Norfolk Boreas Offshore Wind Farm

Appendix 25.4

Norfolk Vanguard Noise and Vibration Consultation Responses

Environmental Statement

Volume 3

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Glossary of Acronyms

BAT	Best Available Technique
BPM	Best Practicable Means
CoCP	Code of Construction Practice
CWS	County Wildlife Sites
DCO	Development Consent Order
EIA	Environmental Impact Assessment
ES	Environmental Statement
ETG	Expert Topic Group
HVDC	High Voltage Direct Current
PRoW	Public Rights of Way
SoS	Secretary of State

Glossary of Terminology

The project	Norfolk Boreas Wind Farm including the onshore and offshore infrastructure.
Onshore infrastructure	The combined name for all onshore infrastructure associated with the project from landfall to grid connection
Onshore cable route	The up to 35m working width within a 45m wide corridor which will contain the buried export cables as well as the temporary running track, topsoil storage and excavated material during construction.

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1 Introduction

1. Consultation is a key driver of the Environmental Impact Assessment (EIA) process, and throughout the lifecycle of the project, from the initial stages through to consent and post-consent.

2. As the Norfolk Boreas and Norfolk Vanguard projects are sister projects due to the proposed strategic development of both projects (Chapter 5 Project Description), as such the pre-application consultation undertaken as part of the Norfolk Vanguard is relevant to the Norfolk Boreas project. Such consultation has directly influenced the Norfolk Boreas project and has been taken into consideration and integrated into the impact assessment for Norfolk Boreas.

3. This appendix contains the results of the Norfolk Vanguard consultation which have been used to inform the Norfolk Boreas assessment.

2 Consultation responses Norfolk Vanguard

4. Table 2.1 summarises the consultation that has been undertaken for Norfolk Vanguard that is relevant to and has informed the development of Chapter 25 Noise and Vibration of the Norfolk Boreas Environmental Statement (ES) and provides details of how it has been taken into consideration.

Table 2.1 Norfolk Vanguard Consultation Responses

Consultee	Date /document	Comment	Response / where addressed in the ES Chapter
Secretary of State (SoS)	November 2016 (scoping response, statutory).	The Secretary of State recommends that the methodology and choice of noise receptors are agreed with the relevant Environmental Health Department of the Council and the Environment Agency.	The overall methodology has been agreed as part of the Expert Topic Groups (ETG) meetings. Follow up consultation meetings held with stakeholders to discuss content on the 25th January and 20th July 2017 where noise receptors used in the baseline survey were agreed as being representative.
SoS	November 2016 (scoping response, statutory).	The ES should provide a description of the noise generation aspects of the proposed project for both the construction and operation stage. Any distinctive tonal, impulsive or low frequency characteristics of the noise should be identified.	Refer to section 25.4
SoS	November 2016 (scoping response, statutory).	Information should be provided on the types of vehicles and plant to be used during the construction phase. The assessment should consider a 'worst case' for receptors, i.e. that within the application site the vehicles and plant are located at the closest possible point to a receptor.	Refer to section 25.4.1.1.1
SoS	November 2016 (scoping response, statutory).	Information should be provided on the layout of onshore infrastructure (e.g. the cable relay station and the substation) and the main sources of noise from these elements should be identified.	Refer to section 25.4.1.3. The selection of High Voltage Direct Current (HVDC) electrical solution minimises environmental impacts by reducing the cable route width to 35m, avoiding the requirement for a Cable Relay Station, reducing the overall total footprint of the project and reducing the overall construction programme by up to one year.
SoS	November 2016 (scoping response, statutory).	Noise impacts on people should be specifically addressed and particularly any potential noise disturbance at night and other unsocial hours such as weekends and public holidays.	Refer to section 25.8
SoS	November 2016 (scoping response, statutory).	Paragraph 1079 of the Scoping Report states that "vibration will only be considered as an issue where significant piling works are required"; however, no	Refer to section 25.4.1.2

Consultee	Date /document	Comment	Response / where addressed in the ES Chapter
		explanation has been given as to what 'significant piling works' are and the Scoping Report has not justified why vibration will not be considered for other construction and related activities e.g. HGV movements. The Secretary of State is of the view that the ES should consider all potential sources of vibration, particularly those in proximity to residential and other sensitive receptors.	
SoS	November 2016 (scoping response, statutory).	Paragraph 1082 of the Scoping Report states that "there are considered to be no significant sources of vibration associated with the operational scheme", however this statement has not been justified. For example, no details on potential operational vibration from the cable relay station and the substation have been provided and at this stage their location and proximity to receptors has not yet been determined; therefore, the Secretary of State does not agree this can be scoped out at this stage.	A key decision is to deploy HVDC technology as the export system and this removes the need for a Cable Relay Station from the project. Operational onshore project substation plant such as transformers and other sound power equipment vibrate at twice the power frequency i.e. 100Hz and associated harmonic frequencies e.g. 200Hz, 300Hz. However, the effects are negligible as industry standard require the use of vibration isolation pads to prevent transmission of ground borne vibration. "*Damping of noise radiating surfaces can reduce resonance and the reductions can be quite dramatic. However, the "damper" has to be carefully selected and designed for the specific situation"* (Environment Agency, 2004). The onshore project substation will be designed to achieve negligible levels of ground-borne vibration. Therefore, operational vibration can be scoped out of the EIA requirements for the operational phase of the project.
SoS	November 2016 (scoping response, statutory).	Consideration should be given to the potential noise impacts resulting from the maintenance campaigns referred to in paragraph 192 of the Scoping Report, which are stated to take place every summer and would require 24/7 working.	Noise levels associated with a maintenance campaign are not expected to greater than operational substation. Additionally, the requirement for a generator to be active during maintenance campaigns has been incorporated into the assessment of operational noise impacts in order to

Consultee	Date /document	Comment	Response / where addressed in the ES Chapter
			present a worst case. Details of this can be found in section 25.4.1
SoS	November 2016 (scoping response, statutory).	The Secretary of State welcomes that the Best Practice Measures will be set out in the Code of Construction Practice (CoCP).	An outline CoCP has been included with the Development Consent Order (DCO) application, which will set out the management measure for any onshore construction works associated with the project.
SoS	November 2016 (scoping response, statutory).	The Scoping Report identifies potential operational mitigation measures, including the installation of acoustic enclosures and barriers and the construction of a landform/embankment around the substation. These measures should be taken into account in other technical assessments, for example the landscape and visual assessment and the ecological assessment.	Site specific mitigation measures have been proposed and assessed. The detailed design stage will confirm and refine the proposed mitigation strategy.
SoS	November 2016 (scoping response, statutory).	Paragraph 1096 of the Scoping Report states that the spatial coverage of the construction noise assessment would be "400m from the cable corridor routes where significant activities could affect noise sensitive receptors". The ES should clearly set out what 'significant activities' would comprise, and should include for potential recreational users of Public Rights of Way (PRoW).	Receptor locations considered for construction and operational phases are the closest sensitive receptors to the onshore cable route; therefore, the noise levels likely to be experienced along the PRoW are likely to be similar to those predicted from the noise modelling. However, in addition any associated impacts would be transient as the receptor would be passing through rather than set at a fixed location. Noise sensitive receptors are shown on Figure 25.2 and are detailed in Appendix 25.1. Also refer to Chapter 30 Tourism and Recreation. Section 25.8 details those aspects of the project that could potentially affect sensitive receptors.
SoS	November 2016 (scoping response, statutory).	Similarly, paragraph 1096 states that traffic routes subject to "significant changes in traffic flows" would be included in the assessment. The ES should explain how a 'significant change' has been determined in accordance with relevant guidance, with cross reference to the traffic and transport chapter where appropriate.	Refer to Construction Road Traffic Emissions Assessment Methodology section 25.4.1.1.2 Also refer to Chapter 24 Traffic and Transport.
SoS	November 2016 (scoping	The Secretary of State welcomes consideration of noise impacts on	Statutory designated sites are presented within Chapter 22 Onshore

Consultee	Date /document	Comment	Response / where addressed in the ES Chapter
	response, statutory).	nature conservation areas. Consideration should also be given to ecological receptors (e.g. protected species) and appropriate cross reference made to the Onshore Ecology chapter.	Ecology shows no sites are located within the noise and vibration study area, and one site (Pigney's Wood Local Nature Reserve) is located adjacent to the noise and vibration study area. Chapter 22 Onshore Ecology considers the impact of the proposed construction works at this site. The potential impacts at these sites have been identified as being of low magnitude and no significant impacts have been predicted. Additionally, Chapter 22 Onshore Ecology considers the impact of the proposed construction works at County Wildlife sites (CWS) in the vicinity of the project. The potential impacts at these sites have been identified as being of low magnitude and no significant impacts on onshore ecology have been predicted.
SoS	November 2016 (scoping response, statutory).	Consideration should be given to monitoring noise complaints during construction and when the project is operational.	An outline CoCP has been submitted as part of the DCO application, detailing the objectives for managing and minimising construction noise and vibration on-site and at nearby sensitive receptors. Detailed design of onshore assets will incorporate Best Available Technique (BAT) and Best Practicable Means (BPM) to minimise any associated noise impacts. Furthermore, in the unlikely event of an operational noise complaint, investigations will be undertaken post liaison with the relevant local authority.
SoS	November 2016 (scoping response, statutory).	Traffic and transport is not specified as a topic for assessment under Schedule 4; although in line with good practice the Secretary of State considers it is an important consideration per se, as well as being the source of further impacts in terms of air quality and noise and vibration.	Refer to sections 25.4.1.1.2 and 25.8.4.
Highways England	November 2016 (scoping	I note the proximity to the A47 and would ask that we be	Refer to sections 25.4.1.1.2 and 25.8.4.

Consultee	Date /document	Comment	Response / where addressed in the ES Chapter
	response, statutory).	consulted on any further scoping work for this site if it is going to impact in any way – e.g. congestion due to the movement of equipment, noise or general impact on our network.	
Breckland District Council	March 2018.	"I have read the documents provided and am happy with the information provided. It is clear that sufficient mitigation can be provided for the harmonic filter reactors and auto transformers to reduce the overall noise level at the Noise Sensitive Receptors (NSR) to an acceptable level, complying with the suggested conditions and falling within the no impact category of BS4142. I also think it sensible to wait until the detail design stage before committing to a final plan of mitigation."	Refer to the operational noise modelling presented in section 25.8.

3 References

Environment Agency (2004). Integrated Pollution Prevention and Control [IPPC] Version 3 Horizontal Guidance for Noise Part 2 – Noise Assessment and Control. Environment Agency, Bristol.
Norfolk Vanguard (2018). Norfolk Vanguard Offshore Wind Farm Chapter 25 Onshore Noise and Vibration Environmental Statement, Volume 1 (Reference: PB4476-005-025).
Royal HaskoningDHV (2016). Norfolk Vanguard Offshore Wind Farm: Environmental Impact Assessment Scoping Report. October 2016.

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