DOGGER BANK
CREYKE BECK

August
2013

Environmental Statement
Non-Technical Summary

Application Reference: 6.36

Document Title	Dogger Bank Creyke Beck Environmental Statement – Non-Technical Summary
Forewind Document Reference	F-OFC-CH-103 Issue 3
Date	August 2013

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Date / initials approval		18-Aug-2013	AMP
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Date / Reference approval		21-Aug-2013	GL

Title:		Contract No.
Dogger Bank Creyke Beck Environmental Statement Non-Technical Summary		Offshore
Document Number:	Issue No:	Issue Date:
F-OFC-CH-103	3	20 August 2013

Status:

Issued for 1st. Technical Review	☐	Issued for PEI3	☐
Issued for 2nd. Technical Review	☐	Issued for Application Submission	☒

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Revision History

Date	Issue No.	Remarks / Reason for Issue	Author	Checked	Approved
28-Mar-13	1	1st technical review	RHDHV	JA	AMP
03-Apr-13	2	Issued for PEI 3	RHDHV	JA	AMP
07-Aug-13	2.1	1st review, final ES	RHDHV	JA	AMP
20-Aug-13	3	Final ES	RHDHV	JA	AMP

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1 Introduction

1.1 Non-Technical Summary

1.1.1 This Non-Technical Summary presents the findings of the Environmental Statement, avoiding, where possible, the use of technical language.

1.1.2 The Environmental Statement documents the findings of the environmental impact assessment process undertaken by Forewind into the potential impacts of construction, operation and decommissioning phases of both the offshore and onshore parts of Dogger Bank Creyke Beck.

1.1.3 Details of how to obtain further information on the development are given at the end of this document.

1.2 Dogger Bank Creyke Beck

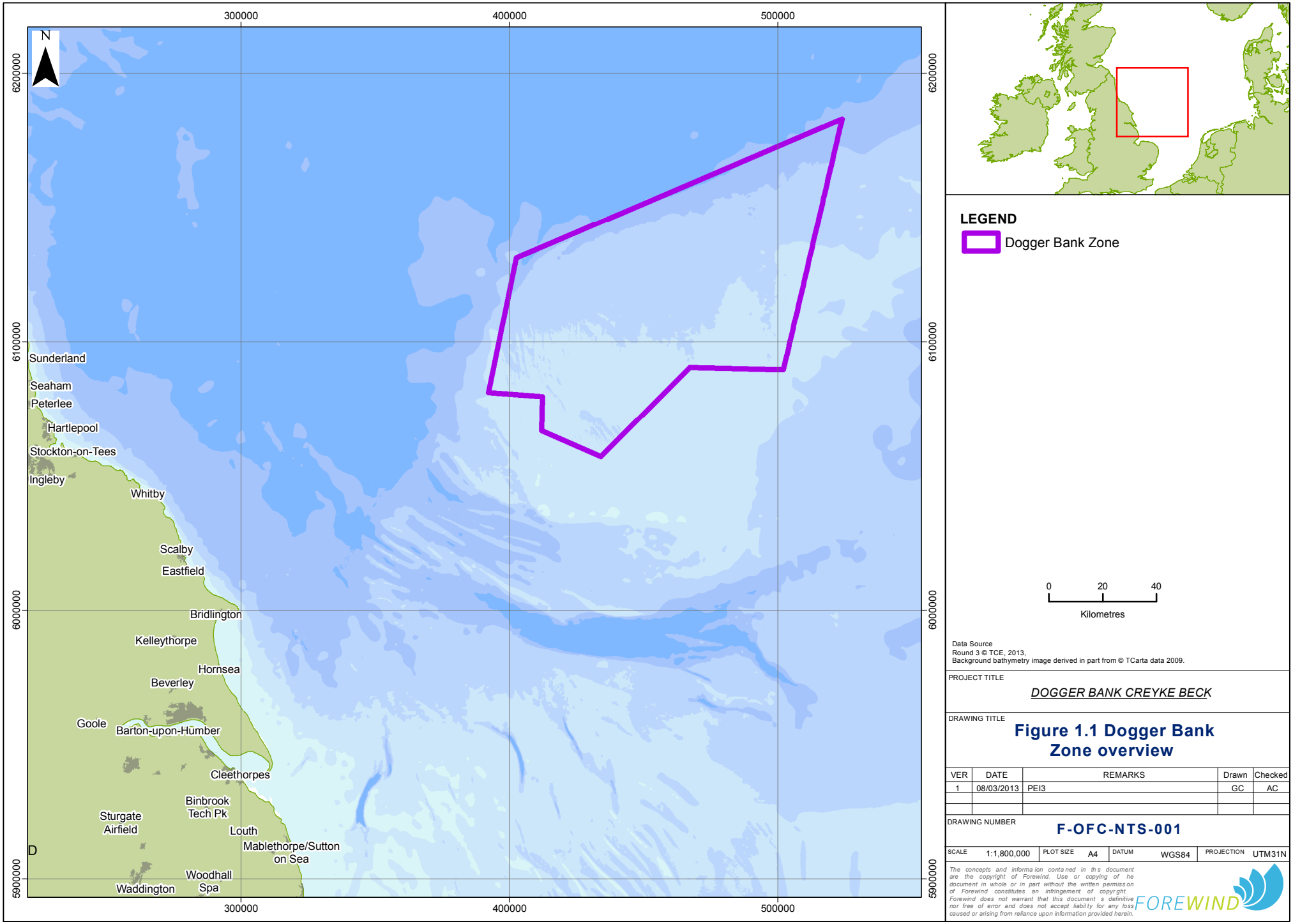
1.2.1 In January 2010, The Crown Estate awarded Forewind the exclusive development rights for 'Zone 3, Dogger Bank'; the largest of the nine Round 3 offshore wind farm zones. The Dogger Bank Zone comprises an area of 8,660 km^2, and is located in the North Sea between 125 km and 290 km off the coast of Yorkshire, see **Figure 1.1**.

1.2.2 Since then, through discussions with National Grid, Forewind identified the potential to connect two wind farms, within the Dogger Bank Zone, to the existing substation at Creyke Beck, near Cottingham in the East Riding of Yorkshire. Forewind therefore proposed that these two wind farms would be developed together during the pre-application phase. Jointly, these offshore wind farms are referred to as 'Dogger Bank Creyke Beck' and it is these two wind farms (Dogger Bank Creyke Beck A and Dogger Bank Creyke Beck B) that are the subject of the environmental impact assessment and Development Consent Order application.

1.2.3 Dogger Bank Creyke Beck will be the first stage of development in the Dogger Bank Zone. It will comprise two offshore wind farms with an installed capacity of up to 1.2 gigawatts (GW) each:

- Dogger Bank Creyke Beck A is located in the southern corner of the zone. Covering 515 km^2, it is 131 km from shore at its closest point.
- Dogger Bank Creyke Beck B is located on the western edge of the zone. It covers 599 km^2 and is also 131 km from shore at its closest point.

1.2.4 Cabling from the wind farms will come ashore close to Ulrome on the Holderness Coast and travel approximately 30 km inland to two new converter stations, situated north of the A1079 between Beverley and Cottingham in the East Riding of Yorkshire. The converter stations will convert the high voltage direct current to high voltage alternating current, to allow connection to the UK's electricity transmission network. Approximately 2 km of high voltage alternating current cabling will connect the converter stations to the existing Creyke Beck substation near Cottingham, refer to **Figure 1.2**.



Data Source
Round 3 © TCE, 2013,
Background bathymetry image derived in part from © TCarta data 2009.

PROJECT TITLE

DOGGER BANK CREYKE BECK

DRAWING TITLE

Figure 1.1 Dogger Bank Zone overview

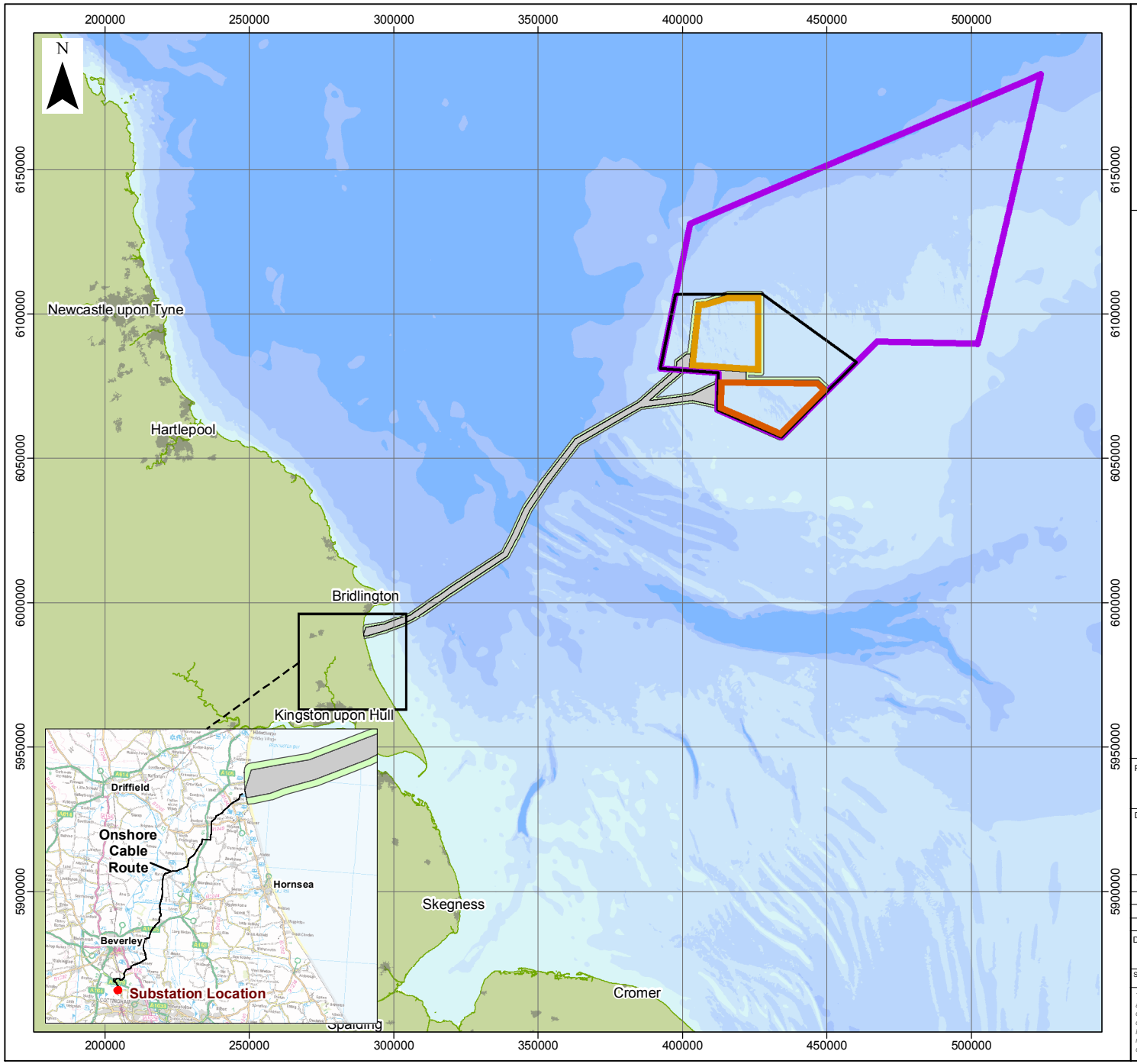
VER	DATE	REMARKS	Drawn	Checked
1	08/03/2013	PEI3	GC	AC

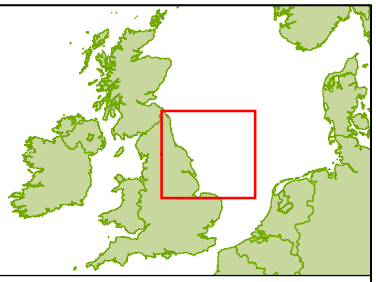
DRAWING NUMBER

F-OFC-NTS-001

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,800,000	A4	WGS84	UTM31N

FOREWIND





LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Export cable corridor
- Temporary works area

0 20 40
Kilometres

Data Source:
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009
Ordnance Survey data © Crown copyright and database right, 2012

PROJECT TITLE

DOGGER BANK CREYKE BECK

DRAWING TITLE

Figure 1.2 Offshore and onshore project elements

VER	DATE	REMARKS	Drawn	Checked
1	08/03/2013	PEI3	GC	AC
2	16/08/2013	Final ES	FK	AC

DRAWING NUMBER

F-OFC-NTS-002

SCALE	PLOT SIZE	DATUM	PROJECTION
1:2,000,000	A4	WGS84	UTM31N

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1.3 The applicant – Forewind

1.3.1 Forewind is a consortium comprising four leading international energy companies - RWE, SSE, Statoil and Statkraft. Together, these companies combine extensive experience of international offshore project delivery and renewable energy development, construction, asset management and operations. Through the combined strength of these four companies, Forewind has the ability to make a significant contribution to the future of wind energy in the UK, and to demonstrate commitment to the continuing development of offshore wind. Forewind's commitment is to secure all of the necessary consents for the construction and development of the Dogger Bank Zone, up to the point that a lead operator is identified to construct and operate each wind farm.

1.4 Project need

1.4.1 The need for renewable energy was summed up by the Department of Energy and Climate Change, in answering the question "Why do we need renewable energy in the UK?"

> …for a whole variety of reasons. It will help us get off the fossil fuel hook and reduce our greenhouse gas emissions. If we meet our target of delivering 15% renewables by 2020 it will reduce our overall fossil fuel demand by around 10%. Our gas imports will reduce by 20-30% against what they would have been in 2020. More renewable energy will also bring outstanding opportunities to create jobs and we will become more energy secure (Department of Energy and Climate Change 2012).

1.4.2 Under the Climate Change Act 2008, the UK is legally bound to reduce its greenhouse gas emissions by at least 80% by 2050 through action either at home or abroad. In order to achieve this, there will have to be major changes in how energy is used and generated. It is estimated that approximately 40-70 GW of new low carbon electricity generation will be needed by 2030 and this will be provided, in part, by offshore wind farms such as Dogger Bank Creyke Beck.

1.4.3 Offshore wind energy generation is well placed to play a significant role in meeting government climate change and energy targets. It has shorter lead-in times than nuclear energy and is more advanced, both from a technical and economic perspective, than other forms of low carbon energy technology (such as carbon capture and storage and other renewable technologies including wave and tidal).

1.4.4 Forewind has a target to achieve consent for 9 GW of projects in the Dogger Bank Zone. Our priority is to secure the first six projects, each up to 1.2 GW, or a total installed capacity of 7.2 GW.

1.4.5 Dogger Bank Creyke Beck and the other potential offshore wind farms within the Dogger Bank Zone all have the potential to contribute to national targets for tackling climate change, reducing reliance on fossil fuels and securing energy supplies. They

also have an important role in supporting the local and regional economy by providing new job and business opportunities.

1.5 Dogger Bank Creyke Beck offshore project details

1.5.1 Dogger Bank Creyke Beck will comprise the following main offshore components summarised in **Table 1.1**:

- Up to 600 wind turbines with supporting tower structures, foundations fixed to the seabed and associated support and access structures (however it should be noted that this maximum number of turbines has been further constrained within the Development Consent Order to a maximum of 400 as a mitigation measure for birds, see Section 6.4);
- Two offshore high voltage direct current converter platforms;
- Up to eight offshore collector platforms;
- Up to four offshore accommodation or helicopter platforms, including facilities for vessels and helicopters for operations and maintenance activities;

Typical offshore collector platform

- Up to 10 offshore weather monitoring stations;
- Subsea cabling carrying electricity between the wind turbines and offshore platforms (inter-array and inter-platform cabling);
- Subsea cabling carrying electricity from the offshore high voltage direct current converter platforms to the Holderness coast, around 175km away; and
- Ancillary works including: cable and pipeline crossing structures; protection against foundation scour and subsea damage, cable protection measures and vessel-mooring facilities.

Table 1.1 Summary of key project parameters

Parameters	Maximum per project	Maximum for projects A and B
Wind turbines	300	600
Offshore collector substation platforms	4	8
Offshore converter substation platforms	1	2
Offshore accommodation or helicopter platforms	2	4
Length of inter-array cabling (km)	950	1900
Length of inter-platform cabling (km)	320	640

1.6 Offshore construction programme

Offshore turbine construction

1.6.1 Offshore construction of Dogger Bank Creyke Beck A and Dogger Bank Creyke Beck B may be undertaken separately or at the same time, and either project could be built first. Although exact timings are yet to be determined, the earliest that construction work will start is 2016. This depends on a number of factors including the connection agreement with National Grid, the date that planning consent is awarded, and the availability of key project components, such as the wind turbines.

1.6.2 The minimum construction period per project is three years and the maximum construction period per project is six years. Offshore construction will commence no sooner than 18 months after planning consent. In addition, it is a requirement of the Development Consent Order that construction must start within seven years of consent. Taking this into account, the minimum construction period for both projects together would be three years and the maximum would be 11 years and six months.

1.7 Dogger Bank Creyke Beck onshore project details

1.7.1 The main onshore components include:

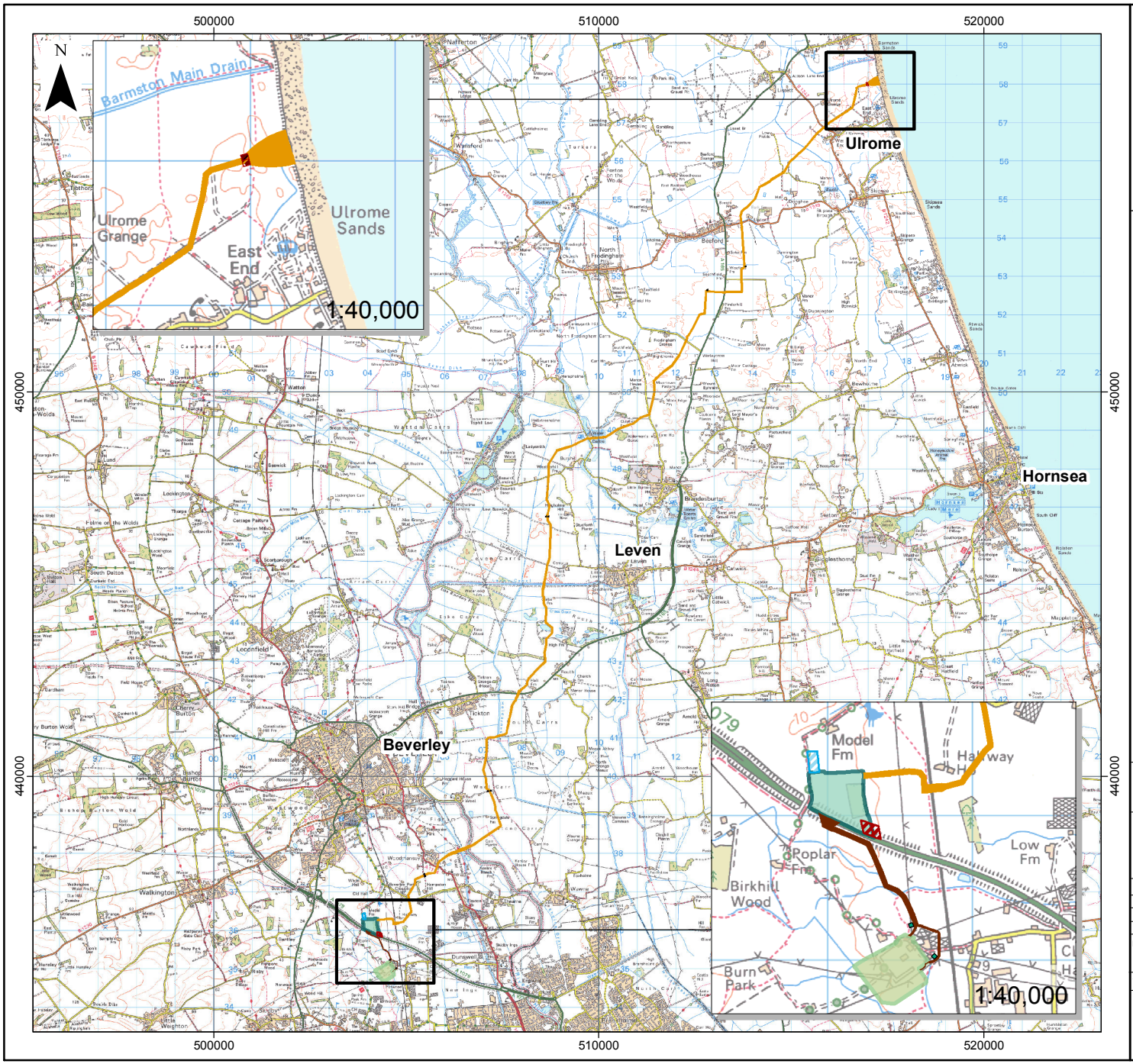
- Underground cable transition joint bays at the landfall, north of Ulrome on the Holderness coast;
- Underground high voltage direct current cables running approximately 30 km from the landfall joint bays to the two converter stations;
- Two proposed new converter stations located between Beverley and Cottingham adjacent to the A1079 and with associated roads, fencing, landscaping and drainage;
- Underground high voltage alternating current cables running approximately 2 km from the converter stations to the existing National Grid substation at Creyke Beck, where connection works will be carried out; and

Onshore cable trenching

- Ancillary works including temporary working areas, permanent and temporary access roads, and service corridors.

1.7.2 An overview of the onshore works is shown in **Figure 1.3**.

1.7.3 The offshore cables will come ashore at the landfall to connect to the onshore cable systems. The cable landfall works, including the methods of installation, will depend on the ground conditions, the height of the cliffs and any local environmental considerations.



LEGEND

- Creyke Beck A and Creyke Beck B high voltage direct current (HVDC) cable route
- Creyke Beck A and Creyke Beck B high voltage alternating current (HVAC) cable route
- Landfall joint transition bay
- Intermediate construction compound (784 m²)
- Creyke Beck A converter station construction compound
- Creyke Beck B converter station construction compound
- Creyke Beck A and Creyke Beck B converter stations works area
- National Grid Electricity Transmission (NGET) substation works area

0 5

Kilometres

Data Source:
Ordnance Survey data © Crown copyright and database right, 2012

PROJECT TITLE

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DRAWING TITLE

Figure 1.3 Onshore overview

VER	DATE	REMARKS	Drawn	Checked
1	08/03/2013	PEI3	GC	AC
2	05/08/2013	Final ES	FK	AC

DRAWING NUMBER

F-OFC-NTS-003

SCALE	1:150,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

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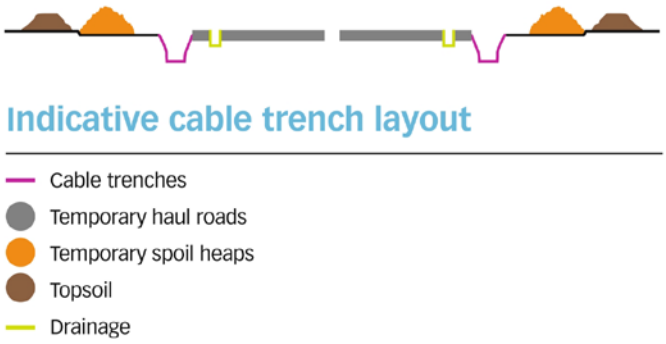
1.7.4 Installation of the cable at the landfall is likely to be via horizontal directional drilling, which removes the needs for trenches. This is the preferred installation technique at the landfall and is proposed to reduce disruption to the shoreline.



Indicative onshore cable corridor layout for both projects

1.7.5 Drilling would start from an onshore transition bay though it may not be possible to go all the way to the seabed at once. This means that the exit point for the horizontal directional drill may fall in the inter-tidal zone – the zone between the low water mark and the high water mark. In this case, cofferdams, which are temporary enclosures dug into the beach, may be required. Water is pumped out of the enclosure to create a dry work environment where cable jointing can take place.

1.7.6 The onshore cables will be buried underground for the entire length of their route and will be laid across agricultural land by open trenching. This method involves trenches being excavated and cables placed inside, before the trenches are filled in. However, the cables will need to cross a number of obstacles such as minor and major roads, railways, and watercourses, where alternative installation methods, such as horizontal directional drilling, will be considered.

1.7.7 A visualisation of the horizontal directional drilling technique is provided in **Figure 1.4**.

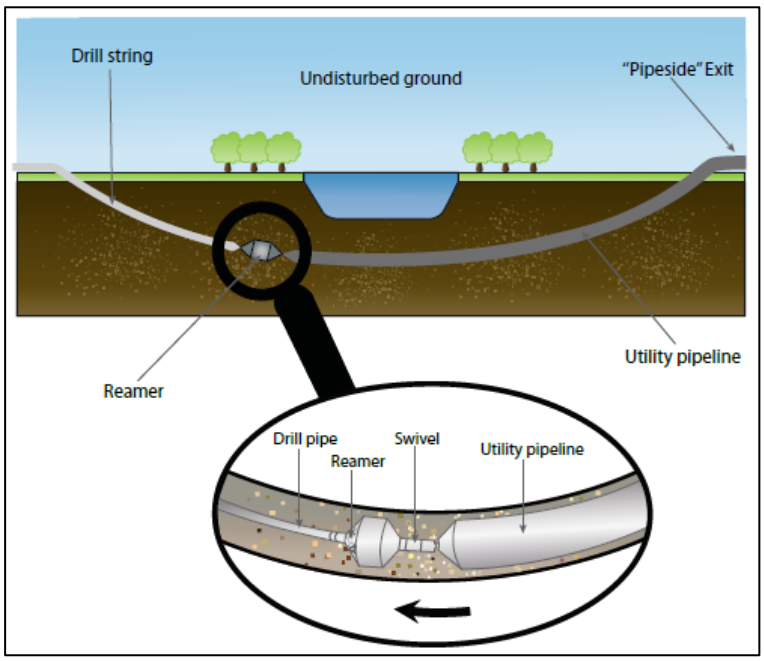


Figure 1.4 Illustrative visualisation of horizontal directional drilling technique

1.7.8 Two converter stations will be built, one for Dogger Bank Creyke Beck A and another for Dogger Bank Creyke Beck B. The site proposed for the converter stations is on the northern side of the A1079 between Beverley and Cottingham approximately 2 km north of the existing Creyke Beck substation. Access to the site for construction traffic will be via a new access road from a lay-by on the A1079.

1.7.9 Each converter station will include a valve hall, control building, outdoor equipment, car parking and internal roads. An example of a typical arrangement for the converter stations is shown in **Figure 1.5**.

Figure 1.5 Landscape mitigation plan – showing indicative converter stations arrangement

1.8 Onshore construction programme

1.8.1 The onshore elements of Dogger Bank Creyke Beck may be constructed separately or at the same time, although exact timings are yet to be determined. It would take a maximum of three years to complete all the onshore works if the two projects were constructed at the same time. However, if the two projects are built separately it would take two periods of up to three years each, i.e. six years of construction activity.

1.8.2 As with the offshore programme construction must start within seven years of consent. Taking this into account, the maximum period over which the construction of both projects could take place is 10 years (which could include up to a five year gap between the end of construction of the first project and the start of the second project). These timeframes represent the worst case scenario based on the longest possible period of construction.

2 Consenting process

2.1 Regulatory consents and environmental impact assessment process

2.1.1 As Dogger Bank Creyke Beck exceeds 100 megawatts of generating capacity, it is classified as a nationally significant infrastructure project and requires a Development Consent Order to allow it to be constructed and operated.

2.1.2 Under the Planning Act 2008 in England, it is possible to include development that is associated with a nationally significant infrastructure project within the Development Consent Order. The inclusion of the onshore works for Dogger Bank Creyke Beck (onshore underground cables, cable landfall, onshore converter stations and connection into the existing National Grid Creyke Beck substation) means that separate onshore planning permission is not required.

2.1.3 The Environmental Impact Assessment Regulations on nationally significant infrastructure projects came into force in October 2009. Offshore wind farm developments require an environmental impact assessment where they are likely to have significant effects on the environment due to their nature, size or location.

2.1.4 In submitting the information included in the request for a Scoping Opinion (Forewind, 2010), Forewind notified the Infrastructure Planning Commission (now the Planning Inspectorate) of its proposal to provide an Environmental Statement alongside a Development Consent Order application.

2.1.5 In addition to the Development Consent Order, it is expected that a number of other consents and permissions will be required prior to construction. These could include traffic regulation orders and land drainage consents. Deemed marine licences are also included in this application, and have been drafted in discussion with the Marine Management Organisation.

3 Approach to the assessment

3.1 Environmental impact assessment

3.1.1 Environmental impact assessment is an iterative tool to examine and assess the impacts and effects of the construction, operation and decommissioning phases of a development on the environment. They are described in a resulting Environmental Statement. This Non-Technical Summary is a summary of the findings reported in that document.

3.1.2 The impact assessment has used standard methodologies (supplemented with additional bespoke work where required) and has been informed by a number of other studies, such as geophysical survey and flood risk assessment. In accordance with the Environmental Impact Assessment Regulations, information included within the Dogger Bank Creyke Beck Environmental Statement includes:

- A description of the development;
- An outline of the main alternatives;
- A description of the aspects of the environment likely to be significantly affected by the development;
- A description of the likely significant effects of the development on the environment;
- A description of mitigation measures proposed to “prevent, reduce and where possible, offset any significant adverse effects on the environment”; and
- An indication of any difficulties encountered when compiling the required information.

3.1.3 The Planning Act 2008 introduced additional requirements for the environmental impact assessment process including:

- Submission of Preliminary Environmental Information to the relevant prescribed stakeholders (this was done earlier in the process);
- Liaison with stakeholders to resolve matters arising from their responses on the Preliminary Environmental Information and responses received on the Environmental Statement during the examination period; and
- A final decision by the Secretary of State on whether consent should be granted in the light of all environmental information.

3.1.4 Potential impacts identified as being major or moderate in the Environmental Statement, can be regarded as significant in terms of the Environmental Impact Assessment Regulations. The potential for mitigation has been considered in relation to such impacts.

3.2 Habitats Regulations Assessment

3.2.1 Certain habitats and species of European importance are protected under the Habitats Directive, creating a network of protected areas referred to as Natura 2000 sites. The Habitats Regulations require consideration as to whether a plan or project has the potential to have an adverse effect on the integrity of a Natura 2000 site. This process is known as Habitats Regulations Assessment.

3.2.2 A Habitats Regulations Assessment Report, including Information to inform an appropriate assessment under the Regulations, has been submitted alongside the Environmental Statement.

4 Site selection and assessment of alternatives

4.1 Site selection process

4.1.1 Forewind recognised the importance of selecting appropriate sites for its proposals and that the identification of those sites needed to give consideration to the technical and commercial feasibility, environmental impact and stakeholder concerns. This has been undertaken in seven stages, as shown in the flow diagram (**Figure 4.1**) below.

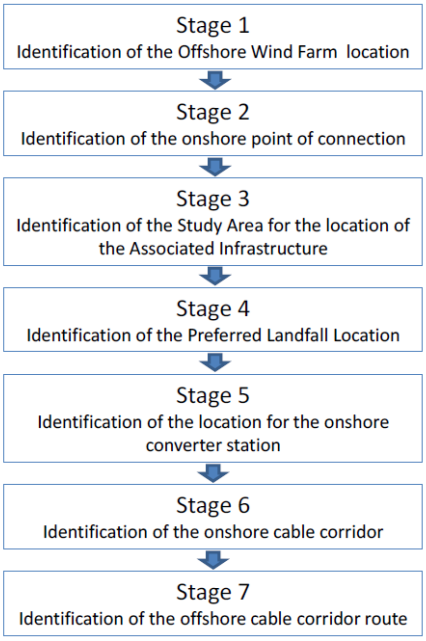


Figure 4.1 The site selection process

4.1.2 An iterative process of surveys, consultation, technical investigations, professional judgement and constraints mapping drove the site selection process. It allowed Forewind to identify the preferred sites of both the offshore wind farm and the chosen route for bringing the power onshore and connecting to the national grid. These seven stages comprised:

- **Stage 1 – Identification of the offshore wind farm location** – The starting point for the offshore wind farm location, following a government-led strategic environmental assessment, was the award of the Dogger Bank Zone by The Crown Estate in January 2010. A Zone Appraisal and Planning process followed to identify the location of the wind farm projects within the zone, taking into account all relevant technical, environmental and commercial considerations. This resulted in the identification of the Dogger Bank Creyke Beck A and B project boundaries in 2012.
- **Stage 2 – Identification of onshore point of connection -** The onshore connection point was determined between Forewind and National Grid through the Grid Connection Application Process.

- **Stage 3 – Identification of the Dogger Bank Creyke Beck study area** – A broad envelope connecting the Dogger Bank Zone to the onshore study area was identified as the area within which the export cable corridor was to be located. It was routed to avoid passing through the Hornsea Offshore Wind Farm Zone and through the area of sand waves immediately south of the zone. The onshore study area was a broad area of land within which the onshore works for Dogger Bank Creyke Beck could be most feasibly located. The study area was roughly cone shaped with the apex including a 4 km circle encompassing the existing Creyke Beck substation, near Cottingham.
- **Stage 4 – Identification of the landfall location** - Due to the complex nature and the potential significance of the technical, commercial, environmental and ecological considerations associated with the identification of a proposed landfall location on the Holderness Coast, a thorough and comprehensive assessment was undertaken. The phased process is shown in **Figure 4.2**.

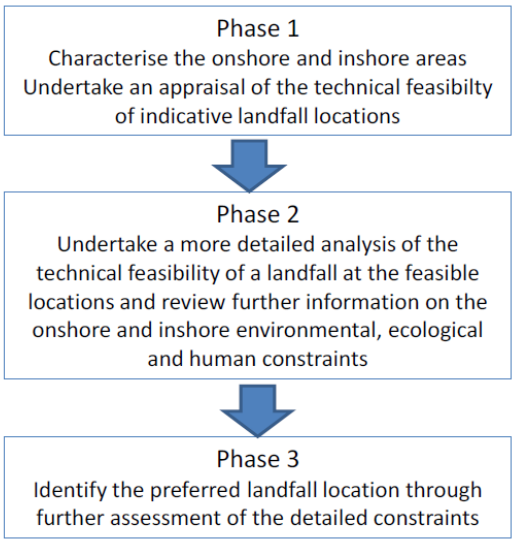


Figure 4.2 The landfall selection process

- **Stage 5 – Identification of the onshore converter station location** - Forewind determined that the onshore converter stations site would ideally be located as close as possible to the existing National Grid substation at Creyke Beck. The aim being to minimise the landscape and visual effects associated with introducing new electricity structures to the surrounding area. The site selection process therefore included consideration of people that live in and use the area, cultural and scientific value of the site, the local context, planning policy, industry guidance and existing land use.

- **Stage 6 – Identification of onshore cable corridor (Creyke Beck to the landfall)** - A cable route construction corridor, 50 m wide, was identified connecting the proposed landfall location to the onshore converter station study area. The route was determined based on a review of the known onshore constraints, such as locations of residential areas, protected plants and animals, important landscape features and buried archaeology. This 50 m wide route was refined to a 36 m wide route for the high voltage direct current cables based on engineering considerations.
- **Stage 7 – Offshore cable corridor selection** – The 2 km wide proposed offshore cable corridor was identified following analysis of known constraints and reconnaissance survey data for the area. The design decision considerations included; physical and biological seabed features, cables, pipelines, wrecks and draft Marine Conservation Zones.

4.2 Consultation

4.2.1 Effective and meaningful consultation is integral to Forewind's development activities and the organisation is committed to ensuring a transparent approach to its consultation and engagement activities. Forewind carried out a multi-stage consultation process in relation to the environmental impact assessment process with a wide range of interested parties (including consultation with National Grid from which an opportunity to connect two projects (rather than just one) into the existing Creyke Beck substation was identified). The consultation process met the requirements of the Planning Act and Environmental Impact Assessment Regulations and took into account relevant advice and guidance published by the Planning Inspectorate (previously the Infrastructure Planning Commission).

4.2.2 The comments received throughout consultation have informed the selection of survey methodologies, helped understand the sensitivity of features, and have informed the selection of the final offshore project boundaries and the locations for the converter stations site and onshore cable route. A full explanation of how the consultation process has shaped the Environmental Statement, as well as tables of all responses received during the statutory consultation periods, is provided in the Consultation Report.

5 Data collection and surveys

5.1.1 To understand the implications of the Dogger Bank Creyke Beck development on the site and surrounding area, a number of baseline surveys and technical studies were undertaken. The scope and methodology of these surveys and assessments were agreed with the relevant stakeholders and have incorporated all relevant existing data, where available. These surveys have covered the following areas:

Offshore Surveys

- Sea bed surveys;
- Ground investigation;
- Wave, current and tidal data collection;
- Vessel movements (recorded and surveyed);
- Marine and intertidal ecology;
- Fish and shellfish;
- Birds (data collected by boat based, coastal and aerial survey work); and
- Marine mammals.

Feeding Gulls

Onshore Surveys

- Viewpoint photography and landscape walkover;
- Archaeology (onshore cable route and converter station sites);
- Contaminated land walkover;
- Flood risk assessment topographical surveys and watercourses walkover;
- Background noise monitoring;
- Onshore ecological work to identify the main habitats onshore and the presence of any protected species; and
- Traffic counts.

6 Assessment outcomes

6.1 Designated sites

6.1.1 A wide range of marine and terrestrial designated sites and protected species are present within the study area, notably:

- Six UK Special Areas of Conservation (five of which comprise component Sites of Special Scientific Interest that are also screened into the assessment);
- 26 UK Special Protection Areas (and Ramsar sites) with component Sites of Special Scientific Interest whose features have also been screened into the assessment;
- Eight Sites of Special Scientific Interest, not present as components of Special Protection Areas (or Ramsar sites), but which support a number of marine seabird species whose populations are known to forage within the study area;
- Five OSPAR[1] threatened species (cod, spurdog, spotted ray, harbour porpoise and black-legged kittiwake);
- Two recommended Marine Conservation Zones;
- One Local Nature Reserve;
- One Local Wildlife Site;
- One Regionally Important Geological and Geomorphological Site;
- Nine Biodiversity Action Plan habitats;
- Various Biodiversity Action Plan species ranging from fish, sharks, grey seals, harbour porpoise, to otter and terrestrial bird species; and
- One 'Schedule 1' bird species – the marsh harrier (as defined by the Wildlife and Countryside Act, 1981, as amended).

6.1.2 All European designated sites are assessed within the Habitats Regulations Assessment under a separate process and separate method to environmental impact assessment, and are not considered here.

6.1.3 The construction, operation, and decommissioning phases of Dogger Bank Creyke Beck are predicted to result in no significant impacts on any UK designated sites and species. Similarly if Dogger Bank Creyke Beck and Dogger Bank Teesside A & B[2] were built and operated at the same time, it is predicted that there would be no significant impacts to any UK designated sites and species.

6.1.4 However, if Dogger Bank Creyke Beck and all other projects that are currently in the planning process were to commence at the same time, harbour porpoise would experience short-term noise impacts during the construction phase and harbour seal would experience increased mortality rates due to the increase in vessels with

[1] OSPAR is the mechanism by which 15 Governments of the western coasts and catchments of Europe, together with the European Community, cooperate to protect the marine environment of the North-East Atlantic.

[2] Dogger Bank Teesside A & B are part of the second stage of development of the Dogger Bank Zone and will each have a generating capacity of up to 1.2GW. They will connect to the national grid at the Lackenby substation in Teesside.

propellers close to the harbour seal colony in the Wash (both assessed as significant impacts).

6.1.5 In addition, there is potential for a significant cumulative impact on four Sites of Special Scientific Interest with regard to common guillemot, great black-backed gull, black-legged kittiwake and northern gannet populations.

6.1.6 All of the cumulative assessments producing significant impacts are noted to be highly conservative (worst case).

6.2 Marine physical processes

6.2.1 The existing marine physical processes, including waves, tidal currents and sediment transport have been investigated using data collected by offshore instruments, geophysical and geotechnical surveys, and seabed sediment sampling, followed by desk-based modelling.

6.2.2 The wind farm site is crossed by low velocity tidal currents and therefore movement of sediment is mainly controlled by waves. The wind farm site is mostly covered by sand with smaller patches of gravel and areas where the underlying geology is exposed. Sediment concentrations within the water across Dogger Bank and along most of the export cable corridor are very low, but increase in the nearshore zone. At the landfall, the coast is eroding and waves drive sediment movement alongshore to the south.

6.2.3 The magnitude of the physical process effects caused by Dogger Bank Creyke Beck has been assessed by modelling the behaviour of waves, tidal currents and sediments. These models have identified a number of potential effects during installation and operation of the wind farm and cables.

6.2.4 Suspended sediment concentrations will temporarily increase during the construction and operation phases and additional sediment will be deposited on the seabed. Sediment deposited on the seabed from suspension will be continuously re-suspended until its thickness is spread to effectively zero. Operation of the wind farm will cause small but permanent changes to wave heights and tidal current velocities, but the magnitude of change will be within what would be expected through existing levels of natural variation. Coarser sediment that is not dispersed as part of the construction plume will be deposited on the seabed at its source position. This deposited sediment is assumed to be sculpted into a sand wave through reworking by tidal currents and waves.

6.2.5 The greatest potential for changes to sediment transport which could alter the rate of coastal erosion would be by interruption from nearshore subtidal linear cable protection (if it was required). However, Forewind has made a commitment that no cable protection will be necessary in the intertidal zone (200 m wide) and from the mean low water spring tide to 350 m seaward of this. The active sediment transport zone at the landfall is from the cliffs to approximately 250 m seaward. Hence there will be no effect on sediment transport, even in the event that linear cable protection is required.

6.3 Marine water and sediment quality

6.3.1 The existing marine water and sediment quality was established through site specific sediment surveys and a review of available literature. The assessment of marine sediment contamination, and the potential implications for water quality, was based on accepted sediment guidelines and action levels.

6.3.2 The majority of the area surveyed did not exceed the published guideline levels for contaminants and therefore no impacts on water quality are anticipated. Potential impacts such as deterioration of water quality due to re-suspension of sediments are also not anticipated to be significant. The risk of deterioration in water quality as a result of accidental spillage of material or discharges of waste water is assessed as low due to environmental protection and control measures which will be implemented.

6.4 Marine and coastal ornithology

6.4.1 Baseline surveys and data collection were carried out to provide a robust understanding of the numbers of the marine and coastal bird species using the area, their abundance and behaviour. This data was also used to understand how the birds located within the Dogger Bank Creyke Beck study area compared to the national and international populations of these species, particularly at designated sites important for their bird interests.

6.4.2 The surveys and baseline data collection identified that there were 11 seabird species which use the offshore areas in significant numbers, whilst 46 migratory bird species were recorded flying through Dogger Bank Creyke Beck

6.4.3 The following potential impacts were examined in the assessment on the marine and coastal bird species:

- Disturbance and displacement due to construction of the cable landfall;
- Disturbance and displacement during construction, operation and decommissioning of the wind farm and offshore cabling;
- Collision risk during operation;
- Barrier effect during operation; and
- Habitat loss or alteration during construction, operation, and decommissioning.

Nesting birds Copyright A. Mackay

6.4.4 The impacts during construction (and decommissioning) are predominantly short-term and reversible disturbance and displacement impacts, which are not considered to be significant, either for Dogger Bank Creyke Beck alone, or when the cumulative effects with Dogger Bank Teesside A & B are considered.

6.4.5 During operation there is likely to be: disturbance and displacement effects due to habitat loss or alteration; a barrier effect on many of the breeding seabird and migratory wintering or passage bird populations; and collision effects could arise on seabird and migratory birds' national populations. As with the construction phase, none of these effects are predicted to be significant.

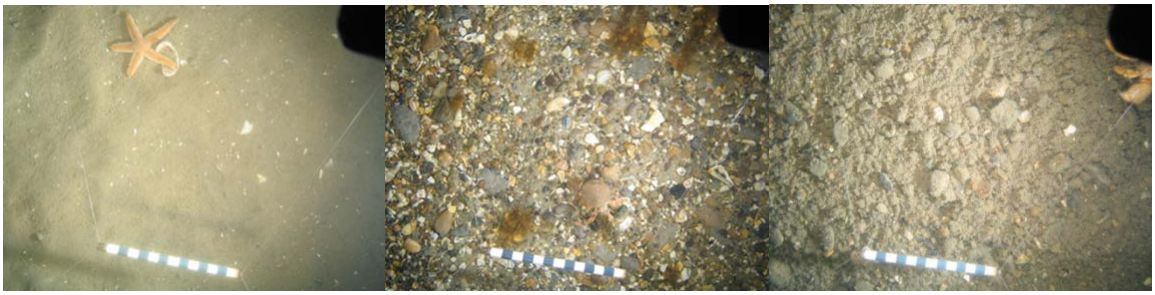
6.4.6 However, potentially significant cumulative impacts have been predicted, based on current information, for populations of common guillemot, great black-backed gull, black-legged kittiwake and northern gannet at four designated sites, as well as on the national populations of great black-backed gull and lesser black-backed gull. The significant impacts only arise when the cumulative impact of all other projects for which there is available information is considered.

6.4.7 Mitigation has been undertaken in order to reduce and minimise these potential impacts, including a reduction in the maximum number of turbines per project from 300 to 200. In all cases, the assessment is considered to be conservative (worst case) and the individual contribution of Dogger Bank Creyke Beck to each cumulative impact is small. Furthermore, it is expected that further consideration of the predictions for several of the other projects considered in the cumulative assessment will enable the overall level of impact to be reduced to within acceptable limits.

6.5 Marine and intertidal ecology

6.5.1 The type and distribution of marine plants, animals and related seabed habitats within the Dogger Bank Creyke Beck wind farm areas and export cable corridor (including at the landfall) have been described using data collected from site-specific surveys and review of existing data.

6.5.2 The seabed habitats recorded in these areas are among the most common habitats found around the coast of the UK. The wind farm site is dominated by sandy sediments which support relatively low diversity plant and animal communities. There are also smaller areas of coarser sediments within the wind farm site that support more diverse animal and plant communities. The majority of the offshore cable corridor comprises relatively uniform sandy sediments, with some mixing with gravels and muds near the landfall and where the export cable corridor joins the wind farm site.



(a) (b) (c)

(a) Slightly shelly sand with or without ripples – main habitat in wind farm site.

(b) Coarse sediments and slightly sandy pebbly gravel – found within small parts of the main site

(c) Coarse mixed sediment – found within offshore cable corridor

6.5.3 The seabed habitats within the boundary of the wind farm site and the offshore part of the export cable corridor form part of the Dogger Bank candidate Special Area of Conservation. The export cable corridor is also located 2 km from the Flamborough Head Special Area of Conservation. The habitats within these areas are protected from certain types of activity and development.

6.5.4 Key potential impacts on marine plants and animals have been assessed for all stages of the development. Temporary disturbance of existing habitats and increases in suspended sediment levels will occur during the construction phase, with some permanent loss of habitat where infrastructure is fixed in place during operation.

6.5.5 The impact assessment has established that these impacts will not be significant. This is based on the fact that the areas of existing seabed habitats that will be subject to temporary disturbance and/or permanent loss represent only a small proportion of similar seabed habitats in the wider region. In addition the areas affected are generally considered to be of low sensitivity and high recoverability.

6.5.6 The impact assessment also concluded no significant impacts on the Dogger Bank candidate Special Area of Conservation and/or Flamborough Head Special Area of Conservation.

6.6 Fish and shellfish ecology

6.6.1 Information on existing fish and shellfish populations was collected by site-specific surveys and a desk study to describe the species present and their abundance and distribution. Principal fish and shellfish species found on the Dogger Bank and in the export cable corridor include several species of commercial value, such as sandeel, herring, haddock, whiting, cod, plaice, lobster and edible crab.

6.6.2 Of particular note, the baseline characterisation surveys undertaken in the Dogger Bank former herring spawning grounds (south of the Dogger Bank Zone), found no evidence of spawning herring in the area. The inshore section of the export cable corridor falls in an area where there may be relatively high densities of herring larvae, however survey data suggests that suitable habitat for spawning is widespread within the spawning grounds. Therefore there are alternative spawning areas available to herring. Important areas for sandeel were also confirmed by survey, but these are primarily found to the west of Dogger Bank Creyke Beck.

6.6.3 Fish and shellfish species may be impacted by the development in a number of ways, including: habitat disturbance or loss; increased suspended sediment concentrations and sediment deposition; underwater noise; and electric and magnetic field emissions from subsea cables.

6.6.4 The impact assessment has established that none of the identified effects will result in a significant impact. This conclusion is based on a number of factors, namely: the available habitats for breeding species are large relative to the development footprint; noise mitigation measures will be used during piling operations enabling fish to swim away from the noise source (pile driver) thus reducing their exposure; the effects of increased suspended sediment concentration and deposition will be temporary, localised and with minimal deposition due to tidal movements; and electromagnetic field emissions from cables are limited to the immediate vicinity of the cable.

6.7 Marine mammals

6.7.1 Site specific boat based and aerial survey data were combined with existing reports and publications to describe the occurrence of marine mammals in the Dogger Bank Zone and the wider region. Harbour porpoise are the most frequently occurring species of marine mammal in the wind farm area, with minke whale, white-beaked dolphin and grey seal also being common. Harbour seal are less common in the offshore area. Based on the data collected, all other species of cetacean (whales, dolphins and porpoises) are considered rare or only occasional visitors, and were therefore not taken forward in the assessment.

White beaked dolphin

6.7.2 All cetaceans are listed as European Protected Species under Annex IV of the Habitats Directive, as they are classified as being endangered, vulnerable or rare. Both grey seal and harbour seal are protected under Annex II of the Habitats Directive which requires Member States of the European Union to designate areas essential to their life and reproduction as Special Areas of Conservation.

6.7.3 Potential impacts include:

- Underwater noise (from pile driving, vessels, operational turbines and cutting);
- Collision risk with vessel hulls and propellers;
- Indirect effects from changes in food sources;
- Electromagnetic fields; and
- Project infrastructure acting as a physical barrier to movements.

6.7.4 The key impacts for marine mammals relate to the potential for auditory injury and/or behavioural disturbance (such as displacement from a feeding area) during construction. The risk of causing auditory injury to marine mammals will be minimised through the use of a Marine Mammal Mitigation Protocol. The protocol will aim to reduce the exposure of marine mammals to sources of noise.

6.7.5 During construction there is the potential for behavioural disturbance, as a result of underwater noise from pile driving, to occur for up to six years per project. However, due to the relatively small proportion of the population of each species that may be temporarily displaced, the impacts are not considered to be significant. No other impacts are considered to be significant in the assessment of Dogger Bank Creyke Beck A and/or B, or cumulatively with Dogger Bank Teesside A & B.

6.7.6 The cumulative impact assessment considers the impacts on marine mammals occurring as a result of Dogger Bank Creyke Beck and other developments within the geographical extent of the population in question. The cumulative impact assessment concludes that there is the potential for significant residual impacts on harbour porpoise and grey seal, due to disturbance from pile driving noise. However, there is limited data linking the effects of disturbance to significant fitness effects in individuals or populations, resulting in a high amount of uncertainty in the conclusions of the assessment. Forewind will continue to keep informed of research in this field, and follow new industry guidelines or mitigation measures should they be introduced, in order to refine the impact levels down. Significant impacts are not anticipated upon other species of marine mammal as a result of underwater noise.

Minke Whale

6.7.7 The impact of collision risk in harbour seal due to propellers is considered significant when taking into account cumulative impacts from projects outside of the Dogger Bank Zone. However this assessment is highly conservative as the actual contribution of the Dogger Bank projects to this cumulative impact is only small. It is anticipated that industry wide initiatives will be developed in due course and Forewind will continue to keep informed of research in this field.

6.8 Commercial fisheries

6.8.1 The commercial fisheries impact assessment has used a variety of sources of information, including fisheries datasets from national fisheries agencies in the UK and other EU countries. The data confirms that in the Dogger Bank Zone and the export cable corridor, fishing vessels from the UK, the Netherlands, Denmark, Germany, Belgium, Norway, France and Sweden target several commercial species of fish and shellfish, with a variety of fishing gears.

6.8.2 Potential impacts on fishing activities as a result of construction, operation and decommissioning of Dogger Bank Creyke Beck include:

Offshore fishing vessel Copyright A.Mackay

- the effects of the temporary or complete loss of, or restricted access to, traditional fishing grounds;
- displacement or interference of fishing activity; safety issues for fishing vessels; increased steaming times to fishing grounds;
- impacts on commercially exploited species of fish and shellfish;
- Accidentally dropped or discarded objects associated with construction and maintenance works; and
- The ecological impact of the development on commercially exploited species.

6.8.3 The only significant impact on commercial fishing interests is the potential loss of fishing area for crab and lobster during construction as a result of the installation of the export cables. This impact will be restricted to the duration of the installation works.

6.8.4 The cumulative impact assessment considers any impacts on commercial fishing activities as a result of the development of Dogger Bank Creyke Beck, as well as other developments within known fishing ranges. The majority of potential cumulative impacts are identified as being not significant, during all phases. An exception to this is a potential significant impact on the seine net fishery during construction and operation, due to the extensive nature of the nets. However, the actual contribution resulting from the construction of Dogger Bank Creyke Beck to the wider cumulative impact is expected to be relatively small.

6.9 Shipping and navigation

6.9.1 A Navigation Risk Assessment was undertaken, which describes the existing hazards within the development area and the navigation routes commonly used by vessels. Common vessel types include commercial fishermen, recreational boats and commercial operators. Very few vessels transit through the site and given its location, relatively small changes in a vessel's course are necessary to avoid the development. High concentrations of commercial fishing vessels are evident during the sandeel fishing season, however this activity is focussed on the area to the west of Dogger Bank Creyke Beck.

6.9.2 Although the number of potential hazards increases as a result of the project, significant impacts are not expected. Due to the potential development of other large offshore renewable projects in the North Sea, cumulative and transboundary impacts, although not significant at this stage, will continue to be assessed as part of the ongoing development of wind farms on Dogger Bank.

6.10 Other marine users

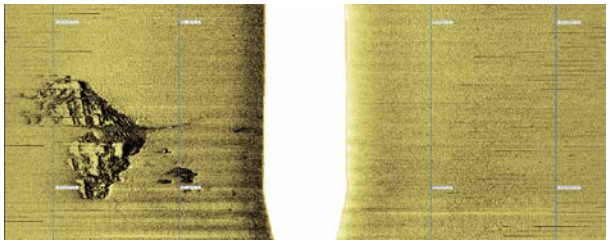
6.10.1 Other activities in this area include: other renewable energy projects; carbon capture and storage; oil and gas activity; underground coal gasification; aggregate extraction; and subsea cables and pipelines.

6.10.2 Other marine users may be disrupted if activities overlap (primarily carbon capture and storage, oil and gas and aggregates activity). However it is anticipated that, through engagement with the potentially affected parties, significant residual impacts will be avoided.

6.10.3 The project area is crossed by, and is close to, telecommunications cables and pipelines. A separation distance will be maintained to allow for necessary operation and maintenance activity. It is expected that agreement will be reached with the owners of the cables and pipelines to allow crossings with wind farm cables where this is necessary, as well as to define proximity arrangements. For this reason, significant residual impacts are not anticipated.

6.11 Marine and coastal archaeology

6.11.1 The marine and coastal archaeological resource has been described through a desk-based assessment and both geophysical and geotechnical site investigations.



Archaeological geophysical mapping

6.11.2 The offshore area of Dogger Bank is a well-researched and archaeologically important prehistoric submerged landscape that joined the UK coastline to north-west Europe during periods of glaciation when sea-levels were at their lowest. Additionally, the North Sea between Dogger Bank and the Yorkshire coastline has records of numerous wreck sites and aviation casualties from the First and Second World Wars. No designated (protected) archaeological sites were found to lie within or around the development footprint.

6.11.3 The assessment has identified a number of potential impacts, both direct (from the physical footprint of the development) and indirect (arising from changes to marine physical processes such as scour effects).

6.11.4 Mitigation proposals recommend the avoidance of any identified archaeology, therefore a series of Archaeological Exclusion Zones around identified archaeological features is recommended. Where features have been identified through geophysical and geotechnical survey, but it is not clear what their origin is, mitigation measures focus on the need for further assessment in line with a Written Scheme of Investigation, and in discussion with English Heritage. As a result, no significant residual impacts on marine and coastal archaeology are anticipated.

6.12 Military activities and civil aviation

6.12.1 Potential military receptors include: exercise and training areas utilised by the British armed forces and other defence interests, military radar systems and military airfields. Civil aviation considers impacts upon search and rescue helicopters, offshore helicopter operations, shore-based communication, navigation and surveillance infrastructure, weather radars, airports and civilian aircraft. Given the distance offshore, there is no mechanism for impacts upon military and civilian communication, navigation and surveillance infrastructure, the military low flying system, civilian and military aerodromes and weather radar.

6.12.2 Search and rescue helicopters may be affected by growing numbers of obstructions (such as wind turbines, meteorological masts, accommodation platforms and cranes) in areas of formerly open water, especially at night and in low visibility. Proposed mitigation measures relate to inclusion of the wind farm on aeronautical charts, lighting, marking, maximising turbine visibility on radar and on-going consultation with search and rescue operators.

6.12.3 Adherence to these measures will minimise the potential for adverse impacts if a search and rescue operation is undertaken near, or within Dogger Bank Creyke Beck. Whilst the presence of a wind farm fundamentally changes the operating environment, search and rescue operations can take place safely as long as revised

procedures, which take account of the changes caused by the wind farm, are followed. Consequently, significant impacts on search and rescue operations are not expected.

6.13 Seascape

6.13.1 Given its distance offshore, there will be no significant impacts on the seascape and coastal character (at the landfall and inshore areas) as a result of the construction and operation of the offshore development.

6.13.2 Impacts on the seascape character of the wind farm area itself are predicted, although within the context of the North Sea, these are expected to be negligible.

6.13.3 In clear weather conditions people may experience a visual change due to the presence of wind turbines within areas up to 15-20 km from the turbines; however the overall experience of people travelling across the North Sea will not be significantly affected.

6.14 Landscape

6.14.1 A computer model of the onshore converter stations was developed (as this is the only above ground onshore feature during operation) and the Zone of Theoretical Visibility (the extent to which any part of the development can be seen) was determined. Sensitive viewpoints were agreed with East Riding of Yorkshire Council including those from Beverley Minster.

6.14.2 During construction there will be disturbance to the local landscape from construction activity at the landfall, along the cable route, and at the site of the converter stations, resulting in a limited number of temporary landscape and visual impacts. These will be short-term at any one location, and following construction each affected area will be reinstated back to its pre-construction condition, with the exception of the converter stations site. Overall, landscape impacts during construction are not considered to be significant.

6.14.3 Impacts are likely to occur at the site of the converter stations, and to the agricultural farmland to the south and southwest of the converter stations. Here, landscape impacts will arise from the presence of new, large man-made structures, and consequent changes to the character of the immediate area. The character of the wider surrounding landscape to the south already contains the existing Creyke Beck substation, a large number of overhead power-lines and road infrastructure, so the change in character in this location is less pronounced.

6.14.4 The converter stations will have a significant effect on views within 1 km, including the views from a small number of residential properties (Poplar Farm and Model Farm) and recreational users of local footpaths and cycle ways between Cottingham and Model Farm.

6.14.5 The converter stations will be designed to reduce significant impacts, and will be integrated into the landscape. This includes keeping the rooflines at approximately the height of the existing mature trees in the woodland to the east of the site, using appropriate materials and colouring for the cladding, and minimising lighting. Additional woodland and hedgerow planting will be incorporated to reduce the visibility of the development.

6.14.6 Overall, the proposed development will have some significant impacts on landscape and visual receptors, but these will be localised, and set in the context of a landscape where built development is already characteristic. The planting associated with the project will offer longer-term reductions in these impacts as vegetation matures.

Practicing survey equipment deployment

6.15 Socio-economics

6.15.1 The Yorkshire and Humber Region was identified as the most relevant local economy to assess for socio-economic impacts. The existing workforce numbers and economic baseline for the region was determined using websites such as the Office for National Statistics.

6.15.2 Potential socio-economic benefits within the Yorkshire and Humber region have been identified for the construction, operational and decommissioning phases, relating to project expenditure and job creation. A number of other major offshore wind farms have the potential for operations and manufacturing activities to be based in the Yorkshire and Humber region and there is the potential for further cumulative benefits to the region's economy and for job creation associated with the renewable sector.

6.15.3 Forewind is actively supporting the Yorkshire and Humber region to ensure that it is well positioned to receive the greatest possible share of this work.

6.15.4 Whilst the Yorkshire and Humber Region was analysed as the relevant local economy for assessment purposes, Forewind notes that development of offshore wind has the potential to have additional beneficial impacts on the national economy and create jobs in the broader economy.

6.16 Tourism and recreation

6.16.1 Both onshore and offshore tourism and recreation features were identified through consultation and information held on tourism websites, such as those managed by Visit England.

6.16.2 Potential construction impacts upon tourism and recreation features include traffic delays due to construction traffic, partial views of the construction works from Beverley Minster, and temporary closures and diversions of a number of public rights of way - including part of a National Cycle Network Route (Route 1) which also follows the alignment of the Beverley 20 (a footpath). These impacts are all considered to be short-term and will be managed through good communication with the general public, and agreement with the Public Rights of Way Officer at East Riding of Yorkshire Council.

6.16.3 During the operation of the converter stations a 1 km stretch of National Cycle Network Route 1 (and public right of way) will have shared use with vehicles visiting the site. This operational traffic is only required for periodic, routine maintenance and is not expected to exceed four vehicles (cars or vans) visiting the converter stations on any given day. The impact associated with this is not considered significant.

6.16.4 No significant impacts were identified for offshore tourism and recreation.

6.17 Onshore geology, water resources and land quality

6.17.1 A desk study and site walkovers provided details of all rivers, streams and ditches, areas of contaminated soils and any sites designated as important geological features along the route.

6.17.2 The cable route will cross more than 70 rivers, streams, canals and ditches. These are mainly drainage ditches within areas of farmland, but also include the River Hull and the Leven Canal. The cable route also crosses an important geological feature beneath the ground near Skipsea (Skipsea Low Mere). Adhering to pollution prevention best practice guidance will ensure that risks of pollution to these features are minimised.

6.17.3 The area close to the existing Creyke Beck substation is within a Source Protection Zone, which is a natural underground source used for household water supplies. The cable will not be buried to a depth that would reach this source of water, but when working in this area, measures required by the Environment Agency will be used, to ensure that water supplies are not impacted during construction.

6.17.4 Forewind will ensure that appropriate methods of working are developed and agreed with the Environment Agency to minimise the risk of encountering potentially contaminated land for the entire length of the cable route during construction. The appropriate methods of working will include measures to deal with contaminated land, should it be found during construction. This will ensure that any risk to people is reduced to an acceptable level.

6.18 Terrestrial ecology

6.18.1 An extensive suite of ecology surveys were undertaken at the converter stations site and along the onshore cable route during 2011 and 2012. These included surveys for habitats, birds, bats, otters, water voles, reptiles and great crested newts.

6.18.2 Known sites of ecological importance, such as ponds, woodland and sites designated for nature conservation, have been avoided when identifying the preferred location of the converter stations and the cable route. The cable route and the converter stations are mainly located within agricultural land of low ecological value. However, the cable route does cross over 70 ditches, rivers and canals, and many of these support important plants and animals including water voles and grass snakes; while other protected species such as great crested newts and otters are present in

Ditch with potential to support water voles

the area.

6.18.3 The largest water bodies that will be crossed include the River Hull, the Leven Canal and Barmston Drain. These are also the water bodies with the greatest ecological potential. These features will be avoided by drilling the cable underneath them (horizontal direction drilling as shown in **Figure 1.4**) to avoid direct impacts. In addition a method of working, for laying cables across other water bodies, will be agreed with Natural England to ensure that impacts to species such as water voles are avoided. With these measures in place the impact upon terrestrial ecology is not considered to be significant.

6.19 Land use and agriculture

6.19.1 Existing land uses were determined by reference to the Agricultural Land Classification mapping held by Natural England and to the National Soil Maps held by Cranfield University. The majority of the onshore elements are located within farm land and the cable route avoids residential and built up areas, where possible.

6.19.2 Onshore construction activities will disrupt existing land use and agricultural activities along the length of the cable route and at the site of the converter stations. Impacts will include the loss of crops within the working footprint, partial removal of affected field drainage systems and general disruption from the presence of construction activities.

6.19.3 However, this disruption will be short-term given the temporary nature of the construction in any one location on the cable route. Landowners will be consulted over the final alignment of the cable route, to reduce disruption to their land, and where financial losses are identified, landowners will be compensated until land is reinstated to its previous condition. With these measures in place, the impact upon existing land uses and agriculture is not considered to be significant.

6.20 Onshore cultural heritage

6.20.1 Known sites of cultural heritage importance were avoided when identifying the preferred location of the converter stations and the cable route. Surveys of the construction areas were undertaken during 2011 and 2012, using equipment to detect buried features below the surface. Trial trenches were dug to further investigate some of these features. This information will be used to develop a Written Scheme of Investigation with measures to ensure these features are appropriately preserved during construction. With these measures in place, there will be no significant impacts on buried

Beverley Minster

archaeological features during construction.

6.20.2 The operational converter stations will not be visible at ground level from Beverley Minster, although the tops of the converter stations will be visible from the Minster Tower. Even from this vantage point the converter station buildings will not be a prominent feature in the landscape and will not dominate views from the Minster Tower to the south. These views are minimal and are not considered to affect the setting of Beverley Minster, or any other features of cultural heritage importance.

6.21 Traffic and access

6.21.1 An assessment of the roads expected to be used for construction traffic was undertaken to identify any routes that are considered to be sensitive to changes in traffic flows. This used traffic count data collected from East Riding of Yorkshire Council and was supplemented with new data collected by Forewind.

6.21.2 The construction phase will involve large numbers of vehicles using the main roads through the area. The onshore development benefits from a haul road extending along much of the length of the onshore cable route, and in this way construction traffic will be directed to the four main construction compounds and access the construction areas via the haul road. The main construction compounds have been positioned to avoid routing traffic through sensitive locations, for example avoiding schools or small rural villages.

6.21.3 In addition, a construction traffic management plan will be developed in consultation with the Highways Authority (East Riding of Yorkshire Council) to ensure that construction traffic is managed throughout the construction period. The plan will include measures to reduce the risk of accidents, and may include temporary speed restrictions close to the works compounds and advanced warning of the site compound entrance. The plan will also ensure an even distribution of lorries during the day, thereby reducing the potential for peaks in daily lorry movements and the chances of 'bunching'. With this in place, the impact of construction traffic is not considered significant.

6.22 Noise

6.22.1 A baseline noise survey was conducted at residential properties within 1km of the converter stations site and along the onshore cable route. The survey demonstrated that noise levels at the converter stations site were typical of a rural area, being generally low during the night. The main noise sources include road traffic from nearby roads, noise from the existing National Grid substation and from the railway line running from Hull to Scarborough.

6.22.2 During construction, a small number of properties in the Woodmansey area have been assessed as close enough to the proposed construction works to potentially experience unacceptable noise levels. Construction noise in any one location will be relatively short-lived and the installation of fencing, to screen these properties from the construction works, will reduce the noise level at this small number of properties.

6.22.3 An assessment of operational noise for the converter stations was conducted using computer-modelling software. Noise predictions were made at the four closest residential receptors: Model Farm, Poplar Farm, Halfway House and Wanlass Farm and some form of noise reduction will be required to ensure operational noise levels

are acceptable at these properties.

6.22.4 There is a range of industry standard methods that can be employed to reduce operational noise including: use of quieter equipment, noise barriers and noise enclosures. Various combinations of these measures will enable a noise reduction for each piece of equipment so that an acceptable low noise level is maintained at these properties. Impacts from the operation of the converter stations are therefore not considered to be significant.

6.23 Air quality

6.23.1 The potential for dust to be generated during the onshore construction activities has been assessed. In addition, vehicle exhaust emissions from construction, operational and decommissioning activities associated with both onshore (cars, heavy good vehicles, excavators, etc.) and offshore activities (boats) were also assessed.

6.23.2 There is the potential for air quality impacts where construction is close to housing and public areas. However, Forewind will implement a range of measures within a dust management plan to ensure that dust generated during construction does not cause a nuisance to people. Such measures are routinely and successfully applied to construction projects throughout the UK.

7 Programme

7.1 Outline programme

7.1.1 The indicative outline programme for the delivery of Dogger Bank Creyke Beck is as follows:

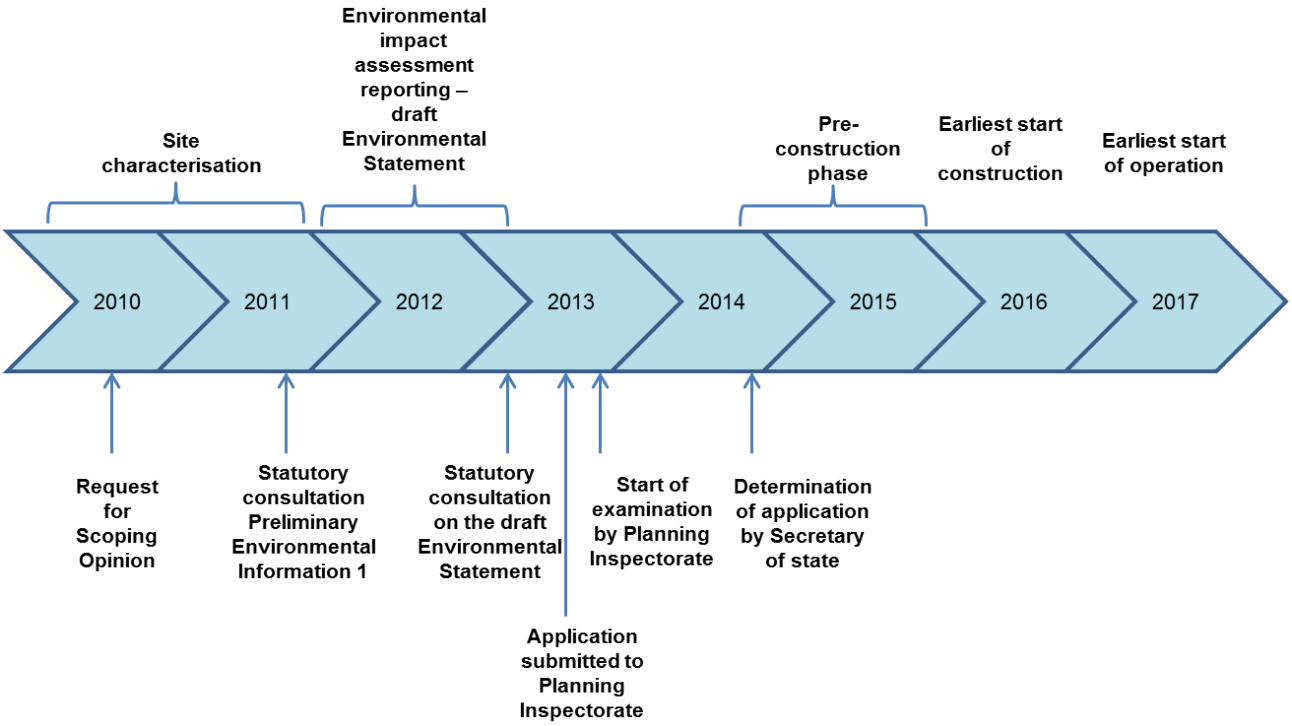


Figure 7.1 Indicative delivery programme outline for Dogger Bank Creyke Beck

7.1.2 Forewind is a development company only and hence, from the point of consent award, the project will be taken forward by two special purpose companies, likely to comprise of one or more of the existing consortium members as the lead operator. The construction programme for Dogger Bank Creyke Beck will be dependent on a number of factors that include, but are not limited to:

- The date that development consent is awarded;
- The development plans of the lead operator;
- The grid connection date agreed with National Grid (which may be subject to change); and
- The availability and lead times associated with the key project components, such as wind turbines and foundations.

8 Further information

8.1.1 Further information on the Dogger Bank Creyke Beck proposals, including the full Environmental Statement and other application documents is available from the Forewind website at: www.forewind.co.uk or via the Planning Inspectorate website at: http://infrastructure.planningportal.gov.uk/.

8.1.2 Queries or comments can be submitted via the contacts page of the website. Alternatively, you can write to Forewind at the address below:

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Email to: info@forewind.co.uk

Freephone Number: 0800 975 5636

