



**DOGGER BANK**  
**TEESSIDE A & B**

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# **Deadline IX Appendix 3**

## **Outline Decommissioning**

### **Statement**

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# 1 Introduction

## 1.1 Introduction

- 1.1.1 This statement is provided by Forewind Limited (Forewind) in relation to Dogger Bank Teesside A & B offshore wind farms.
- 1.1.2 Dogger Bank Teesside A & B comprises two proposed offshore wind farms to be located within the Dogger Bank Zone in the North Sea. As these wind farms both propose an installed capacity of more than 100 megawatts, under the Planning Act 2008 the project is classed as a nationally significant infrastructure project. Therefore, in order to gain development consent and deemed Marine Licences to construct and operate Dogger Bank Teesside A & B it is necessary to apply the Planning Inspectorate for a development consent order.
- 1.1.3 This statement accompanies the final application and is submitted alongside a draft development consent order (DCO), Environmental Statement, Consultation Report and other statutory and non-statutory documents. All references to the draft DCO are related to version 7 submitted at Deadline IX.

## 1.2 The purpose of this document

- 1.2.1 Requirement 15 of the draft development consent order states that in accordance with the principles established in Outline Decommissioning Statement, no offshore works can commence until a written decommissioning programme has been submitted to the Secretary of State in accordance with section 105(2) the Energy Act 2004. In addition, for the onshore elements of the development, Requirement 36 states that a decommissioning scheme must be submitted and implemented once operation of the wind farms has ceased. This must include detail of the demolition and removal of the onshore works, and the final proposed condition of the relevant land. In both cases the proposed scheme must be based on the outline Decommissioning Statement submitted with the application.
- 1.2.2 This document provides an outline of the principles and parameters within which the decommissioning of the development will take place and demonstrates the likely content of the final decommissioning statements for both offshore and onshore. The operators of Dogger Bank Teesside A & B will be required to adhere to the content of the decommissioning programme once this has been approved post-consent. This includes the method of decommissioning and any remediation or mitigation measures proposed.
- 1.2.3 The Environmental Statement for Dogger Bank Teesside A & B has informed the content of this statement.

- 1.2.4 The focus is predominantly on the offshore elements of the scheme (wind turbines, foundations etc.), but reference is also made to the onshore cables and converter stations.

## 2 Background to the project

### 2.1 Background

- 2.1.1 In January 2010, following a competitive tender process, The Crown Estate awarded Forewind the exclusive development rights for 'Zone 3 Dogger Bank'; the largest of the Round 3 offshore wind farm zones. The Dogger Bank Zone comprises an area of 8,660km<sup>2</sup>, and is located in the North Sea between 125km and 290km off the UK coast. Forewind is a consortium comprising four leading international energy companies (RWE, SSE, Statkraft and Statoil).
- 2.1.2 Dogger Bank Teesside A & B will be the second application within the zone (the first being Dogger Bank Creyke Beck) to be submitted to the Planning Inspectorate for consent. The application comprises two offshore wind farms; Dogger Bank Teesside A and Dogger Bank Teesside B, with a total generating capacity of up to 2.4 Gigawatts (GW).
- 2.1.3 Decommissioning is the final stage of the development and, under the 'polluter pays' principle, ensures that development sites are left, as much as is reasonably practicable, in the same as or better condition than they were initially found.
- 2.1.4 Decommissioning measures can range from leaving infrastructure in-situ after the development ceases operation, to complete removal and remediation measures. The method selected will aim to minimise significant negative environmental impacts, and will balance any disturbance of removal against the benefits.

### 2.2 Project description

- 2.2.1 **Table 1** shows the key project components, both offshore and onshore, and thus the infrastructure that will need to be considered as part of the decommissioning statements. A comprehensive project description is provided in **Chapter 5** of the Environmental Statement.

**Table 1: Key Project Components**

Parameter	Maximum for Dogger Bank Teesside A	Maximum for Dogger Bank Teesside B
Wind Turbines	200	200
Offshore Collector Substation Platforms	4	4
Offshore Converter Substation Platforms	1	1
Offshore Accommodation and/or Helicopter Platforms	2	2
Offshore meteorological stations	5	5
Inter-array and inter-platform cabling (length of) (km)	1270	1270
Length of HVDC export cable route (set of 2 cables) (offshore) (km)	260.5	220.2
Length of HVDC export cable route (set of 2 cables) (onshore) (km)	7	7
Length of HVAC export cable route (set of 3 cables) (onshore) (km)	2	2
Number of export HVDC cable pairs	1 pair (plus associated fibre optics)	1 pair (plus associated fibre optics)
Onshore Converter Stations	1	1
Number of export HVAC cables	3	3

## 2.3 Current site characteristics

2.3.1 Site characteristics are an important factor in determining appropriate decommissioning measures. The current site characteristics and an assessment of the significant environmental effects likely to arise from decommissioning are documented in the Environmental Statement submitted with the application.

## 2.4 Anticipated program

2.4.1 The anticipated construction programme for Dogger Bank Teesside A & B is shown in detail in **Table 6.1** of **Chapter 5** in the Environmental Statement. The maximum time period post-consent for completing offshore construction is estimated to be 13 years after the award of consent.

- 2.4.2 The design life for the wind turbines that will be installed at Dogger Bank Teesside A & B will be between 20 and 25 years. However, the lease term for the project area issued by the Crown Estate is for a 50 year period. It is therefore possible, although not certain at this stage, that the wind farms could be re-powered (also known as re-planting) midway through the lease term, which would require a new consent being sought to replace the existing infrastructure.
- 2.4.3 However, notwithstanding this possibility, Forewind acknowledges the need for installations to be decommissioned as soon as is reasonably practicable upon cessation of their operational life span.

## 3 Legislation and guidance

### 3.1 Relevant legislation

3.1.1 Any decommissioning activities may, where appropriate, need to comply with the following legislation, as advised by a guidance note produced by the Department of Energy and Climate Change (DECC) (2011)<sup>1</sup>:

- The Coast Protection Act (CPA) 1949;
- The Marine and Coastal Access Act 2009;
- The Water Resources Act 1991;
- The Environmental Impact Assessment Regulations 2009;
- The Conservation of Habitats and Species Regulations 2010;
- Part II of the Environmental Protection Act 1990 (in relation to the disposal or recovery of waste on land); and
- Other legislation in relation to the carriage and transfer of waste and, where appropriate, the Hazardous Waste Regulations 2005; and relevant health and safety legislation.

Decommissioning activities will also need to comply with any relevant international legislation, for example, the London Convention 1972 and the 1996 Protocol relating to the prevention of marine pollution by dumping of wastes.

3.1.2 The developers of Dogger Bank Teesside A & B, also have an obligation to produce a Decommissioning Statement under international agreements, set out by UNCLOS (United Nations Convention on the Law of the Sea) and OSPAR (Oslo/Paris convention (for the Protection of the Marine Environment of the North-East Atlantic)). These agreements operate under the 'polluter pays' principle, i.e. if any damage is done to the environment, it is the developer that must remediate this damage.

### 3.2 Legislative framework – offshore

3.2.1 Under Section 105 of the Energy Act 2004 the Secretary of State will notify the developers of Dogger Bank Teesside A & B of the requirement to prepare and submit a decommissioning programme, post-consent but prior to commencement of development. In addition, this will be secured through a requirement of the consent as set out in Section 3 of the development consent order. Requirement 15 states

*“No offshore works may commence until a written decommissioning programme in compliance with any notice served upon the undertaker by the Secretary of State/the notice pursuant to section 105(2) of the 2004 Act has*

<sup>1</sup> DECC, 2011 (revised), Decommissioning of Offshore Renewable Energy Installations under the Energy Act 2004: Guidance notes for the industry

been submitted to the Secretary of State for approval. The submitted scheme shall accord with the principles set out in the Outline Decommissioning Statement.

3.2.2 The legislation (Section 105(8)) requires that a decommissioning programme must include:

- i) The measures to be taken;
- ii) An estimate of the expenditure;
- iii) Provision for determining times;
- iv) Provision for restoring to original condition; and
- v) Provision for monitoring and maintenance.

### **3.3 Legislative framework – onshore**

3.3.1 Specifically in relation to onshore works, when commercial operation of the development ceases a decommissioning scheme is required. To secure this Requirement 36 in the draft development consent order as submitted states:

*“Upon the cessation of commercial operation of the onshore works (in whole or in part), a scheme for the demolition and removal of the onshore works (in whole or in part), and the final proposed condition of the relevant land, including a proposed timetable, shall be submitted to the relevant planning authority for approval. The proposed scheme shall be based on the onshore decommissioning statement submitted with the application. The scheme shall be carried out in accordance with the approved details, unless otherwise agreed in writing by the relevant planning authority.”*

## 4 Offshore decommissioning principles

### 4.1 Offshore decommissioning principles

- 4.1.1 The draft Development Consent Order as submitted provides for, in accordance with the principles established in Outline Decommissioning Statement, no offshore works commencing until a written decommissioning programme in compliance with any notice served upon the undertaker by the Secretary of State/the notice pursuant to section 105(2) of the 2004 Act has been submitted to the Secretary of State for approval.
- 4.1.2 The offshore decommissioning programme shall be guided by the following principals:
- Principle 1: Wind turbines and platforms to be removed.
    - Piled foundations cut below seabed level and the protruding section removed.
    - Gravity base foundations either i) left on the seabed (to preserve the marine habitat that has established over their life), with the central tubular section cut off and removed or ii) remove the entire base (if, for example, it is considered a navigational hazard or there is an environmental preference).
    - Suction foundations to be removed.
  - Principle 2: Meteorological monitoring masts to be removed (where meteorological monitoring masts are fixed to the seabed) according to Principle 1.
  - Principle 3: Scour protection and subsea protection preferable to leave in-situ (to preserve the marine habitat that has established).
  - Principle 4: Removal of offshore cabling will be informed by discussions with stakeholders and regulators at the time. Where appropriate, buried assets such as cables could also be left in-situ when the project is decommissioned, however there may be a need for cables to be wholly or partially removed.

### 4.2 Dogger Bank SCI

- 4.2.1 Different decommissioning principles apply in the case of the Dogger Bank SCI. The Dogger Bank SCI is an Annex I habitat, designated as a sandbank slightly covered by seawater all of the time. The planned wind farm arrays within the Dogger Bank Teesside A & B application are situated completely within the Dogger Bank SCI.
- 4.2.2 During the examination of Dogger Bank Teesside A & B, Natural England advised that if hard infrastructure (e.g. remedial cable protection, scour protection / prevention and foundations) were to be left in –situ on or above the seabed in the SCI they would not be able to rule out an adverse effect on integrity from the project alone

level. If all hard infrastructure on or above the seabed was removed, within the SCI, at the time of decommissioning, Natural England confirmed it would be able to conclude no adverse effect on integrity on the basis that the habitat loss would be lasting (for the duration of the project), but temporary (reparable effect) and not lasting irreparable loss i.e. permanent<sup>2</sup>.

- 4.2.3 As such, Forewind has agreed that where hard infrastructure is installed on or above the seabed within the Dogger Bank SCI, it will remove this at the time of decommissioning, subject to a pre-decommissioning EIA and Appropriate Assessment (AA) being undertaken. It is acknowledged by all relevant parties, that at the time of decommissioning and upon undertaking a pre-decommissioning EIA/AA, the preferred approach may be to leave some/all of the infrastructure in situ.,
- 4.2.4 Forewind has also agreed to monitor any disposal mounds within the Dogger Bank SCI, generated through the deposition of drill arisings, to determine changes in size and form of mounds throughout the lifetime of the project, in order to inform any decommissioning.

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<sup>2</sup> Natural England, 2014, Annex A: Natural England's FINAL Site Integrity Position Statement for the Dogger Bank SCI (<http://infrastructure.planningportal.gov.uk/wp-content/ipc/uploads/projects/EN010051/2.%20Post-Submission/Representations/Comments/Responses%20to%20ExA%20Questions/11-12-2014%20-%20%20Comments%20on%20Responses%20to%20ExA%20Second%20Qs/Natural%20England%20Annex%20A%20-%20Site%20integrity%20Position%20Statement.pdf>)

## 5 Anticipated offshore decommissioning methodologies

### 5.1 Decommissioning of offshore wind turbine foundations

#### Piled Foundations

5.1.1 It is envisaged that piled foundations would be cut below seabed level, and the protruding section removed. Typical current methods for cutting piles are abrasive water jet cutters or diamond wire cutting. The final method chosen shall be dependent on the technologies available at the time of decommissioning.

5.1.2 The indicative methodology would be:

- i) Deployment of remotely operated vehicles (ROVs) or divers to inspect each pile footing and reinstate lifting attachments if necessary;
- ii) Mobilise a jack-up barge or heavy lifting vessel;
- iii) Remove any scour protection or sediment obstructing the cutting process – it may be necessary to dig a small trench around the foundation;
- iv) Deploy crane hooks from the decommissioning vessel and attach to the lift points;
- v) Cut piles at just below seabed level;
- vi) Inspect seabed for debris and remove debris where necessary;
- vii) Considering the current technology, the decommissioned components are likely to be transported back to shore by lifting onto a jack-up or heavy lift vessels, freighter, barge, or by buoyant tow;
- viii) Transport all components to an onshore site where they will be processed for reuse, recycling and/or disposal; and,
- ix) Inspect seabed and remove debris.

#### Gravity Base Foundations

5.1.3 In the case of gravity base foundations, it may be preferable to leave gravity base structures on the seabed to preserve the marine habitat that has established over their life, subject to discussions with key stakeholders and regulators. In this case the central tubular section would be cut off and removed whilst the base remains in place. However, where removal of the entire base is considered necessary, for example if it is considered a navigational hazard or there is an environmental preference to remove it, it would probably be achieved in a manner similar to the following:

- i) Deploy remotely operated vehicles (ROVs) or divers to establish the base structural integrity and reinstate lifting attachments if necessary;

- ii) Mobilise suction dredging vessel to remove ballast from base and dispose of it appropriately;
- iii) Deploy remotely operated vehicles or diver to inspect the base to ensure remaining ballast is removed;
- iv) Disaggregate compacted sediments below gravity base;
- v) Mobilise heavy lift vessel, to lift the bases completely out of the seabed and onto a transportation vessel;
- vi) Transport to an onshore site, where it will be processed for reuse, recycling and/or disposal; and,
- vii) Inspect seabed and remove debris.

### **Suction Foundations**

5.1.4 Suction bucket foundations can be removed using approximately the reverse of the process required to install them. This could include use of a pump system to apply pressure inside the buckets, and allow the foundation to be released and extracted from the seabed. During the release process, any seawater or ballast inside the foundation shaft could be pumped out to make the structure buoyant, so that it can be recovered by an appropriate barge for transport from the site.

## **5.2 Decommissioning of meteorological monitoring masts**

5.2.1 The removal of the structure is expected to involve the approximate reverse of the installation process. The methodology would be expected to be broadly similar to that described above for wind turbine foundations (piled, gravity or suction).

## **5.3 Removal of scour protection and subsea protection**

5.3.1 In order to preserve the marine habitat that has become established over the life of the wind farm, it may be preferable to leave any scour or subsea protection around the turbine bases or covering cables in-situ. However, following consultation with stakeholders if it is considered preferable to remove the scour protection this could be achieved using the following techniques:

- i) Dredging of the scour protection with subsequent transportation to an approved site for appropriate disposal or re-use;
- ii) For rock fill, the individual boulders may be recovered using a grab vessel, deposited in a hopper barge, and transported to an approved site for appropriate disposal or re-use; or,
- iii) For other systems such as frond mats, concrete aprons, or proprietary cable protection systems, the components could be recovered onto a crane vessel for appropriate recycling or disposal.

## 5.4 Decommissioning of offshore cabling

- 5.4.1 Discussions with stakeholders and regulators may identify the need for cables to be wholly or partially removed. However, it is envisaged that, where appropriate, buried assets such as cables could also be left in-situ when the project is decommissioned. Where necessary, potential recovery of these cables may be possible using techniques including mass flow excavation, grapnels or other available future techniques.
- 5.4.2 An indicative methodology using current technology would be:
- i) Identify the location where cable removal is required – this may require deployment of remotely operated vehicles;
  - ii) Removal of seabed material or cable protection measure where necessary to allow access to the cable;
  - iii) Mobilise suitable vessels for cable removal;
  - iv) Raise cables from seabed using a grapnel; then,
  - v) The required sections of cables will be cut and the remaining ends weighted and returned to the seabed; and then,
  - vi) Transport cable to onshore facility for processing and reuse, recycling and/or disposal.
- 5.4.3 The question of whether or not cable crossing infrastructure should be left in-situ will also depend on the commercial arrangements and requirements in the individual crossing agreements.

## 5.5 Decommissioning of offshore platforms

### Platform Topside

- 5.5.1 It is envisaged that any offshore platforms, (collector, convertor, or accommodation) will be removed at the end of the project life and returned to shore for decommissioning and disposal. The decommissioning techniques would be expected to be similar to the decommissioning method employed for the wind turbine structures, as follows:
- i) Assessment of the potential hazards during decommissioning and development of suitable procedures for mitigating them;
  - ii) Assessment of potential risk of pollutants entering the environment;
  - iii) Disconnecting of offshore platform from grid and SCADA system (including any additional condition monitoring and communications systems);
  - iv) Mobilisation of decommissioning vessels – it should be noted that a heavy lift vessel may be required for some tasks;

- v) Removal of any potentially hazardous or polluting materials from the offshore platform;
- vi) Removal of the topside structure with the use of appropriate vessels; then,
- vii) Transport all components to onshore facility for processing and reuse, recycling and/or disposal.

## **Platform Foundation**

5.5.2 The decommissioning programme for any platform foundations will be dependent on the foundation type selected for the platform. The decommissioning of the platform foundations will be in line with the descriptions given for the wind turbine foundations.

## **5.6 Decommissioning of disposal mounds**

5.6.1 Disposal mounds within the Dogger Bank SCI, generated through the deposition of drill arisings, may require removal at the time of decommissioning. This is dependent on the outcome of monitoring throughout the lifetime of the project, as outlined in the In Principle Monitoring Plan. It is acknowledged by all relevant parties, that at the time of decommissioning and upon undertaking a pre-decommissioning EIA/AA, the preferred approach may be to leave some/all of the remaining disposal mounds in situ.

5.6.2 The removal of disposal mounds, with current technology, would typically be undertaken by either a grab dredger or suction dredger. A grab dredger would utilise a hydraulically operated grab to recover the spoil material from the seabed and deposit on a suitable vessel, either the grab dredger itself or, more probably, a hopper barge. A suction dredger utilises a pump to lift the disposal mound material from the seabed, via a pipe. In general a suction dredger will store any recovered materials in its own hopper rather than a separate barge

## **5.7 Offshore site restoration**

5.7.1 Generally it is considered that letting the sea self-settle post decommissioning of works limits the extent of impact on the seabed. For example, any scour pits that form due to the presence of the monopile structures acting on local hydrodynamic processes, upon removal of these structures it is predicted that the localised effects of these processes will no longer be present and the scour pits will infill naturally (self-settle).

## 6 Onshore decommissioning principles

### 6.1 Onshore decommissioning principles

- 6.1.1 The draft Development Consent Order as submitted provides for, upon the cessation of commercial operation, a scheme for the demolition and removal of the onshore works, including a proposed timetable of decommissioning works to be submitted to the relevant planning authority for approval.
- 6.1.2 The onshore decommissioning scheme shall be guided by the following principals:
- i) Principle 1: Landfall infrastructure left in-situ where considered appropriate.
  - ii) Principle 2: Onshore underground cables left in-situ upon decommissioning of the wind farm. Principle to be reviewed over the operational life of the project and in consultation with key stakeholders at the appropriate time.
  - iii) Principle 3: Onshore converter substations and any associated equipment, removed at the end of the project life, and the land restored to its original state where feasible.

## 7 Environmental assessment

### 7.1 Environmental assessment

7.1.1 Forewind has undertaken an Environmental Impact Assessment for Dogger Bank Teesside A & B, with the resulting Environmental Statement submitted with the application, alongside this outline Decommissioning Statement. This document includes an assessment of the likely significant effects upon the baseline environment arising from the decommissioning phase. However, it is recognised that the baseline environment may change over the time period during which the wind farm is constructed and operational. Therefore, further assessment work may be necessary, prior to decommissioning works taking place, to fill any gaps in relation to the key areas. Where necessary, any additional environmental assessment will:

- Identify and assess potential impacts of the decommissioning process on the environment;
- Identify any surveys that will need to be carried out;
- Review designated conservation areas;
- Identify and assess potential impacts on the historic environment;
- Assess the potential interference with other marine users;
- Identify and assess potential impacts on amenities, communities and future uses of the environment; and,
- Describe detailed measures envisaged to avoid, reduce and mitigate against any potentially significant adverse effects.

### 7.2 Post-decommissioning surveys

7.2.1 In order to confirm completion of offshore decommissioning works to a satisfactory standard, geophysical surveys will be carried out by an independent survey contractor following the completion of the works. Any results would then be issued to the operators of the wind farm and the Marine Management Organisation and DECC (or the appropriate statutory body) for review.

7.2.2 These surveys are likely to include side-scan, magnetometer and bathymetric surveys, with possible use of drop-down video or remotely operated vehicles to investigate and recover any potential hazards identified. The area to be covered will be determined prior to decommissioning.

## 8 Costs and financial security

### 8.1 Estimate of cost breakdown

- 8.1.1 The Energy Act 2004 provides that the Secretary of State may require a person responsible for an offshore renewable energy installation to prepare a costed decommissioning programme and ensure that it is (eventually) carried out. To achieve this, DECC's 2011 guidance on the structure of a Decommissioning Statement requires that detail is provided on costs and financial security.
- 8.1.2 These detailed costings and the provisions to ensure that sufficient funds will be available to meet the liabilities will be specified in the decommissioning programme to be produced pre-construction.

## 9 Schedule

### 9.1 Anticipated decommissioning schedule

- 9.1.1 As set out in Section 2.4 of this document, the latest predicted construction period for Dogger Bank Teesside A & B is for construction of the offshore works to be completed within 13 years of the award of consent at the latest, although it is likely to be sooner. The operational period is estimated at 25 years from commissioning, based upon the typical operational life of turbines; however as the lease period is for 50 years, full decommissioning may not take place until after that time. It is recognised that additional consents would be required to re-power or re-plant the wind farm after the estimated 25 years.
- 9.1.2 Whilst it is not possible to confirm a full decommissioning schedule for projects of this scale at this time, initial estimates suggest it would be approximately 3 years including project management, planning and procurement, offshore decommissioning works and onshore works (including dismantling and disposal).

## 10 Summary of commitments

### 10.1 Works commitments

10.1.1 Commitments documented through this outline Decommissioning Statement are summarised in **Table 2**.

Table 2: Summary of Commitments – Works

Works	Commitment
Wind Turbines (tower, nacelle, blades)	Removed
Wind Turbine Foundations	
- Piled	Cut below seabed level, and the protruding section removed
- Gravity Base	Removed unless preferable to leave gravity base structures on the seabed to preserve marine habitat, subject to discussions with key stakeholders and regulators prior to decommissioning. In this case the central tubular section would be removed with the base left in-situ.
- Suction Foundations	Removed
Meteorological Monitoring Masts	
- Mast Topside	Removed
- Mast Foundation (fixed)	Subject to foundation(s) selected, commitment consistent as made for each wind turbine foundation.
- Mast Foundation (floating)	Removed
Scour and Subsea Protection	Left in-situ, unless preferable to remove
Buried assets, incl. offshore cabling	Left in-situ, or wholly or partially removed
Cable crossing infrastructure	Subject to individual crossing agreements
Offshore Platforms	
- Platform Topside	Removed
- Platform Foundation	Subject to foundation selected
Offshore Site Restoration	Self-settle

Landfall Infrastructure	Left in-situ
Onshore Underground Cables	Left in-situ or removed if preferable
Onshore Converter Substations	Removed

## 10.2 Other commitments

10.2.1 Other commitments documented through this outline Decommissioning Statement are:

- prior to commencement of construction, to provide an outline offshore decommissioning programme in compliance with any notice served by the Secretary of State;
- prior to commencement of the onshore decommissioning works, a detailed decommissioning statement will be provided to the local planning authority for their written approval;
- prior to commencement of decommissioning works there will be consultation with stakeholders;
- The environmental baseline will be reviewed and relevant environmental assessment work will be carried out before and after the decommissioning phase, where updated information is required; and,
- Removal of all hard infrastructure on or above the seabed that lies within the Dogger Bank SCI, unless the pre-decommissioning EIA/AA concludes otherwise.
- Potential decommissioning of disposal mounds within the Dogger Bank SCI, generated through the deposition of drill arisings. This is dependent on the outcome of monitoring throughout the lifetime of the project.