

Decommissioning Programme



Blue Transmission Sheringham
Shoal Limited

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1 INTRODUCTION

This document presents the proposed decommissioning programme for Blue Transmission Sheringham Shoal Limited's offshore transmission (OFTO) assets and is based upon the proposals by the Developer for the decommissioning of the wind farm.

The Sheringham Shoal Offshore Wind Farm (SSOWF) comprises 88 wind turbine generators (WTG) and has a total capacity of 315MW. The wind farm is located approximately 17km to 23km offshore from the coastal town of Sheringham on the north Norfolk coast, and approximately 5km north of the sand bank known as Sheringham Shoal. The associated landfall for the onshore works is located in Weybourne Hope, on the north Norfolk coast.

The OFTO assets comprise the two offshore platforms (including substations), two export cables/onshore & offshore) and the onshore substation.

The Environmental Statements (ES) for the offshore and onshore elements of the development were approved in August 2008 through the respective consents according to the Energy Act 2004 (Section 36), The Coast Protection Act 1949, the Food and Environmental Protection Act 1985, as well as the Town and Country Planning Act 1990. Elements related to decommissioning were briefly discussed in the Environmental Statements. Upon issue of the Section 36 consent for the SSOWF, a notice under Section 105(2) of the Energy Act 2004 was also issued, regarding the requirement to prepare and seek approval for a decommissioning programme for the project prior to commencement of construction.

This Decommissioning Programme is consistent with SCIRA's response to their consent condition relating to the preparation and submission of a Decommissioning Programme prior to the start of offshore installation work and to the corresponding Notice from DECC dated 7th of August 2008. Installation of offshore foundations is scheduled to start March 2010, while the horizontally directional drilling in the landfall area is scheduled to start October 2009.

This Decommissioning Programme has been produced in accordance with the Department of Trade and Industry (DTI) (now the Department for Energy and Climate Change (DECC)) guidance document "Decommissioning of Offshore Renewable Energy Installations under the Energy Act 2004 – Guidance Notes for Industry".

This draft Decommission Plan is intended to form the basis of an intended discussion with DECC. We would envisage a similar process to be carried out to that defined in the DECC Guidelines.

We will adopt the principles of the DECC programme process stages. However we believe that the process will differ because of the change in circumstance and will be:

- STAGE 1: Blue Transmission Sheringham Shoal Ltd discusses draft decommissioning programme with DECC, SCIRA and other interested parties.
- STAGE 2: Blue Transmission Sheringham Shoal Ltd produces decommissioning programme
- STAGE 3: Review of decommissioning programme
- STAGE 4: Responsible person ensures decommissioning is carried out in accordance with the programme
- STAGE 5: Responsible person carries out post decommissioning monitoring, maintenance and management offsite as specified in the programme.

2 EXECUTIVE SUMMARY

Sheringham Shoal Offshore Wind Farm (“**SSOWF**”) consists of 88 wind turbine generators (WTG) and marine infield cables. The OFTO assets and wind farm have a design life of 20 years, at the end of which the condition of both installations will be evaluated jointly with respect to the possibility for further production lifetime.

The Energy Act 2004 requires that SCIRA prepares and eventually carries out at the appropriate time a decommissioning programme for the Sheringham Shoal Offshore Wind Farm prior to commencement of construction. Blue Transmission Sheringham Shoal Ltd will submit this decommissioning programme as a basis for consultation with DECC.

The Environmental Statement and Appropriate Assessment presented by SCIRA during the consenting process provide the current baseline of conditions in the physical, biological and human environment.

The scope of the OFTO decommissioning works described in this document is determined by the legislation in place at the time of writing and involves all accessible installed components of the OFTO assets. This includes Offshore Substations (both topsides and foundation structures; the foundations and sections of the export cable close to offshore structures. Cable sections planned to be removed, will be those from the J/I tubes on the offshore substation structures to the grade-in point of cable burial. The Table 2.1 below summarises the decommissioning proposals for the separate components of the OFTO assets.

Table 2.1 Decommissioning proposal

Component	Decommissioning Proposal
Foundations (transformer platforms)	Cut off at or below seabed and removed
Cables (export)	Left in situ
Transformer platforms	Complete removal of topside

Health, Safety and Environment (HSE) performance management will be central to the decommissioning process. HSE risks will be identified and mitigated during the whole process, embedded in the contract philosophy and carried out through evaluation of decommissioning contractors and the planning and execution of the work. Specific evaluation criteria for evaluation of future decommissioning contractors will be established in due course.

As per the DTI guidance notes (2011) the proposed method of removal for the separate components will have regard to:

- The Best Practicable Environmental Option (BPEO), the option which provides the most benefit or least damage to the environment as a whole, at an acceptable cost, in both the long and short term;
- Safety of surface and subsurface navigation;
- Other uses of the sea; and
- Health and safety conditions

Decommissioned material, such as metal, will be recycled wherever possible. Hydraulic oil will be returned to the supplier for reuse. Unused and/or remaining chemicals will be returned to the supplier for reuse or satisfactory treatment. The need for emptying fluid systems prior to decommissioning will be assessed and planned prior to decommissioning. Equipment such as motors, cranes, transformers etc, may be returned to the supplier for possible re-use and/or recycling.

It will be both appropriate and necessary to review the decommissioning programme throughout the lifetime of the wind farm as legislation, regulatory requirements and current approaches change overtime. Such reviews will also need to reflect advances in knowledge and understanding of the marine environment, changes in working practices and technological advances.

Consultation throughout the decommissioning process will be similar to that undertaken by SCIRA during the Environmental Impact Assessment (EIA) process

but will also incorporate changes and amendments made overtime to the requirements within the regulatory consultation process.

Costs and financial security provisions have also been provided within this document as per requirements set out in the DTI guidance notes (2011).

The following key documents have informed the provisions presented:

- Decommissioning of Offshore Renewable Energy Installations under the Energy Act 2004: Guidance notes for Industry, DTI, 2011
- Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone, International Maritime Organisation (IMO), 19th October 1989
- Guidance Notes for Industry: Decommissioning of Offshore Installations and Pipelines under the Petroleum Act 1998, DTI
- Review of the Current State of Knowledge on the Environmental Impacts of the Location, Operation and Removal/Disposal of Offshore Wind-Farms, OSPAR, 2006, ISBN 978-1-905859-15-3, www.ospar.org
- Guidelines for Environmental Risk Assessment and Management, Defra, September 2002,

3 BACKGROUND INFORMATION

3.1 Organisation

The OFTO for the Sheringham Shoal project will be responsible for decommissioning of the transmission system. SCIRA will be responsible for decommissioning of those parts of the Wind Farms that are not part of the transmission system. Blue Transmission Sheringham Shoal Ltd proposes this plan and undertakes this decommissioning in conjunction with the Developer.

3.2 Project status

The SCIRA wind farm was consented in August 2008 as part of the Round Two site allocation process. The following consents were awarded at that time:

- Section 36 Electricity Act 1989 (construction and operation of the wind turbines, offshore transformer stations and met masts; granted by DTI);
- Section 5 Food and Environment Protection Act 1985 (installation of foundations of offshore structures, rock armouring, scour protection etc; granted by DEFRA);
- Section 34 Coast Protection Act 1949 (obstruction to navigation works; granted by DEFRA);

- Section 36 Energy Act 2004 (navigation extinguishment declaration; granted by DTI); and
- Planning permission has also been received under Section 57 of the Town and Country Planning Act 1990 for the onshore works at Weybourne Hope.

The construction of the offshore wind farm is complete.

3.3 Project overview

SSOWF covers 35km² and is sited approximately 17km to 23km offshore from the coastal town of Sheringham on the north Norfolk coast, and approximately 5km north of the sand bank known as Sheringham Shoal. The depth is 15 – 22 m. The associated landfall for the onshore works is located in Weybourne Hope, on the north Norfolk coast. The two offshore substation platforms are located towards the edges of the windfarm. The subsea cables are 21/23 km in length and connect to land cables which are 22 km in length. The electrical connection is located at an existing electricity substation at Salle near Cawston, which is owned by EDF Energy (EDFE).

The location of the wind farm site and the export cable route corridor is as shown in Figure 3.1 and Table 3.1.

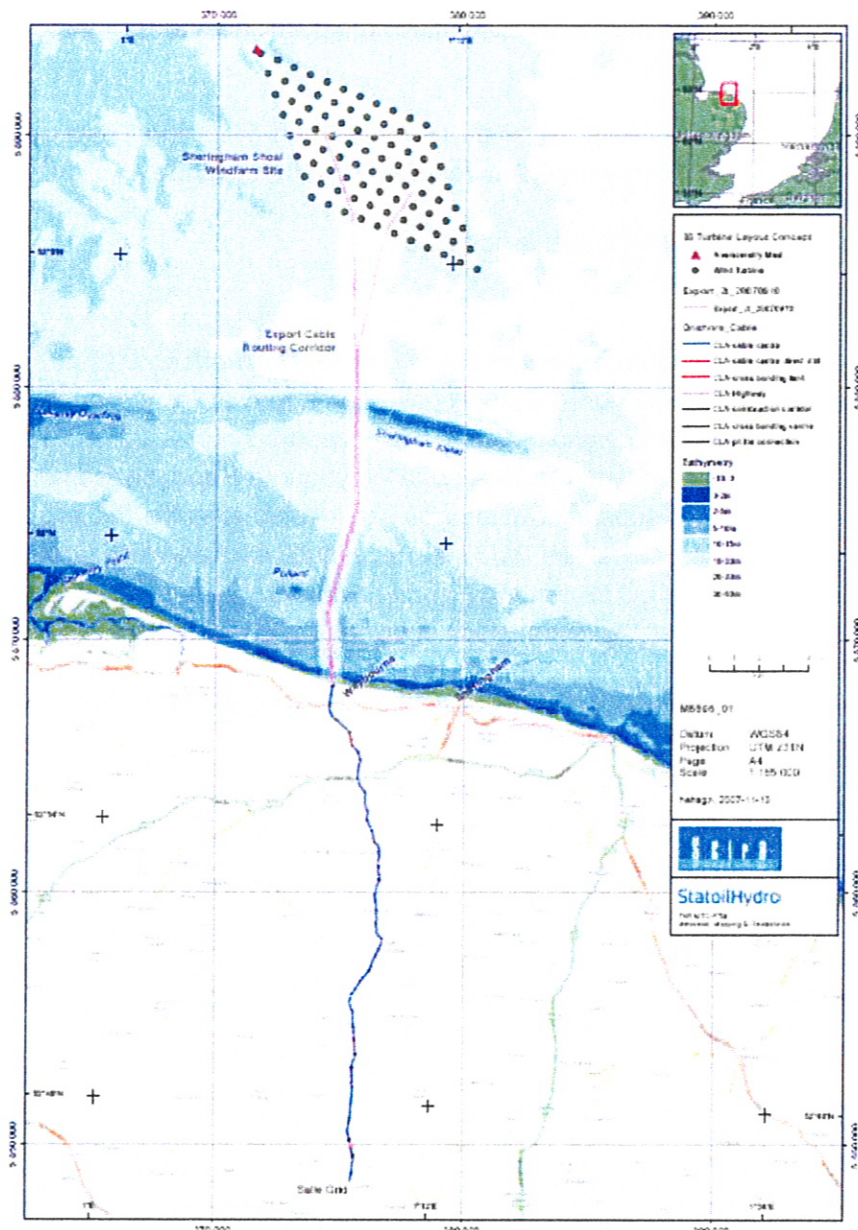


Figure 3.1 Sheringham Shoal Offshore Wind Farm site lay-out

Each of the two offshore substations is connected to the onshore substation in Salle via a submarine export cable, coming onshore near Weybourne, and underground cables from Weybourne to Salle. The main section of the submarine export cable is a 145 kV 3x1x630 mm² cable and the landfall section is a 145 kV 3x1x1000 mm². Both sections include one fibre optic element. Cable burial depth is 1m. At the Salle substation the underground export cables connect the wind farm to the regional distribution network, and further via overhead powerlines connect it to the UK transmission network at Norwich.

3.4 Other human activities in the area

The area adjacent to the site has a range of ongoing activities and uses which may change over the lifetime of the wind farm. At present and in the near future they will include:

- Other wind farm operators;
- Oil and gas activities;
- Marine aggregate extraction;
- Disposal of dredged material;
- Outfalls and subsea cables;
- Navigation and shipping; and
- Commercial fisheries.

Due to changes in use over time it will be necessary to review these key activities on a regular basis and eventually reconfirm those still relevant prior to decommissioning taking place. Following confirmation of other activities and uses in the area at the time of decommissioning a programme of consultation and communication with the relevant stakeholders will be developed. Predicted possible activities and uses are outlined below.

3.4.1 Other wind farm operators

It is highly likely that there will be other wind farm operators in the area adjacent to Blue Transmission Sheringham Shoal Ltd's OFTO assets over the project lifetime. Currently Blue Transmission Sheringham Shoal Ltd is aware of a number of other existing and potential wind farms in the vicinity of the Sheringham Shoal OFTO and these are described in Table 3.2 and their positions relative to the project are shown in Figure 3.2.

Table 3.2 Potential wind farms in the vicinity of SSOWF

Site	Developer	Location	Distance from SSOWF	Status	Capacity	Round of award
Dudgeon	Dudgeon Offshore Wind Ltd.	22km off Sheringham	3km	Approved	300 MW	Two

Inner Dowsing	Centrica Renewable Energy Ltd.	5km off Ingoldmells	43km	Operational & under construction	97MW	One
Lincs	Centrica Renewable Energy Ltd.	8km of Skegness	39km	Operational	250MW	Two
Lynn	Centrica Renewable Energy Ltd.	5km off Skegness	42km	Operational & under construction	97MW	One
Race Bank	Centrica Renewable Energy Ltd.	30km off Ingoldmells	28km	Approved	620 MW	Two
Triton Knoll	RWE Npower Renewables	38km off Mablethorpe	40km	Planning Application	1200MW	Two

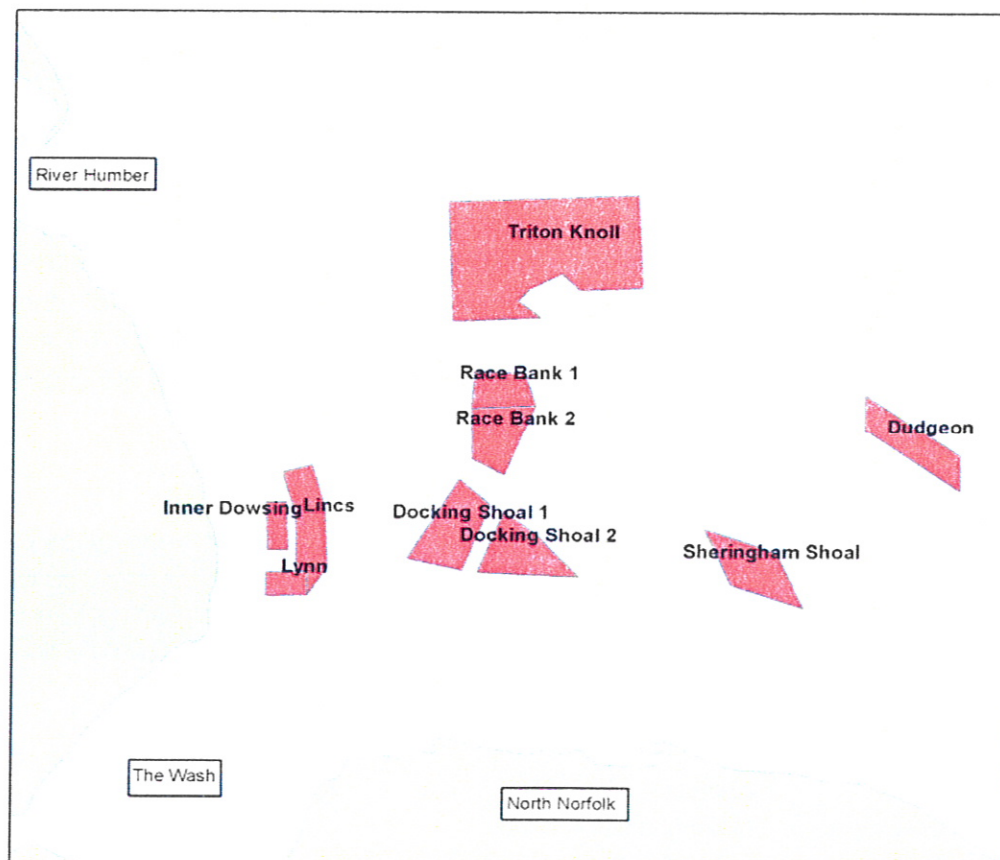


Figure 3.2 Potential and existing wind farms in the vicinity of Sheringham Shoal Offshore wind farm

4 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED AND PROPOSED DECOMMISSIONING MEASURES

4.1 Proposed decommissioning programme

At the end of the OFTO asset economic lifetime, decommissioning will take place. Towards the end of the initial lifetime, of 20 years, an assessment of the technical conditions of the installation and its continuing economic potential will be made.

When planning the decommissioning of the wind farm, the possibility of recycling material and/or reuse of plant elements will be considered. Prior to decommissioning a contract strategy will be established, defining number of contracts and scope of work for each contract. Through the contractual process, reuse and or recycle of plant items, handling of Health, Safety and Environment (HSE) during working operations, principles described in the decommissioning program and applicable laws and regulations at the time of decommissioning will be assessed.

Decommissioning will need to be performed in accordance with applicable laws and regulations current at that time. In the following the expected decommissioning is described based on requirements, guidelines and practices at the time of writing.

Effective management of HSE issues is central to the owners of Blue Transmission Sheringham Shoal Ltd and, as such, prior to the start of decommissioning, detailed plans including HSE risk assessments and mitigation will be developed.

The onshore and offshore Environmental Statements described the environmental impacts related to construction, operation and eventual decommissioning of the OFTO assets. The environmental impacts of the decommissioning are considered to be temporary and either within or of lower magnitude and significance than those described for the construction and operation of the OFTO assets.

4.2 Decommissioning sequence

Decommissioning will generally be a reverse of the order of installation. Prior to decommissioning, the power will be cut off and disconnection from the grid system will occur. The electrical transmission system will be part of the OFTO system. Blue Transmission Sheringham Shoal Ltd will be responsible for decommissioning of the transmission system. In the following sub-chapters decommissioning activities for the different offshore part of the wind farm are discussed. In addition, appendix 3, contain a rough preliminary evaluation (pros and cons) of decommissioning activities made for some criteria.

4.3 Offshore foundations

The foundation structures, which are made of steel, will be removed. The proposed decommissioning procedure is based on the general principle of removing all parts of the foundations above seabed level. Consequently the mono-pile and the cable connections will be cut off directly beneath the mud-line and the loose foundation part will be lifted off and subsequently transported to the base harbour for demolition, re-

use and/or deposition. It is anticipated that the small hollow in the seabed left after the foundation automatically will be filled up by natural deposition of sand materials. The type of crane vessel to be used for the decommissioning work can be a floating crane type, a standard jack-up vessel or a special type offshore unit with stabilising legs.

The possible sequence for decommissioning of the offshore foundations is presented in Table 4.1 and is discussed in greater detail below.

Table 4.1 Possible sequence for decommissioning of the offshore foundations

Activity No.	Main Activities	Detailed Action to be taken
1	Mobilise supply vessel with ROV spread and required equipment	
2	Excavation at cable pit / interface between cable and seabed.	Sea Jet Trencher (or equivalent) and obs-ROV are required
3	Cutting of cables	Cable to be cut at 1-2 meters below seabed
4	Removal of the cable up to switchgear platform	
5	Removal of bend restrictor / chute from seabed to bellmouth	
6	Possible excavation around pile depending upon removal of pile at 1 meter below seabed.	
7	Removal of Brattberg gaskets between J-tube and TP	
8	Removing J-tubes	
9	Preparation for cutting to be carried out. Mounting of cutting tool on pile underneath TP. Carried out by use of divers or ROV.	
10	Demobilisation of supply vessel	
11	Mobilising of heavy lift vessel with ROV spread	
12	Perform Rigging of TP	
13	Cutting of pile underneath TP Cutting tool to be clarified.	
14	Removal of the TP – lift to vessel	

15	Possible Clamping on to pile
16	Possible Cutting of pile 1 meter below seabed
17	Possible Removal of pile
18	Demobilisation of heavy lift vessel

Preparations for foundation removal

After having exposed the cables/J-tubes in the vicinity of the foundation the cables will be cut off immediately outside the bell mouth of the external J-tube elements. Subsequently the external Jtube elements will be disconnected and lifted out of the water for removal. Divers using water jet abrasive cleaning equipment will simultaneously remove the marine growth on the external surfaces of the piles.

The internal platforms will be removed giving access to the interior part of the mono-pile foundation. Following the necessary excavation inside the pile (approx. to 4 m below the seabed level), a tailor made support/cutting tool will be installed for cutting the pile approx. 2 m below mud-line. The tool will be fixed in the correct level inside the pile activating a system of hydraulic cylinders.

The cutting will be executed using a mechanical water jet abrasive system remote controlled and guided by horizontal rails following the internal circumference of the pile.

Removal of the foundation

Before activating the cutting tool the foundation structure will be suspended loosely in the hook of the crane vessel using a set of preinstalled lifting eyes bolted to the top flange in level +21.00.

After cutting the crane will be able to lift off the loose part weighing approx. 400T. During and immediately after the cutting process the cutting tool will support and stabilize the pile horizontally at the cutting level.

The loose part of the foundation will now be lifted out of the water, the cutting tool will be disconnected ready for reuse and the foundation part will be sea-fastened to allow for the subsequent transport to the base harbour.

Demolition works on shore

At the base harbour the foundation element must be cut into minor transportable pieces ready for deposition and/or re-use.

The grout material used in the connection between the mono-pile and the transition piece will be demolished into minor parts to be transported to a dumping ground for deposition. Likewise the steel structures will be cut into transportable units to be scrapped.

Figure 4.5 Foundation Transport



4.4 Scour protection

Due to expected erosion at some of the J-tubes at the foundations, it is expected to be need for scour protection like rock dumping. The requirements set for stones are typically that they shall have a high density and also have a certain strength (in order to not later get pulverized). The scour protection is in accordance with what is described in the Environmental Statement.

Generally the Project during its assessments want to minimize the need for scour protection and rock dumping to a minimum, but it is concluded that there is a need for scour protection at some of the foundations. The requirement for scour protection and where it would be needed is currently being assessed by the Project and its contractors, taking into account the different seabed conditions and tidal flows in the area. Assessments will reveal which of the foundations will be in need of “scour protection” and the extent of it. The assessment will also discuss if there are a need for checking of the installed foundations and method for this.

The scour protection is planned to be left in-situ.

In relation to the circumstances set out in the DECC guidance where non-removal may be considered acceptable, it is considered that “the installation or structure will serve a new use ... through the enhancement of a living resource”. It is also stated that entire removal would involve an unacceptable risk to personnel.

4.5 Offshore electrical substations

The decommissioning of the two offshore electrical substations may be carried out by a jack-up vessel. (See **Figure 4.5** for example of typical substation). Prior to the start of the decommissioning, the system will be de-energised, any liquids chemicals present will be emptied and removed and loose items will be removed. The marine infield and marine export cables will be cut at the grade-in point of burial. When this step is finalised, preparation for rigging and lifting of each of the two substations will take place. The substations are then expected to be transported from the wind farm area to a yard for recycling and/or possible re-use of components. Prior to commencement of operations, special procedures for the work including checklists will be developed and followed-up.

Figure 4.5 Typical substation



4.6 Marine export cables

The two marine export cables (outer diameter, approx. 205mm) are each approximately 20km long (see **Figure 4.6**). Close to the point of landfall the two marine export cables are installed within two casings, pre-installed by a horizontal directional drilling (HDD) rig as part of the onshore transmission works. The marine export cables are joined to the onshore cables in a transition pit, located within the Muckleburgh Collection on the north Norfolk coast, to the north of the village of Weybourne.

From the landfall, the marine export cables have been laid and buried in a route towards their respective offshore substation in the area of the wind farm. Cable burial was achieved via a water jetting technique. Target burial depth is 1m below the level of the seabed. Leaving cables in-situ beneath the seabed may be considered to be the best practical environmental option in order to minimise disturbance to the marine

habitats and species that may have substantially colonised the areas. The buried cables will pose no threat to navigation or commercial fisheries.

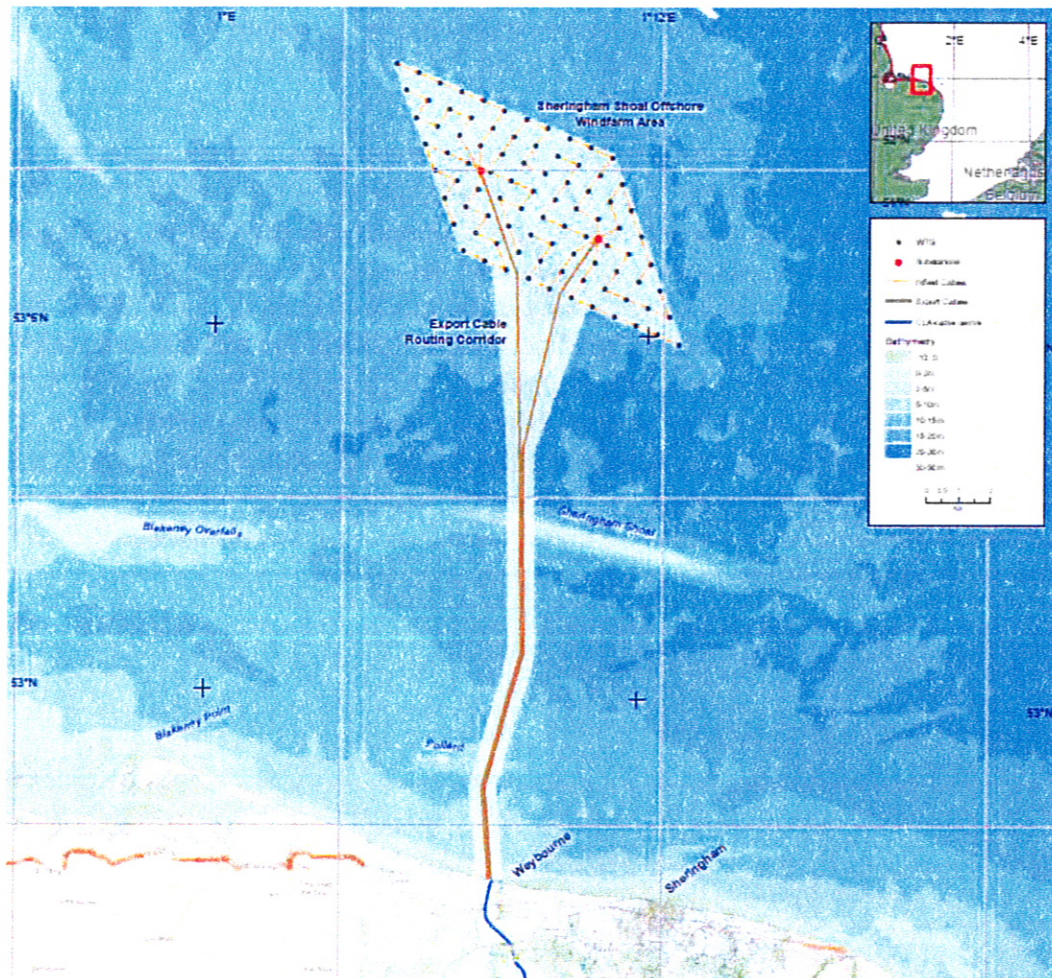


Figure 4.6 Route of the marine export with corresponding landfall drill and junction pit

4.6.1 Decommissioning of submarine cables

The submarine export cables were buried during installation, and the intention is that they are left in-situ. At the time of decommissioning, the cables will be left in their trench but will have to be cut at the grade in point of cable burial. No cables will be left on the seabed surface. The cables themselves consist of three power cores (copper conductors) with water blocking compound and insulation, and armouring. The cut sections will be removed with minimal disruption of the seabed.

The sediment along the submarine export cable routes consists mainly of sand and sand waves with a mixture of other sediments (locally gravelly, with occasional whole shells, and gravelly shelly sand underlain by stiff clay, which can also be silty or slightly sandy). The methodology and tools for the installation/burial of the submarine export cables have been selected based on knowledge of the seabed and subsurface geology and to ensure burial protection over the life of the project. The infield cables will be trenched down to approximately 1m.

With the target burial depth of 1.0 m, the submarine cables are not be visible on the seabed. The cables may be even further protected by moving sand waves generated over the lifetime of the wind farm. Removal of submarine cables will disturb the seabed as it has to be pulled out of the trench, jetted and/or excavated. This will leave deeper seabed sediments on the seafloor, and is considered to be detrimental to the seabed. Other technical challenges and unforeseen problems may be involved with work associated with excavating the sandbank.

Further, leaving the well protected cables in buried conditions is not considered to have any new environmental or pollution impacts. And it is not considered to pose safety risks to mariners.

4.7 Lighting and Marking

In accordance with Clauses 4f and 5a of the Sheringham Shoal consent under Section 36 of the Electricity Act 1989, Blue Transmission Sheringham Shoal Ltd will ensure that the appropriate marks and lighting are displayed during the decommissioning of the wind farm. Navigational marking in the construction phase has been discussed and agreed with the authorities. In the decommissioning phase, a similar navigational marking and lighting as for the construction phase, is expected.

With regards to aviation safety, the shape, colour and character of the lighting will be compliant with the Air Navigation Order 2005 (or as otherwise directed by the Civil Aviation Authority).

For navigational safety, lights and marks will be agreed with Trinity House, in consultation with the Maritime and Coastguard Agency. Trinity House will be, consulted prior to decommissioning to specify any obstruction marking that may be required during the removal operations. Should any obstruction be left on site that could be considered to present a hazard to navigation SCIRA will provide the necessary markings specified.

4.8 Authority handling

Prior to start planning for decommissioning an authority plan will need to be prepared addressing the applications and notifications needed to be performed prior to the stopping of electricity production and during the decommissioning. Reference is made to the authority plan prepared for the installation project. Consultation will be carried out with the relevant regulatory authorities at the time of decommissioning. Some of the notifications will include notification to Mariners and fishermen. Further to ensure safety for third parties at sea, temporary safety zones around the installations during decommissioning will be applied for.

4.8.1 Marine archaeology

A draft Written Scheme of Investigation (WSI) has been prepared and initially discussed with English Heritage. For the construction phase, some archaeological construction exclusion zones are suggested. It is expected that these also may be

relevant for the decommissioning, and information about these will then be communicated to a future decommissioning contractor and followed-up by Company

4.9 Construction safety

Decommissioning involves heavy lifting activities, electrical work, offshore working, entering of the offshore substations from the sea, offshore transportation etc. As already pointed out thoroughly planning will be carried out prior to the commencement of decommissioning. Risk activities will be identified and mitigating measures will be addressed and followed-up. This relates both to the Contract requirements, mechanical and electrical checking prior to lifting, decommissioning activities offshore and at possible yard.

Prior to decommissioning and during decommissioning several safety mitigating measures will need to be addressed. Such safety mitigating measures may include the following:

- Evaluation of decommissioning procedures;
- Establishing contract philosophy and nominating well experienced and suited Contractors;
- Safety assessments of the plans and activities;
- HSE-follow up of the activities;
- Perform safety risk assessments and compare the risk with the project's safety acceptance criteria;
- Notifying 3rd parties;
- Notifying relevant authorities and fishery; and
- Temporary safety zone around the offshore electrical substations during decommissioning.

5 ENVIRONMENTAL IMPACT ASSESSMENT

The intention of the decommissioning process will be to remove the foundations to either sea bed level or 1m below sea bed level. If scour protection has been used then this will need to be assessed with regard to its removal or its retention in-situ. It is intended that the cabling will remain buried in-situ. It is currently estimated that the decommissioning process will take approximately six months.

The ES provided by SCIRA and subsequent studies undertaken to inform pre-construction baseline represents Blue Transmission Sheringham Shoal Ltd's current understanding of the site and impacts. Both the ES and the further studies undertaken would be used in the preparation of applications to decommission the OFTO assets. It is further anticipated that a full EIA will be required prior to the

decommissioning of the wind farm and this will focus heavily on the same list of key criteria as the original EIA together with any issues that may have arisen in the interim. Those key criteria are expected to be:

- Identification and assessment of potential impacts on the environment;
- Identification of surveys to inform the assessment process;
- A review of nature conservation designations
- The potential interference with other legitimate users of the sea
- Identification and assessment of potential impacts on amenities, communities and future uses of the environment; and
- Identification and assessment of potential impacts on the historic environment.

Some of these key criteria may change in emphasis over time and the EIA will need to recognise and examine such changes.

6 CONSULTATIONS WITH INTERESTED PARTIES

During the EIA and consenting process consultation by SCIRA took place with statutory and non-statutory bodies representing key interests and user groups in the north Norfolk area and the wider area during the Scoping Study. Initial consultation included a description of the project proposals and invited comments and requested relevant data or information. Detailed formal and informal consultation has continued throughout the EIA via correspondence and meetings. All comments received were taken into consideration during the EIA.

The statutory consultees and non-statutory organisations involved in the EIA and consenting process will also be involved in the decommissioning process. The list of consultees may develop and change overtime, but at present the key consultees are anticipated to be *inter alia*:

- The National Federation of Fishermen's Organisations;
- The local Sea Fisheries Committee;
- Chamber of Shipping;
- Royal Yachting Association;
- Joint Nature Conservation Committee;
- Natural England;
- The Environment Agency;
- English Heritage;

- Maritime and Coastguard Agency;
- Trinity House Lighthouse Service;
- The relevant harbour authority; and
- British Marine Aggregate Producers Association (BMAPA).

The consultation process for the decommissioning phase will be scheduled to begin early enough so that initial responses can be adequately assessed and any concerns or queries addressed and/or mitigated in advance of the proposed timing of the decommissioning.

Once decommissioning is due to begin a Notice to Mariners will be issued as well as other navigational warnings as per Clauses 5c and 5d of the Sheringham Shoal consent under Section 36 of the Electricity Act 1989. Appropriate notification on the progress and completion of the works will be supplied to the UK Hydrographic Office.

7 COSTS

Costs are confidential.

8 FINANCIAL SECURITY

The financial security is confidential.

9 SCHEDULE

In approximately 20 years time the wind farm will be approaching the end of its design lifetime. However, the actual technical status will be regularly assessed and an operation and maintenance system is expected to be in place, in order to prolong the lifetime of the plant. The possibility to extend the lifetime of the wind farm is in a lifetime perspective positive with respect to the environment.

Blue Transmission Sheringham Shoal Ltd plans to undertake internal reviews of the decommissioning programme. It is proposed that DECC is consulted at the following times:

- After 10 years of operation
- After 18 years of operation
- 2- 5 years prior to decommissioning

A final decommissioning programme will be prepared prior to decommissioning, 2 - 5 years prior to closing down the wind farm. The final decommissioning programme is expected to include references to relevant surveys performed during the construction phase and during the operational phase.

Prior to decommissioning, Blue Transmission Sheringham Shoal Ltd in conjunction with SCIRA will establish a project that will execute and follow-up the following main activities with the following roughly anticipated duration:

- Decommissioning EIA and consultation phase: 12 months
- Project management, planning, procurement and contract follow-up: 36 months
- Offshore decommissioning: 6 – 12 months

10 PROJECT MANAGEMENT AND VERIFICATION

It is understood that information pertaining to project management and verification will only be required to be included when the final review of the programme takes place towards the end of the installation's life.

Guidance provided by DECC suggests that at that time the programme should provide information on how the Operator will manage the implementation of the decommissioning programme and provide verification to Government concerning progress and compliance. This should include a commitment to submit a report,

detailing how the programme was carried out. The guidance suggests that this report should generally be submitted within four months of completion of the decommissioning work.

11 SEA-BED CLEARANCE

Following the completion of the decommissioning of the wind farm, surveys will be carried out to check that the site has been cleared. The purpose of the surveys will be to identify any debris located on the sea-bed which may be associated with the wind farm's construction, operation, maintenance or decommissioning and that may pose a risk to navigation, other users of the sea or the marine environment. The type of surveys to be carried out (side scan etc) and the technical requirements will be specified in due course prior to decommissioning.

The area to be covered by the survey will be determined prior to decommissioning taking into account the results of the "as-laid" surveys and other surveys performed in the operation phase.

The decommissioning surveys may be part of the scope of work for the future decommissioning contractor(s) or as separate contracts. SCIRA also understands that DECC will expect to see an element of independent third party involvement in providing evidence that the site has been cleared and therefore propose that the survey reports can be made available to the authorities as necessary.

12 RESTORATION OF THE SITE

Post decommissioning the intention is to return the site, as far as possible and desirable, to the condition that it was in prior to construction of the installation. The key areas of work will be in relation to:

- Cutting the foundations to below the seabed and ensuring that they are made safe and adequately covered; and
- Ensuring that cables and cable ends are adequately buried

No active restoration which would rely on intervention with equipment is proposed as it is considered that this present unnecessary and unacceptable risks to personnel. Rather, it is considered that allowing the seabed to "self-settle" is sufficient and is proportional to the limited environmental impact of the proposed decommissioning.

13 POST DECOMMISSIONING MONITORING, MAINTENANCE AND MANAGEMENT OF THE SITE

As cables and foundations are proposed to remain at the site post-decommissioning there will be a need for some further work so that any possible unexpected risks to navigation or to other users of the sea can be identified and mitigated to an appropriate level. The assessment of the level of risk and appropriate mitigation will

be dependent on the nature and scale of those items remaining, the likelihood of the remaining items becoming exposed and the degree of risk to other users of the sea.

Based on present day conditions and knowledge the following assessments have been made:

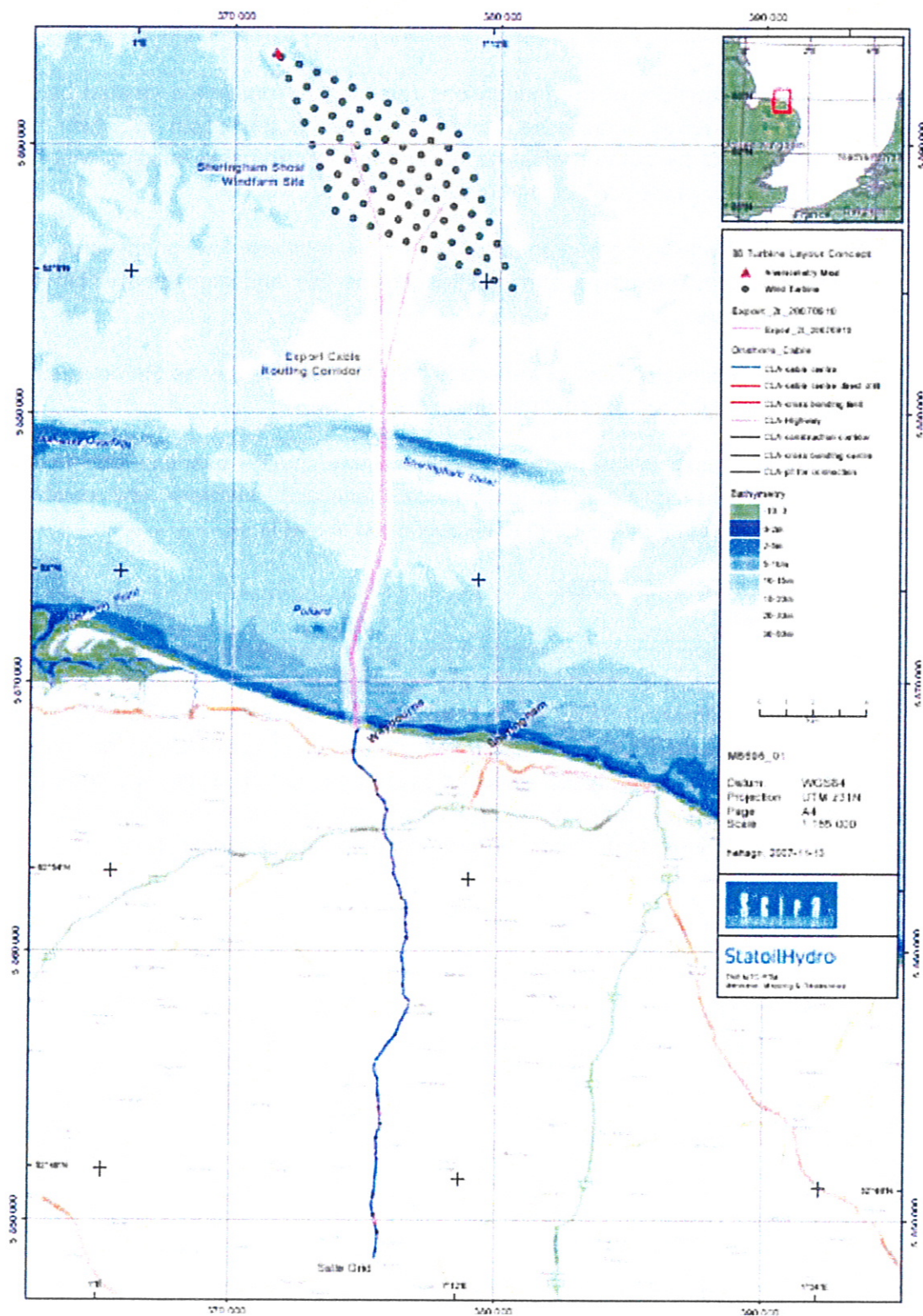
- The risk of exposure of the foundations (the part of foundation located below seabed) or cabling is assessed to be low due to the depth to which the foundations will be cut and also the burial depth of the cable coupled with the relative stability of the sea bed in the area;
- The risk of debris falling overboard at any time is relatively low as offshore work associated with operations and maintenance is low and contained within the turbine structure;
- The risk to legitimate users of the sea is considered to be low as the area is not heavily fished and recreational use of the area is low.

The parameters used in the above assessment may change overtime and so will need to be re-visited closer to decommissioning and therefore any possible monitoring survey strategy will need to be confirmed at that time.

14 SUPPORTING STUDIES

At present the supporting studies used for this decommissioning plan are the studies already carried out in connection with the Sheringham Shoal Offshore Windfarm Environmental Statement (May 2006). In addition to these studies there are geological surveys performed by the Project (2007/2008), pre-construction, during construction and post-construction monitoring programmes either already underway or scheduled to be undertaken at the appropriate time. These monitoring studies will also feed into the assessment and final form of the decommissioning plan.

Appendix 1 A4 version of Figure 1-1



Appendix 2 List of abbreviations

AONB	Area of Outstanding Natural Beauty
BPEO	Best Practicable Environmental Option
CD	Chart Datum
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Fisheries and Rural Affairs
DTI	Department for Transport and Industry
EDFE	EDF Energy
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ES	Environmental Statement
FEPA	Food and Environmental Protection Act
HDD	Horizontal Directional Drilling
HSE	Health, Safety and Environment
kV	kiloVolt
LME	London Metal Exchange
MHWN	Mean High Water Neaps
MHWS	Mean High Water Springs
MLWN	Mean Low Water Neaps
MLWS	Mean Low Water Springs
MODN	Mean Ordnance Datum Newlyn
MSL	Mean Sea Level
MW	Mega Watts
NNR	National Nature Reserve
OD	Ordnance Datum
OFTO	Offshore Transmission Owner
OSPAR	Oslo Paris Agreement
PEXA	Military Practice and Exercise Areas
Project	The Sheringham (Shoal Offshore Wind Farm) Project
ROV	Remotely Operated Vehicle
SAC	Special Area of Conservation
SPA	Special Protected Area
SSSI	Site of Special Scientific Interest
SSOWF	Sheringham Shoal Offshore Wind Farm
TP	Transition Piece
UXO	Unexploded Ordnance
WSI	Written Scheme of Investigation
WTG	Wind Turbine Generator

Appendix 3 Preliminary table listing of pros and cons of possible decommissioning activities

The following appendices list a rough preliminary evaluation (pros and cons) of decommissioning activities made for some criteria.

Appendix 3.1 Foundations

For the foundations, cutting below seabed is the planned decommissioning activity.

Foundations		
Criterion	Complete Removal	Cutting below seabed
No harm to people	This alternative is assessed to represent a much higher risk towards personnel.	Fewer activities to be undertaken over a shorter time period offshore, minimising the risk to personnel.
Consideration of the rights and needs of legitimate users of the sea	Disadvantages to other users of the marine environment include disruption over a longer time period whilst the works are undertaken and remaining scour holes associated with excavation.	No risk presented providing cutting is at sufficient depth and site is monitoring post decommissioning.
Minimise environmental impact	Excavation pits over a wide area causing significant impact to marine environment. Associated dumping of excessive volume of waste material also required. Disturbance would take place over long time period. Some artificial reef habitat may be lost, but long term risk of decay and pollution will be eliminated.	Considerable reduced works footprint relative to complete removal. Works would take place over reduced time period and involve less equipment. Seabed recovery time shorter than complete removal scenario. Some artificial reef habitat may be lost, but long term risk of decay and pollution will be eliminated.
Commercial viability	Not commercial viable. Excavation and extreme lifting involves major equipment requirements over longer periods of time.	Less expensive alternative to complete removal, involving minimal excavation.
Practical integrity	Not a practical solution as the following are expected: High risk associated with heavy	Expected to be more standard procedures and equipment. The

lift, considerable excavation decommissioning is expected needed with possible to re reverse of the associated storage of construction. disposal of large volumes of waste

Appendix 3.2 Offshore substations (platforms)

For the offshore substations (platforms), removal is the planned decommissioning activity.

Offshore substations (platforms)	
Criterion	Complete removal
No harm to people	Prior to decommissioning a more detailed method evaluation and risk assessment has to be performed addressing the mitigating measures that need to be in place prior to start this decommissioning activity. (Standard) for our activities). Removal of the offshore substations at the end of the operational life time, is considered to be accordance with applicable guidances.
Consideration of the rights and needs of legitimate users of the sea	Complete removal of structures is considered the best long term solution. Appropriate notification and consultation will be carried out prior to and during the decommissioning work. Further to ensure safety for third parties at sea, safety zones around the installations during decommissioning will be applied for.
Minimise environmental impact	Materials will be completely removed from site. Materials are expected to be reused as much as possible.
Commercial viability	Most commercial viable solution. Optimization of the method and the associated costs, will be further assessed in due time prior to decommissioning.
Practical integrity	The decommissioning is expected to re reverse of the construction

Appendix 3.3 Marine cables

For the marine cables, leave in-situ is the planned decommissioning activity.

Scour Material		
Criterion	Complete Removal	Leave in-situ
No harm to people	Some risk to personnel as all possible decommissioning activities represent a HSE risk	No decommissioning activity, hence no risk to personnel
Consideration of the rights and needs of legitimate users of the sea	No risk assumed, except temporarily during possible removal operation	No risk assumed from leaving buried cables in-situ. The situation is expected to be unchanged from what will be experienced in the future operational phase.
Minimise environmental impact	Given the considerable length of cable and the need for jetting techniques, removal would cause considerable damage and disruption to the seabed and established communities. These impacts could be considered large relative to the environmental gains from removal.	Benign – no environmental impact associated with long term disintegration of buried cables
Commercial viability	Extensive operation, offset to some extent by copper resale value	Costs limited
Practical integrity	Possible to undertake. Likely to cause disturbance to the marine environment.	N/A

Appendix 3.4 Scour material

For scour material, leave in-situ is the planned decommissioning activity.

Marine Cables		
Criterion	Complete Removal	Leave in-situ
No harm to people	No harm to people Removal is labour intensive and involves a risk to personnel involved in operation	Reduced risk for contractor personnel
Consideration of the rights and needs of legitimate users of the sea		
Minimise environmental impact	Removal will cause considerable damage and disruption to the seabed and established communities. Associated equipment and vessels will generate disturbance and additional noise. Materials gathered would need to be dumped elsewhere.	Habitat for established communities retained, no short or long term detrimental effects on marine environment anticipated.
Commercial viability	Expensive, labour intensive, high volume of operation	Costs limited
Practical integrity	High reliance on manual work, labour intensive. Possible, but not practical	N/A

For scour material, leave in-situ is the planned decommissioning activity.

