



Beatrice Offshore Wind Farm Consent Plan

Development Specification and Layout Plan
(OfTW)

December 2016


Beatrice
Offshore Windfarm Ltd

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Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005-PLN-181
Date:	December 2016

Beatrice Offshore Wind Farm

Development Specification and Layout Plan (OfTW)

Pursuant to the Marine Licence (Offshore Transmission Works)
Condition 3.2.2.6

For the approval of the Scottish Ministers

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Rev	Prepared By	Sign off	Checked By	Sign Off	Approved By	Sign Off	Date of Issue
2.0	Steve Bellew, GoBe Consultants		Jonathan Wilson, Consenting and Stakeholder Manager, BOWL		Steven Wilson, Senior Project Manager, BOWL		* 13/12/2016

OfTW Development Specification and Layout Plan Overview

Purpose and Objectives of the Plan

This Development Specification and Layout Plan (DSLPL) has been prepared to address the specific requirements of the relevant condition attached to the Offshore Transmission Works (OfTW) Marine Licence issued to Beatrice Offshore Windfarm Limited (BOWL).

The overall aim of this OfTW DSLPL is to confirm details of the final design and layout of the OfTW in so far as it relates to the offshore export cables and Offshore Transformer Module (OTM) Interconnector Cable (noting that a separate Wind Farm DSLPL sets out the equivalent for the Wind Farm array, including wind turbines, inter-array cables and OTMs).

This OfTW DSLPL confirms that the design and layout of the OfTW align with those considered in the original Application for consent.

Scope of the Plan

This OfTW DSLPL covers, in line with the requirements of the OfTW Marine Licence Condition, the following:

- Details of the location and layout of the subsea export cables and OTM Interconnector Cable.

Structure of the Plan

This OfTW DSLPL is structured as follows:

Sections 1 and 2 set out the scope and objectives of the OfTW DSLPL and set out broad statements of compliance.

Section 3 sets out the process for making updates and amendments to this Plan.

Section 4 provides detail on the arrangements and lengths of the export cables and OTM Interconnector Cable.

Section 5 provides information to demonstrate compliance with the original Application, and how the mitigation proposed in the Application will be delivered.

Appendix A provides a comparison of the OfTW design parameters considered in the original Application with those presented in this DSLPL.

Appendix B details ES and SEIS mitigation commitments relevant to this OfTW DSLPL.

Plan Audience

This OfTW DSLPL is intended to be referred to by relevant personnel involved in the construction of the Beatrice Project, including BOWL personnel, Key Contractors and

Subcontractors. All relevant method statements and work plans produced in relation to the Development must comply with this OfTW DSLP.

Plan Locations

Copies of this OfTW DSLP are to be held in the following locations:

- BOWL Head Office;
- At the premises of any agent, Key Contractor or Subcontractor acting on behalf of BOWL;
and
- With the ECoW(s).

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Term	Definition / Description
AC	Alternating current.
AEZ	Archaeological Exclusion Zone.
Annex I cobble reef	The JNCC have to date identified Special Areas of Conservation (SACs) within UK offshore waters for three habitat types listed on Annex I of the Habitats Directive. One of these habitat types is Reefs, which may be variously comprised of bedrock, boulders and/or cobbles, or may be biogenic.
Application	The application letters and Environmental Statement submitted to the Scottish Ministers by BOWL on 23 April 2012 and Supplementary Environmental Information Statement submitted to the Scottish Ministers by BOWL on 29 May 2013.
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
CaP	Cable Plan as required for approval under Condition 19 of the S36 Consent and Condition 3.2.2.10 of the OfTW Marine Licence (LF00000-PLN-214).
CLT	Consents and Licensing Team.
CoS	Chamber of Shipping.
ddm	Degrees Decimal Minutes.
Development	The Wind Farm and the OfTW.
Direct Pipe	DIRECT PIPE® is a pipeline installation methodology pioneered by Herrenknecht, a form of HDD which has the advantages of micro tunnelling technology. This technique excavates the borehole using a micro tunnelling machine, pushed by the prefabricated final pipeline in one single step.
DS	Design Statement as required for approval under Condition 14 of the S36 Consent and Condition 3.2.2.7 of the OfTW Marine Licence (LF000005-PLN-167).
DSL P	Development Specification and Layout Plan as required for approval under Condition 13 of the S36 consent and Condition 3.2.2.6 of the OfTW Marine Licence (Ref: LF000005-PLN-152).
EC1	Beatrice Transmission subsea Export Cable 1 (Easterly cable).
EC2	Beatrice Transmission subsea Export Cable 2 (Westerly cable).
ES	The Environmental Statement submitted to the Scottish Ministers by the Company on 23 April 2012 as part of the Application as defined above.
Entry Point	The onshore entry point for the pipe on completion of the Direct Pipe installation activities and after the pipeline has been cut to the required length. Typically, the final pipe entry point

Term	Definition / Description
	corresponds to the front wall of the Pipe Thrust Pit.
Export Cable	The High Voltage (HV) Alternating Current (AC) 220kV electrical transmission cable required to connect the Windfarm to the OnTW.
Final Exit Point	The offshore seabed end of pipe position, once the pipeline has been pulled back in to the seabed to achieve the required depth of burial. It is also the point at which the Polypipe attaches the pipe end flange.
GIS	Geographic Information Systems.
HDD	Horizontal Directional Drilling. A steerable, trenchless, method of installing an underground pipe, conduit or cable in a shallow arc along a prescribed bore path by using surface-launched drilling equipment, with minimal impact on the surrounding area.
HVAC	High Voltage Alternating Current.
Inter-array cables	The Medium Voltage (HV) Alternating Current (AC) 33kV electrical cables that connect the wind turbines to the OTMs.
OTM Interconnector Cable	The High Voltage (HV) Alternating Current (AC) 220kV electrical cable that connects the OTMs to one other.
JNCC	Joint Nature Conservation Committee
Key Contractors	The Contractors appointed for the individual work streams of Marine Installation; Transmission; and, wind turbines.
kV	Kilovolt.
LAT	Lowest Astronomical Tide.
Licensing Authority	The Scottish Ministers.
MCA	Maritime and Coastguard Agency.
MHWS	Mean High Water Springs.
MS - LOT	Marine Scotland Licensing Operations Team.
NLB	Northern Lighthouse Board.
OfTW	The Offshore Transmission Works. The OfTW includes the transmission cables required to connect the Wind Farm to the OnTW. This covers the OTMs and the cables from the OTMs to the Mean High Water Springs (MHWS) at the landfall west of Portgordon on the Moray coast. It also includes the two OTMs and the OTM Interconnector Cable.
OfTW DSLP	The Offshore Transmission Works Development Specification and Layout Plan in respect of the Export Cable installation to be submitted for approval under Condition 3.2.2.6 of the OfTW Marine Licence (Ref: LF000005-PLN-181).
OfTW Marine	The written consent for the OfTW granted by the Scottish

Term	Definition / Description
Licence	Ministers under Section 20(1) of the Marine (Scotland) Act 2010 and Section 65 of the Marine and Coastal Access Act 2009, issued on 2 September 2014, as revised by the issue of licence 04461/16/0 on 27 April 2016.
OnTW	Onshore Transmission Works. The onshore transmission works from landfall, consisting of onshore buried export cables to the onshore substation and connection to the National Grid network.
OSP	Offshore Substation Platform.
OTM	Offshore Transformer Module means an alternating current (AC) OSP which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator.
Pipe Thruster	The unit which is used to provide up to 750 tonnes of thrust or pull force to the pipeline string being installed.
Pipe Thruster Pit	The onshore location of the Pipe Thruster. The Pipe Thruster Pit (sometimes known as the launch pit) is a temporary pit structure which provides the necessary structural anchorage for the Pipe Thruster and is configured to allow the required ground entry angle for the pipe. The Pipe Thruster Pit is usually constructed from sheet piles and concrete which is fully removed on completion of the pipeline installation.
Polypipe	The Polypipe is a medium or high density 20-30m long plastic pipe conduit which facilitates the cable entry and pull-in into the offshore pipe Final Exit Point situated beneath the seabed. The Polypipe is attached to the pipe end flange. On completion of the cable pull-in both the Polypipe and cable are buried beneath the seabed for long term protection.
Pop-out	The offshore seabed exit point for the Direct Pipe and micro tunnelling machine. The pipeline is "over" pushed out onto the seabed to allow recovery of micro tunnelling machine, before the pipe is sealed and pulled back in to the seabed to achieve the required depth of seabed burial at the end of the pipe
S36 Consent	Consent granted by the Scottish Ministers under Section 36 of The Electricity Act 1989 to construct and operate the Beatrice Offshore Wind farm electricity generating station, dated 19 th March 2014.
SEIS	The Supplementary Environmental Information Statement submitted to the Scottish Ministers by the Company on 29 May 2013 as part of the Application as defined above.
Site	The area outlined in red in Figure 1 attached to the S36 Consent Annex 1 and the area outlined in red and the area outlined in black in the figure contained in Part 4 of the Marine Licence.
SFF	Scottish Fisherman's Federation.

Term	Definition / Description
SNH	Scottish Natural Heritage.
SSS	Side Scan Sonar.
SSSI	Site of Special Scientific Interest.
Subcontractors	Subcontractors to Key Contractors as defined above.
UXO	Unexploded Ordnance.
WGS84	World Geodetic System 1984; the reference coordinate system used by the Global Positioning System.
Wind Farm	The offshore array development as assessed in the ES including wind turbines, their foundations, inter-array cabling and meteorological masts.
Wind Farm Marine Licence	The written consent for the Wind Farm granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010, issued on 2 September 2014, as revised by the issue of licence 04462/16/0 on 27 April 2016.
WTG	Wind Turbine Generator.

1 Introduction

1.1 Background

1.1.1 The Beatrice Offshore Wind Farm received consent under Section 36 of the Electricity Act 1989 from the Scottish Ministers on 19th March 2014 (the S36 Consent) and was granted two Marine Licences from the Scottish Ministers, for the Wind Farm and associated Offshore Transmission Works (OfTW), on 2nd September 2014 and revised on 27th April 2016 (Reference: [04461/16/0]/[04462/16/0] respectively).

1.2 Objectives of this Document

1.2.1 The S36 Consent and Marine Licences contain a variety of conditions that must be discharged through approval by the Scottish Ministers prior to the commencement of offshore construction. One such requirement is the approval of the proposed layout and specification of the Wind Farm and OfTW design through the preparation and approval of Development Specification and Layout Plans (DSLPS).

1.2.2 The relevant condition setting out the requirement for an OfTW DSLP for approval is set out in full in Table 1.1.

1.2.3 This document is intended to satisfy the requirements of the relevant OfTW Marine Licence condition, by providing details of the proposed design and layout specification in so far as it relates to the two offshore Export Cables, which each run from the two Offshore Transformer Modules (OTMs) located within the Wind Farm array, to the landfall location at Mean High Water Springs (MHWS) on the shoreline, and the OTM Interconnector Cable, which runs between the two OTMs.

1.2.4 A separate DSLP has (Ref: LF000005-PLN-152) been prepared that addresses the Wind Farm and the remainder of the OfTW (i.e. the OTMs). This consent plan was approved by MS-LOT on the 7th of December 2015 and also partially discharges the OfTW Marine Licence condition 3.2.2.6 (in so far as it describes the OTMs).

1.2.5 This OfTW DSLP serves to fully discharge OfTW Marine Licence condition 3.2.2.6.

Table 1.1 - Consent condition to be discharged by this OfTW DSLP

Consent Document	Condition Reference	Condition Text	Reference to relevant Section of this OfTW DSLP
OfTW Marine Licence	3.2.2.6	The Licensee must, no later than 6 months prior to the Commencement of the Works, submit a DSLP, in writing, to the Licensing Authority for their written approval.	This document sets out the OfTW DSLP in so far as it relates to the offshore Export Cables and OTM Interconnector Cable for approval by the Scottish Ministers
		Such approval may only be granted following consultation by the Licensing Authority with the MCA, NLB, CoS, JNCC, SNH, SFF and any such other advisors or organisations as may be required at the discretion of the Licensing Authority.	Consultation to be undertaken by the Scottish Ministers
		The DSLP must include, but not be limited to the following: a) A plan showing the proposed location of each individual OSP [OTMs], seabed conditions, bathymetry, confirmed foundation type for each OSP and any key constraints recorded on the Site;	OTM details provided in the approved Wind Farm DSLP (Ref: LF000005-PLN-152) Section 4.2 and 4.3 of this OfTW DSLP also provides information on the bathymetry and seabed conditions and any key constraints for the OTM Interconnector Cable and export cable corridor.
		b) A list of latitude and longitude co-ordinates accurate to three decimal places of minutes for each OSP [OTM], this should also be provided as a GIS shape file using WGS84 format;	OTM details provided in the approved Wind Farm DSLP (Ref: LF000005-PLN-152)
		c) A table or diagram of each OSP [OTM];	OTM details provided in the approved Wind Farm DSLP (Ref: LF000005-PLN-152)
		d) The finishes for each OSP [OTM]; and	OTM details provided in the approved Wind Farm DSLP (Ref: LF000005-PLN-152)
		e) The length and proposed arrangements on the seabed of all cables.	Section 4 of this OfTW DSLP

1.2.6 In addition to the specific consent requirements for a DSLP and the requirements thereof (as set out in Table 1.1), this DSLP also includes information in respect of another condition within the OfTW Marine Licence, as set out in Table 1.2.

Table 1.2 - Other consent conditions relevant to this OfTW DSLP

Reference	Summary of Condition	Where Addressed
OfTW Marine Licence 3.2.3.12	The Licensee must ensure that no OSPs are positioned within 1.5km and that no cables are laid or positioned within 500m of the Beatrice Alpha, Bravo, Charlie and Jacky platforms.	Section 4.4

1.3 Linkages with other Consent Plans

1.3.1 This OfTW DSLP document sets out the proposed design and layout specification for the two Export Cables and the OTM Interconnector Cable. However, ultimately it will form part of a suite of approved documents that will provide the framework for the construction process – namely the other Consent Plans required under the S36 Consent and Marine Licences.

1.3.2 Condition 14 of the S36 Consent and Condition 3.2.2.7 of the OfTW Marine Licence require the submission for approval of a Design Statement (DS). A DS (Ref: LF000005-PLN-014) providing visualisations of the above sea structures of the Development (including Wind Turbine Generators (WTGs) and OTMs) as set out in the Wind Farm DSLP was approved by MS-LOT on 4th December 2015.

1.4 DSLP Document Structure

1.4.1 In response to the specific requirements of the OfTW Marine Licence conditions, this DSLP has been structured so as to be clear that each part of the specific requirements have been met and that the relevant information to allow the Scottish Ministers to approve the DSLP has been provided. The document structure is set out in Table 1.3.

Table 1.3 – DSLP document structure

Section	Title	Overview
1	Introduction	Outlines consent requirements and provides an overview of the OfTW DSLP scope and structure.
2	BOWL Statements of Compliance	Sets out the BOWL statements of compliance in relation to the OfTW DSLP.
3	Updates and amendments to this DSLP	Sets out the procedures for any required update or amendment of the approved OfTW DSLP and subsequent further approval by the Scottish Ministers.
4	Design, specification and layout of the Offshore Transmission Works	Provides the required details in relation to the design and layout specification of the Export Cables and the OTM Interconnector Cable.
5	Compliance with the Environmental Statement, Supplementary Environmental Information Statement and	Confirms the details set out in this OfTW DSLP are in accordance with those assessed in the original application.

Section	Title	Overview
	Application	

2 BOWL Statements of Compliance

2.1 Introduction

- 2.1.1 The following section is intended to re-affirm the BOWL commitment to ensuring that the Development is constructed in such a manner as to meet the relevant legislative requirements set out by the OfTW Marine Licence.

2.2 Statements of Compliance

- 2.2.1 BOWL in undertaking the final design and construction of the Development will require compliance with this OfTW DSLP as approved by the Scottish Ministers (and as updated or amended from time to time following the procedure set out in Section 3 of this OfTW DSLP).
- 2.2.2 Where updates or amendments are required to this OfTW DSLP, BOWL will ensure the Scottish Ministers are informed as soon as reasonably practicable and where necessary the OfTW DSLP will be updated or amended (see Section 3 below).
- 2.2.3 BOWL in undertaking the construction of the project will require compliance with the limits defined by the original Application and the project description defined in the Environmental Statement (ES) and Supplementary Environmental Information Statement (SEIS) and referred to in Parts 2 and 4 of the OfTW Marine Licence in so far as they apply to this OfTW DSLP (unless otherwise approved in advance by the Scottish Ministers) (see Section 5).
- 2.2.4 BOWL will, in undertaking the design and construction of the Development, require compliance with the approved OfTW DSLP (and all other relevant, approved Consent Plans) by the Key Contractors and Subcontractors through condition of contract and by an appropriate auditing process.

3 Updates and Amendments to this DSLP

- 3.1.1 The OfTW Marine Licence (OfTW) condition 3.2.3.1 recognises that updates or amendments to this DSLP may be required, stating that:

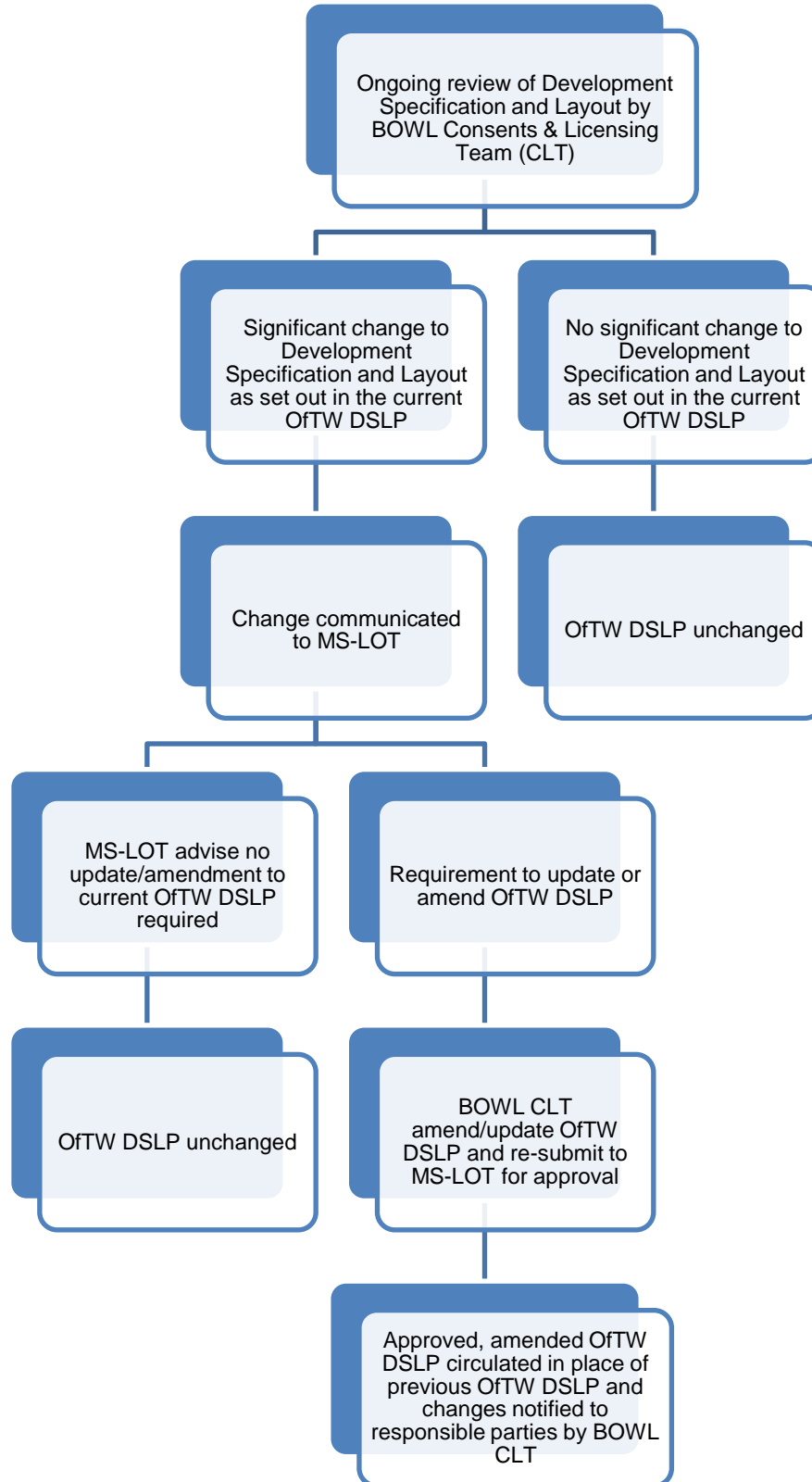
Any updates or amendments to the ...DSLP... by the Licensee, must be submitted, in writing, by the Licensee to the Licensing Authority for their written approval.

- 3.1.2 The main design and layout specifications for both the subsea Export Cables and the OTM Interconnector Cable are described in this OfTW DSLP including:

- The two Export Cable lengths and arrangements on the seabed; and
- OTM Interconnector Cable length and arrangement on the seabed.

- 3.1.3 Where it is necessary to update this OfTW DSLP in light of any significant new information related to the OfTW specification and layout, BOWL proposes to use the change management process set out in Figure 3.1 in identifying such information, communicating such change to the Scottish Ministers, re-drafting the DSLP, seeking further approval for the necessary amendments or updates and disseminating the approved changes/amendments to responsible parties.

Figure 3.1 - DSLP change management procedure



4 Design, Specification and Layout – Offshore Transmission Works

4.1 Introduction

- 4.1.1 OfTW Marine Licence Condition 3.2.2.6 requires that the OfTW DSLP include the following details:

The length and proposed arrangements on the seabed of all cables.

- 4.1.2 This section of the DSLP details the design and layout of the two Export Cables and the OTM Interconnector Cable.

4.2 Export Cables

Arrangement and Lengths

- 4.2.1 The Wind Farm and OTMs are connected to the onshore transmission works (OnTW) by two High Voltage Alternating Current (HVAC) 220kV cables, referred to as 'export cables' since they export electricity from the Wind Farm to the OnTW. The two Export Cables will be located within the OfTW corridor shown in Figure 4.1, and as defined in the OfTW Marine Licence. The corridor is between 570m and 1500m wide and approximately 58km long from the landfall to the Wind Farm boundary. The arrangement of the Export Cables between the OTMs and the OnTW is shown in greater detail in Figures 4.2 to 4.5.
- 4.2.2 These two subsea Export Cables will run from the OTMs within the Wind Farm to a common landfall location west of Portgordon on the Moray coast.
- 4.2.3 The total lengths of the Export Cables and the Interconnector Cable, and the start and end locations of the cables, are set out in Table 4.1 below.

Table 4.1 – OfTW Export Cables and Interconnector Cable arrangements and cable lengths

Layout		Start Point		End Point		Approximate Length (m)
Start	End	Latitude (ddm) WGS84	Longitude (ddm) WGS84	Latitude (ddm) WGS84	Longitude (ddm) WGS84	
Export Cable 1						
OTM1	Landfall	50 70.10'E	64 56.558'N	49 74.30'E	63 91.575'N	68,400
Export Cable 2						
OTM2	Landfall	50 61.13'E	64 57.311'N	49 73.64'E	63 91.607'N	69,900
OTM Interconnector cable						
OTM1	OTM2	50 70.10'E	64 56.558'N	50 61.13'E	64 57.311'N	1,200

4.2.4 The two Export Cables will be buried where possible within the seabed sediments along their length, or mechanically protected where burial is not possible. At the Portgordon landfall site, the Export Cable route crosses the Spey Bay Site of Special Scientific Interest (SSSI) for a length of approximately 100m. At the landfall the cables will be installed via two horizontal preinstalled pipes, beneath the SSSI, so as to avoid disturbance to the SSSI features.

4.2.5 The final location of the Export Cables remains subject to possible further micro-siting during installation, as set out in the OfTW Cable Plan (CaP) (LF000005-PLN-214).

Bathymetry and Seabed Conditions

4.2.6 A series of geotechnical, geophysical and benthic surveys have already been commissioned and completed by BOWL to understand seabed conditions along the OfTW route. The results of these surveys have been considered in defining the Export Cable routing and installation methods.

4.2.7 Bathymetry along the Export Cable routes ranges from 1m below Lowest Astronomical Tide (LAT) where the cables exit the horizontal pipes seawards of the SSSI to a maximum depth of 99m in the central portion of the routes.

4.2.8 The general bathymetry of the Export Cable routes from the landfall to the Wind Farm is characterised by a flat, gently sloping seabed. The bathymetry of the Export Cable routes within the Wind Farm is characterised by higher variability with surface channels observed.

4.2.9 Seabed sedimentary conditions across the OfTW export cable corridor were classified using Side Scan Sonar (SSS) data collected in 2015. The surficial geology of the OfTW corridor in the northern and middle part is generally dominated by gravelly sand and sandy gravel. The presence of diamicton was detected in the southern region of the corridor with numerous boulders also recorded. Single boulders and low density boulder fields were detected along the entire export cable route; however, the densest boulder field was found to lie within 10km of the shoreline. This nearshore dense boulder field has the potential to be problematic for seabed burial of the Export Cables, especially if the boulders also exist buried within the seabed sediments. As such this area has already been identified as a potential area within which additional seabed preparation or mechanical protection (e.g. rock placement) may be required.

4.3 OTM Interconnector Cable

Arrangement and Length

4.3.1 A single 220kV Interconnector Cable will connect the two OTMs and allow routing of power from one OTM to the other should one of the two Export Cables become temporarily unavailable. The OTM interconnector will enable transmission of the whole of the Wind Farm generated power up to the maximum capacity of a single

export cable or the circuit components.

4.3.2 The total length of the OTM Interconnector Cable will be approximately 1.2km (see Table 4.1 above for cable start and end point and length data).

4.3.3 The arrangement of the OTM Interconnector Cable is shown in Figure 4.2. The final location of the OTM Interconnector Cable remains subject to possible further micro-siting as set out in the OfTW CaP.

4.3.4 The OTM Interconnector Cable will be buried along its length, or mechanically protected where burial is not possible.

Bathymetry and Seabed Conditions

4.3.5 The water depth across the Wind Farm site, within which the OTMs are situated, varies between 35m and 68m.

4.3.6 Surveys identified that the seabed consists mainly of clayey or sandy sediments and areas of gravels and coarse sediments.

4.3.7 Surveys have identified boulders across the Wind Farm with a significant number of boulders with a diameter greater than 0.2m (and up to 1.3m). There is the potential for subsurface boulders to also be present. Boulders have the potential to hinder seabed burial of the Interconnector Cable and as such, boulder clearance will be undertaken prior to cable installation. Boulder clearance methods are described in the Wind Farm Construction Method Statement (LF000005-PLN-184) and Cable Plan (LF000005-PLN-214).

4.4 Key Constraints

4.4.1 There are a small number of physical spatial constraints within the Wind Farm 'developable area' and along the OfTW corridor. The following constraints have been taken into account in defining the Export Cable and OTM Interconnector Cable arrangements and layouts, and are shown in Figures 4.2 to 4.5:

- A 500m buffer around the Beatrice Alpha, Bravo, Charlie and Jacky oil platforms to preclude the installation of any cables (as required by Condition 3.2.3.12 of the OfTW Marine Licence).
- A 770m buffer from the Moray Firth Round 3 Zone boundary (as required under the terms of the Crown Estate Agreement for Lease) applies to all cables within the Wind Farm boundary. Cables within the export cable corridor are not subject to this limitation;
- Plugged or abandoned wellheads have been avoided;
- A small number of magnetic anomalies that could represent unexploded ordnance (UXO) were identified by survey. The Export Cables have been routed to avoid these;

- Features of potential archaeological interest identified by geophysical surveys and their associated Archaeological Exclusion Zones (AEZs) have been avoided; and
- The location of previously laid cables and/or pipelines have been avoided.

4.4.2 In addition to the constraints listed above, the OfTW Marine Licence includes a provision for horizontal directional drilling (HDD) to install the Export Cables beneath the Spey Bay SSSI where the cable makes landfall in order to minimise potential effects on features of conservation interest (see Table 1.2). To avoid impacting designated features of the Spey Bay SSSI the Export Cables will be installed via pre-installed horizontal pipes, beneath the SSSI.

4.4.3 Scottish Hydro Electric Transmission (SHE-T) have been awarded a licence by The Crown Estate to lay sub-sea transmission cables as part of the Caithness to Moray HV DC transmission project. The SHE-T cable landfall will be west of Portgordon and lies just within the BOWL OfTW export cable corridor. Under a proximity agreement BOWL and SHE-T have agreed cable routings within the BOWL corridor, with the BOWL Export Cables now constrained to the western side of the BOWL OfTW corridor at landfall as shown on Figure 4.4.

4.4.4 A series of environmental baseline surveys have been commissioned and carried out by BOWL to understand environmental conditions across the OfTW cable corridor and to identify any environmental sensitivities. A low to medium resemblance to Annex I cobble reef habitat was identified within areas of the OfTW cable corridor. On the basis that no areas of high resemblance to Annex I cobble reef were identified within the OfTW corridor, the highly localised extent of temporary disturbance from cable installation works, the high recoverability of these habitats and the widespread distribution of similar habitats in the area, Marine Scotland agreed that the results should not have implications for the export cable routing within the OfTW corridor (Ref: LF000005-LET-290).

BOWL Development Specification and Layout Plan (OfTW)

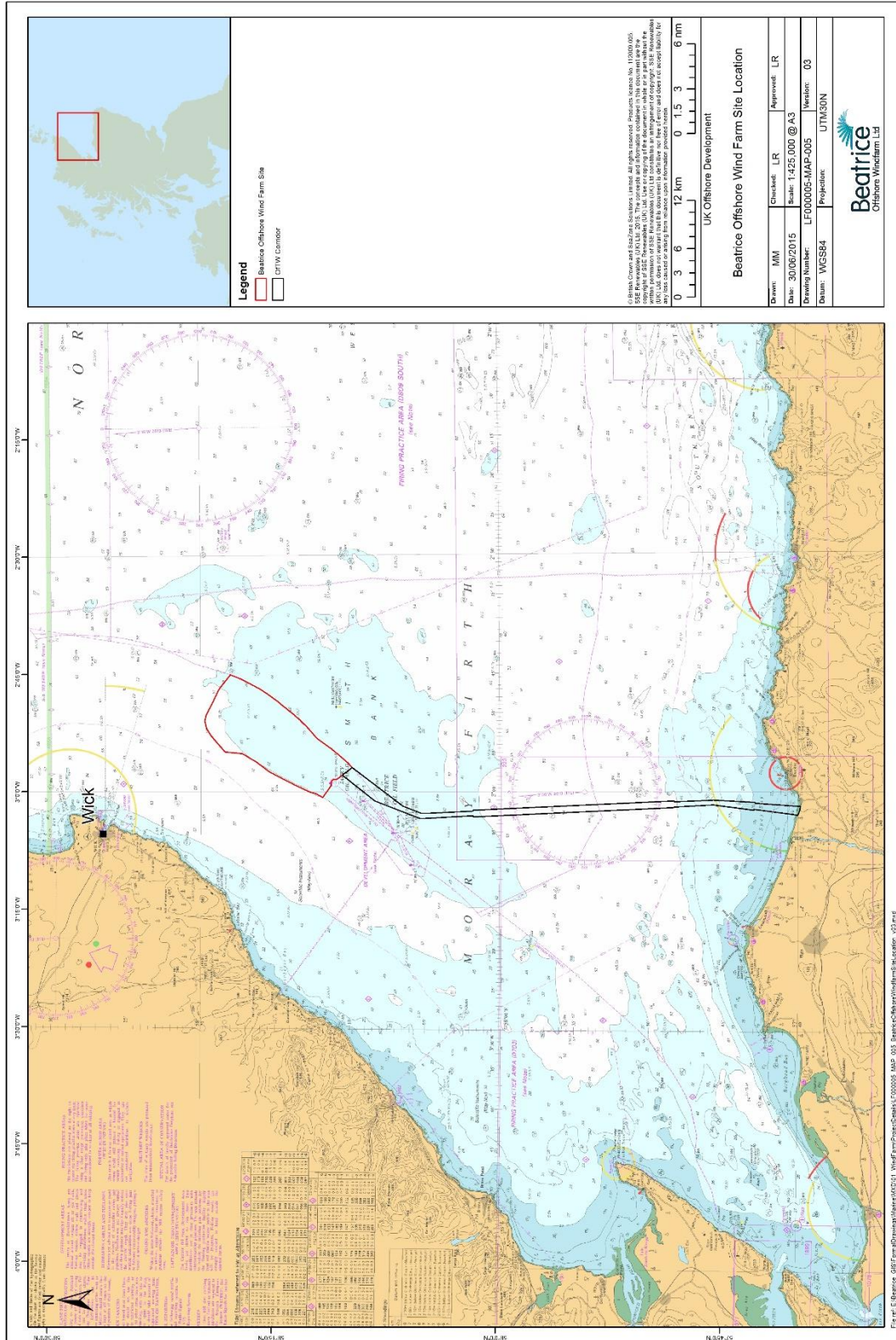


Figure 4.1 – OfTW (export cable) corridor, running from Wind Farm to landfall

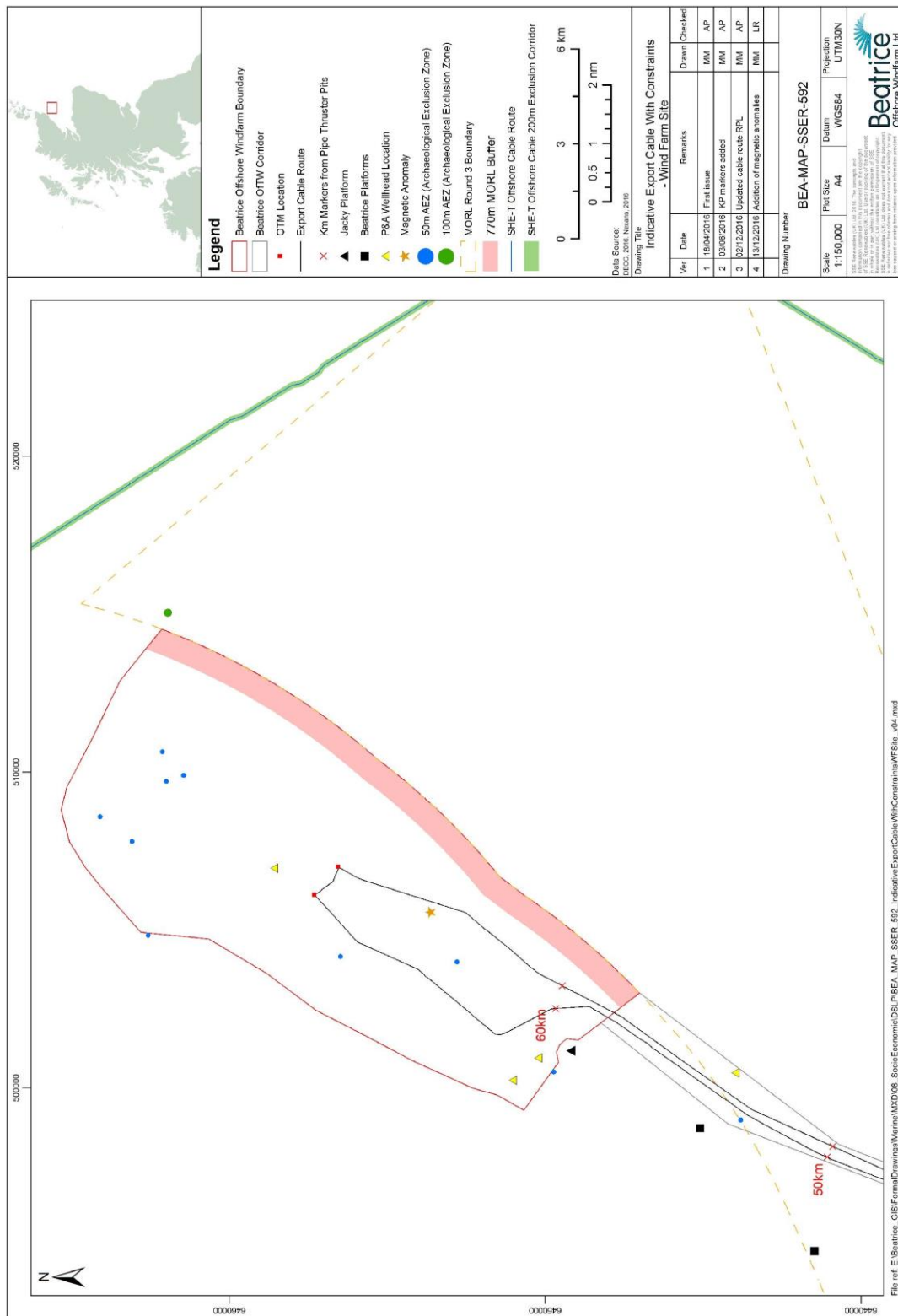


Figure 4.2 –Key constraints within the ‘developable area’ relevant to the Export Cables and OTM Interconnector Cable

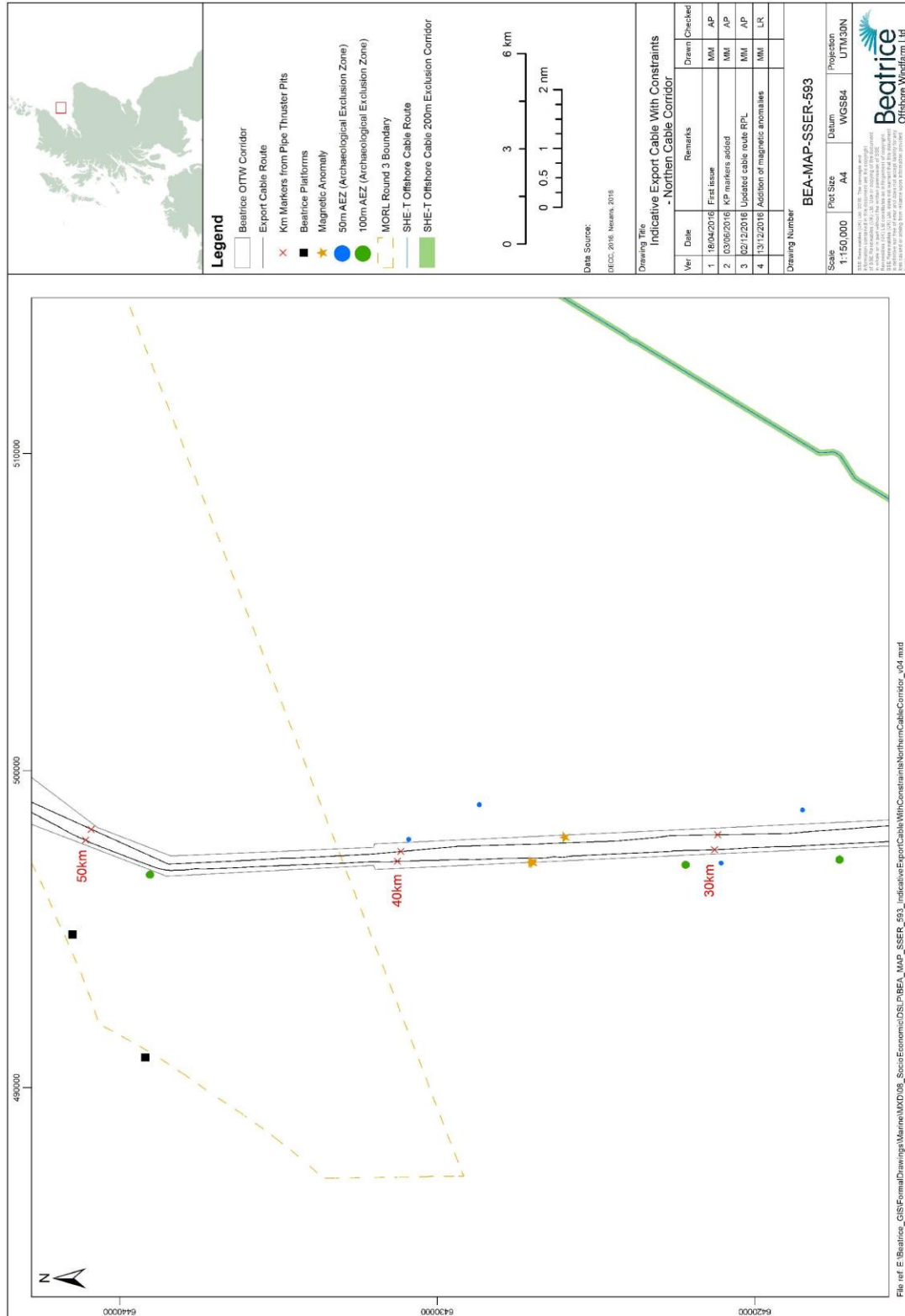


Figure 4.3 –Key constraints relevant to the Export Cables (northern section of OfTW corridor)

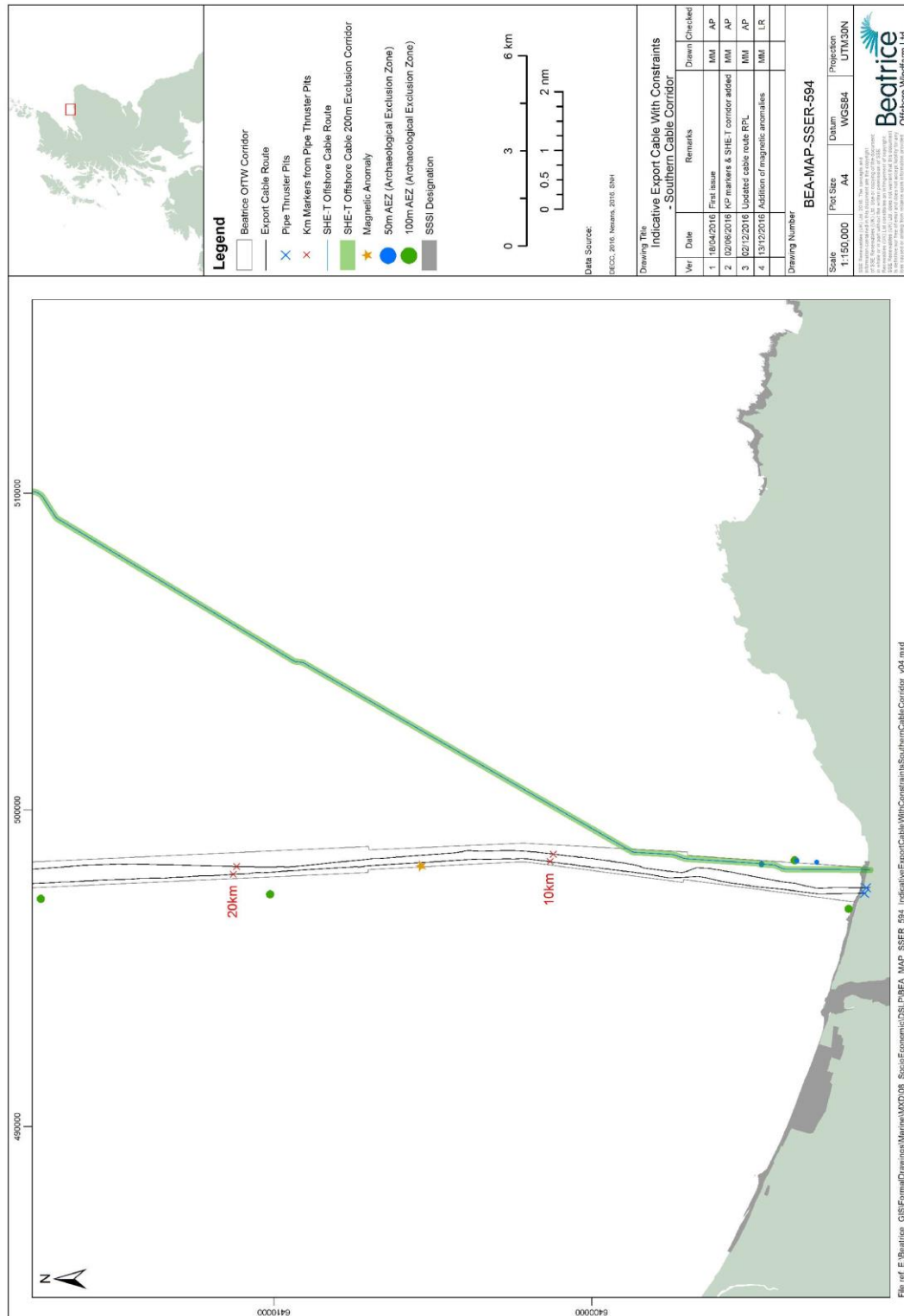


Figure 4.4 – Key constraints relevant to the Export Cables (southern section of OfTW corridor)

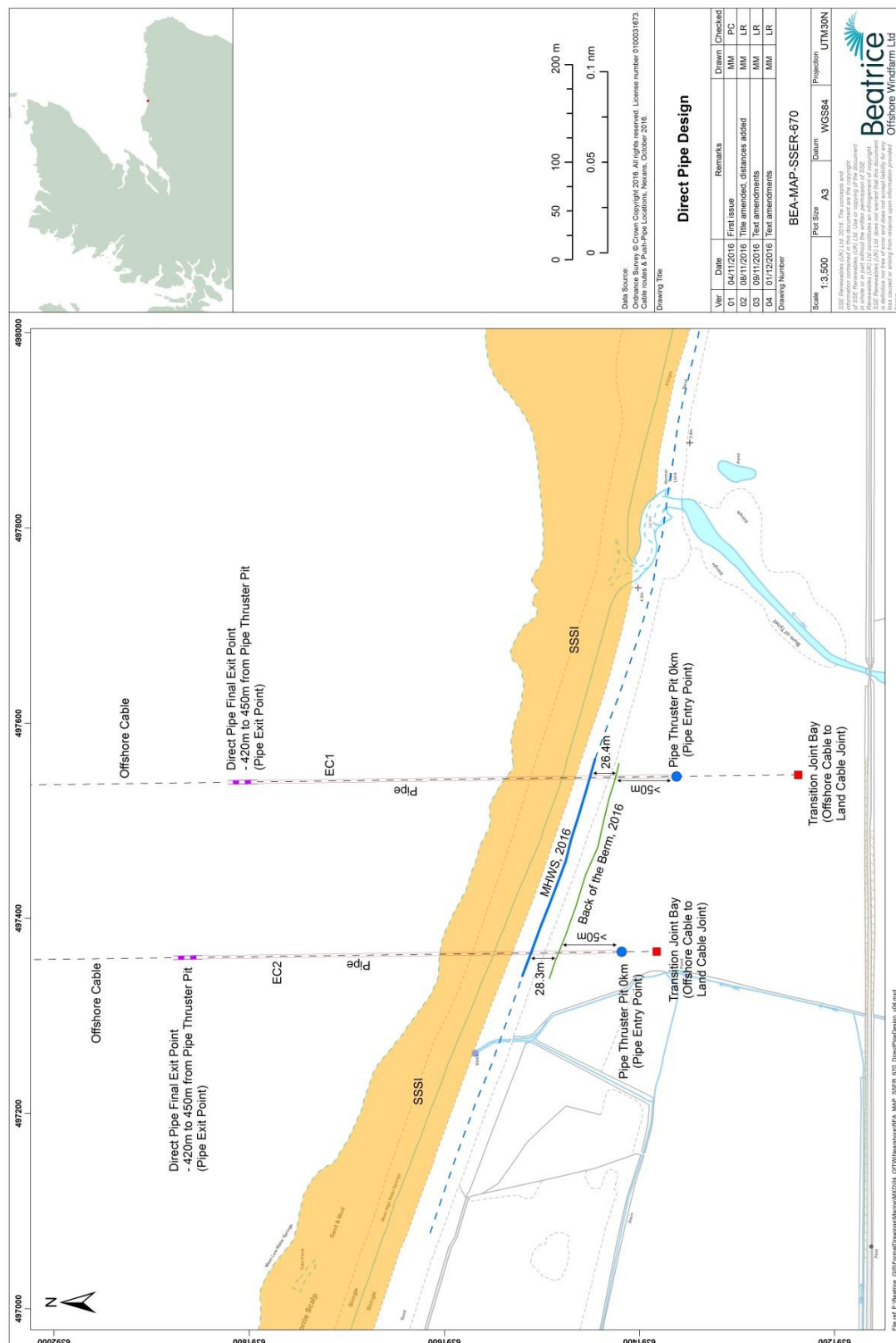


Figure 4.5 – Key constraints relevant to the Export Cables (nearshore and landfall section of OTTW corridor)

5 Compliance with the Application

5.1 Introduction

5.1.1 In addition to the condition provided in Table 1.1, Condition 3.1.4 of the Marine Licence (OfTW) states:

The Licensee must, where any information upon which the granting of this licence was based has after the granting of the licence altered in any material respect, notify the Licensing Authority of this fact, in writing, as soon as is practicable.

5.1.2 Sections 5.2 and 5.3 set out information from the ES/SEIS with regard to:

- Compliance with the specification and layout assessed; and
- Delivery of the stated design-related mitigation.

5.2 Compliance with the Specification and Layout Assessed in the ES/SEIS

5.2.1 The ES and SEIS described a range of specification and layout options that could be applied during the construction of the Development.

5.2.2 Since the Development consents were awarded, the design of the Development has been substantially refined to that described in this OfTW DSLP (and in other relevant Consent Plans including the Wind Farm DSLP). In order to demonstrate the compliance of this refined design, Appendix A provides a tabulated comparison of relevant project design parameters as presented in the ES/SEIS and in this OfTW DSLP.

5.3 Delivery of Design-related Mitigation Proposed in the ES/SEIS

5.3.1 The ES and SEIS detailed a number of mitigation commitments specific to the design of the Development and relevant to the details set out in this OfTW DSLP. Relevant measures are presented in full in Appendix B, which also identifies where each commitment has been addressed within this OfTW DSLP.

Appendix A – Comparison of ES/SEIS Rochdale Envelope and DSLP design parameters

Design-related parameter	ES/SEIS	OfTW DSLP
Export cabling		
Voltage range	Not specified	220kV
Cable type	HVAC or HVDC	HVAC
Number of cables	3	2 export cables (plus the OTM interconnector cable)
Maximum length	190km	~140km
Maximum distances between cable trenches	~4 times the water depth Water depth was referenced in the ES since it is a factor that affects the final length of a cable repair/installed cable joint.	Minimum 93m to Maximum 570m The ES/SEIS provided an approximate separation distance, which has now been refined. The separation distances allow for potential thermal effects/interaction between the cables, planned installation and burial methods, and the potential future requirement for repair.

Appendix B – Relevant ES and SEIS Mitigation Commitments

Source	Reference (ES or SEIS chapter)	Details of Commitment	Implementation
ES	Project Description	Horizontal Directional Drilling will be used to allow the cables to be installed under the Spey Bay SSSI.	Section 4.2 confirms that the cables will be installed beneath the SSSI.
ES	Archaeology OfTW	Appropriate exclusion zones will be implemented to guard against physical/direct effects, i.e. potential damage to or loss of an asset. All sites of cultural heritage interest included in this report will be avoided where possible with the implementation of temporary exclusion zones and the micro-siting and re-routing of the OfTW cable. Exclusion zones of at least 100 m will be established around sites identified as being of high sensitivity in this assessment while an exclusion zone of a minimum 50 m will be established around those of medium sensitivity.	Refer to approved Archaeology Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD). See also OfTW routing constraints set out in Figures 4.2 to 4.5 of this OfTW DSLP which show relevant archaeological AEZs in relation to the export cable routing.
SEIS	Introduction	The subsea cable will be a minimum of 1.5 km from the Beatrice Bravo Oil Platform.	The OfTW Marine Licence revised this obligation to a 500m safety buffer. Section 4.4 confirms the buffer around the Beatrice platforms.