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Inch Cape Offshore Wind Farm Section 36 Variation Application Report

Inch Cape Acceptance

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Acronyms & Abbreviations

Acronym	Term
AA	Appropriate Assessment
CRM	Collision Risk Modelling
DSLP	Development Specification and Layout Plan
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ICOL	Inch Cape Offshore Limited
LAT	Lowest Astronomical Tide
MSL	Mean Sea Level
MW	Megawatt
OFTW	Offshore Transmission Works
OSP	Offshore Substation Platform
SLVIA	Seascape, Landscape and Visual Impact Assessment
WTG	Wind Turbine Generator

Glossary

Defined Term	Meaning
Development Area	The area for the Wind Farm, within which all WTGs, inter-array cables, interconnector cables, OSPs and the initial part of the Offshore Export Cable and any other associated works must be sited. As stipulated in the Crown Estate agreement for lease.
The Wind Farm	The Inch Cape Offshore Wind Farm

Executive Summary

Inch Cape Offshore Limited (ICOL) request a variation to the existing Section 36 Consent under Section 36C of the Electricity Act 1989 and, should this be granted, Marine Licence 06781 – Offshore Wind Farm (OWF) (Revised Design), in accordance with section 30(3) of the Marine (Scotland) Act 2010 (2010 Act).

The proposed changes (the Proposed Variation) are required to optimise wind farm efficiency and enable utilisation of the best available technological solution for the site, taking into account the results of site investigations and detailed engineering design. The Proposed Variation maximises the potential for renewable energy production to meet government targets and ensures the most optimal technology solution can be deployed at the site both from an environmental impact and cost of technology perspective.

The Proposed Variation will capture the following in relation to the Wind Farm:

- Altered turbine spacing to allow an optimised border layout to maximise wind resource use;
- Increased hammer energy required to successfully install the foundations; and
- Confirmed parameters pertinent to the Preferred Design Scenario¹.

A Screening Opinion under the Electricity Works Environmental Impact Assessment (EIA) Regulations and Marine Works EIA Regulations was made by Scottish Ministers on 16 September 2022. This concluded that the Scottish Ministers were of the view that the Proposed Variation to the Inch Cape Offshore Wind Farm Section 36 Consent, and Marine Licence 06781 was not an EIA project under the 2017 Marine Works Regulations and 2017 Electricity Works Regulations and, therefore, an EIA is not required to be carried out in respect of this Proposed Variation.

This document has been produced to provide the supporting information to inform the request for the Proposed Variation.

¹ Summarised in Table 2.1

1 Introduction

1.1 Background

- 1 The Inch Cape Offshore Wind Farm (the Wind Farm) and Offshore Transmission Works (OfTW), hereafter referred to as The Development, is being developed by Inch Cape Offshore Limited (ICOL) (see Figure 1.1).

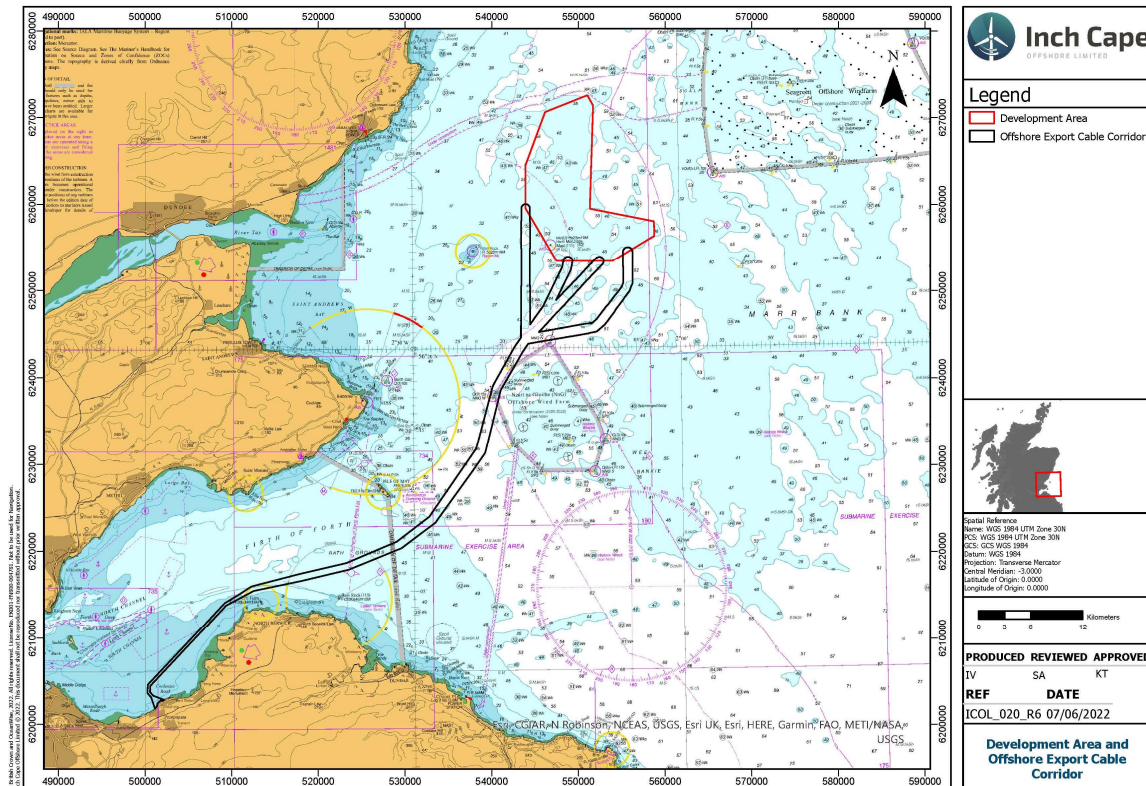


Figure 1.1: Inch Cape Offshore Development Area and Offshore Export Cable Corridor

- 2 In 2014, the Scottish Ministers granted ICOL Section 36 and Marine Licence consents for the construction and operation of an offshore Wind Farm and a marine licence for the construction and operation of the OfTW. The licences granted to ICOL in 2014 (along with those for other Forth and Tay projects, Seagreen Alpha and Bravo and Neart na Gaoithe) were subject to a petition for judicial review in early 2015. A decision was made by the UK Supreme Court in November 2017 to uphold the Scottish Ministers' decisions to grant the offshore consents.
- 3 In 2018, ICOL submitted a new application with a revised design that would allow the development of a project that could utilise progressions in turbine technology since the 2014 consent. The revised design was aimed at reducing the environmental impacts and increasing the cost competitiveness

of the project, primarily by reducing the overall number of turbines and increasing the height of the turbines being installed. Section 36 and Marine Licence Consents for the revised design were granted by Scottish Ministers in 2019.

- 4 Since the consent for the revised design was received, ICOL have also sought variations to the existing consents, firstly to allow for increased maximum generation capacity of 1000 MW (variation approved July 2020) and secondly to remove the maximum generation capacity from the Section 36 consent (approved July 2021).
- 5 On 4 July 2022 ICOL submitted a request for a Screening Opinion under the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (see Appendix A). To support the request for a Screening Opinion, ICOL submitted a Screening Report (Inch Cape Offshore Wind Farm Section 36 Variation Application – Screening Report). The Screening Report contained information to demonstrate that the Proposed Wind Farm Variation will not have significant adverse effects on the environment and therefore did not constitute Environmental Impact Assessment (EIA) development and it was appropriate to screen the Proposed Wind Farm Variation out of the requirement for EIA.²
- 6 A Screening Opinion under the Electricity Works EIA Regulations and Marine Works EIA Regulations was made by Scottish Ministers on 16 September 2022. This concluded that the Scottish Ministers were of the view that the Proposed Wind Farm Variation to the Inch Cape Offshore Wind Farm Section 36 Consent, and Marine Licence 06781 was not an EIA project under the 2017 Marine Works Regulations and 2017 Electricity Works Regulations and, therefore, an EIA is not required to be carried out in respect of this Proposed Wind Farm Variation.

1.2 Intention to Vary Existing Consents

- 7 ICOL requests a variation to the existing Section 36 Consent under Section 36C of the Electricity Act 1989 and, should this be granted, Marine Licence 06781 – Offshore Wind Farm (OWF) (Revised Design), in accordance with section 30(3) of the Marine (Scotland) Act 2010 (2010 Act).
- 8 The Proposed Wind Farm Variation is required to optimise wind farm efficiency and enable utilisation of the best available technological solution for the site, taking into account the results of site investigations and detailed engineering design. The Proposed Wind Farm Variation maximises the potential for renewable energy production to meet government targets and ensures the most optimal technology solution can be deployed at the site both from an environmental impact and cost of technology perspective.

² The position under the Marine Works EIA Regulations is broadly similar to that under the Electricity Works EIA Regulations.

1.3 Scope of this document

9 This document has been produced to provide the supporting information to inform the request for the Proposed Variations, and contains the following:

- Details of the Project and Proposed Variations (Section 2);
- Further Technical Considerations following Screening Opinion (Section 3);
- Habitats Regulation Assessment (HRA) (Section 4); and
- Summary and Conclusion (Section 5).

2 Project Description and Proposed Variations

2.1 Existing Project Characteristics

2.1.1 Description of Development

10 The Section 36 Consent describes the Consented Development as an offshore energy generating station comprised of:

1. *No more than 72 three-bladed horizontal axis Wind Turbine Generators ("WTGs"), each with:*
 - a) *A maximum height to blade tip of 291 metres (measured from Lowest Astronomical Tide ("LAT"));*
 - b) *A maximum rotor diameter of 250 metres;*
 - c) *A minimum blade tip clearance of 27.4 metres (measured from LAT);*
 - d) *A maximum blade width of 7.8 metres; and*
 - e) *A nominal turbine spacing of 1,278 metres.*
2. *No more than 72 substructures and foundations and ancillary equipment.*
3. *No more than 190 km of inter-array cabling.*

The total area within the Development site boundary is 150 km².

2.1.2 WTG Layout

11 Layout is not specified in the Section 36 Consent (or Marine Licence) but was anticipated to be a grid or offset grid configuration (Figure 2.1, Figure 2.2). The Original Development included 213 WTGs with a nominal minimum spacing of 820 m as the worst case, while the Revised Development encompassed 72 WTGs with a nominal minimal spacing of 1,278 m.

Source: Inch Cape Offshore Wind Farm Environmental Impact Assessment Report (2018) Chapter 7 – Project Description

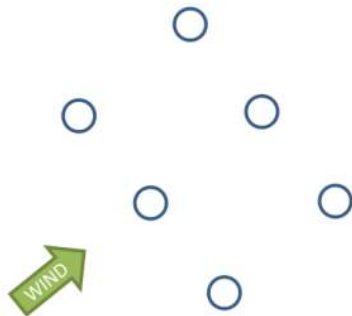


Figure 2.1: Illustration of a 'Grid' Configuration



Figure 2.2: Illustration of 'Offset Grid' Configuration

12 The layout of the wind farm is subject to a design optimisation process including selection and procurement of WTGs, and is dependent on several factors including:

- Prevailing wind direction, as WTG rows must be orientated to benefit from the dominant wind direction;
- Distance from adjacent WTG to maximise efficiency of energy capture;
- Geological conditions;
- Bathymetry;
- Physical and spatial constraints; and
- Environmental considerations.

2.2 Proposed Changes and Variation Requirements

13 The Proposed Variation will capture the following in relation to the engineering design of the Development:

- Altered spacing to allow an optimised layout to maximise wind resource capture;
- Increased hammer energy required to successfully install the WTG foundations; and
- Confirmed parameters pertinent to the Preferred Design Scenario.

2.2.1 Optimised Border and Minimum Spacing

14 Recent site geotechnical data has been collected for 80 potential WTG locations, of which 72 locations will be chosen for WTG placement, arranged in an optimised border layout. This would result in an increase in WTGs around the border of the Development Area, with the remaining WTGs arranged in a grid in the centre of the Development Area, and a change of the minimum spacing to 1,025 m. A variation is required to change the nominal WTG spacing of 1,278 m in Marine Licence 06781 and Section 36.

15 Wind farm layout is not specified in the Section 36 Consent (or Marine Licence), however there is a general requirement to comply with the assessment and conclusions of the Environmental Impact Assessment Report (EIAR) and the approved Development Specification and Layout Plan (DSLPL).

16 The updated wirelines to present the Preferred Design Scenario provided in the Screening Request (in Appendix D) are presented in this Report in Appendix A. Final wirelines will be provided in support of the discharge of the Design Statement condition, 13 and 3.2.2.10, of the Section 36 and Marine Licence 06781 consent respectively.

2.2.2 Hammer Energy

17 In order to be able to successfully pile monopile foundations in all ground conditions expected within the Development Area, it is anticipated that a 5,500 kJ hammer will be required.

18 Hammer energy is not specified in the Section 36 Consent (or Marine Licence), however there is a general requirement to comply with the assessment and conclusions of the EIAR and the approved Piling Strategy.

2.2.3 Preferred Design Scenario

- 19 As described in 2.1.1 above, the Section 36 Consent sets out parameters, but provides by condition 7 that the Development must be constructed and operated in accordance with the Application (which includes the EIAR). The ornithology chapter of the EIAR assessed two design scenarios, A and B (see Table 2.1). The two scenarios (A and B) represent two designs to represent the extent of the design envelope, each giving a maximum rotor swept area below 50 m above mean sea level of 87,000 m² (a commitment in the EIAR, see for example Table 11.4, "Worst Case Scenario Definition"). The Marine Licence sets out parameters for both of these assessed design scenarios ("Part 2 – The Works") but provides that where the final design agreed through the DSLP falls between A and B, the collision risk to birds must be no greater than assessed in the Appropriate Assessment. The Marine Licence also provides by condition 3.1.1 that the works must be constructed and operated in accordance with the Application (which includes the EIAR). Both the Section 36 Consent and Marine Licence provide a condition requiring approval of the DSLP (Section 36 condition 12, Marine Licence section 1.4 and condition 3.2.2.9 respectively).
- 20 At this time a Preferred Design Scenario (in terms of WTG numbers and dimensions and number of Offshore Substation Platforms OSPs) for the Wind Farm has been identified. The Preferred Design Scenario falls within a combination of parameters from A and B. For completeness, in order to demonstrate that for the Proposed Design Scenario the collision risk to birds is no greater than the consented worst-case parameters, Collision Risk Modelling (CRM) for the Preferred Design Scenario is appended to the original screening report included as Appendix A. Appendix C provides the updated CRM report that includes the stochastic CRM (sCRM), in line with the NatureScot advice, for the Revised Design Scenarios A and B and the Preferred Design Scenario. The updated wirelines provided in Appendix D of the Screening Report and included in this report as Appendix A present the Preferred Design Scenario, which includes the reduction in turbine spacing. The Preferred Design Scenario falls between A and B in terms of the Marine Licence, to ensure full alignment between the Section 36 Consent and Marine Licence. For the avoidance of doubt, CRM will also be submitted along with the DSLP and Design Statement for approval under the Section 36 and Marine Licence conditions when the layout is finalised.

Table 2.1: Comparison of the 2018 EIAR Revised Design/2019 Consents with the Preferred Design Scenario

Parameter	Section 36	Marine Licence Scenario A	Marine Licence Scenario B	Preferred Design Scenario	Comparison
No more than X, three-bladed horizontal axis WTG	72	72	40	72	Does not exceed maximum number of turbines 72
A maximum height to blade tip of X metres (measured from Lowest Astronomical Tide ("LAT"));	291	215	291	270.7	Does not exceed worst case maximum blade tip of 291 m
A maximum rotor diameter of X metres;	250	167	250	236	Does not exceed worst case rotor swept area 250 m
A minimum blade tip clearance of X metres (measured from Mean Sea Level "MSL");	27.4	32.6	27.6	34.7	Does not exceed worst case and provides increased minimum clearance to comply with 87,000m ² commitment
A maximum blade width of X metres; and	7.8	6.0	7.8	5.1	Does not exceed worst case
A nominal turbine spacing of X metres.	1,278	1,278	1,278	1,025	Reduction in minimum spacing screened in this report.
Number of Offshore Substation Platforms	Up to 2	Up to 2	Up to 2	1	Does not exceed maximum number of OSPs

2.3 Proposed Variation

- 21 The Proposed Variations to the project description are set out in the above sections and summarised in Section 5 below. The Proposed Variation will also clarify that the definition of Application documents which must be complied with in terms of the Section 36 Consent and Marine Licences should include this Variation Report and appendices, if accepted. This is to ensure that the proposed increase to hammer energy (which is not otherwise a consent parameter) must be complied with.
- 22 No variation is sought in respect of the number of OSPs, as the Preferred Design Scenario falls within the consented parameters of Marine Licence 06782/19/0 (Part 2.1) which permits up to two

OSPs. Additionally, the number, placement and design of the OSFs will continue to be governed by the existing Condition 3.2.2.8 which requires a Development Specification and Location Plan (DSLPL) to be submitted to and approved by the Licensing Authority in consultation with others.

2.4 Screening Opinion Consultation

- 23 Following review of the 2013 Environmental Statement and 2018 EIAR, and further consideration of environmental effects arising from the Proposed Variation, no further significant impacts were identified to arise from the Proposed Variation, and it is considered that no EIA is required. The Scottish Ministers, in their Screening Opinion were of the view that the Proposed Variation to the Inch Cape Offshore Wind Farm Section 36 Consent, and Marine Licence 06781 was not an EIA project under the 2017 Marine Works Regulations and 2017 Electricity Works Regulations and, therefore, an EIA is not required to be carried out in respect of this Proposed Variation.
- 24 Table 2.2 provides a summary of the consultation responses received for the screening request and, where relevant, how these have been addressed in this variation report.

Table 2.2: Summary of Screening Consultation

Consultee	Method	Consultee Response Summary	ICOL Response
Aberdeenshire Council	Screening Opinion Consultation Response	<p>I am writing to you in respect of the consultation request for the development above. After a review of the submission, I would offer the following observations:</p> <ul style="list-style-type: none"> The interests of Aberdeenshire Council are limited to those effects or impacts which would occur within the Aberdeenshire Council Area. Aberdeenshire Council agree that the development would fall under Schedule 2 paragraph 2 as stated within the Screening Report. The scope of the screening therefore relates to differential impact of the variation, as opposed to reassessing the development as a whole. The variation falls largely within the previously agreed parameters, with the proposed textual changes limited to a reduction in turbine spacing and a statement on design parameters. <p>Bearing in mind the above points, it is considered that the scope for comment is limited. As such Aberdeenshire Council would agree that the potential environmental impacts of the variation are unlikely to be so widespread as to warrant the submission of a complete Environmental Impact Assessment (EIAR).</p> <p>This screening opinion is offered without prejudice to the assessment of any future application or further screening requests. I would highlight that the Seascape, Landscape and Visual Impact of the development would remain a key consideration for Aberdeenshire Council and as such the variation application should be supported by appropriate information in respect of this matter.</p>	<p>In support of the Screening Request wireline visualisations were prepared for the 26 viewpoints assessed in the EIAR, and a consideration based on review of those comparative wirelines undertaken. The review concluded that there would be no change in the distribution of likely significant effects on seascape, landscape or visual amenity, and the existing assessment remains valid in view of the Proposed Variation. This information has been provided in support of this application within Appendix A.</p> <p>ICOL will, as required by the consents, submit a Design Statement for approval which will include representative wind farm visualisations from key viewpoints as agreed with the Scottish Ministers, based upon the final DSLP as approved by the Scottish Ministers as updated or amended.</p>

Consultee	Method	Consultee Response Summary	ICOL Response
Angus Council	Screening Opinion Consultation Response	<p>I refer to the above consultation and having reviewed the submitted information in so far as potential impacts on Angus, Angus Council is satisfied that the S36 variation proposal would not result in impacts of significance that are new or materially different to those of the consented Inch Cape Project.</p> <p>Angus Council would be minded to accept the conclusions presented in the screening report.</p>	Noted
Dundee City Council	Screening Opinion Consultation Response	<p>Thank you for sending the screening information. I can advise that we have no comment to make on the request for a screening opinion.</p>	Noted
East Lothian Council (ELC)	Screening Opinion Consultation Response	<p>The proposal is for a new layout which has the effect of increasing the density of the turbines. This proposal will appear in views from East Lothian in the context of the Forth Islands. These views are obtainable in particular from the coast around North Berwick. Both visitors and residents appreciate these views. We consider these views to be among the best in East Lothian, and therefore are a highly sensitive receptor. The change does not introduce turbines into the view, as this was done by the consented proposal. Nor does it significantly extend the view. However, it does intensify the impact of the proposal as the turbines appear considerably 'busier' and with less separation between them. We consider this to be a moderate effect. As a moderate impact on a highly sensitive receptor, we consider the proposal is likely to have significant adverse effects on the environment. In our view therefore the change should be considered through EIA</p>	<p>As per the Screening Request report ICOL acknowledge the appearance of Inch Cape Offshore Wind Farm would change as a consequence of the Proposed Variation but would like to reiterate the findings of that Screening Report. Wireline visualisations were prepared for the 26 viewpoints assessed in the EIAR, and a consideration based on review of those comparative wirelines undertaken. The review concluded that there would be no change in the distribution of likely significant effects on seascape, landscape or visual amenity, and the existing assessment remains valid in view of the Proposed Variation. As ELC correctly point out in their response, the important question for screening is whether the "change" being proposed "may have significant adverse effects on the environment", it is</p>

Consultee	Method	Consultee Response Summary	ICOL Response
			<p>not a re-assessment of the whole project as proposed to be changed but the change itself.</p> <p>Viewpoint 25 (Dunbar) and Viewpoint 26 (Berwick Law) are specific to East Lothian and are representative of the visual receptors referred to by East Lothian Council. Both these viewpoints are on the edge of the 50km study area applied in the Seascape, Landscape and Visual Impact Assessment. Inch Cape Offshore Wind Farm would be seen in the context of (extending to the left of) the Neart na Gaoithe and Seagreen offshore wind farms, both of which are consented and/or under construction. Neart na Gaoithe Offshore Wind Farm is also located closer to East Lothian than Inch Cape Offshore Wind Farm and therefore may be more prominent in views, particularly taking into account potential weather conditions. Based on the wireline visualisations that have been prepared, the turbines within the Neart na Gaoithe and Seagreen Offshore Wind Farms would typically be clustered within the views from East Lothian and therefore consistent with the appearance of the Proposed Variation to Inch Cape Offshore Wind Farm.</p> <p>Therefore, ICOL consider that the impacts of the Proposed Variation in respect of seascape, landscape, and visual effects have been fully considered.</p>

Consultee	Method	Consultee Response Summary	ICOL Response
Fife Council	Screening Opinion Consultation Response	Having examined the details of the proposed variation to the Inchcape OWF, I can confirm that Fife Council has no comment to make on the matter.	Noted
HES	Screening Opinion Consultation Response	<p>We are content to agree with the scoping report that the changes to the design of the scheme will not have significant effects on our interests. We note that there will be no change to impacts on marine archaeology from the previous scheme. The only potential for increased impacts would be on the setting of terrestrial heritage assets.</p> <p>The change in impacts on the setting of heritage assets would result from alterations to the scheme design, including reduction in turbine tip height from 291m to 274m, increase in turbine numbers from 40 to 72 turbines and an additional offshore substation platform.</p> <p>We consider that of these changes, the only one which would have the potential to materially alter setting impacts for our interests is the change in turbine numbers and layout.</p> <p>As the screening report states, the 2018 EIA Report assessed impacts based on a worst case scenario, with the highest number of turbines and the greatest height to tip. The currently proposed variation therefore would not increase the impacts as previously assessed for our interests.</p> <p>We are content that any alteration to layout is not likely to alter the impacts on our terrestrial interests significantly. Paragraph 71 of the screening report notes that impacts on marine archaeology receptors are avoided by embedded mitigation. We therefore have no identified any reason to consider the proposed variation as EIA development for cultural heritage reasons within our remit.</p>	Noted, however there is not an increase in the total number of turbines or OSPs. Please refer to Table 2.1 which provides a comparison of the 2018 EIAR Revised Design/2019 Consents with the Preferred Design Scenario.

Consultee	Method	Consultee Response Summary	ICOL Response
NatureScot	Screening Opinion Consultation Response	<p>However, we note that on page 26 (PDF page 31) of the Screening Report (IC02-INT-EC-OFL-001-INC-RPT002 Rev 2), the final proposed revision of the Section 36 and Marine Licence condition text (highlighted in yellow) is not worded clearly. We advise that this is reviewed and reworded in the application.</p> <p>Overall we are content with the approaches and findings outlined in the Screening Report and appendices such that we agree that there would be no material change to predicted natural fish and shellfish, marine mammals, ornithology or seascape/landscape impacts from the proposed variation.</p> <p>Therefore NatureScot consider that the proposed variation would not require a full EIA to support the variation application. Please see below for further advice specific to marine mammals, ornithology and SLVIA, that we hope will assist Inch Cape with their forthcoming variation application.</p> <p>We have reviewed the Screening Report and note that the percentage of the reference population impacted, as based on the updated modelling, is still considered to be not significant under EIA legislation. However, it would have been helpful to have the numbers of individuals and percentages of reference populations detailed in this report to enable comparison. We advise that this evidence is included in the variation application as it will also assist with consideration for subsequent EPS licences.</p> <p>We have reviewed the CRM approach outlined in the Screening Report and Appendix A and note that this assessment was run as a like for like with the previous CRM for ICOL (with updated turbine</p>	<p>Noted, the proposed revisions to the conditions have been refined for clarity.</p> <p>Noted, requested additions provided in Section 3.1 and Appendix B</p> <p>Noted, requested additions provided in Section 3.2 and Appendix C. To enable a like-for-like comparison, this application has presented two sets</p>

Consultee	Method	Consultee Response Summary	ICOL Response
		<p>parameters). We made comparisons with current NatureScot and SNCB advice and note a couple of discrepancies highlighted below, which we recommend are updated for the variation application. As highlighted above, we recommend that variability is incorporated for all collision risk modelling. This can be implemented using the sCRM for Seabirds in Flight tool developed by McGregor et al. (2018) – for the nocturnal activity scores this should be run once with each value. We also recommend that mean collision estimates and associated 95% confidence limits should be presented in tabular form, as generated by the sCRM tool. We note the use of Option 2 of the basic Band model, which we recommend is always presented, with other options also presented as/if appropriate.</p> <p>We have reviewed Appendices C-E and note the comparisons to the 2018 EIA, which was carried out for 40 WTGs with a 166m hub height and a 291m tip height, as this was determined to be the worst-case scenario for SLVIA at the time. The ZTV for the proposed variation is based on 79 turbines with 155.6m hub heights and 273.6m tip heights. We note that whilst the proposed variation is for 72 WTGs, 79 potential WTG locations have been presented in the visualisations because the final layout is still being refined. We agree with the conclusions of the Screening Report that there will be limited changes to predicted visibility from the proposed variation and that whilst the appearance of the wind farm would change, there would be no change to the likely significant effects to seascape, landscape or visual receptors. Therefore NatureScot agree that there is no requirement to undertake a new SLVIA for the proposed variation. However, we advise that the revised wirelines should also be included in the variation application, to show the significant changes in the appearance of the wind farm</p>	<p>of CRM: (a) the Preferred Design Scenario vs the Revised Design Scenario A and B using the deterministic Band model and (b) the Preferred Design Scenario vs the Revised Design Scenario A and B using the requested sCRM/nocturnal modelling.</p> <p>ICOL will, as required by the consents, submit a Design Statement for approval which will include representative wind farm visualisations from key viewpoints as agreed with the Scottish Ministers, based upon the final DSLP as approved by the Scottish Ministers as updated or amended.</p>

Consultee	Method	Consultee Response Summary	ICOL Response
		and to provide the baseline for consideration against the Design Statement, that is a requirement of the original consent, to provide visualisations to indicate the as built windfarm.	
Scottish Borders Council	Screening Opinion Consultation Response	Thank you for consulting Scottish Borders Council but we have no comments to offer on the Screening request as we feel that any areas of interest to this Council would be adequately covered by other bodies and agencies, given the distance of the wind farm from our Council boundary.	Noted
SEPA	Screening Opinion Consultation Response	SEPA does not consider that EIA is required, in relation to our interests. It therefore appears that this application falls under our standing advice. Please therefore refer to the advice provided in our document "SEPA standing advice for the Department for Business, Energy and Industrial Strategy and Marine Scotland on marine consultations" Should you have concerns regarding this development, which are not covered by our standing advice, we would be happy to be re-consulted. However, please provide details of the specific issues upon which you would like our comment.	Noted

3 Further Technical Considerations following Screening Opinion

25 The following section provides further information and consideration of environmental effects arising from the Proposed Variation, accounting for advice in the MS-LOT Screening Opinion, on the marine mammals and ornithological receptors.

3.1 Marine Mammals

26 An analysis of pile driving using greater hammer energies was undertaken in consultation with Marine Scotland Science and NatureScot (see Appendix B).

27 Several new scenarios were modelled using the INSPIRE underwater noise propagation software (Subacoustech Environmental) to explore how use of greater hammer energies may affect the size of potential impact zones (and numbers of marine mammals which have the potential to be exposed to received noise levels sufficient to induce either the onset of permanent threshold shift (PTS) or displacement).

28 For instantaneous PTS the maximum impact ranges were up to 710 m for very high frequency cetaceans (harbour porpoise, *Phocoena phocoena*). For the other hearing groups (low frequency cetaceans, high frequency cetaceans, phocid seals in water) they were ≤ 60 m. Appropriate use of mitigation (i.e., activation of an acoustic deterrent device) will ensure that no animals are present within the zone of potential impact. The potential impact (with mitigation) is therefore considered to be zero, i.e., no effect (and not significant).

29 For cumulative PTS (Table 3.1) and displacement (Table 3.2) the numbers of individuals of the different species estimated to have the potential to be exposed to noise levels sufficient to induce the onset of cumulative PTS or a behavioural response (displacement) were greater than those presented in the 2018 EIAR (see Appendix B). This is the result of a combination of factors; use of a different noise modelling approach (Subacoustech's INSPIRE as opposed to Cefas' model), use of different species density surfaces, use of different noise dose-behavioural response relationships, and use of greater hammer energies. However, when expressed as percentages of the relevant reference populations and used to predict the significance of the potential effects, the potential impacts arising were considered to result in nil, minor, or moderate effects. Using the same criteria (for predicting significance of effects) as the 2013 ES and 2018 EIAR, these potential effects were not significant.

30 The findings of this exercise are in line with those from the 2018 EIAR, i.e., no significant effects. As such, use of greater hammer energies can be considered acceptable.

31 In response to NatureScot's comment regarding European Protected Species (EPS) licensing, further modelling is being undertaken to reduce conservatism and produce more realistic estimates of the number of individuals which have the potential to be affected. The Project's aim is to negate the potential for cumulative PTS and reduce the potential for displacement as a result of pile driving. Discussions with Marine Scotland Science and NatureScot are ongoing, and it is understood that the final methodology and mitigation will be agreed and approved via the Piling Strategy.

Table 3.1: Number of individuals (and percentage of reference population) estimated to have the potential to be exposed to noise levels sufficient to induce the onset of cumulative PTS (current worst-case location presented)

Species	Modelling Using Greater Hammer Energies – data source 1	Modelling Using Greater Hammer Energies – data source 2	2018 EIAR Modelling
Minke whale	24 (0.1%)	13 (0.1%)	0.3 (<0.1%)
Bottlenose dolphin	0	NA	0
White-beaked dolphin	<0.1	<0.1	0
Harbour porpoise	67 (<0.1%)	59 (<0.1%)	0
Grey seal	<0.01	0.02	0
Harbour seal	<0.01	<0.01	0

Note: For minke whale, white-beaked dolphin and harbour porpoise data source 1 is the SCANS-III density estimates and data source 2 is the SCANS-III density surfaces. For bottlenose dolphin an inferred density surface was used. For seals data source 1 is the estimated at-sea distribution maps produced by the Sea Mammal Research Unit (SMRU; Russell *et al.*, 2017) and data source 2 is the density surfaces provided by Carter *et al.* (2020).

Table 3.2: Number of individuals (and percentage of reference population) estimated to have the potential to be exposed to noise levels sufficient to induce the onset of a behavioural response (displacement; current worst-case location presented)

Species	Modelling Using Greater Hammer Energies – data source 1	Modelling Using Greater Hammer Energies – data source 2	2018 EIAR Modelling
Minke whale	183 (0.9%)	96 (0.5%)	138 (0.6%)
Bottlenose dolphin	18 (8%)	NA	7 (3.6%)
White-beaked dolphin	1144 (2.6%)	355 (0.8%)	39 (0.2%)
Harbour porpoise	2819 (0.8%)	2543 (0.7%)	261 (0.1%)
Grey seal	579 (3.8%)	2138 (13.9)	1058 (6.6%)
Harbour seal	16 (3.4%)	14 (2.9%)	15 (2.9%)

3.2 Ornithology

- 32 Final methodology and mitigation will be agreed and approved via the DSLP. As noted in Section 2.2.3 above, a Preferred Design Scenario (in terms of WTG numbers and dimensions and number of substations) for the Wind Farm has been identified. Details of the CRM for the Preferred Design Scenario is included within this variation report to confirm that it does not affect ornithology collision risk modelling (Appendix C), with the comparison of the resulting collision estimates also presented below in Table 3.3.
- 33 The collision estimates presented in Table 3.3 are based on a like-for-like comparison between the Preferred Design Scenario and the two scenarios on which the consent was based. Thus, all CRMs were undertaken using the deterministic version of the SOSS offshore CRM (Band 2012), with only the input parameters relevant to the respective wind farm designs differing between the three scenarios for which estimates are presented in Table 3.3. This followed the instruction provided by NatureScot that the deterministic CRM should be used for the purposes of comparing collision estimates between the Preferred and consented design scenarios (reference details of email/letter from NS to Inch Cape).
- 34 As is apparent from Table 3.3, for each of the three species of relevance, the collision estimates for the Preferred Design Scenario are lower than the worst-case of the scenarios on which the consent

was based (or in the case of the option 2, but not option 3, estimates for herring gull, equivalent to this worst-case scenario).

Table 3.3: Comparison of collision risk estimates using the deterministic model for Scenarios A and B in the EIAR and for the preferred design Scenario. Estimates are given for the full annual period and for the breeding season. Red font indicates the worst-case.

Species	Scenario A		Scenario B		Preferred Design Scenario	
	Annual	Breeding season	Annual	Breeding season	Annual	Breeding season
Gannet	105	96	117	108	105	98
Kittiwake	64	36	72	40	61	36
Herring gull (option 2)	4	1	3	1	4	2
Herring gull (option 3)	3	1	2	1	2	1

35 In addition to the above CRMs, NatureScot also requested that collision estimates for the Preferred Design Scenario should also be calculated using the stochastic version of the CRM (McGregor et al. 2018) and according to the bird input parameters set out in the NatureScot consultation response of 29 July 2022 (Annex A of Appendix C). The stochastic CRMs are undertaken for the purpose of providing estimates that are consistent with more recent CRM estimates, as advised by NatureScot (pers. comm., 07/10/22). These collision estimates are presented in Table 3.4 below and continue to demonstrate that the estimates for the Preferred Design Scenario remain lower than (or in the case of herring gull equal to) those associated with designs on which the consent is based. Overall, the stochastic CRM estimates differ from those presented in Table 3.3 as a result of the differences in bird input parameters (particularly the nocturnal activity levels) and modelling approaches used.

Table 3.4: Comparison of collision risk estimates using the stochastic model for Scenarios A and B in the EIAR and for the preferred design Scenario. Estimates, mean (2.5% – 97.5% centiles), are given for the full annual period and for the breeding season. Red font indicates the worst-case.

Species	Nocturnal activity	Scenario A		Scenario B		Preferred Design Scenario	
		Annual	Breeding season	Annual	Breeding season	Annual	Breeding season
Gannet	8%	124 (17 – 341)	114 (15 – 317)	132 (22 – 333)	121 (19 – 309)	121 (16 – 340)	113 (14 – 318)
Kittiwake	25%	76 (12 – 178)	40 (4 – 97)	85 (14 – 187)	46 (4 – 102)	70 (11 – 161)	39 (4 – 93)
	50%	86 (13 – 197)	43 (4 – 101)	97 (18 – 213)	49 (6 – 111)	80 (13 – 183)	43 (4 – 102)
Herring gull (option 2)	25%	5 (1 – 13)	2 (0 – 7)	5 (1 – 11)	2 (0 – 6)	5 (1 – 13)	3 (0 – 8)
	50%	7 (2 – 15)	3 (0 – 7)	6 (2 – 12)	2 (0 – 6)	6 (1 – 15)	3 (0 – 8)
Herring gull (option 3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

3.3 Cumulative considerations

- 36 Following review and further consideration of existing environmental effects, the proposed changes are not anticipated to have significant environmental effects and no new or materially different impacts have been identified, therefore no change in cumulative or in-combination effects is anticipated.

4 Habitats Regulation Assessment (HRA)

- 37 An Appropriate Assessment (AA) of the Revised Design dated 14/03/2019 concluded that there will be no adverse effects on the site integrity on any designated site where mitigation is applied in line with the conditions set out in the Marine Licences and Section 36.
- 38 Following review and further consideration of existing environmental effects, no new or materially different impacts have been identified leading to an increase in significant effects on HRA features, therefore there is no change to HRA.
- 39 As noted at 2.2.3 above, CRM for the Preferred Design Scenario taking account of the NatureScot consultation advice is included with this screening report in Section 3.2 and Appendix C.

5 Summary and Conclusion

40 The Proposed Variation does not give rise to any new or materially different impacts and so does not require EIA. However, supporting information for this variation was provided in Section 3 and appendices A to C. The anticipated changes to the design and the proposed resolution are summarised in Table 5.1. Proposed alterations to consents are summarised in Table 5.2.

Table 5.1: Summary of Proposed Variation

			Optimised Border and Nominal Minimum Spacing	Increased Hammer	Preferred Design Scenario
2013	EIAR/ Consent	2014	Grid / offset grid layout, minimum spacing of 1,000 m	2,400-4,500 kJ, max 5,000 kJ	n/a
2018	EIAR/ Consent (current)	2019	Grid / offset grid layout, Nominal minimal spacing of 1278 m	5000 kJ (90% energy 4500 kJ)	See Table 2.1
Change required			Change layout to Optimised Border, Decrease minimum spacing to 1,025 m	Increase energy to 5,500 kJ	Confirmation Preferred Design Scenario is within the parameters assessed in the existing consent
Proposed resolution			Variation required to ML 06781 and Section 36 to change nominal minimum spacing to 1,025 m	Variation required to ML 06781 and Section 36 to permit increase in hammer energy	Variation required to ML 06781 to clarify condition wording

Table 5.2: Proposed Alterations to Section 36 Consent and Marine Licence 06781

Condition	Proposed revision of condition text
Section 36	
Paragraph 1.4	<p>The offshore generating station shall be comprised of: No more than 72 three-bladed horizontal axis Wind WTG Generators ("WTGs"), each with:</p> <ol style="list-style-type: none"> A maximum height to blade tip of 291 metres (measured from Lowest Astronomical Tide ("LAT")); A maximum rotor diameter of 250 metres; A minimum blade tip clearance of 27.4 metres (measured from LAT); A maximum blade width of 7.8 metres; and A nominal WTG spacing of 1,278 1,025 metres. <p>2. No more than 72 substructures and foundations and ancillary equipment; and 3. No more than 190 km of inter-array cabling.</p>
Marine Licence 06781 – Generating Station	
Part 2, Section 2.1	<p>An offshore energy generating station at the Site located approximately 15-22km off the Angus coastline, to the east of the Firth of Tay, as shown in Figure 1, comprised of either:</p> <p>A) No more than 72, three-bladed horizontal axis Wind Turbine Generators ("WTG") each with;</p> <ol style="list-style-type: none"> A maximum height to blade tip of 215 metres (measured from Lowest Astronomical Tide ("LAT")); A maximum rotor diameter of 167 metres; A minimum blade tip clearance of 32.6 metres (measured from Mean Sea Level ("MSL")); A maximum blade width of 6.0 metres; and e. A nominal turbine spacing of 1,278 metres 1,025 metres. <p style="text-align: center;">OR;</p> <p>B) No more than 40, three-bladed horizontal axis WTG each with;</p> <ol style="list-style-type: none"> A maximum height to blade tip of 291 metres (measured from LAT); A maximum rotor diameter of 250 metres; A minimum blade tip clearance of 27.6 metres (measured from MSL); A maximum blade width of 7.8 metres; and j. A nominal turbine spacing of 1,278 1,025 metres. <p>Where the final design agreed through the Development Specification and Layout Plan ("DSLPL") falls between includes a combination of parameters from A and B, the collision risk to birds must be no greater than assessed in the Appropriate Assessment. If required by the Licensing Authority Scottish Ministers the Licensee Applicant must provide evidence of this using the best available science.</p>