	✓
Vessel to structure allision risk for third party vessels due to the presence of project structures		X	✓	X
Reduction in under keel clearance due to the presence of cable protection or cable crossings		X	✓	X
Vessel interaction with sub-sea cables associated with the Project		X	✓	X
Interference with vessel navigation and communication equipment due to the Project		X	✓	X
Reduction of emergency response capability due to increased incident rates and / or reduced access for S&R responders		X	✓	X
Cumulative impacts		✓	✓	✓
Transboundary impacts		✓	✓	✓
Aviation, Radar and Military				
Impacts on military and civil radar		X	X	X
Impacts on radio navigation aids		X	X	X
Creation of an aviation obstacle environment		✓	✓	✓

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Increased air traffic in the area related to wind farm activities	✓	✓	✓
Impact of the offshore export cable route on Staxton Wold Danger Area activities	✓	X	✓
Impact of onshore infrastructure on airfield operations	✓	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	✓	✓	✓
Offshore Archaeology and Cultural Heritage			
Direct impacts to heritage assets	✓	✓	✓
Indirect impacts to heritage assets associated with changes to marine physical processes	✓	✓	✓
Change to the setting of heritage assets, which could affect their heritage significance	X	✓	X
Change to character which could affect perceptions of the historic seascape character	X	✓	X
Cumulative impacts	✓	✓	✓
Transboundary impacts (direct and indirect)	✓	✓	✓
Seascape, Landscape and Visual Impacts (Offshore & Landfall only)			
Seascape character	X	X	X
Landscape character and designated landscapes	X	X	X
Visual receptors	X	X	X
Cumulative impacts	X	X	X
Transboundary impacts	X	X	X
Other Marine Users			
Potential interference with other wind farms	✓	✓	✓
Potential interference with oil and gas activities	✓	X	✓
Physical impacts on sub-sea cables and pipelines	✓	X	✓
Impacts on CCS sites	✓	X	✓
Impacts on aggregate dredging activities	X	X	X
Impacts on disposal sites	X	X	X
Impacts of MoD activities	✓	X	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	✓	✓	✓
Offshore Air Quality			
Impacts on human receptors	X	X	X
Impacts on ecological receptors	X	X	X
Cumulative impacts	X	X	X

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Transboundary impacts	X	X	X
Offshore Airborne Noise			
Impacts on human receptors	X	X	X
Impacts on marine ecological receptors	X	X	X
Cumulative impacts	X	X	X
Transboundary impacts	X	X	X
Onshore Topics			
Geology and Ground Conditions			
Impacts to human health both on and off site from contamination sources	✓	✓	✓
Direct impacts on groundwater quality and groundwater resources from contamination sources and construction methods	✓	✓	✓
Impacts on surface water quality and the ecological habitats they support, from contamination	✓	✓	✓
Physical impacts on geologically designated sites	✓	✓	✓
Loss, damage or sterilisation of mineral resources	✓	✓	✓
Impacts to the built environment	✓	✓	✓
Impacts to agricultural land	✓	✓	✓
Cumulative impacts	✓	✓	✓

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Onshore Air Quality and Dust			
Impacts of emissions of dust on human and ecological receptors	✓	X	✓
Impacts of emissions from plant and machinery on human health and ecological sites	✓	X	✓
Impacts of emissions from road traffic on human health and ecological sites	✓	X	✓
Cumulative impacts	✓	X	✓
Water Resources and Flood Risk			
Direct disturbance of surface water bodies	✓	X	✓
Increased sediment supply	✓	X	✓
Supply of contaminants to surface and groundwater	✓	✓	✓
Changes to surface and groundwater flows and flood risk	✓	✓	✓
Cumulative impacts	✓	✓	✓
Soils and Land Use			
Agricultural drainage	✓	✓	✓
Disruption to farming practices (in general)	✓	✓ (buried infrastructure may be scoped out once cable burial depths are confirmed)	✓

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Disruption to farming practices (soil heating)	X	X	X
Soil degradation and erosion	✓	X	✓
Stewardship and land management schemes	✓	✓	✓
Existing utilities	✓	X	✓
PRoWs,cycle routes and CRoW	✓	✓ (for PRoWs and NCNs in relation to the OCS(s) and infrastructure within the OCS zone only)	✓
Cumulative impacts	✓	✓	✓
Onshore Ecology, Ornithology and Nature Conservation			
Direct and indirect impacts to designated sites	✓	✓	✓
Direct impacts to habitats	✓	✓	✓
Direct and indirect impacts on legally protected species	✓	✓	✓
Spread of INNS	✓	✓	✓
Cumulative impacts	✓	✓	✓
Onshore Archaeology and Cultural Heritage			
Physical impacts to designated heritage assets	✓	X	X
Physical impacts to known and unknown non-designated heritage assets	✓	X	X

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Changes to the setting of designated heritage assets, which could affect their heritage significance	✓	✓	✓
Changes to the setting of non- designated heritage assets, which could affect their heritage significance	✓	✓	✓
Change to the setting of historic landscapes, which could affect their heritage significance	✓	✓	X
Cumulative impacts	✓	✓	✓
Onshore Noise and Vibration			
Noise affecting NVSRs	✓	✓ (OCS(s) and associated infrastructure only)	✓
Vibration affecting NVSRs	✓	X	✓
Road traffic noise affecting NVSRs	✓	✓	✓
Road traffic vibration affecting NVSRs	X	X	X
Cumulative impacts	✓	✓	✓
Traffic and Transport			
Severance	✓	X	✓
Amenity	✓	X	✓
Fear and Intimidation	✓	X	✓

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Road safety (including consideration of hazardous loads)	✓	✓ (Related to ESBI only)	✓
Driver delay (capacity)	✓	X	✓
Driver delay (highway constraints)	✓	X	✓
Abnormal loads	✓	X	✓
Hazardous loads	X	X	X
Cumulative impacts	✓	X	✓
Landscape and Visual Impacts			
Landscape character and designated landscapes (resulting from the landfall and onshore export cables)	✓	X	X
Landscape character and designated landscapes (resulting from the OCS(s) and infrastructure within the OCS zone)	✓	✓	✓
Visual receptors (resulting from the landfall and onshore export cables)	✓	X	X
Visual receptors (resulting from the OCS(s) and infrastructure within the OCS zone)	✓	✓	✓
Cumulative impacts (resulting from the landfall and onshore export cables)	✓	X	X
Cumulative impacts (resulting from the OCS(s) and infrastructure within the OCS zone)	✓	✓	✓

Potential Impact		Scoped in (✓) or out (X)		
		Construction	Operation	Decommissioning
Project-Wide Topics				
Human Health				
Social Environment				
Housing	Offshore and Onshore	X	X	X
Open space, leisure and play	Offshore	X	X	X
	Onshore	✓	X	✓
Transport modes, access and connections	Offshore	X	X	X
	Onshore	✓	X	✓
Community safety	Offshore and Onshore	X	X	X
Community identity, culture, resilience and influence	Offshore	X	X	X
	Onshore	X	✓	X
Economic Environment				
Education and training	Offshore and Onshore	✓	✓	✓
Employment and income	Offshore and Onshore	✓	✓	✓
Unemployment or Adverse Economic Implications	Offshore and Onshore	X	X	X
Bio-Physical Environment				
Climate change and adaptation	Offshore	X	✓	X
	Onshore	X	✓	X

Potential Impact		Scoped in (✓) or out (X)		
		Construction	Operation	Decommissioning
Air quality	Offshore	X	X	X
	Onshore	✓	X	✓
Water quality or availability	Offshore	X	X	X
	Onshore	✓	X	✓
Land quality	Offshore and Onshore	X	X	X
Noise and vibration	Offshore	X	X	X
	Onshore	✓	✓	✓
Radiation (actual EMF risk)	Offshore	X	X	X
	Onshore	X	X	X
Radiation (public understanding of EMF risk)	Offshore	X	X	X
	Onshore	X	✓	X
Institutional and Built Environment				
Health and social care services	Offshore and Onshore	X	X	X
Built environment	Offshore	X	X	X
	Onshore	X	✓	X
Cumulative and Transboundary Impacts				
Cumulative impacts	Offshore and Onshore	✓	✓	✓
Transboundary impacts	Offshore and Onshore	X	X	X
Socio-Economics, Tourism and Recreation				

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Direct economic benefit (supply chain)	✓	✓	✓
Increased employment	✓	✓	✓
Loss of, disruption to or pressure on local infrastructure and services	✓	X	✓
Disturbance (noise, air, visual and traffic) to social infrastructure	✓	✓ (Related to onshore infrastructure only)	✓
Disruption to recreational activities	✓	✓ (Related to onshore infrastructure only)	✓
Disruption to the tourism industry	✓	✓ (Related to onshore infrastructure only)	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	X	X	X
Climate Change			
GHG Assessment			
Whole lifecycle GHG emissions	✓	✓	✓
Avoided emissions from the provision of renewable energy	X	✓	X
Net contribution to the UK's trajectory towards net zero	✓	✓	✓
Cumulative effects	X	X	X

Potential Impact	Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning
Transboundary effects	✓	✓	✓
CCR Assessment			
Vulnerability and resilience to climate change impacts	✓	✓	✓
Cumulative effects	✓	✓	✓
Transboundary effects	X	X	X
Major Accidents and Disasters			
Major accident or disaster impact arising from the ESBI element of the OCS zone upon the Project site, human or ecological receptors	X	✓ (Including commissioning activities)	✓
Impact of an incident associated with an existing major accident hazard risk on the ESBI element of the OCS zone	X	✓ (Including commissioning activities)	✓
Impact of natural hazards on the ESBI element of the OCS zone	X	✓ (Including commissioning activities)	✓
Cumulative impacts	X	✓ (Including commissioning activities)	✓
Transboundary impacts	X	X	X

Table 12-2 Key for summary table comparing the 2023 and 2024 Scoping Report

Colour	Meaning
	Denotes a change to the consideration of a potential impact from the 2023 Scoping Report
	Denotes a change to the scoping in / out of the potential impact from the 2023 Scoping Report

1759. **Table 12-3** compares the potential offshore impacts of the 2023 Scoping Report to the 2024 Scoping Report for the offshore topics. Due to the spatial and design differences between the Project described in the 2023 Scoping Report and the Project described within the 2024 Scoping Report, a comparison has not been included for the onshore and project wide topics. **Table 12-2** presents a key to explain the use of colours within **Table 12-3**.

Table 12-3 Changes in Potential Impacts Associated with the Project from the 2023 Scoping Report

Potential Impact	2023 Scoping Report - Scoped in (✓) or out (X)			2024 Scoping Report - Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Offshore Topics						
Marine Physical Processes						
Impacts on waves and tidal currents	X	✓	X	X	✓	X
Impacts on bedload sediment transport at the landfall	Not considered in the 2023 Scoping Report			✓	✓	✓
Impacts on bedload sediment transport and seabed morphological change offshore	✓	✓	✓	✓	✓	✓
Impacts on suspended sediment concentrations	✓	✓	✓	✓	✓	✓
Indentations on the seabed due to installation vessels	✓	✓	✓	✓	✓	✓
Indentations on the seabed due to repair and maintenance vessels	Not considered in the 2023 Scoping Report			X	✓	X
Impacts on coastal and nearshore sediment transport due to marine outfalls and intakes for the Hydrogen Production Facility (HPF)	X	✓	X	Not considered in the 2024 Scoping Report		
Impacts on water circulation (Flamborough Front)	Not considered in the 2023 Scoping Report			X	✓	X
Cumulative impacts	✓	✓	✓	✓	✓	✓
Transboundary impacts	X	X	X	X	X	X
Marine Water and Sediment Quality						
Localised temporary increases in suspended sediments.	✓ (HPF and ECC only)	X	✓ (HPF and inshore ECC only)	Not considered in the 2024 Scoping Report		
Remobilisation of existing contaminated sediments	✓ (HPF and inshore ECC only)	X	✓ (HPF and inshore ECC only)	Assessed separately in the 2024 Scoping Report		
Remobilisation of existing contaminated sediments – Array Area	Not considered in the 2023 Scoping Report			X	X	X
Remobilisation of existing contaminated sediments – Offshore ECC	Not considered in the 2023 Scoping Report			✓	X	X
Accidental pollution	X	X	X	X	X	X
Reduction in marine water quality during operation of the HPF	X	✓	X	Not considered in the 2024 Scoping Report		

Potential Impact	2023 Scoping Report - Scoped in (✓) or out (X)			2024 Scoping Report - Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Cumulative impacts	✓ (HPF and inshore ECC only)	✓ (HPF only)	✓ (HPF and inshore ECC only)	X	X	X
Transboundary impacts	X	X	X	X	X	X
Benthic and Intertidal Ecology						
Temporary habitat loss / physical disturbance	✓	X	✓	✓	✓	✓
Long term habitat loss / alteration	X	✓	X	X	✓	✓
Increased suspended sediment concentrations	✓ (HPF and inshore ECC only)	X	✓ (HPF and inshore ECC only)	Not considered in the 2024 Scoping Report		
Increased suspended sediments and sediment re-deposition	Not considered in the 2023 Scoping Report			✓	✓	✓
Remobilisation of contaminated sediments	✓ (HPF and inshore ECC only)	X	✓ (HPF and inshore ECC only)	Assessed separately in the 2024 Scoping Report		
Remobilisation of contaminated sediments (DBD Array Area)	Not assessed separately in the 2023 Scoping Report			X	X	X
Remobilisation of contaminated sediments if present (offshore ECC)	Not assessed separately in the 2023 Scoping Report			✓	X	✓
Reduction in marine water quality during operation of the HPF in the intertidal area	X	✓	X	Not considered in the 2024 Scoping Report		
Pollution events resulting from the accidental release of pollutants.	X	X	X	X	X	X
Underwater noise and vibration	✓	X	✓	✓	X	✓
Interactions of EMF, including potential cumulative EMF effects	X	X	X	X	✓	X
Introduction of marine INNS from vessel traffic	X	X	X	X	X	X
Sediment heating from export cables	Not considered in the 2023 Scoping Report			X	X	X
Colonisation of introduced substrate	X	✓	X	X	✓	✓
Cumulative impacts	✓	✓	✓	✓	✓	✓
Transboundary impacts	✓	✓	✓	✓	✓	✓

Potential Impact	2023 Scoping Report - Scoped in (✓) or out (X)			2024 Scoping Report - Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Fish and Shellfish Ecology						
Accidental release of pollutants	Not considered in the 2023 Scoping Report			X	X	X
Temporary habitat loss / physical disturbance	✓	X	✓	✓	✓	✓
Long term habitat loss	X	✓	X	Not considered in the 2024 Scoping Report		
Habitat loss / alteration	Not considered in the 2023 Scoping Report			X	✓	✓
Increased suspended sediment and sediment-redeposition	✓	X	✓	✓	✓	✓
Remobilisation of contaminated sediments if present (cable and foundation installation)	X	X	X	Not considered in the 2024 Scoping Report		
Remobilisation of contaminated sediments if present (HPF intake / outfalls)	✓	✓	✓	Not considered in the 2024 Scoping Report		
Remobilisation of contaminated sediments if present (Array Area)	Not assessed separately in the 2023 Scoping Report			X	X	X
Remobilisation of contaminated sediments if present (offshore ECC only)	Not assessed separately in the 2023 Scoping Report			✓	X	X
Underwater noise and vibration	✓	X	✓	✓	✓	✓
Changes in fishing pressure	✓	✓	✓	✓	✓	✓
EMF effects	X	✓	X	X	✓	X
Sediment heating from export cables	Not considered in the 2023 Scoping Report			X	X	X
Introduction of hard substrate	X	✓	X	X	✓	X
Cumulative impacts	✓	✓	✓	✓	✓	✓
Transboundary impacts	✓	✓	✓	✓	✓	✓
Marine Mammals						
Underwater noise: physical and auditory injury resulting from impact piling during construction	✓	X	X	✓	X	X
Underwater noise: behavioural impacts resulting from impact piling during construction	✓	X	X	✓	X	X
Underwater noise: physical and auditory injury resulting from operational wind turbine noise	X	✓	X	X	✓	X

Potential Impact		2023 Scoping Report - Scoped in (✓) or out (X)			2024 Scoping Report - Scoped in (✓) or out (X)		
		Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Underwater noise: behavioural impacts resulting from operational wind turbine noise		X	✓	X	X	✓	X
Underwater noise: physical and auditory injury resulting from noise associated with other construction and maintenance activities (such as dredging and rock placement) and vessel noise		X	X	X	✓	✓	✓
Underwater noise: behavioural impacts resulting from other construction and maintenance activities (such as dredging and rock placement), and vessel noise (including disturbance to foraging areas)		✓	✓	✓	✓	✓	✓
Underwater noise: barrier effects		✓	✓	✓	✓	✓	✓
Disturbance at seal haul-out sites		✓	✓	✓	✓	✓	✓
Vessel interaction (increase in risk of collision)		X	X	X	✓	✓	✓
Changes to prey resource		✓	✓	✓	✓	✓	✓
Changes to water quality		✓ (HPF only)	✓ (HPF only)	✓ (HPF only)	Not considered in the 2024 Scoping Report		
Changes to water quality (sediment bound contaminants) in the Array Area		Not assessed separately in the 2023 Scoping Report			X	X	X
Changes to water quality (sediment bound contaminants) in the ECC		Not assessed separately in the 2023 Scoping Report			✓	X	X
Physical barrier effect		X	X	X	X	✓	X
Effects from EMF		X	X	X	X	X	X
Cumulative impacts		✓	✓	✓	✓	✓	✓
Transboundary impacts		✓	✓	✓	✓	✓	✓
Intertidal and Offshore Ornithology							
Direct Habitat Loss	Offshore ornithology receptors	X	X	X	Not considered in the 2024 Scoping Report		
	Intertidal ornithology receptors	✓	✓	✓			
Direct disturbance and displacement due to work activity in the Array Area	Offshore ornithology receptors only	✓	✓	✓	Not assessed separately in the 2024 Scoping Report		
Direct disturbance and displacement due to work activity in the offshore ECC	Offshore ornithology receptors only	✓	X	✓	Not assessed separately in the 2024 Scoping Report		

Potential Impact		2023 Scoping Report - Scoped in (✓) or out (X)			2024 Scoping Report - Scoped in (✓) or out (X)		
		Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Direct disturbance and displacement due to work activity at landfall and within the intertidal area	Intertidal ornithology receptors (plus red-throated diver (offshore ornithology receptor))	✓	✓	✓	Not assessed separately in the 2024 Scoping Report		
Direct disturbance and displacement due to work activity in the Array Area, offshore ECC or landfall	Intertidal and Offshore receptors	Assessed separately in the 2023 Scoping Report			✓	✓	✓
Direct disturbance and displacement due to nearshore vessel movements	Intertidal ornithology receptors only (Offshore receptors considered within 'work activity' in offshore areas above)	X	X	X	Not considered in the 2024 Scoping Report		
Direct disturbance and displacement due to presence of wind turbines and other offshore infrastructure	Offshore ornithology receptors only (red-throated diver, gannet, auks)	X	✓	X	✓	✓	✓
Barrier effect due to presence of wind turbines and other offshore infrastructure	Offshore and intertidal ornithology receptors (including migratory waterbirds)	X	X	X	Different receptors considered in the 2024 Scoping Report		
	Offshore (including migratory non-seabirds)	Different receptors considered in the 2023 Scoping Report			X	✓	X
Accidental pollution	Offshore and intertidal receptors	X	X	X	X	X	X
Changes to prey availability	Offshore and intertidal receptors	✓	✓	✓	Not considered in the 2024 Scoping Report		
Indirect Impacts via Habitats or Prey Availability	Offshore and intertidal receptors	Not considered in the 2023 Scoping Report			✓	✓	✓
Collision risk	Offshore ornithology receptors (gulls, skuas, gannet) and intertidal ornithology receptors (including migratory waterbirds)	X	✓	X	X	✓	X
Entrapment and / or entrainment of Prey at marine outfall / intake locations for the HPF	Offshore ornithology receptors only	X	✓	X	Not considered in the 2024 Scoping Report		
Cumulative impacts	Offshore and intertidal receptors	✓	✓	✓	✓	✓	✓
Transboundary impacts	Offshore ornithology receptors only	✓	✓	✓	✓	✓	✓

Potential Impact		2023 Scoping Report - Scoped in (✓) or out (X)			2024 Scoping Report - Scoped in (✓) or out (X)		
		Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Commercial Fisheries							
Reduction in access to, or exclusion from established fishing grounds	Mobile gear fleets in the Dogger Bank byelaw area	X	X	X	X	X	X
	All other fleets	✓	✓	✓	✓	✓	✓
Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	All fleets	✓	✓	✓	✓	✓	✓
Displacement or disruption of commercially important fish and shellfish resources	All fleets	✓	✓	✓	✓	✓	✓
Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity	All fleets	✓	✓	✓	✓	✓	✓
Additional steaming to alternative fishing grounds	Mobile gear fleets in the Dogger Bank byelaw area	X	X	X	X	X	X
	All other fleets	✓	✓	✓	✓	✓	✓
Physical presence infrastructure leading to gear snagging	Mobile gear fleets in the Dogger Bank byelaw area	X	X	X	X	X	X
	All other fleets	X	✓	✓	X	✓	✓
Cumulative impacts	All fleets	✓	✓	✓	✓	✓	✓
Transboundary impacts	All fleets	✓	✓	✓	✓	✓	✓
Shipping and Navigation							
Vessel displacement due to construction activities or the presence of the Project		✓	✓	✓	✓	✓	✓
Increased vessel to vessel collision risk between third-party vessels due to vessel displacement		✓	✓	✓	✓	✓	✓
Vessel to vessel collision between a third-party vessel and a project vessel		✓	✓	✓	✓	✓	✓
Vessel to structure allision risk for third party vessels due to the presence of project structures		X	✓	X	X	✓	X
Reduction in under keel clearance due to the presence of cable protection or cable crossings.		X	✓	X	X	✓	X

Potential Impact	2023 Scoping Report - Scoped in (✓) or out (X)			2024 Scoping Report - Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Vessel interaction with sub-sea cables associated with the Project	X	✓	✓	X	✓	X
Interference with vessel navigation and communication equipment due to the Project	X	✓	✓	X	✓	X
Reduction of emergency response capability due to increased incident rates and / or reduced access for Search and Rescue (S&R) responders	X	✓	✓	X	✓	X
Cumulative impacts	✓	✓	✓	✓	✓	✓
Transboundary impacts	✓	✓	✓	✓	✓	✓
Aviation, Radar and Military						
Impacts on military and civil radar	X	X	X	X	X	X
Impacts on radio navigation aids	X	X	X	X	X	X
Creation of an aviation obstacle environment	✓	✓	✓	✓	✓	✓
Increased air traffic in the area related to wind farm activities	✓	✓	✓	✓	✓	✓
Impact of the offshore export cable route on Staxton Wold Danger Area activities	Not considered in the 2023 Scoping Report			✓	X	✓
Impact of onshore infrastructure on airfield operations	✓	✓	✓	✓	✓	✓
Cumulative impacts	✓	✓	✓	✓	✓	✓
Transboundary impacts	✓	✓	✓	✓	✓	✓
Offshore Archaeology and Cultural Heritage						
Direct impacts to heritage assets (offshore ECC only)	✓	✓	✓	Not considered in the 2024 Scoping Report		
Direct impacts to heritage assets	Only offshore ECC considered in the 2023 Scoping Report			✓	✓	✓
Indirect impacts to heritage assets associated with changes to marine physical processes	✓	✓	✓	✓	✓	✓
Change to the setting of heritage assets, which could affect their heritage significance	X	✓	X	X	✓	X
Change to character which could affect perceptions of the historic seascape character	X	✓	X	X	✓	X

Potential Impact	2023 Scoping Report - Scoped in (✓) or out (X)			2024 Scoping Report - Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Cumulative impacts	✓	✓	✓	✓	✓	✓
Transboundary impacts (direct and indirect)	✓	✓	✓	✓	✓	✓
Seascape, Landscape and Visual Impact						
Seascape character	X	X	X	X	X	X
Landscape character and designated landscapes	X	X	X	X	X	X
Visual receptors	X	X	X	X	X	X
Cumulative impacts	X	X	X	X	X	X
Transboundary impacts	X	X	X	X	X	X
Other Marine Users						
Potential interference with other wind farms	✓	X	✓	✓	✓	✓
Potential interference with oil and gas activities	Not considered in the 2023 Scoping Report			✓	X	✓
Potential interference with oil and gas operations and decommissioning activities	✓	X	✓	Not considered in the 2024 Scoping Report		
Physical impacts on sub-sea cables and pipelines	✓	X	✓	✓	X	✓
Impacts on CCS sites	✓	X	✓	✓	X	✓
Impacts on aggregate dredging activities	X	X	X	X	X	X
Impacts on disposal sites	X	X	X	X	X	X
Impacts of MoD activities	X	X	X	X	X	X
Cumulative impacts	X	X	X	✓	✓	✓
Transboundary impacts	X	X	X	✓	✓	✓
Offshore Air Quality						
Impacts on human receptors	X	X	X	X	X	X
Impacts on ecological receptors	X	X	X	X	X	X
Cumulative impacts	X	X	X	X	X	X

Potential Impact	2023 Scoping Report - Scoped in (✓) or out (X)			2024 Scoping Report - Scoped in (✓) or out (X)		
	Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Transboundary impacts	X	X	X	X	X	X
Offshore Airborne Noise						
Impacts on human receptors	X	X	X	X	X	X
Impacts on marine ecological receptors	X	X	X	X	X	X
Cumulative impacts	X	X	X	X	X	X
Transboundary impacts	X	X	X	X	X	X
Onshore Topics						
Due to the spatial and design differences between the Project described in the 2023 Scoping Report and the Project described within the 2024 Scoping Report, a comparison has not been included for the onshore topics.						
Project Wide Topics						
Due to the spatial and design differences between the Project described in the 2023 Scoping Report and the Project described within the 2024 Scoping Report, a comparison has not been included for the onshore topics.						

13 References

AECOM (2018) East Riding of Yorkshire Landscape Character Assessment. Available at: https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/landscape-character-assessment/. Accessed 29/04/24.

Air Quality Expert Group (AQEG). (2017). Impacts of Shipping on UK Air Quality. Available at: https://uk-air.defra.gov.uk/assets/documents/reports/. Accessed 18/04/24.

Alves, J. A., Gunnarsson, T. G., Hayhow, D. B., Appleton, G. F., Potts, P. M., Sutherland, W. J., and Gill, J. A. (2013). Costs, benefits, and fitness consequences of different migratory strategies. Ecology, 94(1), 11-17.

AOC (2021). Dogger Bank Windfarm A & B: SMR1 and TAM3, Post-Excavation Assessment Report (Draft). Accessed 26/04/24.

Aynsley, C.L. (2017). Bottlenose dolphins (Tursiops truncatus) in north-east England: A preliminary investigation into a population beyond the southern extreme of its range. MSc Thesis, Newcastle University. Accessed 19/04/24.

Balmer, D., Fuller, R., and Gillings, S., (2013) Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland.

Band, W., (2012) SOSS-02: Using a Collision Risk Model to Assess Bird Collision Risks For Offshore Wind Farms (No. SOSS-02).

Beatrice Offshore Windfarm Ltd. (2012). Beatrice Offshore Windfarm Environmental Statement Section 17: Wind Farm Airborne Noise. Available at: https://marine.gov.scot/. Accessed 26/02/23.

BEIS (2019). Industrial Strategy: Offshore Wind Sector Deal. Available at: Offshore wind Sector Deal - GOV.UK (www.gov.uk). Accessed 29/04/24.

BEIS, (2021). Net Zero Strategy: Build Back Greener. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf. Accessed 29/04/24.

BEIS (2022a). United Kingdom of Great Britian and Northern Ireland's Nationally Determined Contribution. Available at: United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution (publishing.service.gov.uk). Accessed 29/04/24.

BEIS (2022b). British Energy Security Strategy. Available at: https://www.gov.uk/government/publications/british-energy-security-strategy/british-energysecurity-strategy. Accessed 29/04/24.

BEIS (2022c). Offshore Energy SEA 4: Appendix 1f Climate & Meteorology. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1061602/Appendix_1f_-_Climate___Meteorology.pdf. Accessed 29/04/24.

BEIS (2021). UK's Sixth Carbon Budget. Available at: https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035. Accessed 26/04/24.

BEIS (2021b). Draft National Policy Statement for Renewable Energy Infrastructure (EN 3). Available at: https://assets.publishing.service.gov.uk/. Accessed 23/04/24.

Berglund, B., Lindval, T., Schwela, D. H., & Organization, W. H. (1999). Guidelines for community noise. Geneva: WHO Occupational and Environmental Health Team. Accessed 10/05/24.

BERR (Business, Enterprise and Regulatory Reform), (2008a). Atlas of UK Marine Renewable Energy Resources: Atlas Pages. A Strategic Environmental Assessment Report, March 2008, 19pp. Accessed 22/04/24.

BERR (Business, Enterprise and Regulatory Reform), (2008b). Review of Cabling Techniques and Environmental Effects Applicable to the Offshore Wind Farm Industry. p.164. Accessed 22/04/24.

BGS Geological Map for Flamborough and Bridlington Solid and Drift, Sheet number 55 and 65, 1985, 1:50,000. Accessed 05/24.

BGS Geological Map for Great Driffield Solid and Drift, Sheet number 64, 1993, 1:50,000. Accessed 05/24.

BGS Geological Map for Beverley Solid and Drift, Sheet number 72, 1995, 1:50,000. Accessed 05/24.

BGS Geological Map for Hornsea Solid and Drift, Sheet number 73, 1998, 1:50,000. Accessed 05/24.

Bochert & Zettler.,(2006). Effect of Electromagnetic Fields on Marine Organisms. Chapter 14 in Offshore Wind Energy; Research on Environmental Impacts. Accessed 05/24.

British Geological Survey (2005) Mineral Resources Map for Humberside, 1:100,000. Accessed 05/24.

British Geological Survey (2020). Onshore Geoindex Viewer. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html. Accessed 05/24.

British Geological Survey (BGS) (2024). UK Modern Earthquakes (Instrument Recorded). Available at: https://maps-bgs.opendata.arcgis.com/datasets/bgs::uk-modern-earthquakes-instrument-recorded/explore?location=53.604287%2C-0.380345%2C8.70. Accessed 29/04/24.

British Standards Institute (1991), BS 7445-2:1991 Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use, British Standards Institute. Accessed 29/04/29.

British Standards Institute (1993), BS 7385-2:2003 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration, British Standards Institute. Accessed 29/04/29.

British Standards Institute (2003), BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures, British Standards Institute. Accessed 29/04/29.

British Standards Institute (2008), BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting, British Standards Institute. Accessed 29/04/29.

British Standards Institute (2014), BS 5228-1:2009 +A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1 Noise, British Standards Institute. Accessed 29/04/29.

British Standards Institute (2014), BS 5228-2:2009 +A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2 Vibration, British Standards Institute. Accessed 29/04/29.

British Standards Institute (2014), BS 8233:2014 Guidance on sound insulation and noise reduction for buildings, British Standards Institute. Accessed 29/04/29.

British Standards Institute (2019), BS 4142:2014 +A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institute. Accessed 29/04/29.

British Standards Institution (BSI) (2023). PAS 2080:2023 Carbon Management in Buildings and Infrastructure. Accessed 29/04/24.

Burnell, D., Perkins, A. J., Newton, S. F., Bolton, M., Tierney, T. D., & Dunn, T. E. (2023). Seabirds Count: A Census of Breeding Seabirds in Britain and Ireland (2015-2021). Lynx Nature Books.

Burton, N.H.K., Thaxter, C.B., Cook, A.S.C.P., Austin, G.E., Humphreys, E.M., Johnston, A., Still D.A. & Wright, L.J. (2013) Ornithology Technical Report for the Proposed Dogger Bank Teesside A and B Offshore Wind Farm Projects BTO Research Report 643. BTO, Thetford.Cleasby, I.R., Owen, E., Wilson, L.J., and Bolton, M., (2018) Combining habitat modelling and hotspot analysis to reveal the location of high-density seabird areas across the UK (Research Report No. 63). RSPB Centre for Conservation Science.

Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, UKHab Ltd. (2023). The UK Habitat Classification User Manual Version 21.1. Available at: http://www.ukhab.org/. Accessed 10/05/24.

C40 Cities (2018). Climate Change Risk Assessment Guidance. Available at: https://www.c40knowledgehub.org/s/article/Climate-Change-Risk-AssessmentGuidance?language=en_US. Accessed 29/04/24.

Callaway, R., Alsvåg, J., de Boois, I., Cotter, J., Ford, A., Hinz, H., Jennings, S., Kröncke, I., Lancaster, J., Piet, G., Prince, P., & Ehrich, S. (2002). Diversity and community structure of epibenthic invertebrates and fish in the North Sea. ICES Journal of Marine Science, 59(6), 1199–1214. Available at: https://doi.org/10.1006/jmsc.2002.1288. Accessed 23/04/24.

Carter, M.I., Boehme, L., Cronin, M.A., Duck, C.D., Grecian, W.J., Hastie, G.D., Jessopp, M., Matthiopoulos, J., McConnell, B.J., Miller, D.L. and Morris, C.D., 2022. Sympatric seals, satellite tracking and protected areas: habitat-based distribution estimates for conservation and management. Frontiers in Marine Science. Available at: https://www.frontiersin.org/articles/10.3389/fmars.2022.875869/full. Accessed 19/04/24.

Carter, M.I., Boehme, L., Duck, C.D., Grecian, W.J., Hastie, G.D., McConnell, B.J., Miller, D.L., Morris, C.D., Moss, S.E.W., Thompson, D., Thompson, P.M (2020). Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles. Sea Mammal Research Unit, University of St Andrews, Report to BEIS, OESEA-16-76/OESEA-17-78. Accessed 19/04/24.

Carter, M.I., Russell, D.J., Embling, C.B., Blight, C.J., Thompson, D., Hosegood, P.J. and Bennett, K.A., 2017. Intrinsic and extrinsic factors drive ontogeny of early-life at-sea behaviour in a marine top predator. Scientific Reports, 7(1), p.15505. Accessed 19/04/24.

Cave, B., Pyper, R., Fischer-Bonde, B., Humboldt-Dachroeden, S., & Martin-Olmedo, P. (2021). Lessons from an International Initiative to Set and Share Good Practice on Human Health in Environmental Impact Assessment. 18(4). Accessed 10/05/24.

Cave, B., Pyper, R., Fischer-Bonde, B., Humboldt-Dachroeden, S., & Martin-Olmedo, P. (2021). Lessons from an International Initiative to Set and Share Good Practice on Human Health in Environmental Impact Assessment. International Journal of Environmental Research and Public Health, 18(4). Available at: http://dx.doi.org/10.3390/ijerph18041392. Accessed 10/05/24.

CCC (2013). Reducing the UK's carbon footprint. Available at: http://www.theccc.org.uk/wpcontent/uploads/2013/04/Reducing-carbon-footprint-report.pdf. Accessed 29/04/24.

CCC. Advice on reducing the UK's emissions. Available at: Advice on reducing the UK's emissions - Climate Change Committee (theccc.org.uk). Accessed 29/4/24

CCC. Independent Assessment of UK Climate Risk. Available at: UK Climate Risk.

CEFAS (Centre for Environment, Fisheries and Aquaculture Science), (2004). Guidance note for Environmental Impact Assessment In respect of FEPA and CPA requirements. Available at: https://www.cefas.co.uk/publications/files/windfarm-guidance.pdf. Accessed 22/04/24.

CEFAS, (Centre for Environment, Fisheries and Aquaculture Science), (2012). Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects. p.99. Accessed 22/04/24.

CEFAS, (Centre for Environment, Fisheries and Aquaculture Science), (2016). Suspended Sediment Climatologies around the UK. Report for the UK Department for Business, Energy and Industrial Strategy offshore energy Strategic Environmental Assessment programme. Accessed 22/04/24.

Centre for Environment, Fisheries and Aquaculture Science (Cefas). (2007). Multispecies Fisheries Management: A Comprehensive Impact Assessment of the Sand eel Fishery along the English East Coast. CEFAS Contract Report MF0323/01. Accessed 23/04/24.

Centre for Environment, Fisheries and Aquaculture Science (Cefas). (2016). Suspended Sediment Climatologies around the UK. Report for the UK Department for Business, Energy & Industrial Strategy Offshore Energy Strategic Environmental Assessment Programme. Accessed 05/24.

Chapman, C., Kite, B. (2021a). Guidance on Decision-Making Thresholds for Air Pollution. JNCC Report No.696 (Main Report), JNCC, Peterborough, ISSN 0963-8091. Air Quality Consultants Ltd. 2021. Accessed 08/05/24.

Chapman, C., Kite, B. (2021b). Decision-Making Thresholds for Air Pollution. JNCC Report No. 696 (Technical Report), JNCC, Peterborough, ISSN 0963-8091. Accessed 08/05/24.

Cheney, B., Graham, I.M., Barton, T.R., Hammond, P.S. & Thompson, P.M. (2018). Site Condition Monitoring of bottlenose dolphins within the Moray Firth Special Area of Conservation: 2014-2016. Scottish Natural Heritage Research Report No. 1021. Accessed 09/04/24.

Cheney, B., Thompson, P.M., Ingram, S.N., Hammond, P.S., Stevick, P.T., Durban, J.W., Culloch, R.M., Elwen, S.H., Mandleberg, L., Janik, V.M. and Quick, N.J. (2013). Integrating multiple data sources to assess the distribution and abundance of bottlenose dolphins Tursiops truncatus in Scottish waters. Mammal Review, 43(1), pp.71-88. Accessed 19/04/24.

CIEEM (2022) Guidelines for Ecological Impact Assessment in the UK and Ireland. Version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester. Accessed 10/05/24.

CIfA (2020) Standard and Guidance for Historic Environment Desk-Based Assessment. Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf. Accessed 07/02/23.

CIfA (2022) Code of Conduct: Professional Ethics in Archaeology. Available at: https://www.archaeologists.net/sites/default/files/Code%20of%20conduct%20revOct2022.pdf. Accessed 07/02/23.

CIfA (2020). Standard and Guidance for Historic Environment Desk-Based Assessment. Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf. Accessed: 01/12/2023.

CIfA (2022) Code of Conduct: Professional Ethics in Archaeology. Available at: https://www.archaeologists.net/sites/default/files/Code%20of%20conduct%20revOct2022.pdf. Assessed: 01/12/2023.

Civil Aviation Authority (CAA) (2023a). CAP 032: UK Aeronautical Information Publication. Available at: https://nats-uk.ead-it.com/cms-nats/opencms/en/Publications/AIP/. Accessed 05/24.

Civil Aviation Authority (CAA) (2022a). CAP 168: Licensing of Aerodromes. Available at: https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=6114. Accessed 05/24.

Civil Aviation Authority (CAA) (2023b). CAP 437: Standards for Offshore Helicopter Landing Areas. Available at: https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=523. Accessed 05/24.

Civil Aviation Authority (CAA) (2019). CAP 670: Air Traffic Services Safety Requirements. Available at: https://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=9124. Accessed 05/24.

Civil Aviation Authority (CAA) (2016). CAP 764: Policy and Guidelines on Wind Turbines. Available at: https://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=5609. Accessed 05/24.

Civil Aviation Authority (CAA) (2021). CAP 1616: Airspace Change. Available at: https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=8127.

Civil Aviation Authority (CAA) (2022b). Air Navigation Order 2016/765. Available at: https://www.caa.co.uk/uk-regulations/aviation-safety/civil-aviation-act-1982-the-ano-2016-the-rules-of-the-air-2015-and-the-dg-regulations-2002/the-civil-aviation-air-navigation-order-2016/. Accessed 05/24.

Cleasby, I., Owen, E., Wilson, L., Wakefield E.D., O'Connell, P., and Bolton, M. (2020) Identifying important at- sea areas for seabirds using species distribution models and hotspot mapping. Biological Conservation. Volume 241, January 2020, 108375.

Coal Authority (2020). Interactive Mapper. Available at: https://mapapps2.bgs.ac.uk/coalauthority/home.html. Accessed 05/24.

Coles, B. (1998). Doggerland: A Speculative Survey. Proceedings of the Prehistoric Society,64, 45-81. Accessed 19/04/24.

Convention on Biological Diversity (2022). Available at: https://www.cbd.int/. Accessed 26/04/24.

Cook, A.S.C.P., Johnston, A., Wright, L. and Burton, N.H.K. (2012) A review of flight heights and avoidance rates of birds in relation to offshore wind farms. British Trust for Ornithology.

Cooper, B. and Beiboer, F. (2002), 'Potential effects of offshore wind developments on coastal processes', ABP Marine Environmental Research Ltd. Accessed 22/04/24.

COWRIE, (2009). Coastal process modelling for offshore wind farm environmental impact assessment: best practice guide. COWRIE Limited, London. Accessed 22/04/24.

Coull, K. A., Johnstone, R., & Rogers, S. I. (1998). Fisheries Sensitivity maps in British Waters. Accessed 23/04/24.

Crackles, F. E. (1968). Some Plant Associates of the River Hull Valley. East Yorkshire Field Studies, 1: 13-24. Accessed 09/05/24.

Cramp, S. and Simmons, K.E.L. (Eds.), (1977) Handbook of the Birds of Europe, the Middle East and North Africa: The Birds of the Western Palearctic. Volume 1: Ostrich to Ducks. Oxford University Press.

Cramp, S. and Simmons, K.E.L. (Eds.), (1983) Handbook of the Birds of Europe, the Middle East and North Africa: The Birds of the Western Palearctic. Volume 3: Waders to Gulls. Oxford University Press.

Cramp, S. and Simmons, K.E.L. (Eds.), (1985) Handbook of the Birds of Europe, the Middle East and North Africa: The Birds of the Western Palearctic. Volume 4: Terns to Woodpeckers. Oxford University Press.

Cutts N., Hemingway, K. & Spencer, J. (2013) Waterbird disturbance mitigation toolkit. Informing estuarine planning and construction projects. Version 3.2. Available at: https://tide-toolbox.eu/tidetools/waterbird_disturbance_mitigation_toolkit/.

DECC. (2011b). National Policy Statement for Renewable Energy Infrastructure (EN-3) Available at: https://assets.publishing.service.gov.uk/. Accessed 23/04/24.

Defra (2016) Marine Conservation Zones: Holderness Inshore. Available at: https://www.gov.uk/government/publications/marine-conservation-zones-holderness-inshore. Accessed 10/05/24.

Defra (2024b). Statutory biodiversity metric tools and guides, Guidance. Available online at: https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides. Accessed 10/05/24.

Department for Business, Energy and Industrial Strategy (BEIS) (2017). The Clean Growth Strategy: Leading the way to a low carbon future. Available at: https://assets.publishing.service.gov.uk/media/5ad5f11ded915d32a3a70c03/clean-growthstrategy-correction-april-2018.pd. Accessed 29/04/24.

Department for Business, Energy and Industrial Strategy (BEIS), (2021a). Draft Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/. Accessed 23/04/24.

Department of Energy and Climate Change (DECC). (2011a). Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/. Accessed 23/04/24.

Department for Energy Security and Net Zero (DESNZ) (2023a). Overarching National Policy Statement for Energy (EN-1). Accessed 29/09/24.

Department for Energy Security and Net Zero (2023a). Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147380/NPS_EN-1.pdf. Accessed 10/04/24.

Department for Energy Security & Net Zero (2023b) National Policy Statement for Renewable Energy Infrastructure (EN 3). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147382/NPS_EN-3.pdf. Accessed 10/04/24.

Department for Energy Security & Net Zero (2023c) National Policy Statement for Electricity Networks Infrastructure (EN-5). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147384/NPS_EN-5.pdf. Accessed 10/04/24.

Department for Energy Security and Net Zero (2023a). Overarching National Policy Statement for Energy (EN-1). [Online] Available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf. Accessed 26/04/24.

Department for Energy Security and Net Zero (2023b). National Policy Statement for Renewable Energy Infrastructure (EN 3). [Online] Available at: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3. Accessed 26/04/24.

Department for Energy Security and Net Zero (2023c). National Policy Statement for Electricity Networks Infrastructure (EN5). [Online] Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5#:~:text=This%20version%20of%20the%20National,nationally%20significant%20infrastructure%20projects%20(%20NSIPs%20). Accessed 26/04/24.

Department for Energy Security and Net Zero (2023d). Energy Trends UK, July to September 2023. Available at: https://assets.publishing.service.gov.uk/media/660430e1f9ab410011eea3e4/Energy_Trends_March_2024.pdf

Department for Energy Security and Net Zero (2023e). CfD auction 2024 updates. Available at: https://www.gov.uk/government/news/boost-for-offshore-wind-as-government-raises-maximum-prices-in-renewable-energy-auction. Accessed 26/04/24.

Department for Energy Security and Net Zero (2023f). Powering Up Britain. Available at: https://www.gov.uk/government/publications/powering-up-britain/powering-up-britain. Accessed 26/04/24.

Department for Energy Security and Net Zero (2024). Climate Change. Available at: https://www.gov.uk/guidance/climate-change-explained. Accessed 26/04/24.

Department for Environment Food & Rural Affairs (Defra) (2023). Government response and summary of responses. Available at: https://www.gov.uk/government/consultations/consultation-on-biodiversity-net-gain-regulations-and-implementation/outcome/government-response-and-summary-of-responses.

Department for Environment, Food & Rural Affairs (Defra) (2024a). Irreplaceable habitats, Guidance. Available online at: https://www.gov.uk/guidance/irreplaceable-habitats. Accessed 10/05/24.

Department for Environment, Food and Rural Affairs (Defra) (2009) UK Offshore Energy Strategic Environmental Assessment. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/194348/OES_A3h_Other_Users.pdf. Accessed 05/24.

Department for Environment, Food and Rural Affairs (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Accessed 24/04/24.

Department for the Environment Food and Rural Affairs (Defra) (2020). Background Mapping data for local authorities – 2018. Available at: https://uk-air.defra.gov.uk/data/laqm-background-home. Accessed 08/05/24.

Department for the Environment Food and Rural Affairs (Defra) (2022). Local Air Quality Management Technical Guidance (TG22). Accessed 08/05/24.

Department for the Environment, Food and Rural Affairs (Defra) (2024). Magic Map Application. Available at https://magic.defra.gov.uk/magicmap.aspx. Accessed 08/05/24.

Department for Levelling Up, Housing & Communities (DLUHC) (2023) Nationally Significant Infrastructure: action plan for reforms to the planning process. Available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-nsip-reforms-action-plan/nationally-significant-infrastructure-action-plan-for-reforms-to-the-planning-process. Accessed 26/04/24.

Department for Levelling Up, Housing and Communities. (2022). Planning Practice Guidance: Flood risk and coastal change. Available at: https://www.gov.uk/guidance/flood-risk-and-coastal-change. Accessed 09/05/24.

Department for Levelling Up, Housing and communities. (2023). National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf. Accessed 09/05/24.

Department for Transport (2023). Road traffic Statistics. Available at: https://roadtraffic.dft.gov.uk/. Accessed 09/05/24.

Department for Transport (2020). TAG Unit M1.2 Data Sources and Surveys, London: DfT. Accessed 09/05/24.

Department of Levelling Up, Housing and Communities (2023) Nationally Significant Infrastructure: action plan for reforms to the planning process. Available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-nsip-reforms-action-plan/nationally-significant-infrastructure-action-plan-for-reforms-to-the-planning-process. Accessed 26/04/24.

Department of Transport. (2023). TAG Unit A3 Environmental Impact Appraisal. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1079013/TAG-unit-A3-environmental-impact-appraisal.pdf. Accessed 09/05/24.

Department of Transport Welsh Office (1988), Calculation of Road Traffic Noise, Her Majesty's Stationary Office. Accessed 29/04/24.

DESNZ (2023b). Greenhouse gas reporting: conversion factors 2023. Available at: https://www.gov.uk/government/collections/government-conversion-factors-for-companyreporting. Accessed 29/09/24.

DESNZ (2023c). Digest of United Kingdom Energy Statistics, 2023. Available at: https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2023. Accessed 29/09/24.

DESNZ (2023d). UK territorial greenhouse gas emissions national statistics. Available at: https://www.gov.uk/government/collections/uk-territorial-greenhouse-gas-emissions-nationalstatistics. Accessed 29/09/24.

DESNZ (2023e). UK local authority and regional greenhouse gas emissions national statistics. Available at: UK local authority and regional greenhouse gas emissions national statistics - GOV.UK (www.gov.uk). Accessed 29/09/24.

DESNZ (2023f). Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal. Available at: https://www.gov.uk/government/publications/valuationof-energy-use-and-greenhouse-gas-emissions-for-appraisal. Accessed 29/09/24.

Dolan, S. L., Heath, G. A. (2012). Life Cycle Greenhouse Gas Emissions of Utility-Scale Wind Power. Accessed 29/09/24.

East Anglia ONE North Limited (2019) East Anglia ONE North Offshore Windfarm: Habitats Regulation Assessment Appendix 1 HRA Screening Report. Accessed 19/04/24/

East Anglia TWO Limited (2019) East Anglia TWO Offshore Windfarm: Habitats Regulation Assessment Appendix 1 HRA Screening Report. Accessed 19/04/24.

East Riding of Yorkshire Council. (2012). Explore the East Riding Coast: Enjoying the Coast Safely. Available at: https://www.eastriding.gov.uk/.Accessed 03/02/23.

East Riding of Yorkshire Council (2016). East Riding Local Plan 2012 – 2029. Accessed 05/24.

East Riding of Yorkshire Council (2023) Air Quality Annual Status Report. Accessed 08/05/24.

East Riding of Yorkshire Council (2018). East Riding of Yorkshire: Landscape Character Assessment. Available at: ERYC LCA Sections 1-3 FINAL (eastriding.org.uk). Accessed 10/04/24.

East Riding of Yorkshire Council. (2019). Level 1 Strategic Flood Risk Assessment. Available at: https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/strategic-flood-risk-assessment/#:~:text=The%20Level%201%20SFRA%20(2019,at%20particular%20risk%20from%20flooding. Accessed 05/09/24.

East Riding of Yorkshire Council (2012). Transport Policy. [Online] Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://downloads.eastriding.org.uk/corporate/pages/transport-policy/HGV%20Freight%20Route%20map.pdf. Accessed 20 November 2023.

East Riding of Yorkshire Council (2023). Transport Asset Management. [Online] extension://efaidnbmnnnibpcajpcglclefindmkaj/https://downloads.eastriding.org.uk/corporate/pages/transport-asset-management/East%20Riding%20Transport%20Asset%20Management%20Plan%202019-2029.pdf. Accessed 20 November 2023.

East Riding of Yorkshire Council and Hull City Council (2019). East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan 2016 – 2033. Accessed 05/24.

Eleveld, A., Pasterkamp, R., Van der Woerd, H.J. and Pietrzak, J. 2006. Suspended Particulate Matter from SeaWiFS Data: Statistical Validation and Verification against the Physical Oceanography of the Southern North Sea. Available at: https://research.vu.nl/en/publications/suspended-particulate-matter-from-seawifs-data-statistical-valida. Accessed 05/24.

Ellis, J. R., Milligan, S. P., Readdy, L., Taylor, N., & Brown, M. J. (2012). Spawning and nursery grounds of selected fish species in UK waters. Science Series Technical Report, Cefas Lowestoft, 147, 56. Accessed 23/04/24.

EMODnet, (2020). EMODnet Bathymetry. Available at: https://emodnet.ec.europa.eu/en/bathymetry. Accessed 22/04/24.

EMODnet (2023). EMODnet broad-scale seabed habitat map for Europe (EUSeaMap). Available from: https://emodnet.ec.europa.eu/en/seabed-habitats. Accessed 05/24.

Environment Act (2021). Available online at: https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted. Accessed 10/05/24.

Environment Agency (2017) Water Framework Directive assessment: estuarine and coastal waters. Available at: https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters. Accessed 05/24.

Environment Agency (2022) Surface water pollution risk assessment for your environmental permit. Available at Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk). Accessed 05/24.

Environment Agency (2024a) Catchment Data Explorer. Available at: https://environment.data.gov.uk/catchment-planning/. Accessed 04/24.

Environment Agency (2024b) Bathing Water Quality. Available at: https://environment.data.gov.uk/bwq/profiles/. Accessed 04/24.

Environment Agency, Environment and Heritage Service and Scottish Environment Protection Agency (2003). Integrated Pollution Prevention and Control (IPPC). Environmental Assessment and Appraisal of BAT. July 2003. Accessed 08/05/24.

Environment Agency. (2022a). Humber river basin district river management plan: updated 2022. Accessed 09/05/24.

Environment Agency. (2022b). Catchment Data Explorer. Available at: https://environment.data.gov.uk/catchment-planning/. Accessed 09/05/24.

Environment Agency. (Undated). Get flood risk information for planning in England. Available at: https://flood-map-for-planning.service.gov.uk/. Accessed 09/05/24.

Environment Agency. (Undated). Long term flood risk service mapping. Available at: https://check-long-term-flood-risk.service.gov.uk/map. Accessed 09/05/24.

Environment Agency Land Contamination Risk Management (LCRM) 2023. Accessed 05/24.

Environmental Protection Agency. (2022). 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'. County Wexford: Environmental Protection Agency. Accessed 10/05/24.

Equinor. (2019). Dudgeon and Sheringham Shoal Offshore Wind Farm Extensions: Scoping Report. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010109/EN010109-000007-EQNR_Scoping%20Report.pdf. Accessed 09/05/24.

Equinor New Energy Limited (2022). Dudgeon Extension and Sheringham Shoal Extension Projects. Accessed 19/04/24.

ESRI (2024). World Imagery Wayback. Available online at: https://livingatlas.arcgis.com/wayback/#active=60013&mapCenter=-0.23057%2C53.86870%2C12. Accessed 10/05/24.

European Commission (1972). The Habitats Directive. Available at: https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm#:~:text=The%20Habitats%20Directive%20ensures%20the,conservation%20in%20their%20own%20right. Accessed 26/04/24.

European Commission (1979). The Birds Directive. Available at: https://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm. Accessed 26/04/24.

European Commission, (2021). Commission Notice – Technical guidance on the climate proofing of infrastructure in the period 2021 – 2027. Available at: https://eur-lex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:52021XC0916(03)&from=EN. Available at 29/04/24.

European Union (2008). Marine Strategy Framework Directive. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0056. Accessed 26/04/24.

European Council and European Parliament (1992) Directive 92/43/EEC of the European Parliament and of the Council of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora OJ L 206, 22.7.1992, p. 7–50. Accessed 05/24.

EUSeaMap. (2021). EUSeaMap 2021 Broad-Scale Predictive Habitat Map - EUNIS classification. Available at: https://www.emodnet-sea bedhabitats.eu/access-data/launch-map-viewer. Accessed 05/24.

Extrium (2019). England Noise and Air Quality Viewer. Available at www.extrium.co.uk. Accessed 29/04/24.

Fjordr (2016) The Wreck of HMS Falmouth. Available at: https://historicengland.org.uk/content/docs/hms-falmouth-broadsheetpdf/#:~:text=The%20wreck%20of%20HMS%20Falmouth%20lies%20off%20Skipsea%20on%20the,torpedoes%20from%20German%20U%2Dboats. Accessed 16/04/24.

Fliessbach, K. L., Borkenhagen, K., Guse, N., Markones, N., Schwemmer, P., and Garthe, S. (2019). A ship traffic disturbance vulnerability index for Northwest European seabirds as a tool for marine spatial planning. Frontiers in Marine Science, 6, 192.

Forewind (2013) Dogger Bank Creyke Beck Environmental Statement Chapter 9 Marine Physical Processes. Application Reference 6.9. Accessed 26/04/24.

Forewind (2013). Dogger Bank Creyke Beck Environmental Statement. Accessed 19/04/24.

Forewind (2014). Dogger Bank Teesside A & B Environmental Statement. Accessed 23/04/24.

Forewind (2014). Dogger Bank Teesside A / Sofia Environmental Statement. Accessed 19/04/24.

Forewind, (2014) Dogger Bank Teesside A & B Environmental Statement – Chapter 9 Marine Physical Processes. Doc. Ref: F-OFL-CH-009 Issue 4.1. Accessed 26/04/24.

Forewind (2014) Dogger Bank Teesside A and B Environmental Statement. Chapter 9 Marine Physical Processes. Application reference: 6.9. March 2014. Accessed 05/24.

Forewind (2014) Dogger Bank Teesside A and B Environmental Statement. Chapter 10 Marine Water and Sediment Quality. Application reference: 6.10. March 2014. Accessed 05/24.

Forewind (2014). Dogger Bank Teesside A & B Environmental Statement Chapter 12 Marine and Intertidal Ecology. Accessed 05/24.

Frost, T.M., Calbrade, N.A., Birtles, G.A., Hall, C., Robinson, A.E., Wotton, S.R., Balmer, D.E. and Austin, G.E. (2021). Waterbirds in the UK 2019/20: The Wetland Bird Survey. BTO/RSPB/JNCC. Thetford.

Furness, R., (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Report 164.

Fugro (2023) Benthic Characterisation Report. Accessed 05/24.

Fugro (2023). Benthic Characterisation Report. Accessed 10/05/24.

Fugro (2023). Dogger Bank D 2023 Benthic Surveys. Dogger Bank D, UK, North Sea: Benthic Characterisation Report Survey Period: 31 July to 23 August 2023. Accessed 23/04/24.

Gibb N., Tillin H., Pearce B. & Tyler-Walters H.,(2014). Assessing the sensitivity of Sabellaria spinulosa reef biotopes to pressures associated with marine activities. Accessed 05/24.

Gilles, A., Authier, M., Ramirez-Martinez, N.C., Araújo, H., Blanchard, A., Carlstrom, J., Eira, C., Dorémus, G., Fernandez-Maldonad, C., Geelhoed, S.C.V., Kyhn, L. (2023). Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys. University of Veterinary Medicine Hannover. Accessed 19/04/24.

Gill, A. B. and Bartlett, M.,(2010). Literature review on the potential effects of electromagnetic fields and subsea noise from marine renewable energy developments on Atlantic salmon, sea trout and European eel. Scottish Natural Heritage, Commissioned Report No. 401. Accessed 05/24.

Gill, A. B., Bartlett, M., & Thomsen, F. (2012). Potential interactions between diadromous fishes of U.K. conservation importance and the electromagnetic fields and subsea noise from marine renewable energy developments. Journal of Fish Biology, 81(2), 664–695. Available at: https://doi.org/10.1111/j.1095-8649.2012.03374.x. Accessed 23/04/24.

Global Maritime Energy Efficiency Partnerships Project (GloMEEP) (2018). Port Emissions Toolkit: Guide No.1 Assessment of Port Emissions. Accessed 29/04/24.

Google Earth (2022). Available at: https://earth.google.com/web/. Accessed 05/24.

Graham, I. M., E. Pirotta, N. D. Merchant, A. Farcas, T. R. Barton, B. Cheney, G. D. Hastie, P. M. Thompson. (2017). Responses of bottlenose dolphins and harbor porpoises to impact and vibration piling noise during harbor construction. Ecosphere 8(5). Accessed 19/04/24.

Hackett, K. (2022). Movement and ecology of bottlenose dolphins (Tursiops truncatus) along the North-East coast of the UK. MSc thesis, Bangor University. Accessed 19/04/24.

Hammond P.S., Macleod K., Berggren P., Borchers D.L., Burt L., Cañadas A., Desportes G., Donovan G.P., Gilles A., Gillespie D., Gordon J., Hiby L., Kuklik I., Leaper R., Lehnert K, Leopold M., Lovell P., Øien N., Paxton C.G.M., Ridoux V., Rogano E., Samarraa F., Scheidatg M., Sequeirap M., Siebertg U., Skovq H., Swifta R., Tasker M.L., Teilmann J., Canneyt O.V. and Vázquez J.A. (2013). Cetacean abundance and distribution in European Atlantic shelf waters to inform conservation and management. Biological Conservation 164, 107-122.

Hammond, P.S., Lacey, C., Gilles, A., Viquerat, S., Boerjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M., Scheidat, M., Teilmann, J., Vingada, J., and Oien, N. (2021). Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. Wageningen Marine Research. Available from: https://synergy.st-andrews.ac.uk/scans3/files/2021/06/SCANS-III_design-based_estimates_final_report_revised_June_2021.pdf Heinänen, S. and Skov, H. (2015). The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area, JNCC Report No.544 JNCC, Peterborough.

Hawkins, A., Roberts, L., & Cheesman, S. (2014). Responses of free-living coastal pelagic fish to impulsive sounds. The Journal of the Acoustical Society of America, 135, 3101–3116. Available at: https://doi.org/10.1121/1.4870697. Accessed 23/04/23.

Heinisch P., and Wiese. K. (1987). Sensitivity to Movement and Vibration of Water in the North Sea Shrimp Crangon 91rangon: Journal of Crustacean Biology Vol. 7, No. 3 pp. 401-413 Published by: The Crustacean Society. Accessed 05/24.

Highways Agency (2019) Design Manual for Roads and Bridges (DMRB) LA 109 (Geology and soils). Accessed 24/04/24.

Highways Agency (2020) Design Manual for Roads and Bridges (DMRB) LA 112, Revision 1 (Population and human health). Accessed 24/04/24.

Highways England (2020), LA 111 Noise and Vibration Revision 2, Highways England. Accessed 29/04/24.

Historic England (2013) Marine Geophysics Data Acquisition, Processing and Interpretation. Guidance prepared by Plets, R., Dix, J., Bates, R. Available at: https://historicengland.org.uk/images-books/publications/marine-geophysics-data-acquisition-processing-interpretation/mgdapai-guidance-notes/. Accessed 19/04/24.

Historic England (2017) The Setting of Heritage Assets. Historic Environment Good Practice Advice in Planning Note 3 (Second Edition). Available at: https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/. 19/04/24.

Historic England (2015a) The Historic Environment in Local Plans. Historic Environment Good Practice Advice in Planning: 1. Available at: https://historicengland.org.uk/images-books/publications/gpa1-historic-environment-local-plans/gpa1/. Accessed: 01/12/23.

Historic England (2015b) Managing Significance in Decision-Taking in the Historic Environment. Historic Environment Good Practice Advice in Planning: 2. Available at: https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/gpa2/. Accessed: 01/12/23.

Historic England (2017) The Setting of Heritage Assets. Historic Environment Good Practice Advice in Planning Note 3 (Second Edition). Available at: https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/. Accessed: 01/12/23.

HM Government (2014). East Inshore and East Offshore Marine Plans. Available at: https://assets.publishing.service.gov.uk/media/5a7ec0eced915d74e33f2342/east-plan.pdf. Accessed 23/04/24.

HM Government (2019). The Environmental Damage (Prevention and Remediation) (England) (Amendment) Regulations 2019 (SI 2019/1285). Available at: https://www.legislation.gov.uk/uksi/2019/1285/introduction/made. Accessed 05/24.

Holland, G., Greenstreet, S., Gibb, I., Fraser, H., & Robertson, M. (2005). Identifying sandeel Ammodytes marinus sediment habitat preferences in the marine environment. Marine Ecology-Progress Series - MAR ECOL-PROGR SER, 303, 269–282. Available at: https://doi.org/10.3354/meps303269. Accessed 23/04/24.

Hull City Council (2017). Hull Local Plan 2016 – 2032. Accessed 24/04/24.

Hull City Council (2021). Highway Infrastructure Asset Management Plan. [Online] Available at: https://downloads.eastriding.org.uk/corporate/pages/transport-policy/HGV%20Freight%20Route%20map.pdf. Accessed 20 November 2023.

Hull City Council (2023). Air Quality Annual Status Report. Accessed 08/05/24.

Humber Field Archaeology (2008). Rapid Coastal Zone Assessment Survey: Yorkshire and Lincolnshire: Bempton- Donna Nook. English Heritage. Accessed 19/04/24.

IAIA. (2020). Human health: Ensuring a high level of protection. A reference paper on addressing Human Health in Environmental Impact Assessment. International Association for Impact Assessment and European Public. Accessed 10/05/24.

IAMMWG (2023). Review of Management Unit boundaries for cetaceans in UK waters (2023). JNCC Report 734, JNCC, Peterborough, ISSN 0963-8091. Accessed 19/04/24.

IEMA (2017). Delivering Proportionate EIA: A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice. Available at: https://www.iema.net/document-download/33945. Accessed 23/04/24.

IEMA. (2022). EIA Guide to: Climate Change Resilience and Adaptation. Accessed 29/04/24.

IEMA, IHBC and CIfA (2021). Principles of Cultural Heritage Impact Assessment in the UK. Available at: https://www.archaeologists.net/sites/default/files/j30361_iema_principlesofchia_v8.pdf. Accessed 07/02/23.

IEMA, IHBC and CIfA (2021) Principles of Cultural Heritage Impact Assessment in the UK. Available at: https://www.archaeologists.net/sites/default/files/j30361_iema_principlesofchia_v8.pdf. Accessed: 01/12/23.

IJsseldijk, L.L., ten Doeschate, M.T., Brownlow, A., Davison, N.J., Deaville, R., Galatius, A., Gilles, A., Haelters, J., Jepson, P.D., Keijl, G.O., Kinze, C.C. (2020). Spatiotemporal mortality and demographic trends in a small cetacean: Strandings to inform conservation management. Biological Conservation, 249, 108733. Accessed 19/04/24.

IMO, M., (2004), January. International convention for the control and management of ships' ballast water and sediments. In BWM/CONF./36. Accessed 05/24.

IMO. (2023). Special Areas under MARPOL. Available at: https://www.imo.org/en/OurWork/Environment/Pages/. Accessed 18/04/24.

INEOS UK SNS Ltd (2020). Cavendish Decommissioning Programmes [online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/889054/RD-CAV-ZPL004_Rev07_CAV_Decommissioning_Programme_May2020_FINAL.pdf. Accessed 18/04/24.

Institute of Air Quality Management (IAQM) (2020). A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.1, May 2020. Accessed 08/05/24.

Institute of Air Quality Management (IAQM) (2024). Guidance on the assessment of dust from demolition and construction. Version 2.2. Accessed 08/05/24.

Institute of Air Quality Management (IAQM), Environment Protection UK (EPUK) (2017). Land-Use Planning & Development Control: Planning for Air Quality. January 2017. Accessed 08/05/24.

Institute of Environmental Management and Assessment (IEMA), (2004). Guidelines for Environmental Impact Assessment. Lincoln: IEMA. Accessed 26/04/24.

Institute of Environmental Management and Assessment (IEMA), (2014) Getting EIA in proportion. Available at: https://www.iema.net/articles/getting-eia-in-proportion. Accessed 26/04/24.

Institute of Environmental Management and Assessment (IEMA), (2016). Environmental Impact Assessment Guide to: Delivering Quality Development. Accessed 26/04/24.

Institute of Environmental Management & Assessment (2014), Guidelines for Environmental Noise Impact Assessment, Institute of Environmental Management & Assessment. Accessed 26/04/24.

Institute of Environmental Management and Assessment (IEMA), (2017). Delivering Proportionate EIA, A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice. Accessed 26/04/24.

Institute of Environmental Management and Assessment (IEMA), (2016). Environmental Impact Assessment Guide to: Delivering Quality Development. Accessed 26/04/24.

Institute of Environmental Assessment and Management (IEMA) (2020). Major Accidents and Disasters in EIA; A Primer. September 2020. Available at: IEMA Major Accidents and Disasters in EIA Guide. Accessed 12/04/24.

Institute of Environmental Management and Assessment (2022) A New Perspective on Land and Soil in Environmental Impact Assessment. Accessed 24/04/24.

Institute of Environmental Management and Assessment (IEMA). (2020). EIA Guide to: Climate Change Resilience and Adaptation. Accessed 29/04/24.

Institute of Public Health. (2021). Health Impact Assessment Guidance: A Manual and Technical Guidance. Standalone Health Impact Assessment and health in environmental assessment. Available at: https://publichealth.ie/hia/guidance.pdf. Accessed 10/05/24.

Intergovernmental Panel on Climate Change (IPCC) (2021). Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change: The Physical Science Basis. Accessed 29/04/24.

International Association for Impact Assessment and European Public Health Association. (2020). Human health: Ensuring a high level of protection. A reference paper on addressing Human Health in Environmental Impact Assessment as per EU Directive 2011/92/EU amended by 2014/52/EU. IAIA and EUPHA. Accessed 10/05/24.

International Civil Aviation Organization (ICAO) (2015). EUR Doc 015 European Guidance Material on Managing Building Restricted Areas. Available at: https://www.icao.int/eurnat/eur%20and%20nat%20documents/forms/allitems.aspx?RootFolder=%2FEURNAT%2FEUR%20and%20NAT%20Documents%2FEUR%20Documents%2FEUR%20Documents%2F015%20%2D%20Building%20Restricted%20Areas&FolderCTID=0x012000DAF95319EADD9946B510C5D7B595637D00AA5EB47B299B9A4BAD1968B24E18655C&View=%7BE414A939-5FB4-4CB9-9139-466754ED0FA9%7D. Accessed 05/24.

International Maritime Organisation (IMO). (2019). IMO 2020 – cleaner shipping for cleaner air. Available at: https://www.imo.org/en/MediaCentre/PressBriefings/pages/. Accessed 18/04/24.

International Organisation for Standardisation (1993), ISO 9613-2 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation, International Organisation for Standardisation. Accessed 29/04/24.

Jaroszweski, D., Wood, R., and Chapman, L. (2021) Infrastructure. In: The Third UK Climate Change Risk Assessment Technical Report. [Betts, R.A., Haward, A.B., Pearson, K.V. (eds)] Prepared for the Climate Change Committee, London. Accessed 29/04/24.

JNAPC (2006) Code for Practice for Seabed Development. Available at: http://www.jnapc.org.uk/jnapc_brochure_may_2006.pdf. Accessed 07/02/23.

JNCC (undated). Special Areas of Conservation - Salicornia and other annuals colonising mud and sand. Available at: https://sac.jncc.gov.uk/habitat/H1310/. Accessed 05/24.

JNCC, Department of Agriculture, Environment and Rural Affairs of Northern Ireland (DAERA), and Natural England (2020) Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/889842/SACNoiseGuidanceJune2020.pdf. Accessed 19/04/24.

JNCC (2007) Information Sheet on Ramsar Wetlands: Humber Estuary Ramsar. Available at: https://rsis.ramsar.org/ris/663. Accessed 10/05/24.

JNCC (2020) Greater Wash Special Protection Area.

JNCC (2024a). Humber Estuary. Available at: https://sac.jncc.gov.uk/site/UK0030170. Accessed 18/06/24.

JNCC (2024b). Flamborough Head. Available at: https://sac.jncc.gov.uk/site/UK0013036. Accessed 18/06/24.

Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M., and Burton, N.H.K., (2014a) Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. Journal of Applied Ecology 51, 31–41. Available at: https://doi.org/10.1111/1365-2664.1219.

Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M., and Burton, N.H.K., (2014b). Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. Corrigendum. Journal of Applied Ecology 51, 1126–1130.

Jones, C., Hammond, G. (2019). Circular Economy and University of Bath ICE (Inventory of Carbon and Energy) Database, Version 3. Available at: https://drive.google.com/drive/folders/1vHpIGkpgkplmItn_0IaPXQ-5Fxnr08Wz?usp=sharing. Accessed 29/04/24.

Jones, E.L., Hastie, G.D., Smout, S., Onoufriou, J., Merchant, N.D., Brookes, K.L., Thompson, D. (2017). Seals and shipping: quantifying population risk and individual exposure to vessel noise. Journal of applied ecology, 54(6), pp.1930-1940. Accessed 19/04/24.

Landscape Institute (2019a) Residential Visual Amenity Assessment (RVAA) – Technical Guidance Note 02/19. Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/03/tgn-02-2019-rvaa.pdf. Accessed 29/04/24.

Landscape Institute (2019b) Visual Representation of Development Proposals. Technical Guidance Note 06/19. Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf. Accessed 29/04/24.

Lepic, B. (2020). Green light to Ineos for Cavendish field decommissioning plan [online]. Offshore Energy. Available from: https://www.offshore-energy.biz/green-light-to-ineos-for-cavendish-field-decommissioning-plan/. Accessed 18/04/24.

Lindeboom, H., Kouwenhoven, H., Bergman, M., Bouma, S., Brasseur, S., Daan, R., Fijn, R., de Haan, D., Dirksen, S., van Hal, R., Hille Ris Lambers, R., ter Hofstede, R., Krijgsveld, K., Leopold, M. and Scheidat, M. (2011). Short-term ecological effects of an offshore windfarm in the Dutch coastal zone; a compilation. Environmental Research Letters, 6(3). Available at: https://www.bing.com/ck/a?!&&p=2aa2c9afa5dc91ccJmltdHM9MTcxNjMzNjAwMCZpZ3VpZD0wYzdhMTA0NC1lYTFlLTZkZGYtMmNmMi0wNDFmZWIxODZjOTImaW5zaWQ9NTIwNA&ptn=3&ver=2&hsh=3&fclid=0c7a1044-ea1e-6ddf-2cf2-041feb186c92&psq=Lindeboom%2c+H.%2c+Kouwenhoven%2c+H.%2c+Bergman%2c+M.%2c+Bouma%2c+S.%2c+Brasseur%2c+S.%2c+Daan%2c+R.%2c+Fijn%2c+R.%2c+de+Haan%2c+D.%2c+Dirksen%2c+S.%2c+van+Hal%2c+R.%2c+Hille+Ris+Lambers%2c+R.%2c+ter+Hofstede%2c+R.%2c+Krijgsveld%2c+K.%2c+Leopold%2c+M.+and+Scheidat%2c+M.+(2011).+Short-term+ecological+effects+of+an+offshore+windfarm+in+the+Dutch+coastal+zone%3b+a+compilation.+Environmental+Research+Letters&u=a1aHR0cHM6Ly93d3cudmxpei5iZS9pbWlzZG9jcy9wdWJsaWNhdGlvbnMvb2NyZC8yMjQ4OTYucGRm&ntb=1. Accessed 05/24.

Lovell J.M, Findlaya M.M, Moateb R M and Yanc H.Y (2005).The hearing abilities of the prawn Palaemon serratus. Comparative Biochemistry and Physiology, Part A 140 89 –100. Accessed 05/24.

Lucke, K., Siebert, U., Lepper, P. A., Blanchet, M. A. (2009). Temporary shift in masked hearing thresholds in a harbor porpoise (Phocoena phocoena) after exposure to seismic airgun stimuli, J. Acoust. Soc. Am., 125 (6), pp. 4060-4070. Accessed 19/04/24.

MacGregor, R.M., King, S., Donovan, C.R., Caneco, B., Webb, A., (2018). A Stochastic Collision Risk Model for Seabirds in Flight. Marine Scotland.

MAGIC (2024) Multi-Agency Geographical Information for the Countryside website. Available at: https://magic.defra.gov.uk/. Accessed 10/05/24.

Marine Biological Association (2023). The Marine Life Information Network (MarLIN). Available at: https://www.marlin.ac.uk/species. Accessed 05/24.

Marine Climate Change Impacts Partnership (MCCIP). Available at: https://www.mccip.org.uk/. Accessed 29/04/24.

Marine Management Organisation (MMO) (2012) Seascape character area assessment East Inshore and East Offshore marine plan areas. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/312481/east_seascape.pdf. Accessed 18/04/24.

Marine Management Organisation (MMO) (2012) Seascape character area assessment East Inshore and East Offshore marine plan areas. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/312481/east_seascape.pdf. Accessed 29/04/24.

Marine Management Organisation (MMO). (2014). Review of post-consent offshore wind farm monitoring data associated with licence conditions. A report produced for the Marine Management Organisation, pp 194. MMO Project No: 1031. ISBN: 978-1-909452-24-4. Accessed 23/04/24.

Marine Scotland (2021) Berwick Bank Offshore Wind Farm - Scoping Opinion adopted by the Scottish Ministers. Available at: https://marine.gov.scot/sites/default/files/scoping_opinion_7.pdf. Accessed 18/04/24.

Marine Scotland (2021) Berwick Bank Offshore Wind Farm - Scoping Opinion adopted by the Scottish Ministers. Available at: https://marine.gov.scot/sites/default/files/scoping_opinion_7.pdf. Accessed 29/04/24.

Maritime and Coastguard Agency (MCA) (2021). MGN 654 Safety of Navigation: OREIs – Guidance on UK Navigational Practice, Safety and Emergency Response. Available at: https://www.gov.uk/government/publications/mgn-654-mf-offshore-renewable-energy-installations-orei-safety-response. Accessed 05/24.

Matthiopoulos, J., McConnell, B., Duck, C., Fedak, M. (2004). Using satellite telemetry and aerial counts to estimate space use by grey seals around the British Isles. Journal of Applied Ecology, 41(3), pp.476-491. Accessed 19/04/24.

Mendel, B., Schwemmer, P., Peschko, V., Müller, S., Schwemmer, H., Mercker, M., and Garthe, S., (2019). Operational offshore wind farms and associated ship traffic cause profound changes in distribution patterns of Loons (Gavia spp.). Journal of Environmental Management 231, 429–438. Available at: https://doi.org/10.1016/j.jenvman.2018.10.053.

Miller, P.I. & Christodoulou, S. (2014). Frequent locations of ocean fronts as an indicator of pelagic diversity: application to marine protected areas and renewables. Marine Policy. 45, 318–329. Accessed 22/04/24.

Ministry of Defence (MoD) (2020). MoD Obstruction Lighting Guidance. Available at: https://cdn.ymaws.com/www.renewableuk.com/resource/collection/0B792CF1-8B8A-474B-95B6-17886BF724A7/20190002-Windfarm_lighting_review__002_.pdf. Accessed 05/24.

Ministry of Defence (MoD) (2023). UK Military Aeronautical Publication. Available at: https://www.aidu.mod.uk/aip/aipVolumes.html. Accessed 05/24.

Ministry of Housing, Communities and Local Government (2019). Planning Practice Guidance (PPG): Historic Environment. Accessed 26/04/24.

Ministry of Housing, Communities and Local Government (2023). National Planning Policy Framework. Accessed 26/04/24.

Mitchell, I., Newton, S.F., Ratcliffe, N., and Dunn, T.E., (Eds.). (2004). Seabird Populations of Britain and Ireland: results of the Seabird 2000 census (1998-2002). Published by T and A.D. Poyser, London.

MMO. (2022). The Dogger Bank Special Area of Conservation (Specified Area) Bottom Towed Fishing Gear Byelaw 2022. Available at: https://assets.publishing.service.gov.uk/. Accessed 23/04/24.

MMO (2023a). UK Sea Fisheries Annual Statistics Report 2022. Accessed 24/04/24.

MMO (2023b). Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023. Available at: Marine_Protected_Areas_Bottom_Towed_Fishing_Gear_Byelaw_20231.pdf (publishing.service.gov.uk). Accessed 24/04/24

Multi Agency Government Information for the Countryside (MAGIC) map application. Available at: https://magic.defra.gov.uk/magicmap.aspx. Accessed 0524.

Nachtsheim, D.A., Viquerat, S., Ramírez-Martínez, N.C., Unger, B., Siebert, U., Gilles, A. (2021). Small cetacean in a human high-use area: trends in harbor porpoise abundance in the North Sea over two decades. Frontiers in Marine Science, 7, 606609. Accessed 19/04/24.

National Grid Company (2006). NGC Substations and the Environment: Guidelines on Siting and Design. Available at: Microsoft Word - horlock_rules.doc (nationalgrid.com). Accessed 26/04/24.

National Grid ESO (2022). Pathway to 2030: Holistic Network Design. Available at: https://www.nationalgrideso.com/document/262681/download. Accessed 26/04/24.

National Grid ESO (2024a). HND Impact Assessment – South Cluster Outcome Summary. Available at: https://www.nationalgrideso.com/document/302691/download. Accessed 26/04/24.

National Grid ESO (2024b). Beyond 2030: A national blueprint for a decarbonised electricity system in Great Britain. Available at: https://www.nationalgrideso.com/document/304756/download. Accessed 26/04/24.

Natural England (2018). Norfolk Vanguard Wind Farm Relevant Representations of Natural England. 31 August 2018. ExA.RR-106.

Natural England (2015). National Character Area profile: Holderness. Available at: NCA Profile: 40: Holderness - NE437 (naturalengland.org.uk). Accessed 10/04/24.

Natural England (2018). Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations, Version: June 2018. Accessed 08/05/24.

Natural England (2019). Site Information – Qualifying Features. Natural England Conservation Advice for Marine Protected Areas | Humber Estuary SPA. Last updated 13 Sep 2019. Available at: https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9006111&SiteName=humber+estuary&SiteNameDisplay=Humber+Estuary+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=15&HasCA=1.

Natural England (2021) Natural England representation Annex I: Natural England advice on Habitats Regulations Appraisal Screening report. December 2021. IN Marine Scotland (2022) Scoping Opinion – Berwick Bank Offshore Wind Farm - Firth of Forth, Appendix I Consultation Representations and Advice – February 2022. Available at: https://marine.gov.scot/data/scoping-opinion-berwick-bank-offshore-wind-farm.

Natural England (2014) National Character Area Profiles. Available at: https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles. Accessed 29/04/24.

Natural England (2022). Carbon Storage and Sequestration by Habitat NERR094 (Second Edition). Available at: https://publications.naturalengland.org.uk/publication/5419124441481216. Accessed 29/09/24.

Natural England (2022). Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications. Natural England. Version 1.2. 140pp. Accessed 29/04/24.

Natural England (2023). Site Information – Qualifying Features. Natural England Conservation Advice for Marine Protected Areas | Greater Wash SPA. Last updated 9 May 2023. Available at: https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9020329&SiteName=greater%20wash&SiteNameDisplay=Greater%20Wash%20SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=6&HasCA=1. Accessed 10/05/24.

Natural England (2024) Yorkshire Wolds Designation Project: The Designation Process. Available at: https://www.yorkshire-wolds-designation-project.org/designation. Accessed 29/04/24.

Natural England (1990) The Lagoons SSSI. Available at https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1003124. Accessed 10/05/24.

Natural England (2004) Humber Estuary SSSI. Available at http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s2000480. Accessed 10/05/24.

Natural England (2014) Humber Estuary SPA. Available at: http://publications.naturalengland.org.uk/publication/5382184353398784. Accessed 10/05/24.

Natural England (2017) Conservation Advice for Marine Protected Areas - Humber Estuary SPA - Advice on Seasonality. Natural England Designated Sites View. Last updated 15 September 2017. Accessed 10/05/24.

Natural England (2018) Greater Wash SPA Classification Citation Version 2.2. Available at: https://jncc.gov.uk/our-work/special-protection-areas/. Accessed 10/05/24.

Natural Environment and Rural Communities Act 2006 (c.16). (2006) NERC Act. The Stationery Office, London,114 pp.. Available at: http://www.legislation.gov.uk/ukpga/2006/16/pdfs/ukpga_20060016_en.pdf. Accessed 05/24.

Natural England (2019) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features - Hornsea Mere Special Protection Area (SPA). 23 Jan 2019. Accessed 10/05/24.

Natural England (2023a) Conservation Advice for Marine Protected Areas - Greater Wash SPA - Advice on Seasonality. Natural England Designated Sites View. Last updated 09 May 2023. Accessed 10/05/24.

Natural England (2023b) Conservation Advice for Marine Protected Areas – Greater Wash SPA – Site Information. Natural England Designated Sites View. Last updated 09 May 2023. Accessed 10/05/24.

Natural England (2024). Designated Sites Viewer. Available online at: Site Search (naturalengland.org.uk). Accessed 10/05/24.

Nedwell J R, Turnpenny A W H, Lovell J, Parvin S J, Workman R, Spinks J A L, Howell D (2007a). A validation of the dBht as a measure of the behavioural and auditory effects of underwater noise. Subacoustech Report Reference: 34R1231, Published by Department for Business, Enterprise and Regulatory Reform. Accessed 23/04/24.

Nedwell, J.R, Parvin, S.J, Edwards, B, Workman, R, Brooker, A.G. and Kynoch, J.E. (2007b). Measurements and interpretation of underwater noise during construction and operation of offshore wind farms in UK waters. Accessed 23/04/24.

NERC (2006). Natural Environment and Rural Communities Act 2006, Section 41. Available at: https://www.legislation.gov.uk/ukpga/2006/16/contents. Accessed 10/05/24.

NMFS (National Marine Fisheries Service). (2018). Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Dept. of Commer., NOAA. NOAA Technical Memorandum NMFS-OPR-59, 167 p. Accessed 19/04/24.

Noordzeeloket (2022). North Sea Program 2022-2027 [online]. Available at: https://www.noordzeeloket.nl/en/policy/north-sea-programme-2022-2027/#:~:text=The%20North%20Sea%20Programme%20%28pdf%2C%2025%20MB%29%20is,in%20the%20spatial%20development%20of%20the%20North%20Sea. Accessed 05/24.

Norfolk Boreas Limited (2019). Norfolk Boreas. Accessed 19/04/24.

Normandeau et al. (2011). Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species. Available at: https://espis.boem.gov/final%20reports/5115.pdf. Accessed 05/24.

Normandeau, Exponent, T. Tricas, A. Gill. (2011). Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region, Camarillo, CA. OCS Study BOEMRE 2011-09. Accessed 19/04/24.

Office of the Deputy Prime Minister, (2004). ODPM A development plan for marine aggregate extraction in England – a scoping study. Posford Haskoning Ltd., David Tyldesley Associates, CEFAS, & HR Wallingford Ltd. Accessed 22/04/24.

Offshore Wind Industry Council (OWIC) (2023). Offshore Wind Skills Intelligence Report. Available at: https://www.owic.org.uk/_files/ugd/1c0521_94c1d5e74ec14b59afc44cebe2960f62.pdf. Accessed 26/04/24.

ONS. (2023a). Mid- 2022 Population Estimates. Available at: https://www.ons.gov.uk/. Accessed 16/04/24.

ONS. (2023b). Business Register and Employment Survey 2022. Available at: https://www.ons.gov.uk/. Accessed 16/04/24.

ONS. (2024a). Ward-level population estimates. Mid-2021 and mid 2022 edition of this dataset. Available at: https://www.ons.gov.uk/. Accessed 16/04/24.

ONS. (2024b). Annual Population Survey. Available at: https://www.ons.gov.uk/. Accessed 16/04/24.

Ordnance Survey (2024). OS Open Data. Available at https://osdatahub.os.uk/downloads/open. Accessed 08/05/24.

ORE Catapult (2017). The Economic Value of Offshore Wind. Available at: https://ore.catapult.org.uk/analysisinsight/the-economic-value-of-offshore-wind-benefits-to-the-uk-of-supporting-the-industry/. Accessed 26/04/24.

Organisation Cetacea (ORCA) (2023). The State of European Cetaceans 2023. Available at: https://cdn2.assets-servd.host/orca-web/production/images/ORCA_TheStateofCetaceans_2023_SCREEN.pdf?dm=168873024. Accessed 11th April 2024.

Orsted Hornsea Project Four Limited (2021). Hornsea Project Four. Accessed 19/04/24.

Orsted (2021). Hornsea Project Four: Environmental Statement (ES). Volume A3, Chapter 5: Historic Environment. Available at: https://infrastructure.planninginspectorate.gov.uk/wpcontent/ipc/uploads/projects/EN010098/EN010098-000719-A3.5%20ES%20Volume%20A3%20Chapter%205%20Historic%20Environment.pdf. Accessed 08.02.23.

Orsted (2021) Hornsea Project Four Offshore Wind Farm Environmental Statement (ES) Volume A5, Annex 5.1: Offshore and Intertidal Ornithology Baseline Characterisation Report. PINS Document Reference: A5.5.1.

Ørsted (2019) Hornsea Project Four: Preliminary Environmental Information Report (PEIR). Volume 3, Chapter 4: Landscape and Visual Assessment. Available at: https://orstedcdn.azureedge.net/-/media/www/docs/corp/uk/hornsea-project-four/01-formal-consultation/pier/volume-3/peir-volume-3-chapter-4-landscape-and-visual.ashx. Accessed 29/04/24.

OSPAR (2010) Quality Status Report 2010. Available at: https://qsr2010.ospar.org/en/index.html. Accessed 05/24.

Oxford Archaeology (2008) Guidance for the Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy. Guidance prepared by Oxford Archaeology and issued by COWRIE. Available at: http://www.biofund.org.mz/wp-content/uploads/2018/11/F1349.Cowrie-Ciarch-Web.pdf. Available 19/04/24.

Paxton, C.G.M., Scott-Hayward, L., Mackenzie, M., Rexstad, E. and Thomas, L. (2016) Revised Phase III Data Analysis of Joint Cetacean Protocol Data Resource JNCC Report No.51. Accessed 19/04/24.

Planning Inspectorate (2012) Nationally Significant Infrastructure Projects - Advice Note Eleven, Annex B – Marine Management Organisation. Available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-eleven-working-with-public-bodies-in-the-infrastructure-planning-process/nationally-significant-infrastructure-projects-advice-note-eleven-annex-b-marine-management-organisation. Accessed 16/04/24.

Planning Inspectorate. (2017). Advice Note Eighteen: The Water Framework Directive. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-18/. Accessed 09/05/24.

Popper, A. N., Hawkins, A. D., Fay, R. R., Mann, D. A., Bartol, S., Carlson, T. J., Coombs, S., Ellison, W. T., Gentry, R. L., Halvorsen, M. B., Løkkeborg, S., Rogers, P. H., Southall, B. L., Zeddies, D. G., & Tavolga, W. N. (2014). ASA S3/SC1.4 TR-2014 Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI. Springer International Publishing. Available at: https://doi.org/10.1007/978-3-319-06659-2. Accessed 23/04/24.

Public Health England. (2020). Health Impact Assessment in spatial. Available at: https://www.gov.uk/government/publications/health-impact-assessment-in-spatial-planning: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929230/HIA_in_Planning_Guide_Sept2020.pdf. Accessed 10/05/24.

Public Health England. (2021). Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning Regime. Available at: https://khub.net/documents/135939561/390856715/Advice+on+the+content+of+environmental+statements+accompanying+an+application+under+the+Nationally+Significant+Infrastructure+Planning+Regime.pdf/a86b5521-46cc-98e4-4cad-f81a6c58f2e2?t=1615998516658&download=. Accessed 10/05/24.

Public Health England. (2021). Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning Regime. Available at: https://khub.net/documents/135939561/390856715/Advice+on+the+content+of+environmental+statements+accompanying+an+application+under+the+Nationally+Significant+Infrastructure+Planning+Regime.pdf/a86b5521-46cc-98e4-4cad-f81a6c58f2e2?t=1615998516658&download=. Accessed 10/05/24.

Pyper, R., Lamming, M., Beard, C., Waples, H., Birley, M., Buroni, A., Cave, B. (2022a). IEMA Guide: Effective Scoping of Human Health in Environmental Impact Assessment. England: Institute of Environmental Management and Assessment. Accessed 10/05/24.

Pyper, R., Waples, H., Beard, C., Barratt, T., Hardy, K., Turton, P., Cave, B. (2022b). IEMA Guide: Determining Significance for Human Health in Environmental Impact Assessment. England: Institute of Environmental Management and Assessment. Accessed 10/05/24.

QGIS.org (2023). QGIS Geographic Information System. QGIS Association. Available at: http://www.qgis.org. Accessed 10/05/24.

Ransley, J., Sturt, F., Dix, J., Adams, J., & Blue, L. (2013). People and the sea: a maritime archaeological research agenda for England. Council for British Archaeology. Accessed 19/04/24.

Reid, C. (1913) Submerged Forests, Cambridge Series of Manuals of Literature and Science. Oxford. Accessed 19/04/24.

RenewableUK (2023). Wind Energy Statistics Explained. [Online] Available at: https://www.renewableuk.com/page/UKWEDExplained. Accessed 29/04/24.

Royal HaskoningDHV (2021). Dogger Bank C Offshore and Intertidal Archaeology Written Scheme of Investigation. Accessed 19/04/24.

Royal HaskoningDHV (2023). Dogger Bank D Scoping Report. Accessed 05/24.

Royal HaskoningDHV (2019) South Withernsea Coastal Defences - Environmental Report. 15 February 2019. Accessed 10/05/24.

RPS Planning Transport & Environment (2005). Humber gateway Offshore Windfarm, marine Mammal survey report, Issue 2. Available at https://www.marinedataexchange.co.uk/details/681/2003-2005-rps-humber-gateway-offshore-wind-farm-marine-mammal-survey/packages/2967?directory=%2F. Accessed 09/04/24.

RWE (2023). Dogger Bank South Offshore Wind Farms; Preliminary Environmental Information Report Chapter 9 – Benthic Habitats. Document Reference: 004300116. Available at: https://rwe-dogger-bank.s3.eu-west-2.amazonaws.com/PEIR/DBS+PEIR+Chapter+9+Benthic+Habitats.pdf. Accessed 05/24.

Russel, D.J.F., Jones, E.L. and Morris, C.D., 2017. Updated seal usage maps: the estimated at-sea distribution of grey and harbour seals. Scottish Marine and Freshwater Science, 8(25), p.25. Accessed 19/04/24.

Russell, D.J., Hastie, G.D., Thompson, D., Janik, V.M., Hammond, P.S., Scott-Hayward, L.A., Matthiopoulos, J., Jones, E.L. and McConnell, B.J. (2016). Avoidance of wind farms by harbour seals is limited to pile driving activities. Journal of Applied Ecology, 53(6), pp.1642-1652. Accessed 19/04/24.

Russell, D.J.F., Jones, E.L. and Morris, C.D. (2017). Updated seal usage maps: the estimated at-sea distribution of grey and harbour seals. Scottish Marine and Freshwater Science, 8(25), p.25. Accessed 19/04/24.

Russell, D.J.F., McConnell, B.J. (2014). Seal at-sea distribution, movements and behaviour. Report to DECC. URN: 14D/085. March 2014 (final revision). Accessed 19/04/24.

Schwemmer, P., Mendel, B., Sonntag, N., Dierschke, V., and Garthe, S., (2011) Effects of ship traffic on seabirds in offshore waters: implications for marine conservation and spatial planning. Ecological Applications 21, 1851–1860. https://doi.org/10.1890/10-0615.1

SCOS (2021). Scientific Advice on Matters Related to the Management of Seal. Available at: http://www.smru.st-andrews.ac.uk/files/2022/08/SCOS-2021.pdf. Accessed 14/03/24.

SCOS (2022). Scientific Advice on Matters Related to the Management of Seal. Available at: https://www.smru.st-andrews.ac.uk/files/2023/09/SCOS-2022.pdf. Accessed 12/04/24.

Scottish Government. (2022). Defining 'local area' for assessing impact of offshore renewables and other marine developments: guidance principles. Available at: https://www.gov.scot/. Accessed 16/04/24.

Scottish Natural Heritage (2017). Visual Representation of Wind Farms: Good Practice Guidance. Version 2.2. Available at: https://www.nature.scot/doc/visual-representation-wind-farms-guidance. Accessed 18/04/24.

Scottish Natural Heritage (2017). Visual Representation of Wind Farms: Good Practice Guidance. Version 2.2. Available at: https://www.nature.scot/doc/visual-representation-wind-farms-guidance. Accessed 29/04/24.

Sea Watch Foundation (2024). Recent sightings. Available at: https://www.seawatchfoundation.org.uk/recentsightings/. Accessed 11/04/24.

Sharpe, M., Berggren, P. (2024). Environmental drivers of odontocete occurrence in a nearshore temperate habitat. Estuarine, Coastal and Shelf Science, p.108697. Accessed 19/04/24.

Sharples R.J., Matthiopoulos, J. and Hammond, P.S. (2008) Distribution and movements of harbour seals around the coast of Britain: Outer Hebrides, Shetland, Orkney, the Moray Firth, St Andrews Bay, The Wash and the Thames, Report to DTI July 2008. Accessed 19/04/24.

Sharples, R.J., Moss, S.E., Patterson, T.A. and Hammond, P.S. (2012). Spatial Variation in Foraging Behaviour of a Marine Top Predator (Phoca vitulina) Determined by a Large-Scale Satellite Tagging Program. PLoS ONE 7(5): e37216. Accessed 19/04/24.

Sheppard, T. (1912). The lost towns of the Yorkshire coast and other chapters bearing upon the geography of the district. Available at https://ia800207.us.archive.org/1/items/losttownsofyorks00sheprich/losttownsofyorks00sheprich.pdf. Accessed 19/04/24.

SMart Wind. (2015). Hornsea Offshore Wind Farm Project Two Environmental Statement Volume 4 – Introductory Annexes Annex 4.3.1: Airborne Noise Technical Report. Available at : https://infrastructure.planninginspectorate.gov.uk/.Accessed 26/03/2023.

Sonnewald & Janssen, (2012). Recent spreading of Xandarovula patula (Mollusca: Gastropoda: Ovulidae) towards the central North Sea suggests a link to rising water temperatures

Sonnewald & Turkay, (2012). Environmental influence on the bottom and near-bottom megafauna communities of the Dogger Bank: A long-term survey.

Southall, B.L., Finneran, J.J., Reichmuth, C., Nachtigall, P.E., Ketten, D.R., Bowles, A.E., Ellison, W.T., Nowacek, D.P., Tyack, P.L. (2019). Marine mammal noise exposure criteria: updated scientific recommendations for residual hearing effects. Aquatic Mammals, 45(2), pp.125-232. Accessed 19/04/24.

Stanev, E.V., Dobrynin, M., Pleskachevsky, A., Grayek, S. and Gunther, H. 2008. Bed shear stress in the southern North Sea as an important driver for suspended sediment dynamics. Ocean Dynamics, 59, 183-194. Available at: https://www.researchgate.net/publication/225349492_Bed_shear_stress_in_the_southern_North_Sea_as_an_important_driver_for_suspended_sediment_dynamics. Accessed 05/24.

Stober, U., and Thomsen, F. (2021) How could operational underwater sound from future offshore wind turbines impact marine life? The Journal of the Acoustical Society of America 149, 1791 (2021). Available at: https://doi.org/10.1121/10.0003760. Accessed 23/04/24.

Sustrans (2023). National Cycle Network. Available at: https://www.sustrans.org.uk/nationalcycle-network. Accessed 09/05/24.

Teilmann, J., Carstensen, J. (2012). Negative long-term effects on harbour porpoises from a large scale offshore wind farm in the Baltic—evidence of slow recovery. Environmental Research Letters, 7(4), p.045101. Accessed 19/04/24.

Teilmann, J., Carstensen, J., Dietz, R., Edrén, S., Andersen, S. (2006). Final report on aerial monitoring of seals near Nysted Offshore Wind Farm. Technical report to ENERGIE E2. National Environmental Research Institute. Accessed 19/04/24.

Thaxter, C., Lascelles, B., Sugar, K., Cook, A., Roos, S., Bolton, M., Langston, R. and Burton, N., (2012). Seabird foraging ranges as a preliminary tool for identifying candidate Marine Protected Areas. Biological Conservation, 156, pp.53-61.

The Crown Estate (2019). Round 3 Offshore Wind. Available at: https://www.thecrownestate.co.uk/media/2970/ei-round-3-offshore-wind-a4.pdf. Accessed 26/04/24.

The Crown Estate (2019) Record of the Habitats Regulations Assessment Undertaken under Regulation 63 of The Conservation of Habitats and Species Regulations 2017 and Regulation 28 of The Conservation of Offshore Marine Habitats and Species Regulations 2017. 2017 Offshore Wind Extensions Plan. Dated 28 August 2019.

The Crown Estate (2021). Offshore Wind Report 2021. Available at: https://www.thecrownestate.co.uk/media/4095/2021-offshore-wind-report.pdf. Accessed 26/04/24.

The Crown Estate (2021). Cable Route Identification & Leasing Guidelines. Available at: https://www.thecrownestate.co.uk/media/3994/the-crown-estate-cable-route-identification-leasing-guidelines.pdf. Accessed 26/04/24.

The Crown Estate (2023). The Crown Estate sets out plan to unlock enough new offshore wind capacity to power up to four million homes. Available at: https://www.thecrownestate.co.uk/news/the-crown-estate-sets-out-plan-to-unlock-enough-new-offshore-wind-capacity. Accessed 26/04/24.

The Crown Estate, De Rijke Noordzee, Cefas, Flanders Marine Institute, Offshore Wind Evidence and Change Programme, North Sea Net Gain Project (2022) - MEDIN Discovery Metadata Portal. Available at: https://portal.medin.org.uk/portal/?tpc=015_5eaaf8c8b72c2c5394e5d9e8d82026d7. Accessed 05/24.

The Institute of Environmental Assessment (1993). The Guidelines for the Environmental Assessment of Road traffic. s.l.:s.n. Accessed 09/05/24.

The Met Office (2016b). UK regional climates. Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/regional-climates/index.

The Met Office (2018). UKCP18 Interface. Available at: https://ukclimateprojectionsui.metoffice.gov.uk/ui/home. Accessed 29/09/24.

The Met Office (2023). UK climate averages. Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages. Accessed 29/09/24.

The North and East Yorkshire Ecological Data Centre (NEYEDC) (2023) Ecological Data Consultation. Accessed 10/05/24.

The Planning Inspectorate (2017). Advice Note Three: EIA consultation and notification. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-three-eia-notification-and-consultation-2/. Accessed 26/04/24.

The Planning Inspectorate (2018). Advice Note Nine: Rochdale Envelope. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/. Accessed 26/04/24.

The Planning Inspectorate. (2018). Advice Note Nine: Using the Rochdale Envelope (Version 3). Available at: https://infrastructure.planninginspectorate.gov.uk/. Accessed 23/04/23.

The Planning Inspectorate (2019). Advice Note Seventeen: Cumulative effects assessment. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/. Accessed 26/04/24.

The Planning Inspectorate (2020). Advice Note Twelve: Transboundary Impacts and Process. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-twelve-transboundary-impacts-and-process/. Accessed 26/04/24.

The Planning Inspectorate (2022). Advice Note Ten: Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-ten/. Accessed 26/04/24.

Thomson, R. C., Harrison, G. P. (2015). Life Cycle Costs and Carbon Emissions of Offshore Wind Power. Weisenfeld, N., Dix, B., Fried, M., Moran, G., Phillips, C., Whiting, M. (2021). Accessed 29/04/24.

Todd, V.L.G., Todd, I.B., Gardiner, J.C., Morrin, E.C.N., MacPherson, N.A., DiMarzio, N.A. and Thomsen, F. (2014). A review of impacts of marine dredging activities on marine mammals. – ICES Journal of Marine Science. Accessed 19/04/24.

Tougaard, J., Carstensen, J., Teilmann, J., Bech, N.I., Skov, H., Henriksen, O.D. (2005). Effects of the Nysted Offshore wind farm on harbour porpoises. Annual Status Report for the T-POD Monitoring Program. Accessed 19/04/24.

Transport and Road Research Laboratory (1986), Report 53 Ground Vibration Caused by Civil Engineering Works, Transport and Road Research Laboratory. Accessed 29/04/24.

Transport Research Laboratory (2000), Report 429 Groundborne Vibration Caused by Mechanised Construction Works, Transport Research Laboratory. Accessed 29/04/24.

Transport Research Laboratory (TRL) Converting the UK traffic noise level LA10,18h to EU noise indices for noise mapping (Transport Research Laboratory, 2002). Accessed 29/04/24.

Tyler-Walters, H., Tillin, H.M., d'Avack, E.A.S., Perry, F. & Stamp, T. (2018). Marine Evidence-based Sensitivity Assessment (MarESA) – A Guide. Marine Life Information Network (MarLIN). Marine Biological Association of the United Kingdom, Plymouth, 91 pp. Accessed 05/24.

UK Centre for Ecology and Hydrology (UKCEH). (2023). Air Pollution Information System. Available at: https://www.apis.ac.uk/. Accessed 18/04/24.

UK Government (1986). UK Gas Act. Available at: https://www.legislation.gov.uk/ukpga/1986/44/contents. Accessed 26/04/24.

UK Government (2000) Countryside and Rights of Way Act. Available at: https://www.legislation.gov.uk/ukpga/2000/37/contents. Accessed 26/04/24.

UK Government (2002). The Dangerous Substances and Explosive Atmospheres Regulations 2002. Available at: https://www.legislation.gov.uk/uksi/2002/2776/contents/made. Accessed 26/04/24.

UK Government (2006) Natural Environment and Rural Communities Act. Available at: https://www.legislation.gov.uk/ukpga/2006/16/contents. Accessed 26/04/24.

UK Government (2008). Climate Change Act, c.27. Available at: https://www.legislation.gov.uk/ukpga/2008/27/contents. Accessed 26/04/24.

UK Government (2008b). Planning Act 2008. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents. Accessed 26/04/24.

UK Government (2009). Marine and Coastal Access Act 2009, c.23. UK: The Stationery Office Limited. Available at: https://www.legislation.gov.uk/ukpga/2009/23/contents. Accessed 26/04/24.

UK Government (2010). The Marine Strategy Regulations 2010. Available at: https://www.legislation.gov.uk/uksi/2010/1627/contents/made. Accessed 26/04/24.

UK Government (2011) UK Marine Policy Statement. London: The Stationery Office. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf. Accessed 26/04/24.

UK Government (2013). Energy Act, c.32. Available at: https://www.legislation.gov.uk/ukpga/2013/32/contents/enacted. Accessed 26/04/24.

UK Government (2015). The Control of Major Accident Hazards Regulations 2015. Available at: https://www.legislation.gov.uk/uksi/2015/483/contents/made. Accessed 26/04/24.

UK Government (2017a). The Water Framework Directive. Available at: https://www.legislation.gov.uk/uksi/2017/407/contents/made. Accessed 26/04/24.

UK Government (2017b). Green Paper: Building our Industrial Strategy. Available at: https://beisgovuk.citizenspace.com/strategy/industrialstrategy/supporting_documents/buildingourindustrialstrategygreenpaper.pdf. Accessed 26/04/24.

UK Government (2017b). The Conservation of Habitats and Species Regulations 2017 (SI 2017/1012). Available at: https://www.legislation.gov.uk/uksi/2017/1012/introduction/made. Accessed 26/04/24.

UK Government (2017c). The Conservation of Offshore Marine Habitats and Species Regulations 2017 (SI 2017/1013). Available at: https://www.legislation.gov.uk/uksi/2017/1013/contents/made. Accessed 26/04/24.

UK Government (2020). Energy white paper: Powering our net zero future. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/945899/201216_BEIS_EWP_Command_Paper_Accessible.pdf. Accessed 26/04/24.

UK Government (2020). Ten Point Plan for a Green Industrial Revolution. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf. Accessed 26/04/24.

UK Government (2021). Net Zero Strategy: Build Back Greener. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf. Accessed 26/04/24.

UK Government (2021). Environmental Land Management Schemes. Accessed 24/04/24.

UK Government (2022a). British Energy Security Strategy. Available at: https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy. Accessed 26/04/24.

UK Government (2022b). Contracts for Difference Fourth Round. Available at: https://www.gov.uk/government/news/biggest-renewables-auction-accelerates-move-away-from-fossil-fuels7. Accessed 26/04/24.

UK Government (2022c). Energy Trends September 2022. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1107461/Energy_Trends_September_2022.pdf. Accessed 26/04/24.

UK Government (2023). Energy Act 2023. Available at: https://www.legislation.gov.uk/ukpga/2023/52/contents/enacted. Accessed 26/04/24.

UK Government. (2021). National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf. Accessed 26/04/24.

UK Government. (2019). UK Offshore Wind Sector Deal. Available at: https://www.gov.uk/government/publications/. Accessed 16/04/24.

UK Government. (2022). The Green Book: Appraisal and evaluation in Central Government. Accessed 16/04/24.

UK Health Security Agency, undated. UK Maps of Radon. Available at: https://www.ukradon.org/radonmaps/. Accessed 05/24.

UK Office For National Statistics (2022). Trends in UK imports and exports of fuels. Available at: https://www.ons.gov.uk/economy/nationalaccounts/balanceofpayments/articles/trendsinukimportsandexportsoffuels/2022-06-29/pdf. Accessed 26/04/24.

UK Office for National Statistics (2023). UK Trade in goods: A Year in Review 2023. Available at: https://www.ons.gov.uk/economy/nationalaccounts/balanceofpayments/articles/uktradeingoodsyearinreview/2023#:~:text=4.-,Trends%20in%20fuels,lower%20exports%20to%20the%20EU. Accessed 26/04/24.

UK SNCBs, (2014). Joint Response from the Statutory Nature Conservation Bodies to the Marine Scotland Science Avoidance Rate Review.

UK SNCBs, (2017) Joint SNCB Interim Displacement Advice Note: Advice on how to present assessment information on the extent and potential consequences of seabird displacement from Offshore Wind Farm (OWF) developments.

UK Parliament (2000). Countryside and Rights of Way Act 2000. Accessed 24/04/24.

United Nations (1992). OSPAR Convention. Available at: https://www.unep.org/cep/ospar-commission-and-cartagena-convention. Accessed 26/04/24.

United Nations (2014). Espoo Convention. Available at: https://unece.org/environment-policy/environmental-assessment. Accessed 26/04/24.

United Nations (2015). Paris Agreement. Available at: http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf. Accessed 26/04/24.

Vattenfall (2019). Norfolk Vanguard Offshore Wind Farm. The Applicant Responses to First Written Questions Appendix 3.1 - Red-throated diver displacement. ExA;WQApp3.1;10.D1.3. // REP1-008.

Vincent, C., Huon, M., Caurant, F., Dabin, W., Deniau, A., Dixneuf, S., Dupuis, L., Elder, J.F., Fremau, M.H., Hassani, S. and Hemon, A., 2017. Grey and harbour seals in France: Distribution at sea, connectivity and trends in abundance at haulout sites. Deep Sea Research Part II: Topical Studies in Oceanography, 141, pp.294-305. Accessed 19/04/24.

Waggitt, J.J., Evans, P.G., Andrade, J., Banks, A.N., Boisseau, O., Bolton, M., Bradbury, G., Brereton, T., Camphuysen, C.J., Durinck, J., Felce, T. (2019). Distribution maps of cetacean and seabird populations in the North-East Atlantic. Journal of Applied Ecology, 57(2), pp.253-269. Accessed 19/04/24.

Weisenfeld, N., Dix, B., Fried, M. Moran, G., Phillips, C. and Whiting, M. (2021) NYSERDA: Offshore Wind Climate Adaptation and Resilience Study. Accessed 29/04/24.

Wessex Archaeology (2014) Offshore Renewables Protocol for Archaeological Discoveries ORPAD Palaeoenvironmental Assessment of Peat Samples. Salisbury, unpublished report 86900.02. Accessed 19/04/24.

Wessex Archaeology (2022) Dogger Bank A, B & C Offshore Wind Farm Stage 1 & Stage 2 Geoarchaeological Assessment of Geotechnical Data (2020 & 2021). Salisbury, unpublished report 201324.01. Accessed 19/04/24.

WHO. (2009). Night Noise Guidelines for Europe Accessed 10/05/24.

WHO. (2018). Environmental Noise Guidelines for the European Region. Copenhagen: World Health Organization Regional Office for Europe. Available at: www.euro.who.int/en/publications/abstracts/environmental-noise-guidelines-for-the-european-region-2018. Accessed 10/05/24.

WHO. (2021). WHO global air quality guidelines. Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide,. Available at: https://apps.who.int/iris/handle/10665/345329. Accessed 10/05/24.

Whyte, K. F., Russell, D. J., Sparling, C. E., Binnerts, B., Hastie, G. D. (2020). Estimating the effects of pile driving sounds on seals: Pitfalls and possibilities. The Journal of the Acoustical Society of America, 147(6), 3948-3958. Accessed 19/04/24.

Wilson, B., Batty, R., Daunt, F., Carter, C. (2007) Collision risks between marine renewable energy devices and mammals, fish and diving birds. Report to the Scottish Executive. Scottish Association for Marine Science, Oban. Available at: https:// tethys.pnnl.gov/sites/default/files/publications/Wilson-et-al-2007.pdf. Accessed 19/04/24.

Woodward, I., Thaxter, C. B., Owen, E., and Cook, A. S. C. P. (2019). Desk-based revision of seabird foraging ranges used for HRA screening. BTO research report, (724).

World Health Organisation. (2007). Mental health: strengthening mental health promotion. Accessed 10/05/24.

World Health Organization. (1948, April 7). Constitution of the World Health Organization. Available at: https://apps.who.int/gb/bd/PDF/bd47/EN/constitution-en.pdf. Accessed 10/05/24.

World Health Organisation (1999), Guidelines for Community Noise, World Health Organisation. Accessed 29/04/24.

World Health Organisation (2009), Night Noise Guidelines for Europe, World Health Organisation. Accessed 29/04/24.

World Health Organisation (2018), Environmental Noise Guidelines for the European Region, World Health Organisation. Accessed 29/04/24.

World Register of Marine Species - Nereis diversicolor Müller (1776). Available at https://www.marinespecies.org/aphia.php?p=taxdetails&id=339374. Accessed 05/24.

World Resource Institute (WRI) and World Business Council for Sustainable Development (WBCSD) (2015). A Corporate Accounting and Reporting Standard, Revised Edition. Accessed 29/04/24.

Wright, L. J., Ross-Smith, V. H., Massimino, D., Dadam, D., Cook, A. S. C. P., and Burton, N. H. K. (2012) Assessing the risk of offshore wind farm development to migratory birds designated as features of UK Special Protection Areas (and other Annex 1 species). BTO report to the Strategic Ornithological Support Service (SOSS), Thetford.

Wright, P.J., Jensen, H. and Tuck, I. (2000). The influence of sediment type on the distribution of the lesser sandeel, Ammodytes marinus. Journal of Sea Research 44(3-4), pp. 243-256. Accessed 23/04/24.

Yorkshire Wildlife Trust (2023). Grey seals at Flamborough. Available at: https://www.ywt.org.uk/blog/marine/grey-seals-flamborough. Accessed 10/04/24.

Yorkshire Wildlife Trust (2023) Hodgson's Fields Yorkshire Wildlife Trust Reserve. Available at: https://www.ywt.org.uk/nature-reserves/hodgsons-fields-nature-reserve#:~:text=Hodgson's%20Fields%20is%20an%20oasis,is%20a%20haven%20for%20wildlife. Accessed 10/05/24.

Yorkshire Wildlife Trust (2023) Kilnsea Wetlands YWT Reserve. Available at: https://www.ywt.org.uk/nature-reserves/kilnsea-wetlands-nature-reserve. Accessed 10/05/24.

Yorkshire Wildlife Trust (2023) Paull Holme Strays YWT Reserve. Available at: https://www.ywt.org.uk/nature-reserves/paull-holme-strays-nature-reserve. Accessed 10/05/24.

Yorkshire Wildlife Trust (2023) Welwick Saltmarsh YWT Reserve. Available at: https://www.ywt.org.uk/nature-reserves/welwick-saltmarsh-nature-reserve. Accessed 10/05/24.

Zetica UXB Risk Map. Available at: https://zeticauxo.com/downloads-and-resources/risk-maps/. Accessed 05/24.

Appendix A List of Figures, Tables and Plates

Table of Figures

Table of Tables

Table of Plates

Appendix B List of Acronyms

Acronym	Definition
AADT	Annual Average Daily Traffic
AARA	Air-to-Air Refuelling Area
AD	Air Defence
ADBA	Archaeological Desk-Based Assessment
AEoI	Adverse effects on integrity
AIL	Abnormal Indivisible Load
AIP	Aeronautical Information Publication
AIS	Automatic Information System
ALC	Agricultural Land Classification
AMSL	Above Mean Seal Level
AONB	Area of Outstanding Natural Beauty
AoS	Area of Search
AP	Annual Probability
APIS	Air Pollution Information System
AQEG	Air Quality Expert Group
AQMA	Air Quality Management Areas
AR6	Allocation Round 6
ARN	Affected Road Network
ASR	Annual Status Report
ATC	Automatic Traffic Count
AtoN	Aid to Navigation
BAP	Biodiversity Action Plan
BAS	Burial Assessment Study
BDMPS	Biologically Defined Minimum Population Scales
BEIS	Department for Business, Energy and Industrial Strategy
BERR	Business, Enterprise and Regulatory Reform
BESS	British Energy Security Strategy
BGS	British Geological Survey
BMV	Best Most Versatile
BNG	Biodiversity Net Gain
BNL	Basic Noise Level
BP	Before Present
BRAG	Black-Red-Amber-Green
BS	British Standard
BSI	British Standards Institution
BTO	British Trust for Ornithology
CAA	Civil Aviation Authority
CBD	The Convention on Biological Diversity
CBRA	Cable Burial Risk Assessment
CCC	Climate Change Committee
CCR	Climate Change resilience
CCS	Carbon Capture and Storage
CEA	Cumulative Effects Assessment
Cefas	The Centre for Environment, Fisheries and Aquaculture Sciences
CES	Coastal East Scotland
CfD	Contracts for Difference
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists

Acronym	Definition
cLWS	candidate Local Wildlife Site
CNP	Critical National Priority
COLREG	International Regulation for Prevention of Collision at Sea
COWRIE	Collaborative Offshore Windfarm Research into the environment
CPA	Coast Protection Act
CRA	Chemical Risk Assessment
CRM	Collision Risk Modelling
CRoW	Countryside Rights of Way
CRTN	Calculation of Road Traffic Noise
CSS	Countryside Stewardship Schemes
DBA	Dogger Bank A
DBB	Dogger Bank B
DBC	Dogger Bank C
DBD	Dogger Bank D
DBS	Dogger Bank South
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DfT	Department for Transport
DLL	District Level Licensing
DLUHC	Department for Levelling Up, Housing and Communities
dLWS	designated Local Wildlife Site
DML	Deemed Marine Licences
DMRB	Design Manual for Roads and Bridges

Acronym	Definition
DPD	Development Plan Document
DTI	Department of Trade and Industry
EATM	Environmental Assessment of Traffic and Movement
EC	European Commission
ECA	Emission Control Area
ECC	Export Cable Corridor
EcIA	Ecological Impact Assessment
EEA	European Economic Area
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ELMS	Environmental Land Management Schemes
EMAP	Environmental Monitoring and Assessment Programme
EMF	Electro-Magnetic Field
EMODnet	European Marine Observation and Data Network
EMP	Ecological Management Plan
EMSA	European Maritime Safety Agency
END	Environmental Noise Directive
EPP	Evidence Plan Process
EPS	European Protected Species
EPUK	Environmental Protection UK
EQS	Environmental Quality Standards
ES	Environmental Statement
ESBI	Energy Storage and Balancing Infrastructure
ESDAL	Electronic Service Delivery for Abnormal Loads

Acronym	Definition
ESO	Electricity System Operator
ESPOO	The Convention on Environmental Impact Assessment in a Transboundary Context
ESS	Environmental Stewardship Schemes
ETG	Expert Topic Group
EU DCF	European Union Data Collection Framework
EUMOFA	EU Market Observatory for Fisheries and Aquaculture
EUNIS	The European Nature Information System
FEPA	Food and Environmental Protection Act
FIR	Flight Information Regions
FL	Flight Level
FLO	Fisheries Liaison Officer
FLOWW	Fisheries Liaison with Offshore Wind and Wet Renewables
FSA	Formal Safety Assessment
GCN	Great Crested Newt
GHG	Greenhouse Gas
GI	Ground Investigation
GIS	Geographical Information Systems
GloMEEP	Global Maritime Energy Efficiency Partnerships Project
GLVIA3	Guidelines for Landscape and Visual Impact Assessment Third Edition
GNS	Greater North Sea
GT	Gross Tonnage
GVA	Gross Value Added
GWDTE	Groundwater Dependent Terrestrial Ecosystem
GWP	Global Warming Potential
HAT	Highest Astronomical Tide

Acronym	Definition
HDD	Horizontal Direct Drilling
HER	Historic Environment Record
HFIG	Holderness Fishing Industry Group
HGV	Heavy Goods Vehicle
HMRI	Helicopter Main Routeing Indicators
HND	Holistic Network Design
HPAI	Highly Pathogenic Avian Influenza
HPMA	Highly Protected Marine Area
HPSSA	House Price Statistics for Small Areas
HRA	Habitat Regulations Assessment
HSC	Historic Seascape Characterisation
HVDC	High Voltage Direct Current
IAIA	International Association for Impact Assessment
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IAMMWG	Inter-Agency Marine Mammal Working Group
IAQM	Institute of Air Quality Management
IBA	Important Bird Area
IBTS	International Bottom Trawl Survey
IBTSWG	IBTS Working Group
ICAO	International Civil Aviation Organisation
ICB	Integrated Care Board
ICE	Inventory of Carbon and Energy
ICES	International Council for the Exploration of the Sea
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IDB	Internal Drainage Board

Acronym	Definition
IEMA	Institute of Environmental Management and Assessment
IFCA	Inshore Fisheries and Conservation Authority
IHBC	Institute of Historic Building Conservation
IHLS	International Herring Larvae Surveys
INNS	Invasive Non-Native Species
IPCC	Intergovernmental Panel on Climate Change
IPH	Institute of Public Health
IPPC	Integrated Pollution Prevention and Control
IROPI	Imperative Reasons of Overriding Public Interest
IUCN	International Union for Conservation of Nature
JCP	Joint Cetacean Protocol
JNAPC	Joint Nautical Archaeology Policy Committee
JNCC	Joint Nature Conservation Committee
JSNA	Joint Strategic Needs Assessment
KIS	Kingfisher Information Service
LAQM	Local Air Quality Management
LAT	Lowest Astronomical Tide
LCRM	Land Contamination Risk Management
LDF	Local Development Framework
LDP	Local Development Plan
LGM	Last glacial maximum
LGS	Local Geological Sites
LGV	Light Goods Vehicle
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserves

Acronym	Definition
LSE	Likely significant effect
LSOA	Lower Layer Super Output Area
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Sites
MAGIC	Multi Agency Government Information for the Countryside map application
MarESA	Marine Evidence-based Sensitivity Assessment
MarLIN	Marine Life's Information Network
MARPOL	International Convention for the Prevention of pollution from ships
MCA	Maritime and Coastguard Agency
MCAA	Marine and Coastal Access Act
MCCIP	Marine Climate Change Impacts Partnership
MCEU	Marine Consents and Environmental Unit
MCZ	Marine Conservation Zone
MEDIN	Marine Environmental Data and Information Network
MEEB	Measures of Equivalent Environmental Benefit
MGN	Marine Guidance Note
MHCLG	Ministry of Housing Communities and Local Government
MHWS	Mean High Water Spring
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MOD	Ministry of Defence
MP	Member of Parliament
MPA	Marine Protected Area
MPI	Multi-Purpose Interconnector
MPS	Marine Policy Statement

Acronym	Definition
MRCA	Marine Character Area
MU	Management Unit
NAEI	National Atmospheric Emissions Inventory
NATS	National Air Traffic Services
NBN	National Biodiversity Network
NCA	National Character Area
NCN	National Cycle Network
NCR	National Cycle Routes
NDC	Nationally Determined Contribution
NEIFCA	North Eastern Inshore Fisheries and Conservation Authority
NERC	Natural Environment and Rural Communities
NERC	Natural Environment and Rural Communities
NEWS	Non-Estuarine Waterbird Survey
NEYEDC	The North and East Yorkshire Ecological Data Centre
NFFO	National Federation of Fishermen's Organisation
NGET	National Grid Energy Transmission
NH_3	Ammonia
NHLE	National Heritage List of England
NHS	National Health Services
NIA	Noise Important Areas
NM	Nautical Miles
NMFS	National Marine Fisheries Service
NMP	National Mapping Project
NNR	National Nature Reserve
NO_2	Nitrogen Dioxide

Acronym	Definition
NOMIS	National Online Manpower Information System
NOTAM	Notice to Airmen
NO_X	Nitrogen Oxides
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRA	Navigational Risk Assessment
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
NSTA	North Sea Transition Authority
NTM	National Transport Model
NVZ	Nitrate Vulnerable Zones
O&M	Operation and Maintenance
OBIS	Ocean Biodiversity Information System
OCNS	Offshore Chemical Notification Scheme
OCS	Onshore Converter Station
OEP	Office for Environmental Protection
OFGEM	Office and Gas and Electricity Markets
OHA	Offshore Hybrid Asset
OHID	Office for Health Improvement and Disparities
ONS	Office for National Statistics
ONTR	Offshore Network Transmission Review
ORCA	Organisation Cetacea
OSP	Offshore Substation Platform
OSPAR	The Convention for the Protection of the Marine Environment of the North-East Atlantic
OWF	Offshore Wind Farm

Acronym	Definition
OWIC	Offshore Wind Industry Council
PAH	Polycyclic aromatic hydrocarbons
PAS	Portable Antiquities Scheme
PBDE	Polybrominated diphenyl ethers
PCB	Polychlorinated biphenyl
PCSM	Preliminary Conceptual Site Model
PEIR	Preliminary Environmental Impact Report
PEMP	Project Environmental Management Plan
PEXA	Practice and Exercise Areas
PHE	Public Health England
PM	Particulate matter
PPG	Planning Policy Guidance
PPS	Planning Policy Statement
PPV	Peak Particle Velocity
PRA	Preliminary Risk Assessment
PRoW	Public Rights of Way
PSD	Particle Size Distribution
PSR	Primary Surveillance Radars
PTS	Permanent Threshold Shift
QSR	Quality Status Report
RAF	Royal Airforce
RAM	Restricted Ability to Manoeuvre
RCP	Representative Concentration Pathways
REZ	Renewable Energy Zone
RIAA	Report to Inform Appropriate Assessment

Acronym	Definition
RLoS	Potential Radar Line of Sight
RNAG	Reasons for Not Achieving Good Status
RSPB	Royal Society for the Protection of Birds
RVAA	Residential Visual Amenity Assessment
RYA	Royal Yachting Association
S&R	Search and Rescue
SAC	Special Areas of Conservation
SAR	Swept Area Ratio
SCANS	Small Cetacean Abundance in the North Sea
sCRM	Stochastic Collision Risk Modelling
SD	Standard Deviation
SeaMaST	Seabird Mapping and Sensitivity Tool
SELSS	Single-strike sound exposure level
SF	Sulphur Hexafluoride
SFF	Scottish Fishermen's Federation
SFRA	Strategic Flood Risk Assessment
SI	Site Investigation
SICG	Scallop Industry Consultation Group
SLVIA	Seascape, Landscape and Visual Impact Assessment
SNCB	Statutory Nature Conservation Bodies
SNH	Scottish Natural Heritage
SNS	Southern North Sea
SO_2	Sulphur dioxide
SoCC	Statement of Community Consultation
SoCG	Statement of Common Ground

Acronym	Definition
SOLAS	International Convention for the Safety of Life at Sea
SOSS	Strategic Ornithological Support Services
SOSS-MAT	Strategic Ornithological Support Services - Migration Assessment Tool
SO_x	Sulphur Oxide
SPA	Special Protected Area
SPR	Source Pathway Receptor
SPZ	Source Protection Zones
SSSI	Site of Special Scientific Interest
SWF	Sea Watch Foundation
TAC	Total Allowable Catches
TBT	Tributyltin
TCA	Trade and Cooperation Agreement
TCPA	Town and Country Planning Act
THC	Total Hydrocarbon Content
TJB	Transition Joint Bays
TRL	Transport Research Laboratory
TRRL	Transport and Road Research Laboratory
TTS	Temporary Threshold Shift
UKCEH	UK Centre for Ecology and Hydrology
UKCP	United Kingdom Climate Projection
UKCP18	United Kingdom Climate Projections 2018
UKFEN	United Kingdom Fisheries Economic Network
UKHO	United Kingdom Hydrographic Office
UNFCC	United Nations Framework Convention on Climate Change
UXB	Unexploded bombs

Acronym	Definition
UXO	Unexploded Ordnance
VHF	Very High Frequency
VMP	Vessel Management Plan
VMS	Vessel Monitoring System
WBCSD	World Business Council for Sustainable Development
WeBS	Wetland Bird Survey
WER	Water Environment Regulations
WFD	Water Framework Directive
WFD	Water Framework Directive
WHO	World Health Organisation
WRI	World Resource Institute
WSI	Written Scheme of Investigation
ZOI	Zone of Interest
ZTV	Zone of Theoretical Visibility

Appendix C Fugro (2023) Sediment Analysis Results

Particle Size Analysis

Geodetic Parameters: WGS 84, UTM 31N [m]			
Station	**Easting**	**Northing**	Data and Sample Acquisition
Export Cable Route			
ST001	299 560	5 967 610	DDV, PSD, FA
ST002	305 019	5 968 840	DDV, PSD, FA
ST005	307 515	5 971 560	DDV, PSD, FA, SC, eDNA
ST009	310 552	5 974 140	DDV, PSD, FA
ST010	306 340	5 974 063	DDV, PSD, FA
ST015	309 341	5 973 470	DDV, PSD, FA
ST016	311 742	5 975 150	DDV, PSD, FA
ST017	312 979	5 976 500	DDV, PSD, FA
ST020	305 563	5 971 200	Reserve: DDV, PSD, FA
ST022	315 591	5 978 180	DDV, PSD, FA, eDNA
ST031	318 645	5 980 530	DDV, PSD, FA
ST033	320 767	5 982 030	DDV, PSD, FA
ST034	321 523	5 983 060	DDV, PSD, FA, SC, eDNA
ST040	327 182	5 987 335	DDV, PSD, FA, eDNA
ST041	330 700	5 991 300	DDV, PSD, FA
ST042	331 961	5 992 950	DDV, PSD, FA
ST043	336 047	5 995 220	DDV, PSD, FA, SC
ST044	339 460	5 996 890	DDV, PSD, FA
ST045	344 846	6 002 140	DDV, PSD, FA
ST046	348 722	6 005 820	DDV, PSD, FA, SC, eDNA

Geodetic Parameters: WGS 84, UTM 31N [m]			
Station	**Easting**	**Northing**	Data and Sample Acquisition
ST047	350 077	6 005 410	DDV, PSD, FA
ST048	352 416	6 008 690	DDV, PSD, FA
ST049	358 615	6 012 880	Reserve: DDV, PSD, FA
ST050	360 444	6 014 900	DDV, PSD, FA, SC
ST051	362 258	6 009 650	DDV, PSD, FA, SC
ST052	361 837	6 015 970	DDV, PSD, FA
ST053	367 734	6 010 450	Reserve: DDV, PSD, FA
ST054	368 097	6 017 220	DDV, PSD, FA
ST055	371 300	6 017 500	DDV, PSD, FA
ST056	371 334	6 010 830	DDV, PSD, FA
ST057	374 398	6 011 130	DDV, PSD, FA, SC
ST058	376 406	6 018 050	DDV, PSD, FA, SC, eDNA
ST059	379 876	6 012 040	DDV, PSD, FA
ST060	382 308	6 017 960	DDV, PSD, FA
ST061	384 796	6 018 480	DDV, PSD, FA
ST062	386 665	6 018 820	DDV, PSD, FA, SC
ST063	387 255	6 012 830	DDV, PSD, FA, SC
ST064	389 101	6 012 990	DDV, PSD, FA, SC
ST065	391 756	6 013 880	DDV, PSD, FA
ST066	394 910	6 014 240	DDV, PSD, FA
ST067	395 348	6 019 460	DDV, PSD, FA, SC
ST068	395 927	6 014 150	DDV, PSD, FA, SC
ST069	403 882	6 019 860	Reserve: DDV, PSD, FA

Geodetic Parameters: WGS 84, UTM 31N [m]			
Station	**Easting**	**Northing**	Data and Sample Acquisition
ST070	399 580	6 019 930	DDV, PSD, FA
ST071	399 693	6 014 790	DDV, PSD, FA
ST072	409 115	6 020 460	DDV, PSD, FA, SC
ST073	410 410	6 016 400	DDV, PSD, FA, SC
ST075	417 062	6 017 939	DDV, PSD, FA, eDNA
ST076	421 244	6 021 700	DDV, PSD, FA
ST077	421 812	6 018 430	DDV, PSD, FA
ST078	422 835	6 021 380	DDV, PSD, FA
ST079	427 155	6 023 070	DDV, PSD, FA
ST082	432 434	6 024 780	DDV, PSD, FA, SC, eDNA
ST083	435 394	6 017 100	DDV, PSD, FA, SC
ST084	436 173	6 020 120	DDV, PSD, FA
ST085	436 286	6 023 940	DDV, PSD, FA
ST086	436 379	6 021 850	DDV, PSD, FA
ST087	437 267	6 017 830	DDV, PSD, FA, eDNA
ST088	438 579	6 026 530	DDV, PSD, FA
ST089	440 296	6 020 620	DDV, PSD, FA
ST090	443 584	6 022 750	DDV, PSD, FA
ST091	444 153	6 028 730	DDV, PSD, FA, SC
ST092	444 558	6 025 820	DDV, PSD, FA, eDNA
ST093	446 348	6 030 960	DDV, PSD, FA
ST094	448 321	6 033 150	DDV, PSD, FA
ST095	455 728	6 041 600	DDV, PSD, FA, SC

Geodetic Parameters: WGS 84, UTM 31N [m]			
Station	**Easting**	**Northing**	Data and Sample Acquisition
ST096	461 011	6 048 290	DDV, PSD, FA, eDNA
ST097	465 029	6 052 230	DDV, PSD, FA, SC
ST098	466 752	6 054 750	DDV, PSD, FA
ST099	471 065	6 058 590	DDV, PSD, FA
ST100	472 858	6 061 590	Reserve: DDV, PSD, FA
ST101	475 013	6 064 030	DDV, PSD, FA, SC
ST102	476 349	6 064 600	Reserve: DDV, PSD, FA
ST103	478 105	6 067 630	DDV, PSD, FA
ST104	480 454	6 070 130	DDV, PSD, FA, eDNA
ST107	485 264	6 075 240	DDV, PSD, FA, SC
ST115	490 665	6 082 100	DDV, PSD, FA, eDNA
ST128	494 850	6 086 870	DDV, PSD, FA, SC
ST141	497 225	6 089 180	DDV, PSD, FA
Array			
ST105	481 654	6 107 660	DDV, PSD, FA
ST106	483 382	6 106 660	DDV, PSD, FA, SC, eDNA
ST108	487 115	6 106 650	Reserve: DDV, PSD, FA
ST109	488 243	6 104 780	DDV, PSD, FA
ST110	489 382	6 105 970	DDV, PSD, FA
ST111	489 798	6 101 360	DDV, PSD, FA
ST112	490 241	6 103 390	DDV, PSD, FA
ST113	490 269	6 104 950	DDV, PSD, FA, eDNA
ST114	490 563	6 106 560	DDV, PSD, FA

Geodetic Parameters: WGS 84, UTM 31N [m]			
Station	**Easting**	**Northing**	Data and Sample Acquisition
ST116	491 803	6 105 710	DDV, PSD, FA
ST117	492 216	6 104 640	DDV, PSD, FA
ST118	492 355	6 106 860	Reserve: DDV, PSD, FA
ST119	492 371	6 100 210	DDV, PSD, FA
ST120	493 213	6 098 020	DDV, PSD, FA, SC
ST121	493 468	6 106 750	DDV, PSD, FA
ST122	493 500	6 102 990	DDV, PSD, FA
ST123	493 831	6 104 580	DDV, PSD, FA
ST124	494 338	6 105 390	DDV, PSD, FA
ST125	494 365	6 098 200	Reserve: DDV, PSD, FA
ST126	494 708	6 102 930	Reserve: DDV, PSD, FA
ST127	494789	6 107 470	DDV, PSD, FA, eDNA
ST129	494 922	6 103 680	DDV, PSD, FA
ST130	494 930	6 105 950	DDV, PSD, FA
ST131	495 743	6 102 200	DDV, PSD, FA
ST132	495 753	6 099 610	DDV, PSD, FA
ST133	495 968	6 106 570	DDV, PSD, FA
ST134	496 431	6 107 090	DDV, PSD, FA
ST135	496 445	6 100 710	Reserve: DDV, PSD, FA
ST136	496 513	6 102 860	DDV, PSD, FA, SC
ST137	496 527	6 093 580	DDV, PSD, FA
ST138	497 054	6 104 290	DDV, PSD, FA
ST139	497 140	6 101 770	DDV, PSD, FA

Geodetic Parameters: WGS 84, UTM 31N [m]			
Station	**Easting**	**Northing**	Data and Sample Acquisition
ST140	497 157	6 092 490	DDV, PSD, FA
ST142	497 441	6 095 520	DDV, PSD, FA, eDNA
ST143	497 527	6 099 570	DDV, PSD, FA, eDNA
ST144	497 595	6 093 870	DDV, PSD, FA
ST145	498 233	6 099 620	DDV, PSD, FA
ST146	498 617	6 098 660	Reserve: DDV, PSD, FA
ST147	498 757	6 102 640	DDV, PSD, FA
ST148	499 369	6 097 000	DDV, PSD, FA
ST149	499 442	6 103 930	DDV, PSD, FA
ST150	499 997	6 096 650	DDV, PSD, FA
ST151	500 203	6 101 120	DDV, PSD, FA
ST152	500 272	6 104 610	DDV, PSD, FA
ST153	500 909	6 093 260	Reserve: DDV, PSD, FA
ST154	501 102	6 094 760	DDV, PSD, FA, eDNA
ST155	502 043	6 092 390	DDV, PSD, FA, SC
ST156	502 197	6 100 980	DDV, PSD, FA
ST157	502 242	6 097 600	Reserve: DDV, PSD, FA
ST158	502 460	6 096 380	DDV, PSD, FA
ST159	503 151	6 106 050	DDV, PSD, FA
ST160	504 820	6 105 780	DDV, PSD, FA, SC, eDNA
ST165*	481 651	6 105 556	DDV, PSD, FA
ST216*	479 551	6 107 644	DDV, PSD, FA
Notes			

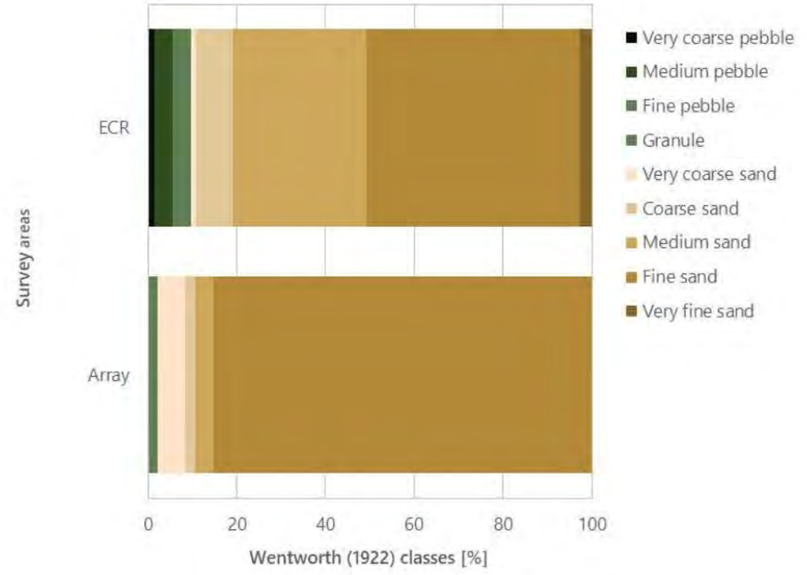
Geodetic Parameters: WGS 84, UTM 31N [m]			
Station	**Easting**	**Northing**	Data and Sample Acquisition

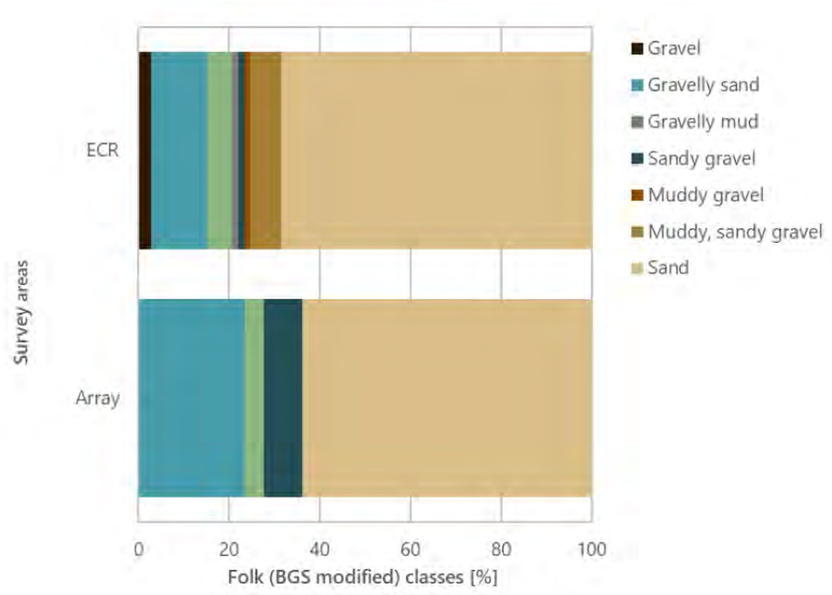
Reserve stations were selected as contingency sample locations in the event of unsuccessful sampling at nearby environmental sampling locations DDV = drop-down video

eDNA = Environmental deoxyribonucleic acid sample FA = Faunal sample A

PSD = Particle size distribution SC = Sediment chemistry

* = These stations were originally within the DBC survey scope, but are included within this report following a redrawing of the boundary between the DBC and the DBD developments. ST165 was originally named ST116 within the DBC scope, but has been renamed to avoid station name duplication





Heavy Metals and Organotins

Stations	As	Cd	Cr	Cu	Hg	Ni	Pb	Sn	Zn
Export Cable Route									
ST034	39.5	0.10	15.9	8.30	0.04	16.3	39.6	0.5	68.1
ST043	4.40	< 0.04	5.60	1.30	0.02	3.30	6.90	< 0.5	15.4
ST046	4.40	< 0.04	5.00	1.10	< 0.01	3.60	4.40	< 0.5	14.5
ST050	8.20	< 0.04	5.70	1.20	< 0.01	3.20	4.60	< 0.5	12.1
ST051	13.8	0.07	5.60	1.70	< 0.01	4.40	5.20	< 0.5	19.8
ST057	5.00	< 0.04	4.40	1.00	0.02	2.30	2.70	< 0.5	10.8
ST058	5.50	0.04	4.40	1.10	0.01	3.10	2.90	< 0.5	13.1
ST062	2.60	< 0.04	4.60	1.10	< 0.01	2.60	3.30	< 0.5	13.2
ST063	3.80	< 0.04	5.10	1.00	< 0.01	3.20	3.50	< 0.5	14.6
ST064	5.00	< 0.04	5.90	1.20	< 0.01	3.10	4.30	< 0.5	13.2
ST067	3.30	0.05	6.10	1.10	0.04	3.10	4.10	< 0.5	15.4
ST068	3.40	< 0.04	6.50	1.40	0.04	3.20	3.90	< 0.5	14.0
ST072	3.80	< 0.04	5.30	1.10	0.03	2.90	3.50	< 0.5	11.1
ST073	4.10	< 0.04	5.80	1.20	0.03	3.00	3.40	< 0.5	14.0
ST082	14.1	0.11	13.4	5.00	0.04	11.3	8.60	< 0.5	29.0
ST083	13.0	0.10	11.3	7.90	0.04	9.60	5.40	< 0.5	22.3
ST091	3.30	0.04	4.30	1.00	0.04	2.90	2.40	< 0.5	9.20
ST095	2.10	0.04	4.10	1.00	0.04	2.20	1.90	< 0.5	11.2
ST097	2.40	< 0.04	3.30	0.80	0.04	1.80	1.90	< 0.5	9.50
ST101	2.30	< 0.04	3.10	0.90	0.04	1.70	1.80	< 0.5	5.50
ST107	1.50	< 0.04	2.90	0.90	0.01	1.80	1.90	< 0.5	7.40
ST128	1.70	< 0.04	3.50	1.00	< 0.01	2.20	1.70	< 0.5	6.20
ST163	21.0	0.12	13.2	6.60	0.04	15.4	18.8	0.5	46.8
Array									
ST106	1.80	< 0.04	3.50	1.10	0.01	2.40	2.30	< 0.5	8.20
ST120	1.50	< 0.04	2.30	0.70	< 0.01	1.90	1.60	< 0.5	8.00
ST136	1.70	< 0.04	3.10	1.20	< 0.01	2.60	1.80	< 0.5	9.70
ST155	1.50	< 0.04	3.20	1.00	< 0.01	2.10	2.00	< 0.5	8.00
ST160	1.60	< 0.04	3.30	0.90	0.04	2.00	1.60	< 0.5	6.30
Minimum	**1.50**	**< 0.04**	**2.30**	**0.70**	**< 0.01**	**1.70**	**1.60**	**< 0.5**	**5.50**
Maximum	**39.5**	**0.12**	**15.9**	**8.30**	**0.04**	**16.3**	**39.6**	**0.5**	**68.1**
Median	**3.60**	**–**	**4.80**	**1.10**	**0.02**	**2.95**	**3.35**	**–**	**12.6**
Mean	**6.30**	**–**	**5.73**	**1.92**	**0.02**	**4.19**	**5.21**	**–**	**15.6**
Standard Deviation	**8.06**	**–**	**3.45**	**2.16**	**0.016**	**3.93**	**7.53**	**–**	**13.2**
RSD	**128**	**–**	**60**	**112**	**73**	**94**	**144**	**–**	**85**
Cefas Guideline Action Levels									
AL1	**20**	**0.4**	**40**	**40**	**0.3**	**20**	**50**	**–**	**130**
AL2	**100**	**5**	**400**	**400**	**3**	**200**	**500**	**–**	**800**
CEMP Assessment Criteria (OSPAR, 2014)									
ERL	**–**	**1.20**	**81.0**	**34.0**	**0.150**	**–**	**47.0**	**–**	**150**
NOAA Effects Ranges (Long et al., 1995)									
ERM	**70**	**9.6**	**370**	**270**	**0.71**	**51.6**	**218**	**–**	**410**
Canadian SQGs (CCME, 2023)									
TEL	**7.24**	**0.7**	**52.3**	**18.7**	**0.13**	**–**	**30.2**	**–**	**124**
PEL	**41.6**	**4.2**	**160**	**108**	**0.70**	**–**	**112**	**–**	**271**

Stations	As	Cd	Cr	Cu	Hg	Ni	Pb	Sn	Zn

Notes

Concentrations expressed in mg/kg dry sediment

CEFAS actions levels available at https://www.gov.uk/guidance/marine-licensing-sediment-analysis-and-sample-plans

For datasets with less than 50 % values below the limit of detection (LOD) these have been treated as equal to ½ the value of LOD to derive the summary statistics

As = Arsenic

Cd = Cadmium

Cr = Chromium

Cu = Copper

Hg = Mercury

Ni = Nickel

Pb = Lead

Sn = Tin

Zn = Zinc

AL1 = Action level 1

AL2 = Action level 2

ERL = Effects range low

ERM = Effects range median

TEL = Threshold effects level

PEL = Probable effects level

Cefas = Centre for Environment, Fisheries and Aquaculture Science

CEMP = Coordinated Environmental Monitoring Programme

OSPAR = Oslo and Paris Commission

NOAA = National Oceanic and Atmospheric Administration

SQGs = Sediment quality guidelines

RSD = Relative Standard Deviation

Key	Below Cefas AL1	Above Cefas AL1	Above Cefas AL2

Station	Dibutyltin (DBT)	Tributyltin (TBT)
Export Cable Route		
ST034	< 0.001	< 0.001
ST043	< 0.001	< 0.001
ST046	< 0.001	< 0.001
ST050	< 0.001	< 0.001
ST051	< 0.001	< 0.001
ST057	< 0.001	< 0.001
ST058	< 0.001	< 0.001
ST062	< 0.001	< 0.001
ST063	< 0.001	< 0.001
ST064	< 0.001	< 0.001
ST067	< 0.001	< 0.001
ST068	< 0.001	< 0.001
ST072	< 0.001	< 0.001
ST073	< 0.001	< 0.001
ST082	< 0.001	< 0.001
ST083	< 0.001	< 0.001
ST091	< 0.001	< 0.001
ST095	< 0.001	< 0.001
ST097	< 0.001	< 0.001
ST101	< 0.001	< 0.001
ST107	< 0.001	< 0.001
ST128	< 0.001	< 0.001
ST163	< 0.001	< 0.001

Station	Dibutyltin (DBT)	Tributyltin (TBT)
Array		
ST106	< 0.001	< 0.001
ST120	< 0.001	< 0.001
ST136	< 0.001	< 0.001
ST155	< 0.001	< 0.001
ST160	< 0.001	< 0.001
Cefas Guideline Action Levels		
AL1	0.1	0.1
AL2	1	1

Notes

Concentrations expressed in mg/kg AL1 = Action Level 1

AL2 = Action Level 2

Cefas = Centre for Environmental Fisheries & Aquaculture Science

Cefas action levels available at https://www.gov.uk/guidance/marine-licensing-sediment-analysis-and-sample-plans

Polycyclic Aromatic Hydrocarbons

Analyte	Station														CSEMP (OSPAR, 2014)	NOAA (Long et al., 1995)	Canadian SQGs (CCME, 2023)	
	Export Cable Route																	
	ST034	ST043	ST046	ST050	ST051	ST057	ST058	ST062	ST063	ST064	ST067	ST068	ST072	ST073	ERL	ERM	TEL	PEL
Acenaphthene	3.59	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	–	500	6.71	88.9
Acenaphthylene	2.08	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	–	640	5.87	128
Anthracene	4.28	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	85	1100	46.9	245
Benzo[a]anthracene	15.2	< 1	< 1	< 1	< 1	2.15	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	261	1600	74.8	693
Benzo[a]pyrene	15.6	2.00	1.51	1.46	< 1	1.95	< 1	< 1	< 1	< 1	1.64	1.68	< 1	< 1	430	1600	88.8	763
Benzo[b]fluoranthene	23.0	3.97	3.04	3.24	2.00	4.75	< 1	< 1	1.50	2.11	3.82	3.81	2.41	2.42	–	–	–	–
Benzo[e]pyrene	22.1	3.50	2.85	2.95	1.69	2.53	< 1	< 1	< 1	1.79	3.57	3.78	1.94	2.01	–	–	–	–
Benzo[ghi]perylene	19.9	2.87	2.07	2.23	1.30	3.42	< 1	< 1	< 1	1.59	2.58	2.65	1.53	1.64	85	–	–	–
Benzo[k]fluoranthene	15.1	2.88	2.31	2.39	1.58	3.63	< 1	< 1	< 1	1.71	2.88	3.05	1.67	1.59	–	–	–	–
C1-naphthalenes	89.0	7.81	5.34	5.32	2.71	10.7	< 1	1.68	< 1	2.24	4.17	5.70	5.58	2.81	155	–	–	–
C1-phenanthrene	56.4	6.08	3.29	3.07	1.76	8.52	< 1	< 1	< 1	1.89	2.93	3.71	3.06	1.63	170	–	–	–
C2-naphthalenes	77.9	9.00	6.82	5.85	3.11	12.8	< 1	2.57	2.27	4.29	8.09	9.42	7.12	4.28	150	–	–	–
C3-naphthalenes	70.7	8.36	5.63	3.74	2.73	12.1	< 1	< 1	1.50	2.78	4.37	5.36	4.89	2.30	–	–	–	–
Chrysene	23.7	2.73	1.64	1.86	< 1	4.01	< 1	< 1	< 1	< 1	1.89	1.87	< 1	< 1	384	2800	108	846
Dibenzo[ah]anthracene	3.73	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	–	260	6.22	135
Fluoranthene	27.6	3.83	2.48	2.89	1.45	6.44	< 1	< 1	< 1	1.58	2.69	2.58	1.56	1.62	600	5100	113	1494
Fluorene	5.86	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	–	540	21.2	144
Indeno[1,2,3-cd]pyrene	15.2	3.18	2.76	2.74	1.68	2.18	< 1	< 1	< 1	1.69	3.44	3.67	1.88	2.05	240	–	–	–
Naphthalene	23.7	2.44	2.24	2.01	< 1	1.91	< 1	< 1	< 1	< 1	2.04	2.33	1.19	1.17	160	2100	34.6	391
Perylene	3.01	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	–	–	–	–

Analyte	Station														CSEMP (OSPAR, 2014)	NOAA (Long et al., 1995)	Canadian SQGs (CCME, 2023)	
	Export Cable Route																	
	ST034	ST043	ST046	ST050	ST051	ST057	ST058	ST062	ST063	ST064	ST067	ST068	ST072	ST073	ERL	ERM	TEL	PEL
Phenanthrene	50.2	4.31	2.34	2.54	1.31	7.73	< 1	< 1	< 1	1.56	2.36	2.93	2.52	1.41	**240**	**1500**	**86.7**	**544**
Pyrene	26.1	3.08	1.90	2.12	< 1	4.88	< 1	< 1	< 1	< 1	2.07	2.04	< 1	1.24	**665**	**2600**	**153**	**1398**
Total	**594**	**< 73.0**	**< 53.2**	**< 51.4**	**<32.3**	**< 95.7**	**< 22.0**	**< 24.3**	**< 24.3**	**< 34.2**	**< 55.5**	**< 61.6**	**< 45.4**	**< 35.2**	–	–	–	–

Analyte	Station														CEMP (OSPAR, 2014)	NOAA (Long et al., 1995)	Canadian SQGs (CCME, 2023)	
	Export Cable Route											Array						
	ST082	ST083	ST091	ST095	ST097	ST101	ST107	ST128	ST163	ST106	ST120	ST136	ST155	ST160	ERL	ERM	TEL	PEL
Acenaphthene	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	8.02	< 1	< 1	< 1	< 1	< 1	–	500	6.71	88.9
Acenaphthylene	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	4.68	< 1	< 1	< 1	< 1	< 1	–	640	5.87	128
Anthracene	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	18.4	< 1	< 1	< 1	< 1	< 1	85	1100	46.9	245
Benzo[a]anthracene	5.04	< 1	< 1	< 1	< 1	< 1	< 1	< 1	38.8	< 1	< 1	< 1	< 1	< 1	261	1600	74.8	693
Benzo[a]pyrene	6.45	1.23	< 1	< 1	< 1	< 1	< 1	< 1	41.3	< 1	< 1	< 1	< 1	< 1	430	1600	88.8	763
Benzo[b]fluoranthene	13.4	2.53	< 1	< 1	< 1	< 1	< 1	< 1	40.4	< 1	< 1	< 1	< 1	< 1	–	–	–	–
Benzo[e]pyrene	13.3	2.32	< 1	< 1	< 1	< 1	< 1	< 1	49.0	< 1	< 1	< 1	< 1	< 1	–	–	–	–
Benzo[ghi]perylene	9.41	2.03	< 1	< 1	< 1	< 1	< 1	< 1	38.3	< 1	< 1	< 1	< 1	< 1	85	–	–	–
Benzo[k]fluoranthene	8.24	1.91	< 1	< 1	< 1	< 1	< 1	< 1	34.0	< 1	< 1	< 1	< 1	< 1	–	–	–	–
C1-naphthalenes	18.4	4.48	1.30	< 1	< 1	< 1	< 1	< 1	193	< 1	< 1	< 1	1.45	< 1	155	–	–	–
C1-phenanthrene	17.0	4.49	1.48	< 1	< 1	< 1	< 1	< 1	132.0	< 1	< 1	< 1	< 1	< 1	170	–	–	–
C2-naphthalenes	24.4	6.80	3.40	2.60	2.10	2.19	2.40	3.14	168	1.89	1.77	1.82	3.85	1.78	150	–	–	–
C3-naphthalenes	18.5	5.65	1.51	< 1	< 1	< 1	< 1	< 1	171	< 1	< 1	< 1	< 1	< 1	–	–	–	–
Chrysene	8.56	1.91	< 1	< 1	< 1	< 1	< 1	< 1	51.8	< 1	< 1	< 1	< 1	< 1	384	2800	108	846
Dibenzo[ah]anthracene	1.78	< 1	< 1	< 1	< 1	< 1	< 1	< 1	9.33	< 1	< 1	< 1	< 1	< 1	–	260	6.22	135
Fluoranthene	9.94	2.42	< 1	< 1	< 1	< 1	< 1	< 1	75.8	< 1	< 1	< 1	< 1	< 1	600	5100	113	1494
Fluorene	2.37	< 1	< 1	< 1	< 1	< 1	< 1	< 1	15.4	< 1	< 1	< 1	< 1	< 1	–	540	21.2	144
Indeno[1,2,3-cd]pyrene	9.98	2.04	< 1	< 1	< 1	< 1	< 1	< 1	34.3	< 1	< 1	< 1	< 1	< 1	240	–	–	–
Naphthalene	5.48	1.39	< 1	< 1	< 1	1.29	< 1	< 1	62.1	< 1	< 1	< 1	< 1	< 1	160	2100	34.6	391
Perylene	7.76	1.19	< 1	< 1	< 1	< 1	< 1	< 1	9.21	< 1	< 1	< 1	< 1	< 1	–	–	–	–
Phenanthrene	11.6	3.05	< 1	< 1	< 1	< 1	< 1	< 1	98.5	< 1	< 1	< 1	< 1	< 1	240	1500	86.7	544

Analyte	Station														CEMP (OSPAR, 2014)	NOAA (Long et al., 1995)	Canadian SQGs (CCME, 2023)	
	Export Cable Route											Array						
	ST082	ST083	ST091	ST095	ST097	ST101	ST107	ST128	ST163	ST106	ST120	ST136	ST155	ST160	ERL	ERM	TEL	PEL
Pyrene	9.00	2.06	< 1	< 1	< 1	< 1	< 1	< 1	68.1	< 1	< 1	< 1	< 1	< 1	**665**	**2600**	**153**	**1398**
Total	**< 204**	**< 51.5**	**< 25.7**	**< 23.6**	**< 23.1**	**< 23.5**	**< 22.9**	**< 24.1**	**1360**	**< 22.9**	**< 22.8**	**< 22.8**	**< 25.3**	**< 22.8**	**–**	**–**	**–**	**–**

Notes

Concentrations expressed in µg/kg dry sediment

CCME = Canadian Council of Ministers of the Environment

CEMP = Coordinated Environmental Monitoring Programme

ERL = Effects range low

ERM = Effects range median

NOAA = National Oceanic and Atmospheric Administration

OSPAR = Oslo and Paris Commission

PEL = Probable Effects Level

SQG = Sediment quality guidelines

TEL = Threshold Effects Level

Effects ranges were developed for NOAA to evaluate the potential toxicological effects of a concentration of a contaminant in sediment; some ERLs are adopted by OSPAR CSEMP for the assessment of monitoring data of hazardous substances in the environment

Polychlorinated biphenyls

Station	PCB 101	PCB 105	PCB 110	PCB 118	PCB 128	PCB 138	PCB 141	PCB 149	PCB 151	PCB 153	PCB 156	PCB 158	PCB 170
Export Cable Route													
ST034	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST043	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST046	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST050	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST051	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST057	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST058	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST062	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST063	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST064	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST067	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST068	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST072	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST073	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST082	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST083	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST091	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST095	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST097	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST101	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST107	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST128	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST163	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008

Station	PCB 101	PCB 105	PCB 110	PCB 118	PCB 128	PCB 138	PCB 141	PCB 149	PCB 151	PCB 153	PCB 156	PCB 158	PCB 170
Array													
ST106	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST120	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST136	0.00016	0.00013	0.00015	0.00017	0.00013	0.00015	0.00021	0.00021	0.00023	0.00015	0.00020	0.00015	0.00020
ST155	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
ST160	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
Minimum	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**
Maximum	**0.00016**	**0.00013**	**0.00015**	**0.00017**	**0.00013**	**0.00015**	**0.00021**	**0.00021**	**0.00023**	**0.00015**	**0.00020**	**0.00015**	**0.00020**
CEFAS Guidelines Action Levels													
AL1	–	–	–	–	–	–	–	–	–	–	–	–	–
AL2	–	–	–	–	–	–	–	–	–	–	–	–	–

Stations	PCB 18	PCB 180	PCB 183	PCB 187	PCB 194	PCB 28	PCB 31	PCB 44	PCB 47	PCB 49	PCB 52	PCB 66	Total
Export Cable Route													
ST034	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST043	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST046	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST050	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST051	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST057	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST058	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST062	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST063	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST064	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST067	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST068	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST072	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST073	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST082	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST083	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST091	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST095	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST097	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST101	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST107	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST128	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST163	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
Array													

Stations	PCB 18	PCB 180	PCB 183	PCB 187	PCB 194	PCB 28	PCB 31	PCB 44	PCB 47	PCB 49	PCB 52	PCB 66	Total
ST106	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST120	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST136	< 0.00008	0.00017	0.00023	0.00023	0.00013	0.00014	0.00016	0.00020	0.00018	0.00019	0.00021	0.00023	**< 0.00439**
ST155	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
ST160	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	**< 0.00200**
Minimum	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00008**	**< 0.00200**
Maximum	**< 0.00008**	**0.00017**	**0.00023**	**0.00023**	**0.00013**	**0.00014**	**0.00016**	**0.00020**	**0.00018**	**0.00019**	**0.00021**	**0.00023**	**< 0.00439**
CEFAS Guidelines Action Levels													
AL1	–	–	–	–	–	–	–	–	–	–	–	–	**0.02**
AL2	–	–	–	–	–	–	–	–	–	–	–	–	**0.2**

Notes

AL1 = Action Level 1 AL2 = Action Level 2

Concentrations expressed as mg/kg dry weight

Cefas = Centre for Environment, Fisheries and Aquaculture Science

Cefas action levels available at https://www.gov.uk/guidance/marine-licensing-sediment-analysis-and-sample-plans