Beatrice Offshore Wind Farm Consent Plan

Vessel Management Plan

May 2016

Beatrice
Offshore Windfarm Ltd

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Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005
Date:	May 2016

Beatrice Offshore Wind Farm

Vessel Management Plan

Pursuant to Section 36 Consent Condition 16 and Marine Licence (Offshore Transmission Works) Condition 3.2.2.8

For approval of the Scottish Ministers

Rev	Prepared By	Sign Off	Checked By	Sign Off	Approved By	Sign Off	Date of Issue
2.0	Steve Bellew, GoBe Consultants Ltd	[redacted]	Jonathan Wilson, Consenting and Stakeholder Manager, BOWL	[redacted]	Steven Wilson, Senior PM, BOWL	[redacted]	4/05/2016

Consent Plan Overview

Purpose of the Plan

This Vessel Management Plan (VMP) has been prepared to address the specific requirements of the relevant conditions attached to Section 36 Consent and Marine Licences issued to Beatrice Offshore Windfarm Limited (BOWL).

The overall aim of the VMP is to provide detail on vessel activity associated with the construction and operation of the Beatrice Offshore Wind Farm (the Wind Farm) and Offshore Transmission Works (OfTW), and to describe the vessel management measures that will be put in place in respect of disturbance of birds and marine mammals, if applicable.

All BOWL personnel and contractors involved in the Beatrice Project will be obliged to comply with the measures and procedures presented in this VMP through conditions of contract.

Scope of the Plan

The VMP covers, in line with the requirements of Section 36 and Marine Licence conditions, the following:

- The location of working ports and an indication of how often vessels will transit to and from ports;
- Vessel coordination during construction and operation;
- Working practices to minimise the unnecessary use of ducted propellers;
- The number, types and specification of vessels involved in construction and operation; and,
- Indicative corridors for vessels transiting to and from the Development Area.

Structure of the Plan

The VMP is structured as follows:

Sections 1 to 4 set out the scope and objectives of the VMP, provides an overview of the Project, set out broad statements of compliance and detail the process for making updates and amendments to this document.

Sections 5 to 9 identifies the location of working ports, the procedures associated with marine coordination, information on the types and numbers of vessels that will be involved in the construction, operation and maintenance of the Development and indicative vessel transit routes.

Section 10 to 12 describes the marine mammal and bird sensitivities relevant to vessel management and sets out the vessel management measures in relation to environmental sensitivities including practices relating to the use of ducted propellers.

Section 13 demonstrates compliance of the VMP with the original Application.

Appendices present supporting information.

Plan Audience

This VMP is intended to be referred to by personnel involved in the construction and operation of the Beatrice Development, including BOWL personnel, Key Contractors and Subcontractors.

Compliance with this VMP will be monitored by the BOWL Consents and Licensing Team and the BOWL Ecological Clerk of Works.

Plan Locations

Copies of this VMP 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;
- All site offices dealing with marine operations;
- The BOWL Marine Coordination Centre (MCC) at Wick;
- On all vessels; and
- With the ECoW(s).

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List of Abbreviations and Definitions

Term	Description
AC	Alternating Current
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.
CLT	Consents and Licensing Team (BOWL)
CLV	Cable Lay Vessel
CMS	The Construction Method Statement (BOWL Document Reference: LF000005-PLN-145) as required for approval under S36 Consent Condition 11 and OfTW Marine Licence Condition 3.2.2.4.
Commencement of the Wind Farm/OfTW	The date on which Construction begins on the site of the Wind Farm or the OfTW (as appropriate) in accordance with the S36 Consent or OfTW Marine Licence (as appropriate).
the (S36) Consent	The written Consent granted by the Scottish Ministers under Section 36 of the Electricity Act 1989, on 19 March 2014.
Consent Conditions	The terms that are imposed on BOWL under the S36 or Marine Licence Consent that must be fulfilled throughout the period that the Consent is valid.
Construction	As defined at section 64(1) of the Electricity Act 1989, read with section 104 of the Energy Act 2004.
CoP	Construction Programme (BOWL Document Reference: LF000005-PLN-138) as required for approval under Condition 10 of the s36 consent and Condition 3.2.2.3 of the OfTW Marine Licence.
CTV	Crew Transfer Vessel
DECC	Department of Energy and Climate Change
Development Area	The marine area associated with the Wind Farm and OfTW corridor.
Development	The Wind Farm and the OfTW.

Term	Description
DP	Dynamic Positioning
DP I	Automatic and manual position and heading control under specified maximum environmental conditions. Equipment Class 1 has no redundancy. Loss of position may occur in the event of a single fault.
DP II	Automatic and manual position and heading control under specified maximum environmental conditions, during and following any single fault excluding loss of a compartment. (Two independent computer systems). Equipment Class 2 has redundancy so that no single fault in an active system will cause the system to fail. Loss of position should not occur from a single fault of an active component or system such as generators, thruster, switchboards, remote controlled valves etc. But may occur after failure of a static component such as cables, pipes, manual valves etc.
DP III	Automatic and manual position and heading control under specified maximum environmental conditions, during and following any single fault including loss of a compartment due to fire or flood. (At least two independent computer systems with a separate back-up system separated by A60 class division). Equipment Class 3 which also has to withstand fire or flood in any one compartment without the system failing. Loss of position should not occur from any single failure including a completely burnt fire sub division or flooded watertight compartment.
ECoW	Ecological Clerk of Works as required for approval under Condition 30 of the s36 consent and Condition 3.2.2.12 of the OfTW Marine Licence.
EMP	The Environmental Management Plan (BOWL Document Reference: LF000005-PLN-026) as required for approval under Condition 15 of the s36 consent and Condition 3.2.1.2 of the OfTW Marine Licence.
ES	The Environmental Statement submitted to the Scottish Ministers by the Company on 23 April 2012 as part of the Application as defined above.
FLO	The Fisheries Liaison Officer as required for approval under Condition 33 of the S36 consent and Condition 3.2.2.13 of the OfTW Marine Licence.
HRA	Habitats Regulation Assessment
HSE	Health and Safety Executive
Inter-array cables	The AC electrical cables that connect the WTGs to the OTMs.
JNCC	Joint Nature Conservation Committee
Key Contractors	The Contractors appointed for the individual work packages of Marine Installation; Transmission; and WTGs.

Term	Description
Landfall site	The point above MHWS near Portgordon, where the OfTW cable connects to the OnTW.
Licencing Authority	The Scottish Ministers.
Licensee	Beatrice Offshore Windfarm Limited, a company registered in Scotland having its registered number as SC350248.
LMP	Lighting and Marking Plan (BOWL Document Reference: LF000005-PLN-136) as required for approval under Condition 20 of the S36 consent and Condition 3.2.2.14 of the OfTW Marine Licence.
Marine Coordination	The management and surveillance of people, vessels and offshore structures to ensure the safe preparation and execution of offshore activities, in order to minimise the probability of an incident, and to provide effective response if an incident does occur.
Marine Licences	The written consents granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010, which were issued on 2 September 2014.
Marine Licence (OfTW)	The marine licence granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010 and under Section 71 of the Marine and Coastal Access Act 2009.
MCC	Marine Coordination Centre
MHWS	Mean High Water Springs
MS-LOT	Marine Scotland Licensing and Operations Team
NSP	The Navigational Safety Plan (BOWL Document Reference: LF000005-PLN-128) as required for approval under Condition 18 of the S36S36 consent and Condition 3.2.2.9 of the OfTW Marine Licence.
OFTO	Offshore Transmission Operator
OfTW	The Offshore Transmission Works. The OfTW includes the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and the cable route from the OTMs to the Mean High Water Springs (MHWS) at the landfall west of Portgordon on the Moray coast.
OMP	The Operation and Maintenance Plan as required for approval under S36 condition 17 and OfTW Marine Licence condition 3.2.3.2.
OnTW	The onshore transmission works from landfall, consisting of onshore buried export cables to the onshore substation and connection to the

Term	Description
	National Grid network.
OTM	Offshore Transformer Module means an alternating current (AC) offshore substation platform (OSP) which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator.
PEMP	The Project Environmental Monitoring Programme as required for approval under S36 Consent Condition 27 and OfTW Marine Licence Condition 3.2.1.1.
PLGR	Pre Lay Grapnel Run
ROV	Remotely Operated Vehicle
SAC	Special Area of Conservation
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.
SHE	Safety, Health and Environment
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 (OfTW) Marine Licence.
SNH	Scottish Natural Heritage
SPA	Special Protection Area, protected sites classified in accordance with Article 4 of the EC Birds Directive.
SSE	Scottish and Southern Energy
Subcontractor	Subcontractors to the Key Contractors.
VMP	The Vessel Management Plan (BOWL Document Reference: LF000005-PLN-168) as required for approval under Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence.
W2W	Walk to Work
Wind Farm	The offshore array development as assessed in the ES including wind turbines, their foundations, inter-array cabling and meteorological masts.
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 issued two Marine Licences from the Scottish Ministers, for the Wind Farm and associated Offshore Transmission Works (OfTW), on 2nd September 2014 (the Marine Licences).

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/Licensing Authority prior to the commencement of any offshore construction works. One such requirement is the approval of a Vessel Management Plan (VMP), which is to provide the details of vessel management during construction and operation.

1.2.2 The relevant conditions setting out the requirement for a VMP for approval, and which are to be discharged by this VMP, are presented in full in Table 1.1.

1.2.3 This document is intended to satisfy the requirements of the S36 Consent and Marine Licence (OfTW) conditions by providing a VMP that can be practically implemented during construction and operation to ensure potential impacts on marine mammals and birds are mitigated.

Table 1.1 - VMP consent conditions to be discharged by this document

Consent Document	Condition Reference	Condition Text	Reference to relevant Section of the VMP
Section 36	Condition 16	The Company must, no later than 6 months prior to the Commencement of the Development, submit a Vessel Management Plan ("VMP"), in writing, to the Scottish Ministers for their written approval.	This document sets out the VMP for approval by the Scottish Ministers.
		Such approval may only be granted following consultation by the Scottish Ministers with the JNCC [Joint Nature Conservation Committee], SNH [Scottish Natural Heritage], and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers.	To be undertaken by the Scottish Ministers.
		The Development must, at all times, be constructed and operated in accordance with the approved VMP (as updated and amended from time to time by the Company).	Section 2
		Any updates or amendments made to the VMP by the Company must be submitted, in writing, by the Company to the Scottish Ministers for their written approval.	Section 3
		The VMP must include, but not be limited to, the following details: a) The number, types and specification of vessels required;	Section 7

Consent Document	Condition Reference	Condition Text	Reference to relevant Section of the VMP
		b) Working practices to minimise the unnecessary use of ducted propellers;	Section 12
		c) How vessel management will be coordinated, particularly during construction but also during operation; and	Section 6
		d) Location of working port(s), how often vessels will be required to transit between port(s) and the site and indicative vessel transit corridors proposed to be used.	Section 5
		The confirmed individual vessel details must be notified to the Scottish Ministers in writing no later than 14 days prior to the Commencement of the Development, and thereafter, any changes to the details supplied must be notified, as soon as practicable, to the Scottish Ministers prior to any such change being implemented in the construction or operation of the Development.	Section 4.4
		The VMP must, so far as is reasonably practicable, be consistent with the CMS, the EMP, the PEMP, the NSP, and the LMP.	Section 1.3
OFTW Marine Licence	3.2.2.8	The Licensee must, no later than 6 months prior to the Commencement of the Works, submit a VMP, in writing, to the Licensing Authority for their written approval.	This document sets out the VMP for approval by the Licensing Authority.
		Such approval may only be granted following consultation by the Licensing Authority with the JNCC, SNH, and any such other advisors or organisations as may be required at the discretion of the Licensing Authority.	To be undertaken by the Licensing Authority.
		The VMP must include, but not be limited to, the following details: a) The number, types and specification of vessels required;	Section 7
		b) Working practices to minimise the unnecessary use of ducted propellers;	Section 12
		c) How vessel management will be co-ordinated, particularly during construction but also during operation; and	Section 6
		d) Location of working port(s), how often vessels will be required to transit between port(s) and the Site and indicative vessel transit corridors proposed to be used.	Section 5
		The VMP must, so far as is reasonably practicable, be consistent with the CMS, the EMP, the PEMP, the NSP, and the LMP.	Section 1.3

1.3 Linkages with other Consent Plans

1.3.1 This VMP document sets out vessel management measures. However, ultimately it will form part of a suite of approved documents that will provide the framework for the construction and operation of the Development – namely the other consent plans required under the Section 36 and OfTW Marine Licence.

1.3.2 Indeed Condition 16 of the S36 Consent and Condition 3.2.2.8 of the OfTW Marine Licence (see Table 1.1 above) requires this VMP to be, so far as is reasonably

practicable, consistent with a number of other specifically named consent plans, namely (in the order listed in the consent condition):

- The Construction Method Statement (CMS) (BOWL Document reference: LF000005-PLN-145) (required under Condition 11 of the S36 Consent and Condition 3.2.2.4 of the OfTW Marine Licence);
- The Environmental Management Plan (EMP) (BOWL Document reference: LF000005-PLN-026) (required under Condition 15 of the S36 Consent and Condition 3.2.1.2 of the OfTW Marine Licence);
- The Project Environmental Monitoring Programme (PEMP) (BOWL Document reference: to be confirmed) (required under Condition 27 of the S36 Consent and Condition 3.2.1.1 of the OfTW Marine Licence);
- The Navigational Safety Plan (NSP) (BOWL Document reference: LF000005-PLN-128) (required under Condition 18 of the S36 Consent and Condition 3.2.2.9 of the OfTW Marine Licence); and
- The Lighting and Marking Plan (LMP) (BOWL Document reference: LF000005-PLN-136) (required under Condition 20 of the S36 Consent and Condition 3.2.2.14 of the OfTW Marine Licence).

1.3.3 The other plans named in the consent clearly have a link to the VMP in so far as they provide additional details on vessel activity and the safety of navigation (i.e. the CMS, NSP and LMP), provide details on the control of construction and operational activities to mitigate or manage potential environmental impacts (i.e. the EMP), or provide information on the monitoring of environmental sensitivities relevant to the VMP (i.e. the PEMP).

1.3.4 The CMS, EMP, NSP and LMP have all been approved by Scottish Ministers. The PEMP will be submitted for approval by the Scottish Ministers. Consistency between these documents has been achieved by ensuring that later documents are consistent with the terms of the already approved consent plans.

1.3.5 The interaction of this VMP with those consent plans specifically listed in S36 Consent condition 16 and OfTW Marine Licence condition 3.2.2.8 is detailed in Table 1.3 below.

Table 1.3 – VMP consistency and links to other named consent plans

Other named consent plan	Consistency with and linkage to VMP
CMS	The CMS details the construction methods and good working practices to be employed during the installation of the Wind Farm and Offshore Transformer Modules (OTMs). It identifies the types of vessels, and in some cases the specific vessels, that will be used during construction. The information on numbers and types of vessel within this VMP is consistent with that presented in the CMS.
EMP	The EMP sets out the environmental management framework for the construction and operation of the Wind Farm and OfTW. The vessel activity and vessel

Other named consent plan	Consistency with and linkage to VMP
	management described in this VMP will be undertaken in line with the environmental management measures described in the EMP.
PEMP	The PEMP provides an overview of the programme developed by BOWL to monitor the environmental effects of the Development. The PEMP includes plans for bird and marine mammal monitoring. Where monitoring identifies any new information relating to bird and marine mammal sensitivities, the VMP will take account of this.
NSP	Sets out the navigational safety measures to be applied for the Project including matters related to marine coordination, safety zones, routing, anchorages and notifications and communications for other sea users. The NSP also sets out emergency response procedures. The NSP will apply to all vessels identified in this VMP. This VMP will therefore be implemented in accordance with the approved NSP for the Development.
LMP	Provides details of lighting and marking of the Wind Farm and OfTW structures during construction and operation. This VMP will be implemented in accordance with the approved LMP for the Wind Farm.

1.4 Structure of this VMP

1.4.1 In response to the specific requirements of the S36 Consent and the OfTW Marine Licence conditions, this VMP 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 VMP has been provided. The document structure is set out in Table 1.4.

Table 1.4 – VMP document structure

Section		Summary of Content
1	Introduction	Background to consent requirements and overview of the VMP scope and structure; and Identifies those other Consent Plans relevant to the construction and operation of the Development and the linkage between those plans and the VMP.
2	BOWL Statements of Compliance	Sets out the BOWL statements of compliance in relation to the VMP consent conditions.
3	Updates and Amendments to this VMP	Sets out the procedures for any required updating to or amending of the approved VMP and subsequent further approval by the Scottish Ministers.
4	Project Overview	Provides an overview of the project relevant to the VMP.
5	Location of Ports	Describes the location and specifications of the construction lay down ports and Marine Coordination Centre.
6	Management and Coordination of Vessels	Summarises the process for the management and coordination of vessels during the construction and operational phases of the development.

Section		Summary of Content
7	Types and Specification of Vessels	Describes the types of vessels that will be used during the construction and operational phases of the development.
8	Numbers and movements of Construction Vessels	Describes the numbers of vessels during the construction and operational phases of the development and the anticipated movements between the Development Area and ports.
9	Indicative Transit Route Corridors	Sets out the indicative vessel transit routes that may be used during the construction and operational phases of the development.
10	Environmental Sensitivities relevant to Vessel Management	Provides an overview of marine mammal and bird sensitivities in the vicinity of the Development and the conclusions of the ES and SEIS with regards to vessel disturbance.
11	Potential Effects of Increased Vessel Activity	Summarises the potential effects on marine mammal and ornithological receptors of increased vessel activity.
12	Ducted Propeller Use	Sets out a summary of matters related to ducted propeller use in relation to marine mammal sensitivities.
13	Compliance with the Application, ES and SEIS	Sets out how the mitigation measures related vessel management and mitigation relating to potential impacts on environmental sensitivities identified in the ES and SEIS are to be delivered.

2 BOWL Statements of Compliance

2.1 Introduction

2.1.1 The following sections are intended to re-affirm the BOWL commitment to ensuring that the Development is constructed and operated in such a manner as to meet the relevant legislative requirements set out by the project consents but also broader legislative requirements. Specifically it sets out:

- A number of statements of compliance relating to this VMP and the broader requirements of the project consents;
- Matters related to vessels; and
- Matters related to legislative requirements.

2.2 Statements of Compliance

2.2.1 BOWL in undertaking the construction of the project will require compliance with this VMP 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 VMP).

2.2.2 Where significant updates or amendments are required to this VMP, BOWL will require the Scottish Ministers are informed as soon as reasonably practicable and where necessary the VMP will be updated or amended (see Section 3 below).

2.2.3 BOWL in undertaking the construction and operation of the project will require compliance with other, relevant consent plans as approved by the Scottish Ministers including, as set out in Section 1.3 above.

2.2.4 BOWL in undertaking the construction and operation of the project will require compliance with the limits defined by the original application and the project description defined in the Environmental Statement and SEIS and referred to in Annex 1 of the Section 36 consent except in so far as amended by the terms of the S36 Consents (unless otherwise approved in advance by the Scottish Ministers) (see section 10 and Appendix A (relevant mitigation identified in the ES/SEIS).

2.2.5 BOWL in undertaking the construction and operation of the project will ensure compliance with BOWL company SHE systems and standards, the relevant HSE legislation and such other relevant legislation and guidance so as to protect the safety of the wind farm construction personnel and other third parties.

2.3 Vessels

2.3.1 BOWL will require that all vessels meet the required, recognised standards and will comply with the relevant international maritime rules (as adopted by the flag state) and regulations. Where necessary, BOWL will conduct appropriate independent vessel audits on all construction vessels to ensure they meet these standards and are fit for purpose for their prescribed roles.

2.3.2 Through conditions of contract, BOWL will require all construction vessels will be required to comply with the procedures and requirements set out in this VMP and in the other relevant consent plans such as the CMS, the NSP, the LMP and the EMP.

2.4 Legislative Requirements

2.4.1 BOWL will, in undertaking the construction and operation of the Development, ensure compliance with all relevant legislation and that all necessary licences and permissions are obtained by the Key Contractors and Subcontractors, through conditions of contract and by an appropriate auditing process.

2.4.2 BOWL will comply - and oblige BOWL contractors to comply through conditions of contract - with the requirements of relevant environmental and maritime legislation as standard.

3 Updates and Amendments to this VMP

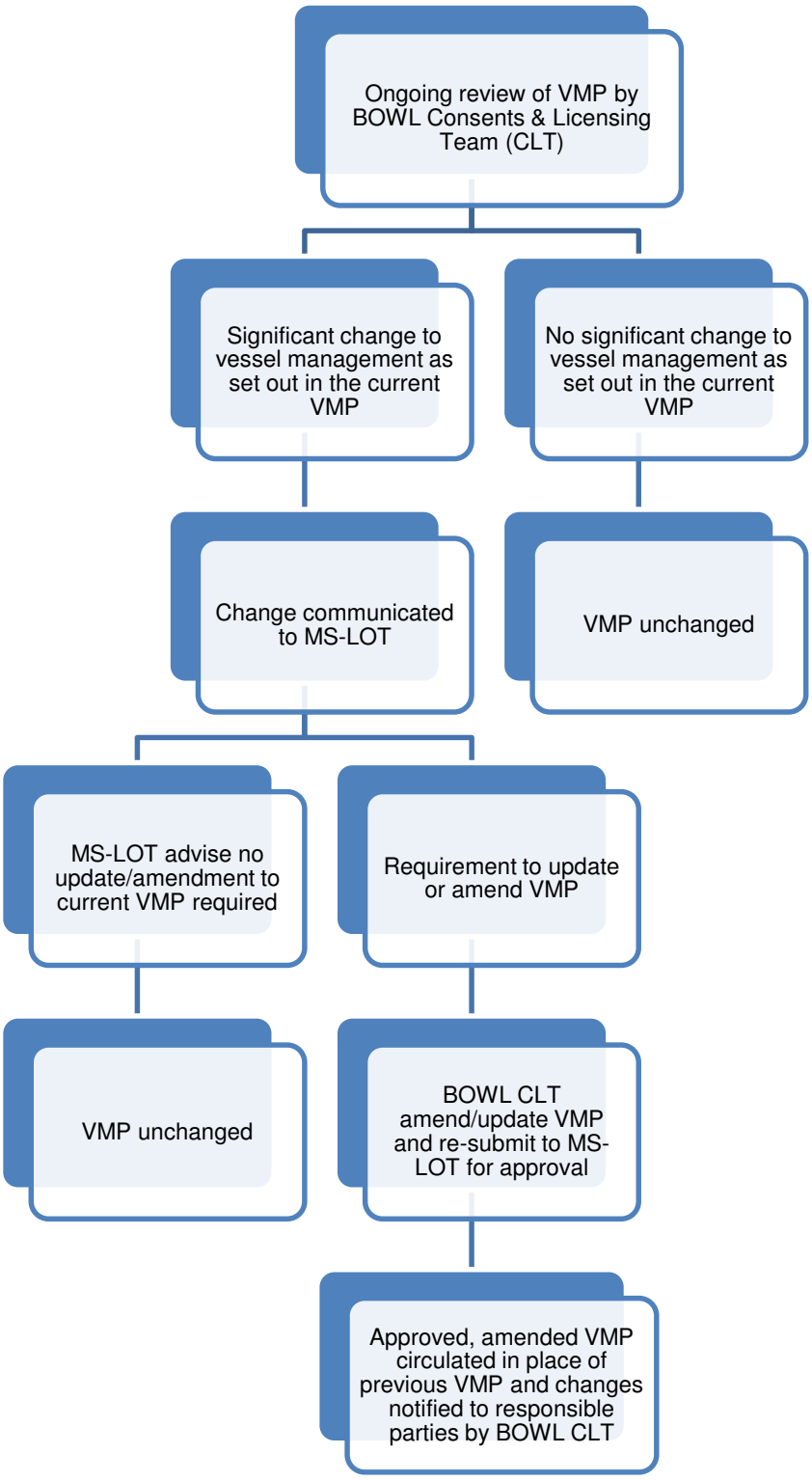
3.1.1 This VMP sets out vessel management measures to be applied during the construction and operation of the Development.

3.1.2 The S36 Consent condition recognises that updates or amendments to this VMP may be required, stating that:

> *The Development [Wind Farm] must, at all times, be constructed and operated in accordance with the approved VMP (as updated and amended from time to time by the Company [BOWL]). Any updates or amendments made to the VMP by the Company [BOWL] must be submitted, in writing, by the Company [BOWL] to the Scottish Ministers for their written approval.*

3.1.3 Where it is necessary to update this VMP in light of any significant new information related to vessel use, BOWL propose to use the change management process set out in Figure 3.1 to identify such information, communicate changes to the Scottish Ministers, re-draft the VMP, seek further approval of amendments or updates, and disseminate the updated version of the VMP.

Figure 3.1 – VMP Change Management Procedure



4 Project Overview

4.1 Introduction

4.1.1 This section provides a brief overview of the Development relevant to the VMP and sets out in relation, to BOWL and the Key Contractors, the main roles and responsibilities.

4.2 Development Overview and Layout

4.2.1 The Development will consist of the following main components:

- A total generating capacity of up to 588MW;
- Up to 84 wind turbines of 7MW rated generating capacity;
- Jacket substructures each installed on four pile foundations driven into the seabed;
- Two AC substation platforms, referred to as offshore transformer modules (OTMs) to collect the generated electricity and transform the electricity from 33kV to 220kV for transmission to shore;
- A network of circa 170 to 190km of inter-array, buried or (if burying is not possible) mechanically protected, subsea cables to connect strings of turbines together and to connect the turbines to the OTMs;
- 2 buried or (if burying is not possible) mechanically protected, subsea export cables, each circa 68 km in length (136 km in total), to transmit the electricity from the OTMs to the land fall at Portgordon and connecting to the onshore buried export cables for transmission to the onshore substation and connection to the National Grid network; and
- Minor ancillary works such as the potential deployment of met buoys and permanent navigational marks.

4.2.2 Figure 4.1 below shows the location of the Development in the Moray Firth, and shows the route of the export cable route and the locations of the relevant ports that may be used during construction and/or operation.

4.2.3 Details of the construction programme for the construction works are provided in the construction programme (CoP) (LF000005-PLN-138) consent plan required under Condition 10 of the S36 consent and Condition 3.2.2.3 of the OfTW Marine Licence.

4.2.4 The approved CoP details the full construction schedule associated with the Development. The CoP will provide further information on the key construction periods relevant to the vessels detailed within this VMP.

4.3 BOWL and Key Contractor Roles and Responsibilities

4.3.1 The Key Contractors, named as Seaway Heavy Lifting Offshore Contractors B.V. (SHL), Siemens Wind Power Ltd (SWPL) and Siemens Transmission and Distribution

Ltd (STDL), will be responsible for constructing the Development as designed. They will also be responsible for complying with the requirements of this VMP.

4.3.2 In summary, the main roles and responsibilities of the Key Contractors will be as follows:

- SHL:
  - Wind turbine and OTM jacket foundation and substructure installation using SHL vessel(s) (with sub-contractors used for additional barges, anchor handling tugs and towing tugs as required);
  - OTM topside lift using SHL heavy lift vessel (with sub-contractors used for additional barges, anchor handling tugs and towing tugs as required); and
  - Inter-array cable installation (using sub-contracted cable laying, trenching and support vessels and subcontractors).
- SWPL:
  - Management of the construction laydown port facility where the wind turbine components will be pre-assembled ready for installation;
  - Wind turbine installation (using a subcontracted jack-up vessel); and
  - Wind turbine cable connections and commissioning works (with sub-contracted crew transfer vessels used to transport personnel to carry out completion and commissioning activities).
- STDL:
  - Export cable laying and trenching (using subcontractors (Nexans) and cable laying, trenching and support vessels); and
  - OTM topside supply and commissioning (with sub-contracted crew transfer vessels used to transport personnel to carry out OTM completion and commissioning activities).

4.3.3 During the operational phase, BOWL and any appointed contractors will retain responsibility for operating and maintaining the Wind Farm in accordance with the requirements of this VMP.

4.3.4 The OfTW assets will be sold to an OFTO and thereafter the responsibility for the implementation of this VMP in so far as it applies to the OfTW assets will transfer to the OFTO. The OFTO will be responsible for the implementation of this VMP in relation to the operation of the OfTW unless a different agreement is reached.

4.4 Reporting Compliance with the VMP

Prior to Construction

4.4.1 As noted in Table 1.1, the consent conditions related to this VMP require that:

The confirmed individual vessel details must be notified to the Scottish Ministers in writing no later than 14 days prior to the Commencement of the

Development, and thereafter, any changes to the details supplied must be notified, as soon as practicable, to the Scottish Ministers prior to any such change being implemented in the construction or operation of the Development.

4.4.2 BOWL will ensure that the details of all vessels to be engaged in the construction process are notified to the MS-LOT / the Licensing Authority no later than 14 days prior to commencement of the Development. Any changes to those vessel details (during either the construction or operational phases) will be notified prior to any change being implemented.

Construction Stage

4.4.3 During the construction phase compliance with the requirements of this VMP will be the responsibility of relevant Key Contractors, Subcontractors and vessel operators.

4.4.4 BOWL will ensure that each contractor and vessel operator provide a log on a regular basis of each vessel movement. Information provided on these vessel movement logs will include, as a minimum:

- Date and time;
- Vessel name/Identification;
- Construction activity;
- Vessel start location (e.g. location or port of origin);
- Vessel destination (e.g. port, wind farm site etc);
- Vessel transit route followed and Wind Farm entry/exit point used;
- Prevailing weather and sea conditions; and
- Notes on required deviations from VMP indicative transit routes (for example due to navigational hazards encountered, weather conditions etc.).

4.4.5 Where available, Automatic Identification System (AIS) data recorded by each vessel (where AIS is fitted to that vessel and is capable of being recorded) will be provided to BOWL on a regular basis throughout the construction phase. BOWL will review the AIS data on a regular basis as a further check on compliance with indicative transit routes. Any significant deviations from the indicative transit routes will be checked against the individual vessel logs recorded.

The Role of the ECoW

4.4.6 Condition 3.2.2.12 of the OfTW Marine Licence and Condition 30 of the S36 Consent require BOWL to appoint an Ecological Clerk of Works (ECoW) to oversee compliance with a number of named consent plans. Specifically, this includes the requirement to provide advice to the Licensee with regard to, and to monitor compliance with, the VMP. These conditions also require the ECoW to provide reports on this compliance monitoring process to the Licensing Authority.

4.4.7 The EMP sets out the reporting protocol for the ECoW with regard to reporting to the Licensing Authority, with reports to be provided on a monthly basis and within a template set out in the EMP. This monthly reporting by the ECoW will include a summary of their findings in relation to the auditing of compliance with the VMP and will be based on the records on vessel movements provided to BOWL by the Key Contractors as set out above.

4.4.8 In addition to the reporting requirements, the EMP also sets out the ECoWs role in relation to training and awareness raising for construction personnel including vessel operators. This will be achieved through tool box talks which will serve to provide training to all relevant personnel in relation to the requirements of this VMP and the environmental sensitivities related to vessel disturbance.

Reporting During Operation

4.4.9 At present there is no intention to undertake regular reporting in relation to this VMP during the operational stage although records of operations and maintenance vessel movements and activity will be maintained by the Marine Coordination Centre (MCC) at Wick Harbour. As noted above any change to vessel details involved in the operation and maintenance of the Wind Farm will be notified to MS-LOT / The Licensing Authority (including for example vessels proposed for unplanned or exceptional maintenance activities).

4.4.10 The Operations and Maintenance Programme (OMP) required under Condition 17 of the S36 Consent sets out, for approval, procedures related to the operations and maintenance phase including further detail on reporting requirements and vessel use.

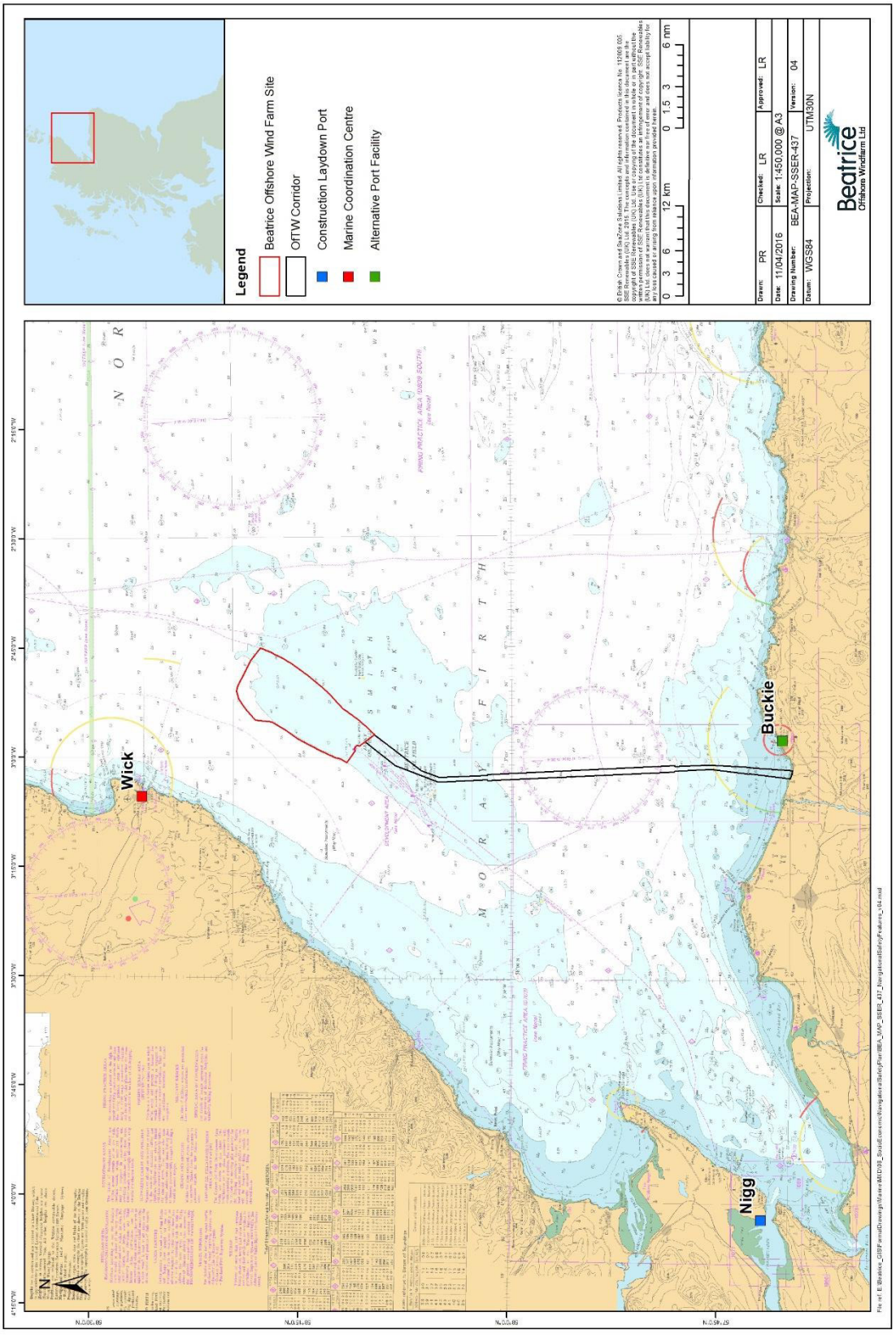


Figure 4.1 – Wind Farm location and OfTW cable route and Main Ports

5 Location of Working Ports

5.1 Introduction

5.1.1 Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence requires that this VMP include details related to location of working ports, specifically:

> *d) **Location of working port(s)**, how often vessels will be required to transit between port(s) and the site and indicative vessel transit corridors proposed to be used.*

5.2 Construction Ports

5.2.1 Nigg Energy Park will be used as the construction lay down port for wind turbine delivery and pre-assembly (see Figure 4.1).

5.2.2 The major wind farm components (foundation piles, substructures, OTMs and cabling) will be shipped directly to the Development Area from the site of manufacture.

5.2.3 The following section provides an overview of the key facilities available at Nigg, the proposed Marine Coordination Centre at Wick Harbour and the alternative port option at Buckie Harbour.

Nigg Energy Park

5.2.4 Nigg Energy Park is located in the Cromarty Firth and provides a range of quayside loading facilities with extensive laydown areas and large construction and assembly yards, offering direct access to the Moray Firth. The sheltered, deep water access permits navigable access at all states of the wind and tide and to be operational 365 days a year.

5.2.5 Pilotage services are available 24 hours a day with certain exceptions, and is compulsory for Vessels of 60m Length Overall (LOA) or more, Vessels over 20m LOA carrying more than 12 passengers and Vessels over 40m LOA carrying hazardous, dangerous or polluting goods.

5.2.6 Notice of arrival is required 24 hours in advance via Port Radio VHF Channel 11 to Cromarty Firth Port Authority. All vessels should also report to Port Radio when passing between Buss Bank Light Buoy inbound or outbound, when departing the berth and when secured on the berth.

Figure 5.1. Nigg Energy Park

5.3 Alternative Port Facilities

Buckie Harbour

5.3.1 Buckie Harbour has been identified as an alternative harbour facility for utilisation during Construction and Operation and Maintenance phases (Figure 5.2). Buckie harbour is comprised of four main basins with usable quaysides between 250m and 330m long. The harbour can accommodate vessels up to 86m in length with a maximum draught of 4.5m. The harbour wall provides sheltered access to the harbour facilities.

5.3.2 The harbour is manned 24 hours a day. All vessels should contact the Port Radio on VHF12 prior to arrival. Stevendore facilities can also be provided with prior notice.

5.3.3 It is not anticipated that Buckie Harbour will be used routinely during Construction and Operation and Maintenance activities. However, in the event that Wick Harbour is inaccessible due to adverse weather conditions or where additional capacity is required, Buckie Harbour may be used. When required, it is anticipated that Buckie Harbour may be used for bunkering, by CTVs for crew transfer and by small workboats to transport supplies to and from the main installation vessels.

Figure 5.2. Buckie Harbour

5.4 Marine Coordination Centre and Operations Base

5.4.1 The project MCC will ultimately be based at Wick (Figure 5.3). Crew transfers to the construction, and later the operational Development Area, will take place from Wick Harbour once the MCC is established.

5.4.2 Wick Harbour is located on the Caithness coast. It consists of the inner harbour which serves as the main fishing and leisure berthing area, the outer harbour which is used for temporary berthing, fuelling and smaller cargo vessels. The main commercial quay is in the River harbour. Larger vessels wishing to use this area should consult the local information board or the Harbourmaster about shipping movements.

5.4.3 Wick harbour has 24 hour access with 24 hour pilotage. Pilotage is required for all vessels over 90 gross tonnes. Wick Harbour can be contacted on working VHF Channel 14.

Figure 5.3. Wick Harbour

5.5 Other Port Options

5.5.1 In addition to the ports detailed above other ports outside the Moray Firth may be utilised during construction activities and potentially for maintenance activities during the operation and maintenance phase of the Development. Some components will be shipped direct from the port of manufacture to the Development Area or via a construction laydown port. These locations are likely to be on the east coast of the UK or in Northern Europe.

5.5.2 In addition smaller vessels such as, but not limited to, Crew Transfer Vessels (CTVs), guard vessels and small workboats, that will travel to and from the Development Area more frequently may potentially use local ports and harbours within the Moray Firth and the along the east coast of Scotland.

6 Management and Coordination of Vessels

6.1 Introduction

6.1.1 Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence requires that this VMP include details related to management and coordination of vessels, specifically:

> *c) How **vessel management will be coordinated**, particularly during construction but also during operation;*

6.2 General Marine Coordination

6.2.1 Matters relating to marine coordination and management of construction vessels are set out, for approval, in the NSP.

6.2.2 In summary, during construction, the following measures, as relevant to this VMP, will be in place:

- A MCC will be established from where construction activities will be managed;
- Permission for construction vessels to enter the construction area and safety zones will be managed by the Marine Coordination Centre, for example using a Permit to Work system;
- The MCC will establish protocols for approaching and leaving the Development Area as well as management systems to record the work being undertaken and the vessels and personnel undertaking that work;
- Movements of vessels around the Development Area will be monitored from the Marine Coordination Centre;
- The Marine Coordinator and their support team, based at the MCC, will obtain and provide localised weather information for vessels working on the Development to plan the construction activities. The Centre will also maintain a copy of the Emergency Response and Co-operation Plan (ERCoP) and will be the main point of contact in the event of emergency incidents; and
- The MCC will also ensure the safety of the Development Area using appropriate methods.

6.2.3 Entry and Exit points to the construction areas will be established to ensure interference with other marine users is minimised and to minimise impacts on sensitive bird and marine mammal species.

6.2.4 All marine operations and vessel movements will be planned given due regard to the requirements of this VMP and the NSP.

6.2.5 During operation, similar provisions for vessel coordination will be established with marine coordination continuing from the MCC at Wick Harbour throughout the operational phase (as set out in the NSP). Further information on marine coordination during the operational phase will be provided, for approval, in the OMP.

7 Types and Specifications of Vessels

7.1 Introduction

7.1.1 Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence requires that this VMP include details related to types and specifications of vessels, specifically:

*a) The number, **types and specification of vessels** required;*

7.1.2 This section describes the anticipated vessel types that will be employed during the construction and operations and maintenance phases of the Development. Specifically it sets out:

- The types and specification of the vessels that may be used to install the Wind Farm and OfTW;
- The estimated numbers of vessels required and the estimated frequency of vessel movements to and from the construction laydown ports being considered and the Development Area;
- The types and specification of the vessels used during the operation and maintenance of the Development; and
- The estimated number of vessels used during operations and maintenance and the estimated frequency of vessel movements to and from the operational wind farm.

7.1.3 Where known specific vessels are named; in other cases indicative, representative vessel types are set out. Where indicative vessel specifications are presented these may vary depending on the typical market availability. The requirement under the Wind Farm and OfTW Marine Licences (as set out in Table 1.1) to notify the Licensing Authority of the final vessel list prior to the commencement of construction works is noted in this regard.

7.1.4 It is anticipated that approximately 26 vessels will be within the Development Area at any one time during construction. This is within the scenarios assessed in the ES and SEIS (Section 13).

7.1.5 The number of transits to and from the relevant ports is set out in Section 8.

7.2 Overview of main construction vessels

7.2.1 The following sections sets out examples of those types of vessels that will be used during the construction works, specifically relating to:

- Foundation and jacket substructure installation;
- Inter-array cable installation;

- Wind turbine installation
- OTM installation;
- Export cable installation; and
- Construction support and ancillary works.

7.2.2 These details are already set out in the approved Wind Farm CMS and will be mirrored in the OfTW CMS.

7.3 Foundation and Jacket Substructure Installation

7.3.1 The pin pile foundations and jacket substructures that will support the wind turbines and OTMs will be installed using a Heavy lift Vessel (HLV). The HLV is expected to travel to the Moray Firth from a northern European port, and remain on site for the duration of each period of installation works in 2017 and 2018.

7.3.2 Currently the following two vessels are under consideration for the foundation and jacket installations:

- The HLV Stanislav Yudin is expected to complete foundation piling and jacket installation for a number of turbines and the OTMs, and install the OTM topsides; and,
- The HLV Oleg Strashnov may also complete wind turbine jacket installation.

7.3.3 The specifications for these vessels are set out in Tables 7.1 and 7.2 respectively.

7.3.4 Note that the HLV Stanislav Yudin uses an anchor point mooring system which will require up to two anchor handling tugs. This would be of a similar specification to the tugs described in Table 7.4 below.

Table 7.1 – Specification for the HLV Stanislav Yudin

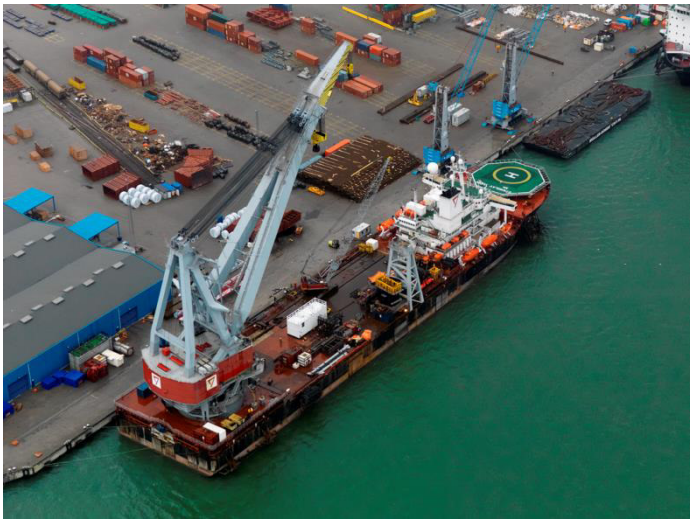
Vessel Name	HLV Stanislav Yudin
Vessel Type	Heavy Lift Vessel (HLV)
Contracting entity	SHL (vessel owners and operators and key contractor)
Vessel role	WTG and OTM Jacket foundation installation & OTM topside installation & piling operations
Vessel key characteristics	Length 182m Breadth: 36m Draught: 5.5-8.9m Gross tonnage: 24,822t Speed: 12 knots max, likely transiting speed 9 knots.
Propulsion	Two fixed pitch main thrusters and bow thrusters
Mooring/station keeping	Station keeping: 8 point mooring system The Stanislav Yudin is equipped with up to eight anchors for mooring. Anchors are positioned on the seabed and recovered by anchor handling tug boats.
Image	

Table 7.2 – Specification for the HLV Oleg Strashnov

Vessel Name	HLV Oleg Strashnov
Vessel Type	Heavy Lift Vessel (HLV)
Contracting entity	SHL (vessel owners and operators and key contractor)
Vessel role	WTG and OTM Jacket foundation installation

Vessel key characteristics (example)	Length 183m Breadth: 47m Draught: 8.5 – 13.5m Gross tonnage: 47,426t Speed: 14 knots max
Propulsion	Two main aziumuth thrusters; and bow thrusters
Mooring/station keeping	Dynamic Positioning (DP) 3 system and 8 point mooring ready
Image	

Transport Barges

7.3.5 The foundation pin piles and the jacket substructures will likely be arriving to the Development Area from the North Sea through the Outer Moray Firth (South) originating from Northern Europe or the east coast of the UK. These components will be delivered by transport barges towed by tugs.

7.3.6 The indicative specification for a typical transport barge are set out in Table 7.3; a typical specification for a tug is set out in Table 7.4.

7.3.7 It is estimated that approximately 4 barges and 4 towing tugs may be present at the Development Area at any one time, though typically the barges and tugs will be regularly transiting to and from the fabrication facility to the Moray Firth and are unlikely to all be on site at the same time.

Table 7.3 – Indicative Specification for a Transport Barge

Vessel Name	To be confirmed
Vessel Type	Transport barge
Contracting entity	SHL charter
Vessel role	Transport of foundation piles and jacket substructures from the fabrication yard to the Wind Farm site
Vessel key characteristics (example)	Length: ~91m Breadth: ~27m Draught: ~1.2 – 4.8
Propulsion	TBC
Mooring/station keeping	TBC

Table 7.4 – Indicative Specification for a Tug

Vessel Name	To be confirmed
Vessel Type	Transport barge tug boat
Contracting entity	SHL charter
Vessel role	Towing of transport barges
Vessel key characteristics (example)	Length: ~50m Breadth: ~16m Draught: ~6. m Speed: ~13 knots max
Propulsion	Main propellers and thrusters (may be ducted)
Mooring/station keeping	TBC

Supply and Bunkering Vessels

7.3.8 During construction, vessels will be required to transport goods, tools, equipment and personnel to the HLV, and to provide HLV bunkering.

7.3.9 It is envisaged that the tug boats engaged on the project will provide these services. However, there remains the option of using a Platform Supply Vessel (PSV) for HLV supply and bunkering. A single PSV, expected to be based in Aberdeen or Peterhead, would be on site at any one time and would typically visit the site on a

monthly basis.

7.3.10 The indicative specification for a typical PSV is set out in Table 7.5; a typical specification for a tug is set out in Table 7.4 above.

Table 7.5 – Indicative Specification for a PSV

Vessel Name	To be confirmed
Vessel Type	Platform Supply Vessel
Contracting entity	SHL charter
Vessel role	Supply HLV with provisions as required
Vessel key characteristics (example)	Length: ~80m Breadth: ~20m Draught: ~5m Transit speed: ~12 knots
Propulsion	TBC
Mooring/station keeping	Dynamic Positioning II System (DP II)

7.4 Inter-Array Cable Installation Vessels

7.4.1 The process of inter-array cable installation will require several vessels, including:

- Pre-lay survey and route clearance vessel;
- Pre-lay grapnel run vessel;
- Inter-array Cable Lay Vessel (CLV);
- Inter-array Cable Installation Support Vessel (ISV); and
- Trenching vessel.

7.4.2 The indicative specifications for these vessel types are set out in Tables 7.6 to 7.10 below.

Pre-lay Survey and Route Clearance Vessel

7.4.3 A single light construction vessel with a crane and an ROV is likely to be used to survey the inter-array cable route in 2017 and 2018 and remove any boulders. The ROV will move along the export cable route, allowing boulders to be located. The crane vessel can then be directed to lift the boulders using the on-board crane and grab. The ROV survey and boulder clearance is likely to be completed approximately 1 month before cable laying, in a single survey operation.

7.4.4 Various vessels are under consideration for this task, but representative vessel information is provided in Table 7.6.

Table 7.6 – Indicative Specification for a Survey and Clearance Vessel

Vessel Name	To be confirmed
Vessel Type	Survey vessel
Contracting entity	SHL charter
Vessel role	Carry out pre-lay survey or cable routes
Vessel key characteristics (example)	Example vessel: Length: ~76m Breadth: ~15m Draught: ~7m Transit speed: 12 knots
Propulsion	Azimuth thrusters and tunnel thrusters TBC
Mooring/station keeping	DP II

Pre-lay Grapnel Run Vessel

7.4.5 The pre-lay grapnel run involves dragging a rake (grapnel) along the seabed of the cable route. This clears away any debris which may hinder cable installation and trenching. This work is likely to be completed in a single operation, by one vessel, one to two months before cable laying commences in both 2017 and 2018.

7.4.6 Various vessels are under consideration for this task, but representative vessel information is provided in Table 7.7.

Table 7.7 – Indicative Specification for a Pre-lay Grapnel Run Vessel

Vessel Name	To be confirmed
Vessel Type	Pre-lay grapnel vessel
Contracting entity	SHL charter
Vessel role	Carry out grapnel runs to remove obstacles on cable route prior to cable lay

Vessel key characteristics (example)	Example vessel: Length: ~76m Breadth: ~15m Draught: ~7m Transit speed: 12 knots
Propulsion	Azimuth thrusters and tunnel thrusters TBC
Mooring/station keeping	DP II

Inter-array Cable Lay Vessel

7.4.7 A single Cable Lay Vessel (CLV) will be used to lay the inter-array cables on the seabed during installation periods in 2018 and 2019.

7.4.8 The indicative specification for a typical cable lay vessel is set out in Table 7.8.

Table 6.8 – Indicative Specification for a Cable Lay Vessel

Vessel Name	To be confirmed
Vessel Type	Cable Lay Vessel (CLV)
Contracting entity	SHL charter
Vessel role	Installation of the inter-array cables – laying of the cables from cable carousel
Vessel key characteristic (example)	Length ~105 m Breadth: ~20m Draught: ~9m Speed: ~14 knots
Propulsion	Main propellers/thrusters
Mooring/ station keeping	DP II

Inter-array Cable Installation Support Vessel

7.4.9 A single Installation Support Vessel (ISV) will be used to support inter-array cable installation, assisting the CLV with cable pull-in and terminations.

7.4.10 The indicative specification for a typical ISV is set out in Table 7.9.

Table 7.9 – Indicative Specification for a Cable Installation Support Vessel

Vessel Name	To be confirmed
Vessel Type	Cable Installation Support Vessel (ISV)
Contracting entity	SHL charter
Vessel role	Installation of the inter-array cables – support role.
Vessel key characteristic (example)	Length: ~98m Breadth: ~19m Draught: ~6m Speed: 14.2 knots
Propulsion	Main propellers/thrusters
Mooring/station keeping	DP II

Trenching Vessel

7.4.11 A single trenching vessel will be used to bury the inter-array cables.

7.4.12 The indicative specification for a typical trenching vessel is set out in Table 7.10.

Table 7.10 – Indicative Specification for a Cable Trenching Vessel

Vessel Name	To be confirmed
Vessel Type	Cable Trenching Vessel
Contracting entity	Key Contractor charter
Vessel role	Installation of the inter-array cables – burial of cables using trenching equipment
Vessel key characteristics (example)	Length: ~127m Breadth: ~50m Draught: ~6m Speed: ~14 knots
Propulsion	Main propellers/thrusters
Mooring/station keeping	DP II

7.5 Wind Turbine Installation Vessels

7.5.1 The wind turbine components (tower sections, nacelles and rotor blades) will be delivered to a local construction lay down yard for marshalling and pre-assembly. Nigg is the intended local construction lay down port.

7.5.2 The prepared wind turbine components are then loaded onto jack up vessel (in sets of 4 or 6) for transportation to the wind farm construction site and subsequent installation.

Turbine Transport Vessel

7.5.3 General cargo vessels are expected to be used to transport the turbines from the turbine manufacture site, expected to be located in south-east England or northern Europe, to the lay down yard. They will transit directly between the manufacturing site and laydown port, and as such will not be present at the construction site itself.

7.5.4 The indicative specification for a typical turbine transport vessel is set out in Table 7.11.

Table 7.11 – Indicative Specification for a Cargo Vessel

Vessel Name	To be confirmed
Vessel Type	General cargo
Contracting entity	SWPL charter
Vessel role	Transport of wind turbine components to the laydown port
Vessel key characteristics (example)	Length: ~ 150m Breadth: ~20m Draught: ~9m Speed: ~15 knots
Propulsion	Main propellers
Mooring/station keeping	Anchor mooring

Jack Up Vessel

7.5.5 A single jack up vessel will be at the Development Area at any one time, during periods of turbine installation in 2018 and 2019. This vessel will transit between the Wind Farm and Nigg.

7.5.6 The likely jack up vessel to be used for wind turbine installation and heavy lift operations associated with wind farm construction is the Swire Blue Ocean vessel 'Pacific Orca'. The specifications for this vessel are set out in Table 7.12. Should a different jack-up vessel be chosen for wind turbine installation, the specifications are likely to be similar to those set out below.

Table 7.12 –Specifications for the JUV Pacific Orca

Vessel Name	Pacific Orca
Vessel Type	Jack Up Vessel
Contracting entity	SWPL Charter
Vessel role	WTG installation transport of turbine components from construction laydown port to site and lift/installation of wind turbine towers, nacelles and rotors
Vessel key characteristics (example)	Length: 160.90m Breadth: 49.00m Draught: 76.00m (excluding spud cans) Speed: 13 knots
Propulsion	4 x azipod stern thruster 2 x bow azimuth thruster 2 x bow tunnel thruster
Mooring/station keeping	DPII and jack up legs with spud cans
Image	

7.6 OTM Installation

7.6.1 The OTM topside will be lifted into position by a HLV vessel of the type set out under Section 7.3, having been brought direct to site from the fabrication facility by a barge and tugs similar to those described under Section 7.3.

7.7 Export Cable Installation

7.7.1 The process of export cable installation will require several vessels, including:

- Pre-lay survey vessel;
- Pre-lay Grapnel Run vessel;
- Export Cable Lay Vessel (CLV);
- Trenching support vessel;
- Rock placement vessel;
- Shallow draught barge;
- Shallow draught cable lay support vessel; and,
- Shallow water dive support vessel.

7.7.2 The shallow draught vessels are required to support nearshore export cable installation where water depths prevent the use of larger vessels.

7.7.3 The indicative specification for these vessel types are set out below. Vessels will be required to support cable installation in both deeper waters offshore, and Horizontal Directional Drilling operations nearshore, in shallow waters.

Pre-lay Survey Vessel

7.7.4 A single survey vessel will be used to survey the export cable route prior to cable laying, in a single survey operation. The survey will identify physical obstructions on the seabed and UXO targets. A representative vessel specification is provided above in Table 7.13.

Table 7.13 - Indicative specification for a Survey Vessel

Vessel Name	To be confirmed
Vessel Type	Survey vessel
Contracting entity	To be confirmed
Vessel role	Conduct UXO / pre-lay survey
Vessel key characteristics (example)	Length: ~55m Breadth: ~12m

	Draught: ~4m Transit speed: ~12 knots
Propulsion	Main propulsion: Single Lips BV controllable pitch propeller Additional positioning: Bow and aft tunnel thrusters and azimuth thrusters bow.
Mooring/station keeping	DP I

Pre-lay Grapnel Run Vessel

7.7.5 The pre-lay grapnel run involves dragging a rake (grapnel) along the seabed of the cable route. This clears away any debris which may hinder OfTW cable installation and trenching. This work is likely to be completed by a single vessel, in a single operation, one to two months before cable laying commences.

7.7.6 Indicative specifications for a PLGR vessel are provided in Table 7.14.

Table 7.14 – Indicative specification for a PLGR vessel

Vessel Name	To be confirmed
Vessel Type	Pre-lay grapnel vessel
Contracting entity	To be confirmed
Vessel role	Carry out grapnel runs to remove obstacles on cable route prior to cable lay
Vessel key characteristics (example)	Length: ~48m Breadth: ~7. m Draught: ~5m Transit speed: ~10 knots
Propulsion	Fixed pitch single propulsion and tunnel thrusters TBC
Mooring/station keeping	Tunnelled bow Thruster

Cable Lay Vessel

7.7.7 A CLV will transit to the cable manufacturing port located in northern Europe to load the cable. The vessel will then return to the export cable route and commence installation.

7.7.8 There will be a single CLV on site at any one time during installation periods in 2017 and 2018. Indicative specifications for a CLV are provided in Table 7.15 below.

Table 7.15 – Indicative specification for a CLV

Vessel Name	To be confirmed
Vessel Type	Cable Laying Vessel
Contracting entity	Nexans Norway
Vessel role	Cable laying, pre lay survey, trenching support
Vessel key characteristics (example)	Length: ~118m Breadth: ~32m Draught: ~5m Transit speed: ~9.0 knots
Propulsion	Main propulsion: 3 off azimuth stern units Additional positioning: one off bow tunnel thrusters and one off azimuth thruster
Mooring/station keeping	DP II

Trenching Support Vessels

7.7.9 A single cable installation support vessel may be used to provide support during the cable laying operations.

7.7.10 A single trenching vessel will be used to support cable installation and bury the cable once it has been deployed. Indicative specifications for a trenching support vessel are provided in Table 7.16.

Table. 7.16 – Indicative specification for a Trenching Support Vessel

Vessel Name	To be confirmed
Vessel Type	Trenching support vessel
Contracting entity	To be confirmed

Vessel role	Carry trenching spread and auxiliary equipment
Vessel key characteristics (example)	Example vessel: Length: ~98m Breadth: ~22m Draught: ~8m Transit speed: ~13 knots
Propulsion	Main propulsion: 2 x controllable pitch propellers Additional positioning: 2 x tunnel thrusters bow, 1 x azimuth thrusters bow, 2 x tunnel thrusters aft
Mooring/station keeping	DP II

Rock Placement Vessel

7.7.11 A single fall pipe vessel may be used to install rock armouring cable protection along stretches of the Export Cable as required.

7.7.12 The rock placement vessel will deploy rock armouring down a fall pipe to the seabed to protect the cable following surface laying and trenching operations. Indicative specifications for a trenching support vessel are provided in Table 7.17.

Table. 7.17 – Indicative specification for a Rock Installation Vessel

Vessel Name	To be confirmed
Vessel Type	Rock placement vessel
Contracting entity	STDL and Nexans Norway
Vessel role	Installation of rock armouring cable protection.
Vessel key characteristics (example)	Example vessel: Length: ~139m Breadth: ~32m Draught: ~6.6m Transit speed: ~12 knots
Propulsion	Main propulsion: 2 x controllable pitch propellers Additional positioning: 2 x bow thrusters
Mooring/station keeping	DP II

Shallow Draught Barge

7.7.13 The shallow draught barge will facilitate shallow water cable installation operations including export cable pull-in operations.

7.7.14 Indicative specifications for a shallow water barge are provided in Table 7.18.

Table. 7.18 – Indicative specification for a Shallow Water Barge

Vessel Name	To be confirmed
Vessel Type	Rock Installation Vessel
Contracting entity	STDL and Nexans Norway
Vessel role	Installation of rock armouring cable protection.
Vessel key characteristics (example)	Example vessel: Length: ~139m Breadth: ~32m Draught: ~6.6m Transit speed: ~12 knots
Propulsion	Main propulsion: 2 x controllable pitch propellers Additional positioning: 2 x bow thrusters
Mooring/station keeping	DP II

Shallow Draught Cable Lay Support Vessel

7.7.15 The shallow draught cable lay support vessel will provide assistance with nearshore cable lay operations including export cable pull-in operations. Indicative specifications for a shallow draught cable lay support vessel are provided in Table 7.19.

Table. 7.19 – Indicative specification for a Shallow Draught Cable Lay Support Vessel

Vessel Name	To be confirmed
Vessel Type	Shallow draught cable lay support vessel
Contracting entity	STDL and Nexans Norway
Vessel role	Support nearshore cable installation operations and first end pull in operations at the subsea drilled cable ducts.
Vessel key characteristics	Example vessel: Length ~38m

(example)	Breadth: ~12 m Draught: ~1.85 – 2.42m Transit speed:10knots
Propulsion	2 x Fixed pitched propellers in nozzles Additional positioning: 2 x azimuth bow thrusters
Mooring/station keeping	DP II

Dive Support Vessel

7.7.16 During installation of the cable at the landfall location and export cable pull-in at the subsea drilled duct entrance dive support may be required. A dive support vessel would be used during nearshore operations only. Indicative specifications for a shallow draught cable lay support vessel are provided in Table 7.20.

Table. 7.20 – Indicative specification for a Dive Support Vessel

Vessel Name	To be confirmed
Vessel Type	Dive support vessel
Contracting entity	STDL and Nexans Norway
Vessel role	Provide dive support during nearshore cable installation operations.
Vessel key characteristics (example)	Example vessel: Length: ~22.30m Breadth: ~8.50m Draught: ~1.85m Transit speed:10knots
Propulsion	2 x Fixed pitched propellers in nozzles Additional positioning: 2 x azimuth bow thrusters
Mooring/station keeping	DPII

7.8 Construction Support and Ancillary Vessels

7.8.1 As set out in the CMS, the process of installation and commissioning of the Wind Farm and OfTW will require the transport of technicians and equipment to the offshore structures (wind turbines and OTMs).

7.8.2 These activities will require the use of:

- Crew Transfer Vessels; and/or
- Walk to Work Vessels.

7.8.3 In addition, general work boats and guard vessels are likely to be used during some or all of the construction period.

7.8.4 These vessel types are described in the following sections.

Crew Transfer Vessels

7.8.5 Crew Transfer Vessels are anticipated to be used throughout construction to transfer technicians and construction personnel from Wick Harbour to the Development Area. Where access to Wick Harbour is restricted due to adverse weather Buckie Harbour may be utilised for crew transfer via CTVs. These transfers will be completed daily for the duration of the relevant works with the vessel usually remaining on site for safety while technicians are working.

7.8.6 Crew transfer vessels are normally fitted with suitable bow fenders and equipment to match the boat landing system installed on wind turbine, OTM foundations and those of the offshore construction fleet. The CTVs may also be equipped with a small crane and equipment storage areas.

7.8.7 The indicative specification for a typical offshore wind farm wind crew transfer vessel is set out in Table 7.17.

Table 7.17 – Indicative Specifications for a Crew Transfer Vessel

Vessel Name	To be confirmed
Vessel Type	Crew Transfer Vessel
Contracting entity	Various – SWPL and STDL charter
Vessel role	Electrical works and WTG and OTM commissioning
Vessel key characteristics (example)	For example: Length: 12 – 30m Breadth: 6 – 10m Speed: 20 – 30 knots
Propulsion	Controllable pitch propeller or jet propulsion
Mooring/station keeping	Anchor

Walk to Work Vessels

7.8.8 A Walk to Work vessel (W2W) may be used as an alternative to CTVs to accommodate wind turbine technicians during completion and commissioning of the wind turbines. The wind turbine technicians live on board the W2W vessel and transfer to the wind turbines using a "walk to work" gangway system. W2W vessels may also have a crane for lifting tools and equipment to the wind turbine platform.

7.8.9 The indicative specification for a typical offshore wind farm W2W vessel is set out in Table 7.18.

Table 7.18 – Indicative Specifications for a W2W Vessel

Vessel Name	To be confirmed
Vessel Type	Walk to Work Vessel
Contracting entity	Key Contractor charter
Vessel role	Electrical works and WTG and OTM commissioning
Vessel key characteristics (example)	For example: Length: ~70m Breadth: ~13m Draught: ~3m Speed: ~13 knots
Propulsion	Main propeller / Thrusters
Mooring/station keeping	DP

Workboats

7.8.10 General workboats may be required to provide general support duties during construction. Duties would typically include transfer of personnel, tools and equipment, responding to emerging requirements during installation works.

7.8.11 The indicative specification for a general workboat is set out in Table 7.19.

Table 7.19 – Indicative Specifications for a Workboat

Vessel Name	To be confirmed
Vessel Type	Workboat
Contracting entity	Various – SHL, SWPL and STDL charter

Vessel role	General support duties
Vessel key characteristics (example)	For example: Length: ~20m Breadth: ~7m Draught: ~2m Speed: 25 knots
Propulsion	Controllable pitch propellers
Mooring/station keeping	None

Guard Vessels

7.8.12 Guard vessels may be employed during the construction period to help ensure the safety of other marine users and the construction activity by warning other vessels that may be approaching the Wind Farm (including fishing vessels) of any navigational hazards (partially completed structures, construction works etc.).

7.8.13 BOWL and their Key Contractors have a long-standing relationship with the Scottish Fishermen's Federation (SFF), who can provide guard boat vessels in Scottish waters. The SFF source local boats where possible, rotating the vessels as much as possible to ensure that work opportunities are spread widely.

7.8.14 Guard Vessels provided by SFF Services are compliant with the relevant legislation for their size and class and hold Load Line Exemption certification issued by the governing body (UK Marine Coastguard Agency).

7.8.15 The Development is located such that the smallest class of SFF guard vessel can operate at this location in summer and a slightly larger class in winter time.

7.8.16 Guard vessel duties will be varied. However as a minimum they will normally be expected to provide the following duties:

- Provide a 24 visual and radar watch of their guard area, recording any and all vessels within the area, and where required opening dialogue with any vessels that may infringe on the guard area;
- Issue Securité messages every 4-6 hours by DSC and VHF Ch 16;
- Intervene within reason to ensure compliance with the guard area; and
- Send detailed reports, including photographs (if possible) of any guard area infringements.

7.8.17 Given the nature of these vessels their specification varies but indicative characteristics are set out in Table 7.20.

Table 7.20 – Indicative Specifications for SFF Guard Vessels

Vessel Name	To be confirmed
Vessel Type	Guard vessels
Contracting entity	SHL charter
Vessel role	Guard vessel duties during construction works
Vessel key characteristics (example)	Length: ~70m Breadth: ~13m Draught: ~4m Speed: ~13 knots
Propulsion	The majority of guard vessels will have a single propeller, which will be either right or left handed with mainly a fixed pitch. Some boats will have variable pitch. Some may be fitted with a kort nozzle.
Mooring/station keeping	None

8 Numbers and Movements of Construction Vessels

8.1 Introduction

8.1.1 Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence requires that this VMP include details related to numbers and movements, specifically:

> *a) The **number**, types and specification of vessels required*
>
> *d) Location of working port(s), **how often vessels will be required to transit between port(s) and the site** and indicative vessel transit corridors proposed to be used.*

8.1.2 Based on the current understanding of the construction vessel requirements and market availability the following section outlines the numbers of vessels estimated to be on site at any one time.

8.1.3 Note that, in line with condition 16 of the S36 consent (See Table 1.1 for full wording), the full list of vessels will be notified to MS-LOT at least 14 days prior to the commencement of construction.

8.2 Construction Vessels

8.2.1 The number of vessels within the Development Area at any one time will vary over the course of the construction period, with peaks in vessel activity reflecting the timing of major installation works.

8.2.2 A small number of vessels will be present at the Development Area for sustained durations, whilst supply and support vessels will make transits to and from the works to various ports in the Moray Firth and beyond.

8.2.3 For each type of vessel that will enter the Development Area, Table 8.1 presents the indicative number of vessels involved in construction, the main construction activities that they will be involved in and when as detailed in the CoP, and the anticipated number of return journeys they will make. One return journey equates to the vessel transiting to the Development Area once, and then returning to a given port (that port maybe within the Moray Firth or further afield).

8.2.4 Vessel numbers will vary throughout the construction phase however, it is anticipated that the total number present at any one time within the Development Area will be approximately 26 vessels inclusive of guard vessels. This is in line with the assessment of effects as a result of vessel activity included within the ES and SEIS. The ES and SEIS assessed the effects of vessel activity based on 46 and 20 (excluding guard vessels) vessels respectively.

Table 8.1 – Indicative construction vessel numbers, key CoP activites and return journeys

Vessel Type	Anticipated Total Number	Key Construction Programme (CoP) Activities (See CoP for full project schedule)	Approximate Number of Return Journeys to Port
Pile, Jacket and OTM Installation			
HLV Stanislav Yudin	1	• Pile installation; • Install jackets; • OTM pile installation.	1 in each year
HLV Oleg Strashnov	1	• Install jackets; • Install both OTM jackets.	1 in each year
Anchor handling tug (works Stanislav Yudin anchors)	2	• Pile installation; • Install jackets; • OTM pile installation.	1 in each year
Tugs (towing of transport barges with WTG piles)	4	• Pile installation;	6 per tug in 2017 2 per tug in 2018
Tugs (towing of transport barges with WTG jackets)	2	• Install Jackets	7 per tug
Tug (towing of transport barges with OTM topsides)	1	• Install both OTM jackets; • OTM topside 1 installed; • OTM topside 2 installed.	1 in each year
Transport Barges	Approx. 6	• Pile installation; • Install jackets; • OTM pile installation; • Install both OTM jackets; • Install and hook up WTGs.	Up to 6 in 2017 Up to 7 in 2018
CTV	1	• Pile installation; • Install jackets; • OTM pile installation; • Install both OTM jackets; • Install and hook up WTGs.	78 per CTV in 2017 28 per CTV in 2018
PSV (optional)	1	• Pile installation; • Install jackets; • OTM pile installation; • Install both OTM jackets; • Install and hook up WTGs.	12 in 2017 18 in 2018
Inter Array Cable Installation			

Vessel Type	Anticipated Total Number	Key Construction Programme (CoP) Activities (See CoP for full project schedule)	Approximate Number of Return Journeys to Port
Survey Vessel	1	• Array cable installation.	1 in each year
Pre-Lay Grapnel Vessel	1	• Array cable installation.	1 in each year
Cable lay Vessel	1	• Array cable installation.	2 in each year
Cable Lay Installation Support Vessel	1	• Array cable installation.	2 in each year
Trenching Vessel	1	• Array cable installation.	2 in each year
CTV	2	• Array cable installation.	70 in each year
WTG Installation			
Jack-Up Vessel	1	• Install WTGs.	7 in 2018 10 in 2019
CTVs	2	• Install and hook up WTGs.	121 per CTV in 2018 152 per CTV in 2019
Export Cable Installation			
Survey Vessel	1		1 in 2016
Pre-Lay Grapnel Vessel	1	• Install export cable.	1
Cable lay Vessel	2	• August – September 2017 • April - June 2018 • Install export cable.	4
Trenching Support Vessel	1	• Install export cable.	3
Shallow draught cable laying barge	1	• Horizontal Directional Drilling (HDD); • Install Export Cable.	1
Shallow draught cable laying support vessel	1	• Install export cable.	1
Diving support vessel	1	• Horizontal Directional Drilling (HDD); • Install Export Cable.	TBC
Rock Placement Vessel	1	• Install export cable.	2 3
Crew Transfer Vessel (CTV)	1	• Install export cable.	15
Support and Ancillary Vessels			
Workboat	TBC	• All project phases as required.	125 in 2017 227 in 2018 129 in 2019
Guard Vessels	Approx. 6	• All project phases as	TBC

Vessel Type	Anticipated Total Number	Key Construction Programme (CoP) Activities (See CoP for full project schedule)	Approximate Number of Return Journeys to Port
		required.	
CTV	8	• All project phases as required.	97 in 2018 129 in 2019
Walk to Work Vessel (alternative to CTVs)	1	• All project phases as required.	2 in 2018 2 in 2019

8.3 Operation and Maintenance Vessels

8.3.1 CTVs, as described in Section 6.8, will provide the primary means of access to the Development during operation. They will transfer personnel and equipment to support servicing and maintenance of turbines and OTMs. As detailed in Section 7.8, the CTVs will operate primarily from Wick Harbour and may travel to the Wind Farm site on a daily basis between 2018 and 2034. During periods of adverse weather when access to Wick Harbour is restricted, CTVs may operate from Buckie Harbour.

8.3.2 During operation CTV's will be the primary access vessel. These shall be similar to those described in table 7.17. It is anticipated that 10 CTV's will journey to site on a daily basis during the operational phase of the project.

8.3.3 For major cable maintenance work it may be necessary to use vessels similar to those presented in Section 7.4. Maintenance vessels could arrive on site from various ports and harbours as required.

8.3.4 For major maintenance work, including component changes and heavy lift repairs, it may be necessary to use a jack-up or heavy lift vessel. This could be similar to those presented in Section 7 or may be a jack-up suited to a particular maintenance activity. The jack-up could arrive on site from various ports and harbours. It is anticipated that a single survey vessel, similar to that presented in Table 7.6, will be deployed to site to undertake bathymetric surveys on an annual basis during the operational phase. Additional surveys would be undertaken as required.

8.3.5 In line with the requirements of Condition 17 of the S36 Consent, BOWL must submit an Operation and Maintenance Programme (OMP) three months prior to commissioning of the first wind turbine.

9 Indicative Transit Route Corridors

9.1 Introduction

9.1.1 Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence requires that this VMP include details related to vessel transit routes, specifically:

> *d) Location of working port(s), how often vessels will be required to transit between port(s) and* ***the site and indicative vessel transit corridors proposed to be used****.*

9.1.2 The indicative transit routes for the major construction vessels between the Development Area and their ports of origin/destination (but also the construction laydown port) together with route between the Development Area and the Marine Coordination Centre at Wick that would be used predominantly by CTVs, are shown in Figure 9.1.

9.1.3 This includes routes entering the Moray Firth for vessels delivering components direct to the Development Area and also for delivery of wind turbine components to the chosen construction laydown port.

9.1.4 The main transit routes shown may be summarised as follows:

- Nigg to the Development Area;
- Wick to the Development Area (principally used by CTVs operating between the Marine Coordination Centre and the Development Area);
- Buckie Harbour to the Development Area (principally used by CTVs and bunkering vessels when access to Wick Harbour is restricted, and supply vessels);
- From outer Moray Firth (south) to the Development Area (for vessels originating from Europe or the UK east coast);
- From outer Moray Firth (south) to the construction laydown port (for vessels originating from Europe or the UK east coast); and
- From outer Moray Firth (north) to the Development Area or onwards to the construction laydown port (for vessels originating from the Atlantic or UK west coast).

9.1.5 It should be noted that smaller vessels involved in the construction process and that are likely to make more frequent journeys to port (such as CTVs, guard vessels and work boats) may utilise a variety of smaller local ports and harbours within the Moray Firth or further afield. These vessels may deviate from the indicative transit routes in making direct passage to alternative destinations.

9.1.6 It should be noted that the main indicative transit routes have been proposed so as to broadly comply, where possible, with the routes followed by the majority of the large commercial shipping entering and leaving the Moray Firth.

9.1.7 It should be noted that these indicative vessel transit routes are not intended to be prescriptive and will not always be followed precisely by every vessel, although it is reasonable to suggest that under normal conditions vessels will take the shortest route to their destination allowing for considerations set out in the vessels passage plan such as navigational hazards, etc. The indicative transit routes identified can be expected to be used by the larger vessels involved in the construction phase.

9.1.8 Vessels may deviate from these indicative routes for a variety of reasons and at the discretion of the vessel's master, for example due to:

- Navigational hazards as indicated on charts or notified through Notices to Mariners or such other sources as may be consulted;
- The presence of other vessels and the need to maintain a safe distance or take avoiding action to comply with the requirements of the COLREGS;
- Prevailing weather, tidal or sea state conditions;
- Due to the vessel originating from or being bound for a destination not indicated by the transit routes shown on Figure 9.1;
- Instructions from the Marine Coordination Centre or other responsible persons in charge of co-ordinating and managing construction vessel traffic; and
- Such other reason as the master of a vessel may deem relevant for the purposes of ensuring the safety of his vessel or another vessel.

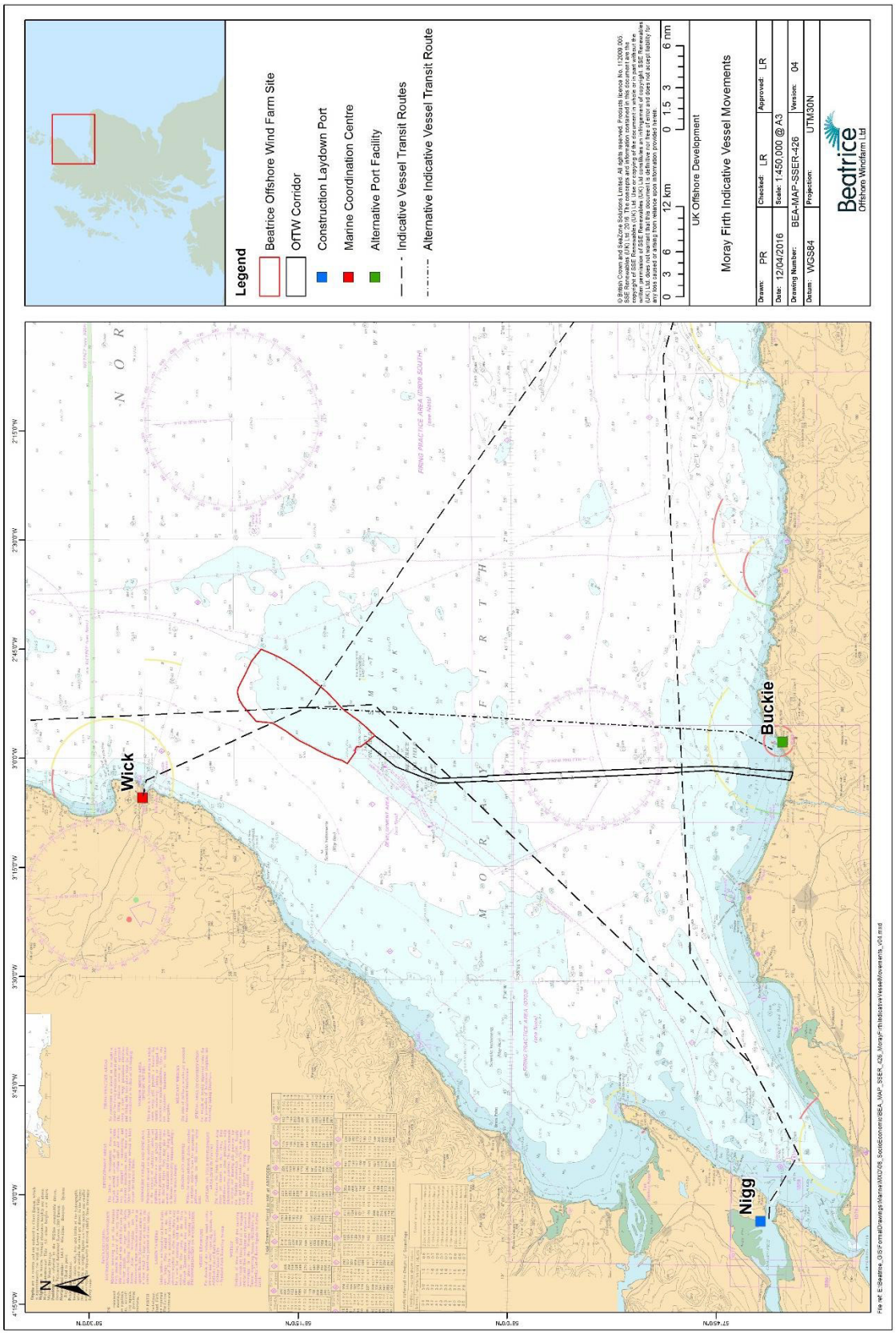


Figure 9.1 – Indicative vessel routes

10 Environmental Sensitivities Relevant to Vessel Management

10.1 Introduction

10.1.1 The reason for the VMP, as stated in S36 Consent Condition 16, is:

'To mitigate disturbance or impact to marine mammals and birds.'

10.1.2 This section summarises the marine mammal and bird sensitivities relevant to vessel traffic associated with construction and operation of the Development. Section 11 describes the potential effects of the vessel traffic on these receptors as described in the ES and SEIS.

10.2 Marine Mammals

10.2.1 Marine mammals occur throughout the Moray Firth either as resident populations or seasonal visitors. Key species identified in the ES (BOWL, 2012) and SEIS (BOWL, 2013) and under consideration within this VMP include bottlenose dolphin, harbour porpoise and harbour seal.

10.2.2 Bottlenose dolphin and harbour seal are primary features of the Moray Firth Special Area of Conservation (SAC) and Dornoch Firth and Morrich More SAC respectively (BOWL, 2012a). The location of the SACs and their proximity to the indicative vessel transit routes are illustrated in Figure 10.1. Harbour porpoise is an Annex V European Protected Species in respect of the Habitats Regulations.

10.2.3 This section sets out the spatial and temporal sensitivities of the three key species of marine mammals (bottlenose dolphin, harbour seal and harbour porpoise); however, it is important to note that this VMP is relevant to all marine mammal species in the Moray Firth.

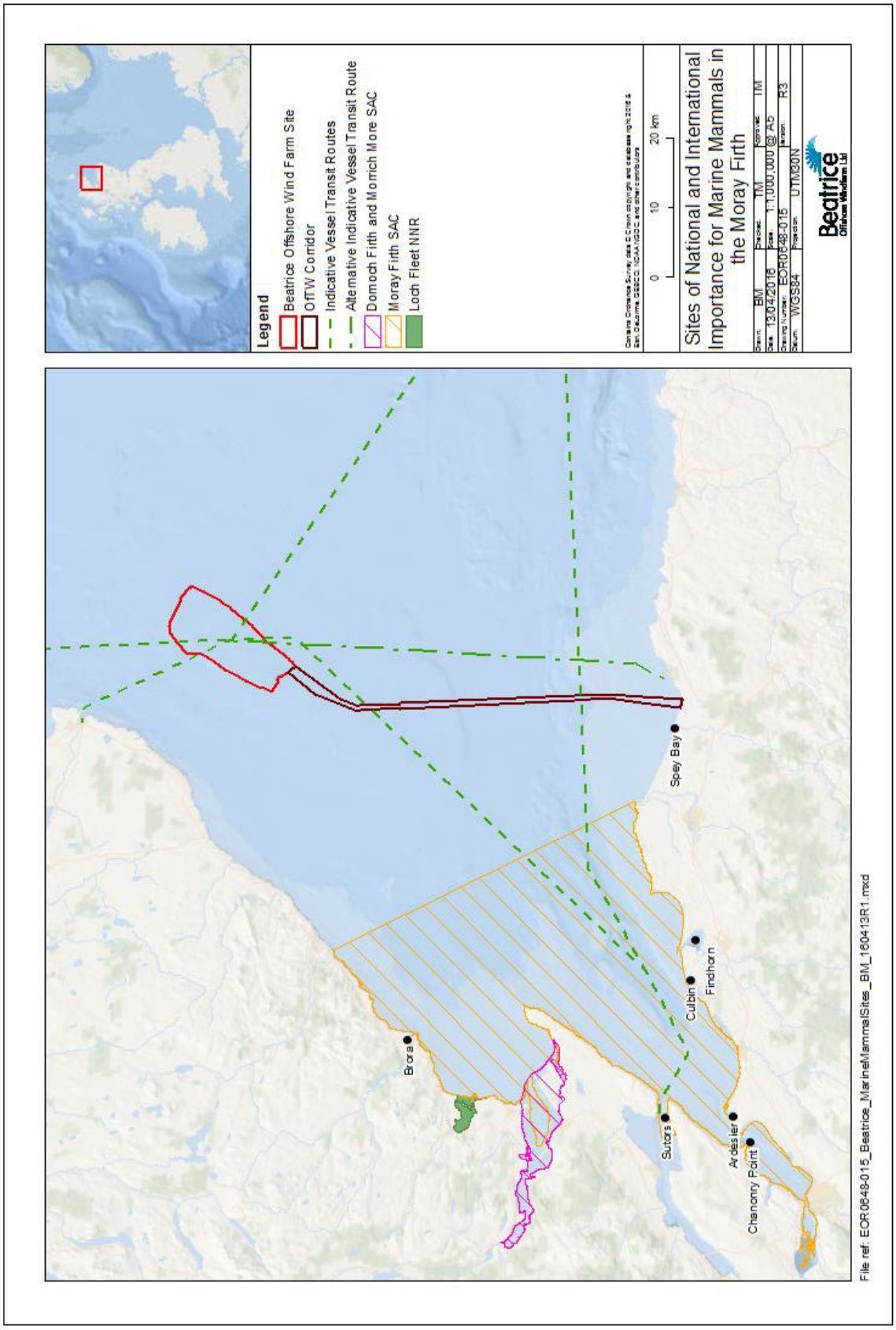


Figure 10.1 – Location of sites of national and international importance for marine mammals

Spatial and temporal sensitivity of marine mammals

Bottlenose dolphin

10.2.4 Bottlenose dolphins are most likely to be encountered around the southern coastal areas and inner reaches of the Moray Firth, generally in waters less than 25 m deep. Areas of particular importance include Spey Bay, Chanonry Point and Sutors (Hastie *et al.,* 2004; Cheney *et al*., 2012). Counts of bottlenose dolphin around the coast decrease during the winter, but whether this is a reflection of movement into offshore waters or a caveat of winter sampling effectiveness is unknown (Wilson *et al*. 1997). It is likely that their seasonal distribution will relate to the distribution of key prey items, however, there is limited understanding of the broader diet of bottlenose dolphin in European waters and how the prey stocks vary in space and time.

10.2.5 The interim results of the BOWL pre-construction MMMP have shown that, at key sites within the Moray Firth SAC and along the southern Moray Firth coast, bottlenose dolphin occurrence tends to be highest from May to August (Graham *et al*., 2015). These summer peaks of bottlenose dolphin in inshore areas could, without further analysis suggest that the population may be more sensitive to disturbance in the summer. However, this conclusion may only be valid in those specific inshore areas should a seasonal influx of dolphins coincide with high levels of local disturbance in those same areas.

10.2.6 Available data suggests that the likelihood of bottlenose dolphin being encountered by vessels transiting to or from the Development Area is most likely to occur close to the coast (Figure 10.2). The likelihood of vessels within the Wind Farm encountering bottlenose dolphin is low (BOWL, 2012a; Thompson *et al.,* 2015) (Figure 10.2). The indicative transit routes from the Cromarty Firth and North Sea to the Development Area avoid the areas of greatest probability of dolphin presence. The transit route along the southern coast of the Moray Firth and the alternative transit route that enters Buckie Harbour, are closest to areas of high probability of dolphin presence with the most sensitive areas located within inshore coastal waters, as described above. Given the uncertainties regarding seasonal distribution in offshore waters and sensitivities, for the purposes of this VMP, bottlenose dolphin is considered to be equally sensitive in all months of the year.

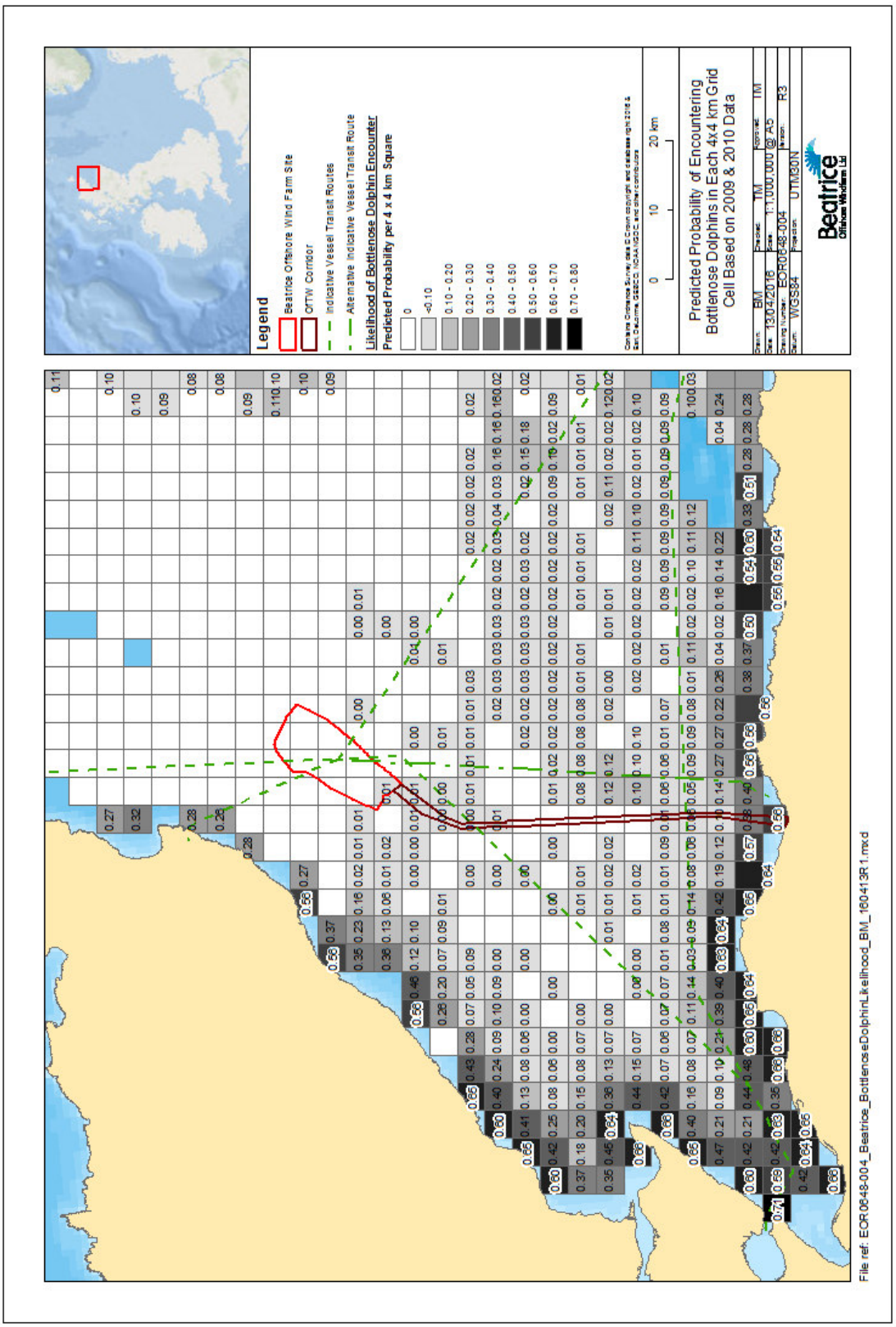


Figure 10.2 – Modelled probability of bottlenose dolphin occurrence in each 4x4 km grid cell within the Moray Firth

Harbour seal

10.2.7 Harbour seal is designated as a primary feature of the Dornoch Firth and Morrich More SAC and breed annually at haul-outs within this area and at colonies in Loch Fleet and along the north and south coastlines of the Inner Moray Firth. The most recent minimum population estimate of harbour seal for the Moray Firth as a whole (based on aerial surveys in 2008, 2011, and 2013) is 898 individuals (SCOS, 2014). Long-term aerial survey data suggests that, despite historical declines in the population of harbour seal, the Moray Firth population may have stabilised to some extent although the population fluctuates annually (SCOS, 2014).

10.2.8 Harbour seal haul-outs occur year-round in the Moray Firth and seals use haul-out sites to rest between foraging trips, during the pupping and breeding season in June/July and to moult in August/September (Bailey and Thompson, 2011). Key haul-outs occur within the inner Moray Firth, and are centred in the Dornoch Firth, Ardersier, Culbin, Findhorn and Loch Fleet (Figure 10.3). There may, however, be seasonal shifts in haul-out distribution in relation to seasonally abundant food supplies (Brown and Mate, 1983; Jeffries, 1986). The latest August survey (2013) show highest counts in the Culbin and Findhorn area (218 individuals) which lie approximately 4.5km from the transit route at its closest point (Figure 10.3).

10.2.9 Harbour seal often forage close to their haul-out sites, resulting in higher densities nearer to coastal areas in the inner Moray Firth (BOWL, 2012a; Bailey *et al.,* 2014) (Figure 10.4). This observation is supported by the results of the 2014/2015 harbour seal tagging studies undertaken as part of the pre-construction MMMP where 25 seals tagged in Loch Fleet were tracked primarily throughout the inner Moray Firth, with fewer individuals venturing further into the outer Moray Firth and beyond. Therefore, in relation to vessel activity, the highest areas of sensitivity of harbour seal is within the inner Moray Firth and close to the haul-out sites.

10.2.10 Distances travelled from haul-outs vary between life-stages, sexes and individuals and it is therefore difficult to determine any seasonal patterns in sensitivity, therefore, for the purposes of this VMP, harbour seal is considered to be sensitive in all months of the year.

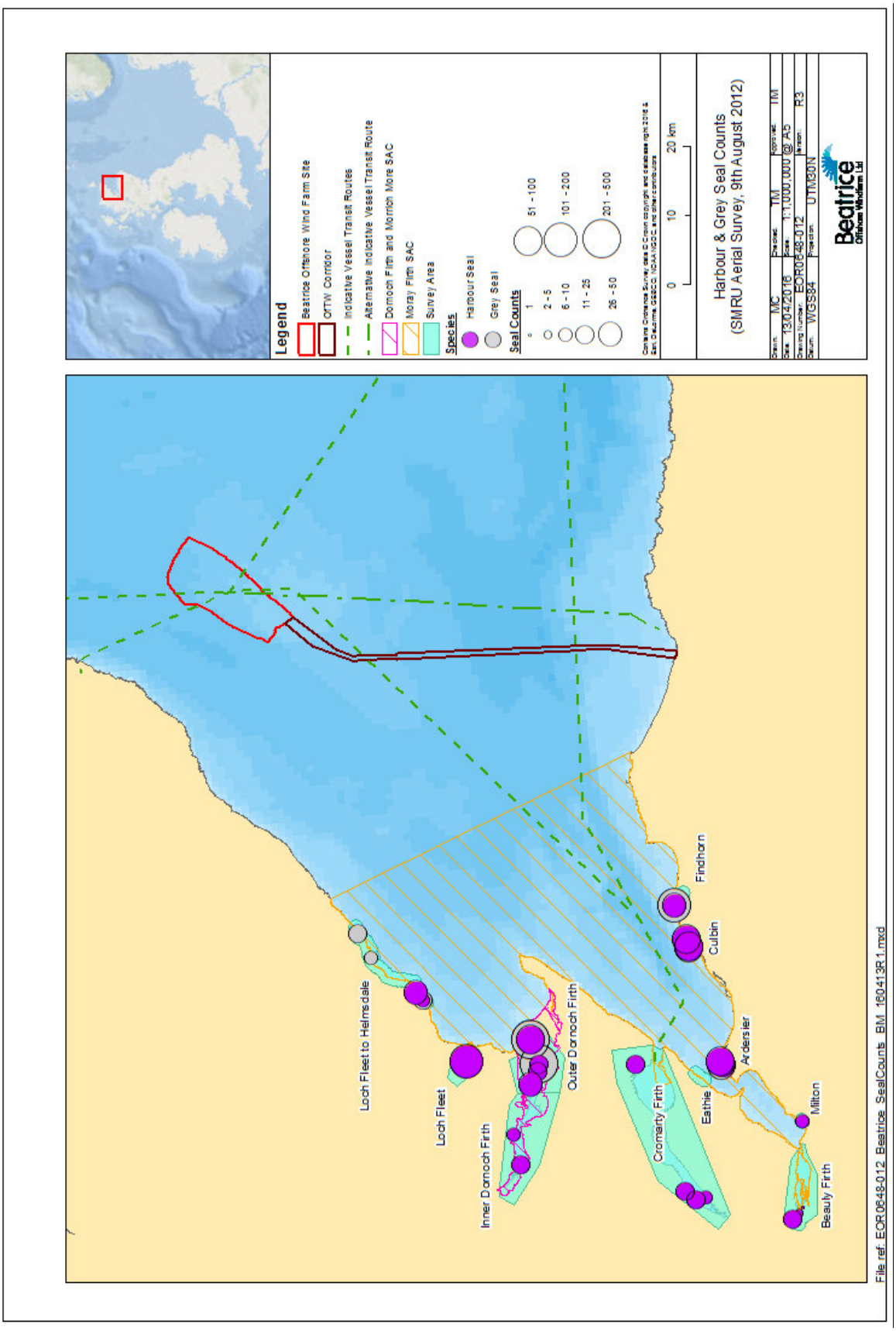


Figure 10.3 – Abundance of harbour seal at haul-outs in the Moray Firth during the aerial survey counts in August 2012 (SCOS, 2013)

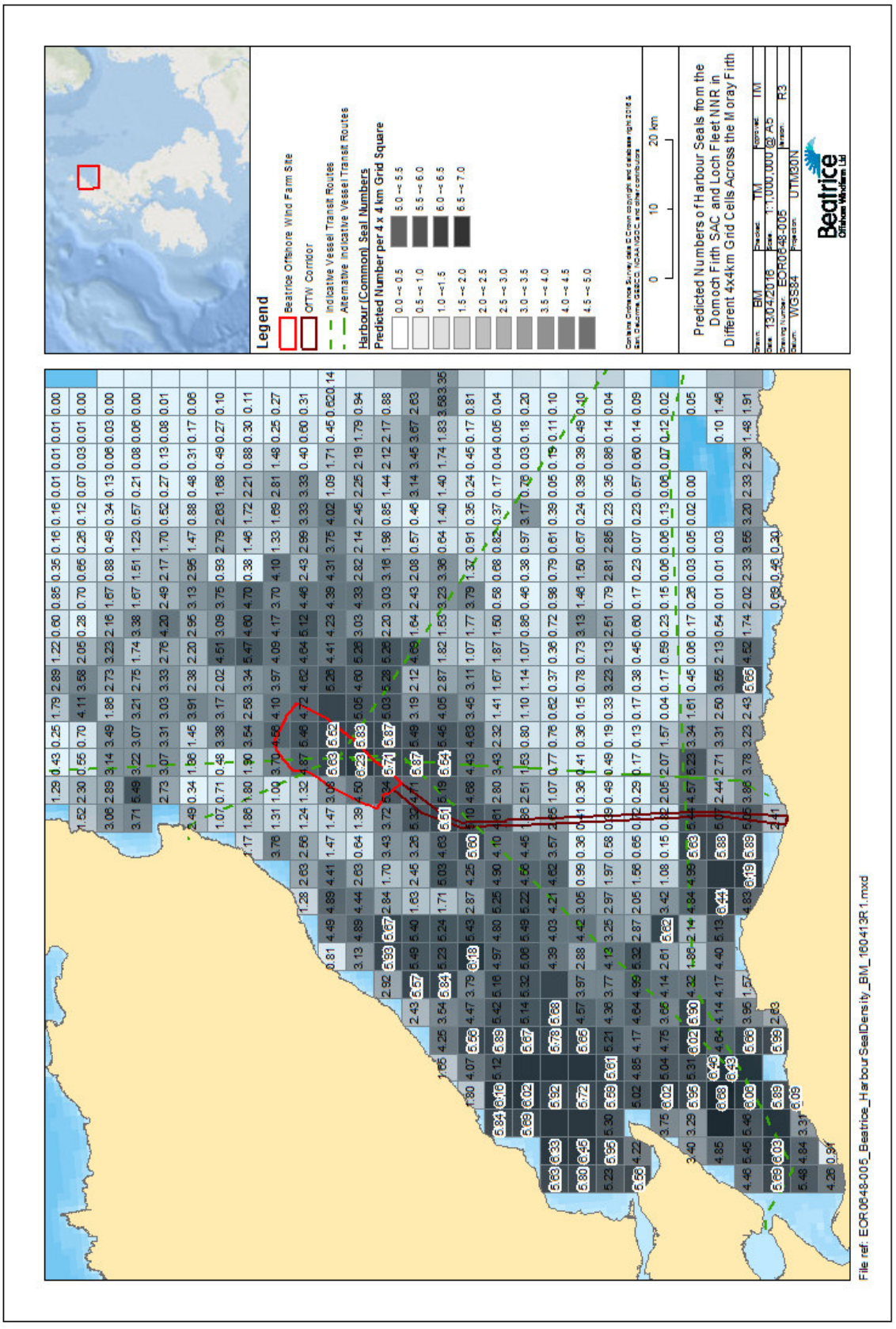


Figure 10.4 – Modelled at-sea densities of harbour seal in the Moray Firth

Harbour Porpoise

10.2.11 Studies have shown that harbour porpoise occur throughout the inshore and offshore waters of the Moray Firth and are present year-round (Thompson and Brookes 2011; Brookes *et al*. 2013). Data from an extensive array of static acoustic recorders deployed within the Moray Firth as part of a University of Aberdeen DECC funded study in 2009 and 2010 demonstrated that harbour porpoise are likely to be present on most days throughout the Moray Firth, including within the Development Area (Thompson *et al*., 2010a & 2011).

10.2.12 Harbour porpoise also occur along the southern Moray Firth coast on a high proportion of days in the year although detection rates are generally lower in coastal areas, where bottlenose dolphin occur more commonly, than in offshore areas (Thompson and Brookes, 2011). For the purposes of the VMP harbour porpoise are considered to be equally sensitive throughout the Moray Firth. There is no evidence suggesting that individual harbour porpoises are more sensitive to vessel disturbance at particular times of year; therefore for the purposes of this VMP, harbour porpoise is considered to be equally sensitive in all months of the year.

10.3 Ornithology

10.3.1 The Moray Firth's coastal and offshore waters are internationally important for populations of seabird, seaduck, wader and wildfowl. Because of this, a number of areas bordering the Moray Firth have been designated as Special Protection Areas (SPAs) under the EU Birds Directive (Kalejta-Summers, 2004). In addition to resident birds, the area is used for breeding, over-wintering or as a temporary feeding ground during the spring and autumn migrations of species breeding in Scandinavia and the Arctic. While a number of studies have reported recent changes in either the relative abundance of some species, or in focal areas of activity, the Moray Firth as a whole remains an important area for seabirds and waterbirds (Kalejta-Summers, 2004).

10.3.2 Numerous sites along the coast of the Moray Firth support internationally and nationally important breeding seabird populations. Species include fulmar, cormorant, shag, gannet, herring gull, great black-backed gull, kittiwake, guillemot, razorbill and puffin. The nearest designated site to the Wind Farm is the East Caithness Cliffs SPA, which at its closest point lies approximately 13.3 km to the north-west of the Wind Farm.

10.3.3 MFRAG Ornithology Subgroup have agreed that the key species of primary concern for monitoring are herring gull, great black-backed gull, guillemot, razorbill and puffin (agreement between BOWL, Marine Scotland, SNH, JNCC and RSPB). The gull species are of concern in relation to collision risk with operational turbines, the auks are of concern in relation to displacement from the operational wind farm. Effects in relation to vessel activity were not identified as a primary concern and impacts were determined to be of minor significance in the ES and SEIS. These species were all assessed in detail in the ES, SEIS and Habitats Regulation Assessment (HRA).

Spatial and temporal sensitivity of ornithological receptors

10.3.4 During the breeding season large numbers of seabirds congregate at breeding sites and in the coastal waters of the Moray Firth. At the end of the breeding season, many of these seabirds, notably the auks, disperse to foraging areas farther offshore. During this period auks were identified as being moderately sensitive to disturbance due to vessel activity, however, the ES concluded that this was of minor significance. Seaducks, including eider, goldeneye, long tailed duck, common scoter and velvet scoter over winter in the Inner Moray Firth in large flocks, and combined populations in excess of 20,000 birds have been reported (Lloyd *et al*. 1991). Red-throated divers, great crested grebes, long-tailed duck and significant numbers of unidentified scoter species are present in large numbers during winter (Dean *et al*. 2003). Nonetheless the ES and SEIS did not identify any seaduck species as being sensitive to disturbance as a result of vessel activity.

10.4 Proximity of Indicative Transit Routes to Key Environmental Sensitivities

10.4.1 The text that follows describes indicative vessel routes as detailed in Section 9 in the context of the environmental sensitivities summarised in Sections 10.2 and 10.3.

Marine Mammals

10.4.2 Comparison of the indicative vessel routes with the summary of environmental sensitivities demonstrates that many of the vessel movements will not impinge on those areas of greatest sensitivity for the three key marine mammal species – bottlenose dolphin, harbour seal and harbour porpoise.

10.4.3 Routeing of large construction vessels may pass close to areas of importance for bottlenose dolphin. In particular, during WTG installation regular return journeys will be made between the construction laydown port at Nigg and the Development Area. These will be generally large, slow moving construction vessels making relatively few and infrequent trips and following the routes used regularly by the other commercial shipping traffic from these ports (BOWL, 2012; Thompson *et al.,* 2015) (Figure 10.2).

10.4.4 Coastal areas favoured by the bottlenose dolphin population will be generally avoided by vessels transiting to and from the Development Area, although a limited number of vessel movements entering the Moray Firth from the south may route along the southern part of the Firth en-route to the construction laydown port (BOWL, 2012). The alternative transit route at the approaches to Buckie Harbour coincides with areas of high bottlenose dolphin probability, however, it is not expected that Buckie harbour will be routinely utilised during construction and Operation activities.

10.4.5 Smaller vessels undertaking more frequent journeys between port and the Development Area, such as CTVs, guard vessels and work boats, may utilise additional ports in the Moray Firth. Similarly for the harbour seal haul out sites, the indicative transit routes to and from the Development Area maintain a separation

between vessel routeing and haul out sites (BOWL, 2012). Indicative separation distances between these haul out sites (as shown on Figure 10.3) and the closest indicative vessel route are summarised in Table 10.5.

Table 10.5 – Proximity of indicative vessel routes to seal haul out locations

Seal haul out site	Approximate distance to closest indicative vessel transit route (by sea)
Findhorn	4.7km
Culbin	4.5km
Ardersier	8.2km
Cromarty Firth	17.9km
Milton	24km
Outer Dornoch Firth	27.4km
Beauly Firth	28.7km
Loch Fleet	33.8km

10.4.6 It is noted also that the indicative vessel transit routes generally avoid the areas predicted to have the highest at sea densities of seals (as shown in Figure 10.4) with the exception of areas closest to the potential construction laydown ports, areas around the Wind Farm and close to the landfall location along the OfTW corridor (Bailey & Thompson, 2011).

10.4.7 Harbour porpoise, given their distribution throughout the Moray Firth, may be subject to some level of disturbance where they encounter vessels. Use of regular vessel transit routes which follow, where possible, established shipping routes will act to restrict the spatial distribution of such disturbance and minimise as far as possible the effects arising. Marine mammals are more likely to tolerate increases in vessel traffic along these existing routes since they will be accustomed to high levels of shipping noise in these areas.

10.4.8 The effects on marine mammal species as a result of increased vessel activity through disturbance or increased risk of vessel strikes are in agreement with the conclusions reported in the ES (BOWL, 2012) and SEIS (BOWL, 2013). The ES and SEIS determined that effects resulting from increased vessel activity would be of minor significance to the marine mammal populations associated with the Moray Firth.

Ornithology

10.4.9 As noted in Section 10.3 a variety of seabird species are likely to be present in the waters of the Moray Firth and will be subject to some level of disturbance where they encounter vessels using the indicative vessel transit routes. However, as set out in the ES, no significant ornithological effects are predicted to result from vessel activity associated with construction or operation. Use of regular vessel transit routes which follow, where possible established shipping routes within the Moray Firth will nonetheless act to restrict the spatial distribution of such disturbance and minimise as far as possible the effects arising.

11 Potential Effects of Increased Vessel Activity on Environmental Sensitivities

11.1 Introduction

11.1.1 The ES identified a number of potential impacts arising from vessel traffic associated with construction and operation of the Development.

1. the potential for physical injury or mortality (otherwise known as collision risk) due to contact with vessels in the area; and
2. the potential for disturbance to marine mammals due to noise associated with vessels in the area.

11.1.2 The ES concluded that effects detailed above would be of minor significance for impacts to marine mammal and bird populations in the Moray Firth and not significant in the context of the EIA regulations.

11.1.3 The assessment outlined in the ES considered a worst-case scenario of up to 46 vessels being present within the Development Area at any one time. This was refined to include a most likely scenario of 20 vessels (excluding guard vessels) in the SEIS. It is anticipated that approximately 26 vessels will be present within the Development Area at any one time during construction inclusive of guard vessels. This falls within the parameters of the assessments detailed within the ES and SEIS (see Section 13 for further information).

11.2 Marine Mammals

11.2.1 Potential risks of collision of marine mammals with construction/operation vessels associated with the Development was considered in light of the concerns (at the time of preparing the application) regarding the potential for corkscrew injury in seals, and more recently cetaceans. At the time of writing the ES, the available evidence suggested that ducted propellers (such as Kort nozzles or Azimuth thrusters) were the most likely mechanisms for corkscrew injuries in seals. More recent research and guidance on this matter is now available and is summarised in Section 12 of this VMP.

11.2.2 In relation to collision risk, for all species of cetacean, and for all phases of the development, the ES concluded that risk from vessel strikes was considered to be low. This was based on the relatively small uplift in vessel movements when considered in the broader context of the existing level of vessel activity in the Moray Firth from oil industry support vessels, shipping, fisheries and recreation, where there are in excess of 4,000 shipping movements per year. As such, it was concluded that cetaceans are likely to have habituated to the current levels of activity such that the additional vessel movements associated with the construction and operation of the Beatrice Offshore Wind Farm would represent a negligible increase to the already high level of vessel activity in the area.

11.2.3 In relation to disturbance caused by vessel noise, the ES assessment again considered the broader context of the existing baseline level of vessel activity. Noise resulting from the construction or operational vessels will represent a small increase compared to the already high level of vessel activity in the area. As with impacts associated with vessel strike/collision, the ES concluded that cetaceans are considered likely to tolerate the current levels of noise resulting from vessel activity.

11.2.4 Since submission of the ES, an assessment of current noise levels within the inner Moray Firth has been undertaken in order to establish a noise baseline (Merchant *et al.*, 2014). Two locations were included in the study, both supporting commercial ship traffic: The Sutors at the entrance to the Cromarty Firth and Chanonry to the south west. Noise levels at The Sutors, in particular, were highly variable in the range 25 Hz–1000 Hz, and the spectrum featured frequent vessel passages. Vessels using dynamic positioning produced sustained, high-amplitude broadband noise concentrated below 1000 Hz. Analysis of data collected from C-PODs deployed in the same locations confirmed that the two sites were heavily used by bottlenose dolphin throughout the deployment periods. The authors of this study therefore concluded that, since the population appears to be stable or increasing (Cheney *et al.*, 2013), the current noise levels are not expected to pose a threat to bottlenose dolphin population levels in the Moray Firth.

11.2.5 Similarly, some haul-outs for harbour seal are within the Cromarty Firth and therefore animals moving to and from these colonies, and foraging inshore, are doing so in the presence of high levels of vessel traffic originating from fabrication yard and port at Nigg within the Cromarty Firth. The continued presence of marine mammals in areas of high vessel activity provides support to the conclusions set out in the ES that baseline vessel activity is high in the area and that marine mammals are likely to be habituated to this level of activity.

11.2.6 There is limited data on the effects of vessel traffic on harbour porpoise, however, this species is likely to avoid boats, showing an aversive reaction as a vessel approaches (Richardson *et al.,* 1995). For example, porpoises tagged in Danish waters, as part of DEPONS (Disturbance Effects on Porpoises in the North Sea) dived deep when approached by a fast ferry, and stopped echolocating until the ferry passed. As for other species, the response of harbour porpoise to vessel noise must be placed in the correct context to understand the potential for behavioural effects (Ellison *et al.* 2011). In the Moray Firth, baseline data shows that high densities of harbour porpoise occur despite the high background noise from existing vessel activities. As highlighted by Merchant *et al.*, (2014), degradation of habitat quality (through additional noise from shipping) is more likely to occur in areas that have low levels of existing noise levels compared with areas of high baseline noise levels. The vessel transit route will broadly comply with existing shipping routes as far as possible (Section 9).

11.2.7 As a result, and in relation to each of the potential impacts set out above, the assessments set out in the ES and SEIS concluded that there would be no significant long term effects on the populations of harbour seals, bottlenose dolphin and harbour porpoise as a result of vessel disturbance or collision. The HRA concluded that there would be no effect on the long term conservation status of bottlenose dolphin and harbour seal as a result of vessel disturbance or collision (BOWL, 2012a and 2012b) (when taking account of the relevant mitigation requirements as summarised in Section 12 and Appendix A of this VMP).

11.3 Ornithology

11.3.1 Great black-backed gull and herring gull are all highly mobile foragers, which spend significant proportions of time in flight, rapidly covering large sea areas in search of prey. Therefore, in relation to the potential effects due to vessel traffic associated with the construction or operation of the Development a small magnitude of change was assessed for these species resulting in predicted negative effects of minor significance.

11.3.2 Guillemot, razorbill and puffin were classed as being of medium sensitivity to disturbance from vessel activity by Garthe and Hüppop (2004). Auks often show a degree of disturbance by vessel activity either by flushing from the water surface or diving when a vessel approaches. However, the distance of displacement tends to be very small, particularly within the context of available suitable habitat within the Moray Firth. Given the relatively small spatial range over which vessel disturbance will extend it was considered highly unlikely that important numbers of birds would be displaced as a result of vessel activity, and thus no negative population level effects were predicted. Therefore a small magnitude of change was assessed for these high sensitivity species resulting in negative effects of minor significance.

11.3.3 In conclusion, in the ES and SEIS no significant impacts on birds were predicted as a result of vessel traffic during the construction or operation of the Wind Farm and OfTW. The assessment was based on the projected levels of vessel traffic and a review of available literature on seabird sensitivity to disturbance (Garthe and Hüppop 2004). While the predicted sensitivity of seabirds to offshore wind farms (including effects during construction) has since been updated (Furness *et al*. 2013), the update does not alter the conclusions of the original assessment: no significant ornithological effects are predicted to result from vessel activity associated with construction or operation.

12 Working Practices Related to Ducted Propeller Use

12.1 Introduction

12.1.1 Condition 16 of the S36 Consent and Condition 3.2.2.8 of the OfTW Marine Licence requires that this VMP include details related to ducted propeller use, specifically:

b) Working practices to minimise the unnecessary use of ducted propellers;

12.1.2 It is understood that this requirement of the condition derived from prevailing advice issued by the Statutory Nature Conservation Bodies (SNCBs) (JNCC, 2012) at the time of consent application and determination, which identified concern regarding the risk of corkscrew injuries to seals, initially attributed to some ducted propeller systems such as Kort nozzles or some types of Azimuth thrusters, commonly used by Ducted Propeller (DP) vessels.

12.1.3 A number of the vessels that will be used in the construction of the Development and during exceptional maintenance activities will be DP vessels (see Section 7).

12.1.4 Since the application, new evidence relating to corkscrew injuries to seals has emerged alongside new advice from the SNCBs (JNCC, 2015). The following section reviews the updated evidence and guidance in relation to this issue and in the context of any need for further mitigation relating to the use of DP vessels.

12.2 Updated Understanding of Ducted Propeller Impacts

12.2.1 The proximity of the Development to areas of importance for seals and the numbers of individuals present meant that seal corkscrew injuries linked to the use of ducted propeller was a potential impact identified in the ES. The ES concluded that the effects of ducted propeller operations on seal populations were of minor significance based on lack of evidence linking the cause of corkscrew seal injuries to ducted propellers.

12.2.2 Since the submission of the original Application there has been ongoing research into the issue of corkscrew injuries in seals which has confirmed that the characteristic wounds can be caused by a seal being drawn through ducted propeller system (Thompson *et al.*, 2010, Bexton *et al.*, 2012; Onoufriou & Thompson, 2014). To date the observed strandings of seals with spiral lacerations appear to be restricted to juvenile grey seal and female harbour seal with seasonal differences evident between the species: grey seal newly weaned pups in the winter and common seal adults or pregnant females in the summer (Brownlow, 2013).

12.2.3 In experimental studies (Onoufriou & Thompson, 2014) it has been shown that using a combination of propeller and seal sizes, smaller seals were more likely to show the characteristic spiral lacerations; while larger seal models often became stuck in the ducted propeller system. The results of these trials and observed stranded seals suggested, at that time that the ES was drafted, that there were still a number of uncertainties as to the frequency of occurrence, and mechanisms for this type of injury.

12.2.4 However, more recent known research (Thompson *et al*., 2015; van Neer *et al*., 2015) now suggests that there is very strong evidence that predatory behaviour by grey seals, rather than ducted propeller injuries, is likely to be the main cause of corkscrew seal deaths. Although this evidence does not completely eliminate ship propellers, it is now considered to be unlikely that they are a key factor. The SNCBs have provided interim advice (JNCC, 2015) on this issue, as an update to their earlier (April 2012) advice, in order to clarify the recommendations on this issue for regulators and industry.

12.2.5 The most recent SNCB advice states that *'it is considered very likely that the use of vessels with ducted propellers may not pose any increased risk to seals over and above normal shipping activities and therefore mitigation measures and monitoring may not be necessary in this regard, although all possible care should be taken in the vicinity of major seal breeding and haul-out sites to avoid collisions'.*

12.2.6 This advice provides a new perspective on the preceding SNCB Guidance (2012) on the potential risk of seal corkscrew injuries, which made recommendations for mitigation.

12.2.7 In the light of the distances between seal haul-outs and the proposed vessel routes, the new scientific evidence and the revised SNCB advice, the risk of propeller collision impacts associated with the use of ducted propellers, by DP or other installation vessels, during construction is considered to be low risk. In line with the latest guidance, BOWL do not, therefore, propose any additional specific mitigation or monitoring measures in respect of the use of DP vessels. However, given that the possibility of injury by ducted propellers cannot be fully disregarded, vessel operators will be made aware of the marine mammal and bird sensitivities in the Moray Firth to enable them to operate their vessels in a way that minimises disturbance or collision risk. This may include measures such as;

- consideration of existing shipping lanes in passage planning;
- avoiding sudden changes in speed or direction in transit to and from the site as far as possible and unless required for health and safety reasons or other emergency purposes;
- consider alternatives to the use of ducted propellers where possible;
- keeping a good look forward (this particularly applies to the smaller vessels);

- not intentionally pursuing marine mammals or birds; and,
- not instigating contact with marine mammals or birds.

13 Compliance with the Application, ES and SEIS

13.1 Introduction

13.1.1 In addition to the conditions presented in Table 1.1, Condition 8 of the S36 Consent states:

The Development [Wind Farm] must be constructed and operated in accordance with the terms of the Application and related documents, including the accompanying ES, the SEIS and Annex 1 of this letter, except in so far as amended by the terms of this section 36 consent.

13.1.2 Sections 10.1 and 10.2 set out information from the ES/SEIS and original Application with regard to:

- Compliance with the vessel details as assessed in the ES/SEIS; and
- Vessel management related mitigation measures detailed in the ES/SEIS.

13.2 Compliance with Vessel Details Assessed in the ES/SEIS

13.2.1 The ES and SEIS provided provisional information on the types and numbers of vessels that could be used in the construction of the Development. Since the Development consents were awarded, the design of the Development and the approach to construction has been refined and currently envisaged types and numbers of vessels are presented in Section 7 of this VMP.

13.2.2 In order to demonstrate compliance of this refined design, vessel types and numbers described in ES and SEIS can be compared to those identified in this VMP (as summarised in Section 7).

13.2.3 Effects of vessels on marine mammals and birds were fully considered within the ES/SEIS for both the OWF and the OfTW. The impact assessments considered the effects of vessel collision on marine mammals and the effects of vessel noise on marine mammal species. The significance of both effects on marine mammals within the Moray Firth was concluded to be of minor significance and not significance in respect of the EIA regulations.

13.2.4 Assessments considered a worst case scenario (as presented in the ESs) of up to 46 vessels in the Wind Farm at any one time, with additional vessels in the OfTW site during the construction phase. Although consented on the basis of the worst case vessel numbers a ‘more ‘realistic’ scenario was presented in the SEIS. This gave an estimated 20 vessels (excluding guard vessels) operating at any one time in Development Area during busy periods of construction.

13.2.5 Vessel numbers for the refined project design, as set out in the approved CMS and this VMP will result in an estimated 26 vessels (including guard vessels) operating at any one time in the Development Area during the busiest periods of construction. This is therefore within the worst case scenario estimate in the ES and in broad

agreement with the 'more 'realistic' scenario estimates given in the SEIS.

13.3 Delivery of Mitigation Proposed in the ES/SEIS

13.3.1 The ES and SEIS detailed a number of mitigation commitments specific to the design of the Development. Measures relevant to vessel management and issues related to vessel disturbance and collision risk for sensitive environmental receptors are presented in full in Appendix A, which also identifies where each commitment has been addressed within this VMP (or within other relevant BOWL Consent Plans).

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Appendix A: BOWL ES/SEIS Commitments

Document	Chapter No.	Chapter	Ref (pg, para)	Details of commitment	Reference to Section in VMP
ES	12	Marine Mammals	12-73, p237	As a result of the uncertainty relating to effects of DP vessels using ducted propellers on seals ongoing monitoring is proposed. BOWL will work closely with the statutory authorities and SMRU to further the understanding of these potential effects, based on the latest information and guidelines as they emerge.	Section 12
ES	12	Marine Mammals	12-73, p238	Operators of all vessels involved in construction of the Wind Farm will be made aware of the risks of DP vessels using ducted propellers to seals.	Section 12
ES	12	Marine Mammals	12-73, p238	Development of further mitigation and monitoring options will be discussed with the regulators should the types of vessels used be thought to cause a risk to seals.	Section 12
ES	24	Marine Mammals OfTW	24-54, p.138	Ongoing monitoring is proposed. BOWL will work closely with the statutory authorities and SMRU to further the understanding of the potential effects of DP vessels using ducted propellers on grey seal, based on the latest information and guidelines as they emerge.	Section 12
ES	24	Marine Mammals OfTW	24-54, p.139	Operators of all vessels involved in construction of the transmission works will be made aware of the risk of potential mortality of grey seal	Section 12
ES	24	Marine Mammals OfTW	24-54, p.139	Development of possible monitoring options will be discussed with the regulators should the types of vessels used be thought to cause a risk to seals	Section 12
ES	24	Marine Mammals OfTW	24-54, p.143	However, should BOWL vessels be found to pose a risk to seals through the use of ducted propellers during construction operations, measures will be developed to minimise risks to	Section 12

Document	Chapter No.	Chapter	Ref (pg, para)	Details of commitment	Reference to Section in VMP
				seals during the construction/ decommissioning works.	