From: Taylor, Jessica
To: Norfolk Vanguard
Subject: RE: EN010079 Norfolk Vanguard Natural England Deadline 5 Submission (Ref: 273183)
Date: 20 March 2019 17:43:46
Attachments: EN010079 273183 Norfolk Vanguard Natural England advice in relation to red-throated diver mitigation measures_Final.pdf
EN010079 273183 Norfolk Vanguard Natural England Comments on changes made to draft DCO at Deadline 4 Final.pdf
EN010079 273183 Norfolk Vanguard Natural England DAS Response Letters to Clarification Notes in relation to onshore ecology.pdf
EN010079 273183 Norfolk Vanguard Natural England Response to Other Consultees Responses to Second set of ExA Qus_Final.pdf

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Dear Sirs,

Please find attached Natural England's submissions at Deadline 5 in relation to the Norfolk Vanguard Offshore windfarm Application, including:

- Natural England's response to other consultees responses to the second set of Examiners questions;
- Comments on Development Consent Order schedule of changes submitted by the Applicant at Deadline 4 [REP4-029];
- Natural England Discretionary Advice Service letters provided to the Applicant with regards to sediment management at River Wensum crossing, Bat at Paston Great Barn SAC, water dependent sites and other unresolved issues; and
- Natural England's comments on red-throated diver mitigation measures.

Natural England would also request that a clear agenda and list of questions is provided ahead of the Issue Specific hearings to allow all interested parties sufficient time to prepare and to ensure that best use is made of the limited time.

Best wishes,
Jessica

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We are here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

In an effort to reduce Natural England's carbon footprint, I will, wherever possible, avoid travelling to meetings and attend via audio, video or web conferencing.

THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

NORFOLK VANGUARD OFFSHORE WIND FARM

Planning Inspectorate Reference: EN010079

Natural England's comments on responses by all other parties to the Examining Authority's second written questions.

20 March 2019

Norfolk Vanguard Offshore Wind Farm – Natural England comments on responses by all other parties to the Examining Authority's second written questions.

Following submission of Natural England's and other consultees responses to the Examining Authority's second written questions regarding the construction and operation of Norfolk Vanguard Offshore Wind Farm, Natural England has reviewed other consultees responses, including statutory and non-statutory consultees, and commented on the major issues within the remit of Natural England. Relevant responses from other consultees are provided in Table 1, together with Natural England's position on the comments. Questions which were originally directed to Natural England have been removed. These comments are colour coded as:

Green Comments – Natural England have no further comments, comments support/agree with Natural England position or does not impact on Natural England concerns

Amber Comments – Natural England comments may be in contradiction, further advice needed, or potential new issue not included in Natural England comments

Red Comments – Comments in direct contradiction/argument with Natural England position or represents a significant issue not mentioned in Natural England's comments

Table 1: Natural England comments on responses provided by other consultees from other consultees to the Examining Authority's second written questions.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
1.	**General**			
1.6	Applicant	Paragraph 2.6.71 of National Policy Statement for Renewable Energy Infrastructure (EN-3) states that ecological monitoring is likely to be required during both the construction and operational phases. Whilst noting that Requirement 14(1)(l) of the dDCO and the 'In Principle Monitoring Plan (Offshore)' [APP-036] respectively require the submission of an	Paragraph 2.6.71 of the National Policy Statement (NPS) for Renewable Energy Infrastructure (EN-3) relates to Biodiversity, which includes the following (as stated in paragraph 2.6.59 of EN-3): • Fish; • Seabed habitats; • Marine mammals; and • Birds. As stated in the Norfolk Vanguard In Principle Monitoring Plan (IPMP) (document 8.12), the aims of project monitoring are to address significant evidence gaps or uncertainty and/or to monitor potentially significant impacts. <u>Fish</u> Environmental Statement (ES) Chapter 11 Fish and Shellfish Ecology concludes that impacts would be non-significant (negligible or minor). As a result, no fish monitoring for construction or operation is proposed. This is now agreed with the Marine Management Organisation (MMO) as shown	As stated in Natural England's Deadline 4 response to ExA Qu 1.7 [REP4-062], there is an In Principle Monitoring Plan that includes monitoring post construction. This is secured in the DCO/DML and in line with all other OWF NSIPs.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		ornithological monitoring plan and monitoring primarily during the pre-construction and construction phases, with much of the post construction monitoring to be agreed, please set out how any other long-term ecological monitoring during the operational phase is to be secured in the dDCO.	in the Statement of Common Ground (SOCG) (document reference Rep1 - SOCG - 11.1). Condition 19(3) of the Generation Deemed Marine Licence (DML)'s (Schedules 9 and 10) and Condition 14(4) of the Transmission DMLs (Schedules 11 and 12) requires monitoring of noise generated by the installation of the first four piled foundations of each piled foundation type (in the event that driven or part-driven pile foundations are proposed). Version 3 of the draft development consent order (dDCO) (submitted at Deadline 4) states that "If, in the opinion of the MMO in consultation with Natural England, the assessment shows significantly different impacts to those assessed in the environmental statement or failures in mitigation, all piling activity must cease until an update to the MMMP and further monitoring requirements have been agreed." Although it has been agreed that specific fish monitoring is not required, if required, the monitoring secured under Condition 19(3) of Schedules 9 and 10 and Condition 14(4) of Schedules 11 and 12 will also be relevant to fish ecology. Seabed habitats: ES Chapter 8 Marine Geology, Oceanography and Physical Processes and ES Chapter 10 Benthic and Intertidal Ecology conclude that impacts would be non-significant (negligible or minor). The IPMP identifies a likely requirement for targeted monitoring of Annex I habitats before and after construction. The Applicant acknowledges that as a European site, the Haisborough Hammond and Winterton (HHW) Special Area of Conservation (SAC) has a special environmental status. For this reason, the Applicant proposes that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with Natural England (NE) as to the precise wording of the condition and content for the plan. This would include proposed monitoring in the HHW SAC.	

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			The IPMP states that if significant impacts are observed, the potential requirement for further surveys will be agreed with the MMO following review of the post-construction survey results. With regards to the impact of temporary seabed disturbance from maintenance operations, the disturbance would be on a much more localised scale than construction operations. Therefore, the Applicant maintains that the proposed monitoring is appropriate to address any uncertainty regarding recovery and no monitoring for maintenance operations is proposed. Marine mammals: ES Chapter 12 Marine Mammals concludes that impacts would be non-significant (negligible or minor). Condition 14(1)(b) of the Generation DMLs (Schedules 9 and 10) and Condition 9(1)(b) of the Transmission DMLs (Schedules 11 and 12) requires a construction programme and monitoring plan (which accords with the offshore IPMP) to be agreed with the MMO. The IPMP identifies a likely requirement for monitoring of marine mammals during construction if pile driving is undertaken. The Marine Mammal Mitigation Protocol (MMMP) for piling (required under dDCO Condition 14(1)(f) of Schedules 9 and 10 and Condition 9(1)(f) of Schedules 11 and 12) will detail monitoring during piling, in accordance with the draft MMMP (document 8.13) and the IPMP (document 8.12). In addition, monitoring of noise generated by the installation of the first four piled foundations of each piled foundation type (in the event that driven or part-driven pile foundations are proposed) is required in accordance with Condition 19(3) of the Generation DMLs (Schedules 9 and 10) and Condition 14(4) of Transmission DMLs (Schedules 11 and 12). With regards to operational noise, and as stated during the offshore issue specific hearing (ISH2), the assessment of operational noise provided in ES Chapter 12 Marine Mammals and the Information to Support Habitats Regulation Assessment (HRA) report indicates no potential significant impacts or effects relating to underwater noise from	

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			operational wind turbines for the Project. Disturbance values have been assessed for a range of 0%-100% disturbance from the Offshore Wind Farm (OWF) sites, noting that there is currently no evidence of any significant disturbance of harbour porpoise or seals from operational wind farm sites and therefore it is highly unlikely that underwater noise from operational wind turbines could result in 100% disturbance. Even taking into account this uncertainty, and therefore taking a highly conservative approach on the basis of 100% disturbance, the magnitude of effect would be negligible or low and therefore the Applicant suggests that a monitoring requirement during operation would be disproportionate. Birds: As noted in the ExA's question, the Applicant has committed to agreeing an Ornithological Monitoring Plan with the MMO in consultation with the relevant Statutory Nature Conservation Bodies (SNCBs) (Condition 14(1)(l) of the Generation DMLs (Schedule 9 and 10 of the Development Consent Order (DCO))). This will state the timeframe over which ornithological monitoring is considered necessary and appropriate. As stated in the IPMP(document 8.12), aspects for consideration in the Ornithological Monitoring Plan will include collision risks, displacement and improving reference population estimates and understanding of colony connectivity.	
1.7	MMO	Are you satisfied that long-term ecological monitoring during the operational phase of the project is adequately secured in the dDCO?	The MMO is satisfied that the conditions within the dDCO adequately secure the long-term ecological monitoring subject to the review and agreement of the updated In Principle Monitoring Plan (IPMP).	As stated in Natural England's Deadline 4 response to ExA Qu 1.7 [REP4-062], there is an In Principle Monitoring Plan that includes monitoring post construction. This is secured in the DCO/DML and in line with all other OWF NSIPs.
1.7	TWT	As above	TWT recommend that a period of post-construction monitoring is undertaken to understand the impact of offshore wind farm development on harbour porpoise within the Southern North Sea SCI. As stated previously, this would be best delivered through a programme of strategic monitoring.	As stated in Natural England's Deadline 4 response to ExA Qu 1.7 [REP4-062], there is an In Principle Monitoring Plan that includes monitoring post construction. This is secured in the DCO/DML and in line with all other OWF NSIPs.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
			Currently monitoring for the Southern North Sea SCI is only secured through the In-Principle monitoring plan. Although we welcome that the applicant supports a strategic approach to monitoring, we highlight that a mechanism to deliver this is not in place. Without a strategic approach in place, the standard for offshore wind farms is to monitor noise levels from the first 4 piling operations. This is not adequate to understand the impact of underwater noise from construction activities on the Southern North Sea SCI. Minimum monitoring requirements should include noise monitoring pre construction, during construction and post-construction and the distribution of harbour porpoise in relation to this.	
1.7	WDC	As above.	Whilst there is a commitment in the dDCO to monitoring during the operational phase, there is little detail on the methodology that will be used to undertake this. Without additional detailed information, it impossible to conclude if this will be adequate.	As stated in Natural England's Deadline 4 response to ExA Qu 1.7 [REP4-062], there is an In Principle Monitoring Plan that includes monitoring post construction. This is secured in the DCO/DML and in line with all other OWF NSIPs.
1.7	RSPB	As above.	No, we are concerned that provision for project level monitoring has not been included. Whilst we welcome the inclusion of strategic monitoring, project level monitoring is also needed to understand impact pathways and test hypotheses that have been used in planning decisions, such as avoidance and collision rates. The main topics for post-construction monitoring and research are collision risk and displacement/barrier effects. Studies benefit from before/after comparison, whilst data collection during construction is also helpful to identify whether construction per se is the cause of observed changes and whether effects persist during the operational phase. Our full position regarding the need to update the In-principle Monitoring Plan and to secure these changes in the dDCO is set out in our Written Representations [doc. REP1-112].	As stated in Natural England's Deadline 4 response to ExA Qu 1.7 [REP4-062], there is an In Principle Monitoring Plan that includes monitoring post construction. This is secured in the DCO/DML and in line with all other OWF NSIPs.
1.8	Applicant	As you have stated in the Planning Statement [APP-026]	A checklist showing how Norfolk Vanguard complies with each relevant objective of the East Inshore and Offshore Marine Plans has been completed and agreed with the MMO.	Natural England would defer to MMO in this regard.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		decision making in relation to NSIP projects in English waters should have regard to the appropriate marine policy document be it the MPS or an adopted marine plan. The ExA notes that the project is said to be in general accordance with the objectives and policies set out in the MPS (para 81), but it is not apparent where the East Inshore and East Offshore Marine Plans, adopted on 2nd April 2014 is dealt with in similar terms. Please identify where the EIEOMP has been submitted to the ExA or supply a copy thereof and explain how relevant policies in EIEOMP are complied with in respect of the Project.	This document is provided in Appendix 1.1 (document reference ExA; FurtherWQApp1.1; 10.D4.6). In addition, the East Inshore and Offshore Marine Plans are provided in Appendix 1.2 (Parts 1 and 2; document reference ExA; FurtherWQApp1.2; 10.D4.6).	
2.	**Principle and nature of the development, including alternatives**			
2.4	Applicant	Paragraphs 4.8.5 and 4.8.6 of the Overarching National	Paragraph 4.8.5 of the Overarching NPS for Energy (EN-1) states:	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		Policy Statement for Energy (EN-1) state that applicants must consider the impacts of climate change when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure, setting out how the proposal will take account of the projected impacts of climate change. Please explain or direct the ExA to the relevant section of the application to demonstrate how the above has been addressed in the design, including appropriate mitigation and adaptation measures, of both onshore and offshore infrastructure for Norfolk Vanguard.	'New energy infrastructure will typically be a long-term investment and will need to remain operational over many decades, in the face of a changing climate. Consequently, applicants must consider the impacts of climate change when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure. The ES should set out how the proposal will take account of the projected impacts of climate change. While not required by the EIA Directive, this information will be needed by the IPC.' Offshore Infrastructure Projected impacts of climate change which could affect the offshore infrastructure are rises in sea level and increased storm events. Chapter 8 of the ES (document 6.1.8) discusses storm surges, wave heights and sea levels with respect to climate projections. The turbine interface level (elevation of the platform above the substructure) and other relevant parameters for turbines and platforms (such as clearance of blade tip from highest astronomical tide and platform height) have been calculated based on latest climate change projections and will be confirmed at the detailed design stage to ensure that values allow for projected sea level rise. Offshore decommissioning is described in Section 5.4.19 of ES Chapter 5 Project Description. This notes that the scope of decommissioning will be determined at the time of decommissioning, however this is likely to include removal of all of the wind turbine and offshore platform components. Decommissioning works will be determined by the relevant planning and guidance at the time and therefore any necessary consideration of the impacts of climate change will be accounted for. Offshore cables and subsea infrastructure would not be influenced by sea level changes, so increased storm events is the only element of climate change that may apply to this infrastructure. The offshore export cable will be buried at a suitable depth (where possible), reducing the likelihood of	

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			exposure due to scouring of the sediment by waves created by storms. Additional detail regarding the resilience of offshore infrastructure to storm events is covered in the Applicant's response to Question 2.5 below. Onshore Infrastructure 1. Landfall The location and design of the landfall infrastructure and construction methods include embedded mitigation taking into account projected impacts of climate change. The Coastal Erosion Study (Appendix 4.3 of the ES – Document reference 6.2.4.3) was completed to inform site selection of the landfall, which resulted in Happisburgh as the chosen location. Mitigation at landfall includes the employment of long Horizontal Directional Drilling (HDD) as the landfall duct installation method, avoiding interaction with the cliffs and ensuring cables would be installed at sufficient depth below the coastal shore platform and cliff base to avoid significant effects on coastal erosion. An HDD feasibility study was undertaken (ES Appendix 4.1 – Document reference 6.2.4.1) to show that HDD would be possible at landfall. Landfall design and mitigation in relation to climate change is described in more detail in Consideration of EN-1 Climate Change Policy in the Application, submitted at Deadline 3 (document reference ExA; ISH; 10.D3.1D). The detailed design of decommissioning activities at the landfall will depend on the coastal geography and topology at that time. A full decommissioning plan (and associated Environmental Impact Assessment (EIA)) will be developed prior to undertaking any such activities and is secured by Requirement 29 of the dDCO. 2. Cable route UK Climate Projections indicate increased rainfall in winter, resulting in higher surface and groundwater flows. Section 20.6.5 of Chapter 20 Water Resources and Flood Risk of the ES (document reference 6.1.20) describes the anticipated trends and notes that a greater number of rain storms is likely as a result of climate change. As a result of the site selection	

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			process undertaken for the Project as described in ES Chapter 4 Site Selection and Assessment of Alternatives, the majority of the onshore cable route is located within an area of low flood risk (Flood Zone 1) according to the Environment Agency flood zone maps. Flood Zone 1 is defined as land having a less than 1 in 1000 annual possibility of river flooding (<0.1%). This embedded mitigation ensures that, where possible, the onshore cable route is located away from areas more likely to be impacted by the projected increased rainfall. The Flood Risk Assessment (document reference 6.1.20.1) provides a detailed description of the baseline flood risk of the study area. During construction, the onshore cable route will be bounded by drainage channels to intercept drainage from within the working corridor. Additional drainage channels will be installed to intercept water from the cable trench. A Surface Water and Drainage Plan (SWDP) (Requirement 20 (2)(i) of the dDCO) will be developed, agreed with the relevant regulators and implemented to minimise water within the cable trench and other working areas and ensure ongoing drainage of surrounding land. Following construction, field drainage systems and ditches would be fully reinstated where possible in consultation with landowners / occupiers. Reinstatement of ditches and culverts that were removed or disturbed during construction would also be undertaken. See section 11 of the Outline Code of Construction Practise (OCoCP) for more detail (document reference 8.1). 3. Onshore project substation and National Grid substation extension Siting of the onshore project substation avoids high flood risk areas. Prior to the onshore construction works, surface water drainage requirements would be dictated by the final drainage study and designed to meet the requirements of the National Planning Policy Framework. The onshore project substation SWDP will have sufficient storage / attenuation volume to ensure that during the 1 in 100 year rainfall event,	

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			plus an allowance for climate change. As the operational life of the project is approximately 30 years, the relevant flood risk epoch is 2040 to 2069 using the Environment Agency's Climate Change Allowance Guidance. This identifies an allowance of 20% for climate change. The design will ensure that there will be no increase in surface water runoff from the site, taking into account climate change, during the operational life of the substation. The climate change allowance to be incorporated into the design is agreed with Norfolk County Council (NCC) as the Lead Local Flood Authority, as noted in the SOCG with NCC (document reference Rep1 – SOCG – 15.1). The full specification for the attenuation pond and drainage strategy would be addressed as part of detailed design post-consent. Operational flood risk at the onshore project substation will be managed through the operational SWDP, secured in an update to the Construction Practice, or another DCO document, and will be secured in an update to the DCO. It is agreed with NCC, and noted in the SOCG, that the proposed mitigation for managing flood risk is appropriate and adequate. Chapter 29 of the ES (document reference 6.2.29) states that mitigation measures at the onshore project substation have taken into account the 'Statements of Environmental Opportunity' as set out in NE's 'National Character Area Profiles'. These statements include a requirement to address the impacts of climate change, which is addressed through the mitigation measures noted above and those described in the Outline Landscape and Ecological Management Strategy (OLEMS) (document reference 8.7) including avoiding main rivers where possible during site selection, use of trenchless crossings at carefully chosen locations, and reinstatement of soils and ponds as well as hedgerows following construction. Paragraph 4.8.6 of the Overarching NPS for Energy (EN-1) states: 'The IPC should be satisfied that applicants for new energy infrastructure have taken into account the potential impacts of climate change using the latest UK Climate Projections	

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			available at the time the ES was prepared to ensure they have identified appropriate mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure. Should a new set of UK Climate Projections become available after the preparation of the ES, the IPC should consider whether they need to request further information from the applicant.' The UK Climate Projections (UKCP) 2009 were the latest projections available at the time of the Norfolk Vanguard application. The parameters in UKCP (2009) which are most applicable to the project relate to rainfall, storms and sea level rise. Section 8.6.6 in Chapter 8 of the ES (document reference 6.2.8) outlines the projected sea level rise on the UK coastline according to the UKCP09. Consideration of EN-1 Climate Change Policy in the Application, submitted at Deadline 3 (document reference ExA; ISH; 10.D3.1D) provides detail on the mitigation at the landfall against projected coastal change. Rainfall events and associated flooding are taken into consideration in ES Chapter 20, and consideration of this is described earlier in this response. Storm surges and the resilience to storms is addressed in the Applicant's response to question 2.5. Since the application was submitted, the UKCP18 has been published. The implications of this are addressed in the Applicant's response to question 16.30.	
2.5	Applicant	Paragraph 2.3.4 of NPS (EN-3) states that applicants should set out how a proposal would be resilient to storms. Please explain or direct the ExA to the relevant section of the application documents to show how this has been	Paragraph 2.3.4 of NPS (EN-3) states: 'Offshore and onshore wind farms are less likely to be affected by flooding, but applicants should particularly set out how the proposal would be resilient to storms.' Detailed design of the project infrastructure will be finalised post consent based on the best available information at the time however, various measures have been embedded into the design of the offshore infrastructure which will ensure that the project is resilient to storms. These are outlined below and detailed in Chapter 5 of the ES (document reference 6.1.5):	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		addressed in the design of offshore infrastructure for Norfolk Vanguard.	• Turbine and offshore electrical platform foundations will be suitable for the size of the turbine/platform, to ensure stability and robustness. • Long HDD will be employed at landfall. Use of long HDD allows the cable to be buried at a suitable depth below the beach and cliffs, as well as the shallow subtidal zone, so that the risk of exposure due to storms is minimised. The long HDD would exit in water depth beyond 5.5m below lowest astronomical tide (LAT), where cable protection would be installed. This would protect the exit point from exposure due to storm-related turbulence. • The offshore export cable will be buried at a suitable depth (where possible), reducing the likelihood of exposure due to scouring of the sediment by waves created by storms. Additionally, an offshore cable monitoring plan will be produced post consent, as part of the Cable Specification, Installation and Monitoring Plan secured under Condition 14(1)(g)(iii) of Schedules 9 and 10, and Condition 9(1)(g)(iii) of Schedules 11 and 12 in the DCO. This monitoring plan would ensure that the cable remains buried throughout its lifetime and any need for reburial would be identified. In this way, although unlikely, any exposure of the cable due to storms would be addressed and the cable reburied as necessary.	
2.6	Applicant	Paragraph 4.5.3 of EN-1 seeks to ensure that energy infrastructure developments are sustainable and as attractive, durable and adaptable as they can be, taking into account both functionality (including fitness for purpose and	Paragraph 4.5.3 of EN-1 states: "In the light of the above and given the importance which the Planning Act 2008 places on good design and sustainability, the IPC needs to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable and adaptable (including taking account of natural hazards such as flooding) as they can be. In so doing, the IPC should satisfy itself that the applicant has taken into account both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located) as far as possible. Whilst the applicant may not have any or very limited choice in the	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		sustainability) and aesthetics.	physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform and vegetation. Furthermore, the design and sensitive use of materials in any associated development such as electricity substations will assist in ensuring that such development contributes to the quality of the area." The Applicant considers that the site selection process, design development, design parameters (and embedded mitigation) and construction methodology for Norfolk Vanguard are the primary mechanisms by which the Project has demonstrated good design and sustainability in accordance with paragraph 4.5.3 EN-1. The site selection process is set out in detail within ES Chapter 4 Site Selection and Alternatives. A detailed summary of the site selection process was previously provided in the Applicant's response to Q2.1 at Deadline 1, which demonstrated how good design had been taken into account in terms of the siting of infrastructure relative to existing landscape character, landform and vegetation. The design and construction methodology for Norfolk Vanguard is set out in detail within ES Chapter 5 Project Description. The offshore and onshore elements of Norfolk Vanguard are defined as far as they can reasonably be at this stage in order to inform the worst-case scenarios within the EIA. The components of the authorised development (as defined in Schedule 1 of the dDCO) have been selected to ensure that Norfolk Vanguard will be functional and fit for purpose for delivering renewable energy, while retaining the necessary degree of flexibility at this stage in the delivery of the project. The design life of the project is approximately 30 years and the installed infrastructure will be designed with this understanding to ensure that it is durable and fit for purpose. Embedded mitigation measures that form part of the design include:	

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
			• Strategic approach to delivering Norfolk Vanguard and Norfolk Boreas, which reduces impacts associated with two separate duct installations; • Commitment to high voltage direct current (HVDC) technology – minimising land take and avoiding additional above ground infrastructure associated with a cable relay station; and • Long HDD at the landfall to reduce potential interaction with the cliff and associated coastal erosion projections. The final design of the onshore project substation and National Grid substation extension are subject to detailed design post-consent. In order to minimise visual impacts as far as possible, the appropriate building design and materials will be considered, to ensure blending with the local environment and minimisation of impacts as far as possible. The Design and Access Statement (document reference 8.03) includes a set of Design Principles for the onshore project substation and National Grid substation extension (Table 5.3) which will set out the process to develop the final design. The concept of sustainability and sustainable energy production is the driving principle underpinning the Project; Norfolk Vanguard would be one of the largest offshore wind projects in the world and would make a large contribution to the achievement of national and global renewable energy targets. Norfolk Vanguard has the potential, at today's level of UK carbon emissions from the power sector, to prevent more than 2,000,000 tonnes of CO2 from entering the atmosphere. Norfolk Vanguard therefore represents a significant beneficial impact in terms of the UK's contribution to global efforts to reduce the effects of climate change. Adaptability relates to the siting of the offshore and onshore infrastructure, and choice of materials, taking into account natural processes such as coastal erosion, flooding and storm surges. These are all directly linked to climate change and a full response is provided on this at Q2.4. The key areas where adaptability to climate change has influenced the	

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			design (as described in more detail in the Applicant's response to Q2.4) include: • The design of the landfall infrastructure and construction methods allowing for coastal erosion projections; • Allowing sufficient room within the design at the onshore project substation for surface water attenuation taking into account climate change plus an allowance of 20%; and • Accounting for sea level rise in the turbine and offshore platform foundation design.	
2.7	Applicant	At ISH1 [EV-006 and EV-007] the Examining Authority (ExA) asked about the contention of some interested parties that the deliverability of HVDC technology was questioned by the promotors of the Hornsea Three Project. Please comment upon these representations and explain any differences in approach between the Norfolk Vanguard project and the Hornsea Three Project. Please explain the reasons behind the Applicant's confidence that HVDC can be	Since many local residents and stakeholders regard the use of HVDC technology as being more suitable for the Project, and with fewer impacts than the use of a High Voltage Alternating Current (HVAC) solution, it is understandable for these Interested Parties (IPs) to seek assurances that the HVDC solution is deliverable, both technically and commercially. The fact that Hornsea Three (H3) is taking a different approach on the HVAC/HVDC question is clearly contributing to the need for further assurances on these points. At project scoping and Preliminary Environmental Information Report (PEIR), the Applicant described both HVAC and HVDC transmission solutions. During pre-statutory consultation, strong feedback was received favouring the HVDC solution from a range of stakeholders. Although as noted in response to q20.121, it is the physical structures (e.g. cable relay station and increased number if cables requiring an increased land take), as opposed to the nature of the Alternating Current (AC), that is the principal issue for IPs in this respect. Vattenfall undertook a technology assessment exercise in late 2017 to establish whether there was a real benefit to the Project in retaining the HVAC option and on the commercial and technical viability of the HVDC solution. Following this assessment, a decision was made to rule out the HVAC option. The Applicant announced this decision in early 2018, and the HVAC solution was not included in the ES and dDCO at submission (June 2018).	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		delivered for this project.	As a result of ongoing collaboration with the HVDC supply chain, the Applicant has a high degree of confidence in the ability to procure a cost-effective HVDC transmission solution in the timescales required for the Project. This confidence is supported by the fact that there are already a number of offshore HVDC 'hubs' in the German sector of the North Sea, through which multiple OWFs export power into the onshore transmission system of that country. Secondly, the supply chain for offshore HVDC solutions is becoming more mature – there are now three suppliers of HVDC converter technology who have experience of designing and delivering offshore HVDC converter platforms, and several cable suppliers who can manufacture and install suitable HVDC cables. The approach being taken by the H3 project is somewhat different to Norfolk Vanguard; H3 have opted to retain both HVAC and HVDC transmission solutions within the envelope of their DCO consent and they contend that this is necessary in order to maximise the range of supply chain options and secure the most cost-effective transmission solution for their project (in order to minimise cost to consumers). This position is set out in section 5 of the H3 document "Appendix 22 to Deadline 1 submission – Transmission System (HVAC/HVDC) Briefing Note" available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-001131-DI_HOW03_Appendix%2022.pdf).	
3.	**Ecology offshore - ornithology**			
3.19	RSPB	Please comment on whether or not the Applicant's response to the First Examination Questions (ExQ1) [PD-008] 3.3, 3.4, 3.5, 3.7 and 3.8 [REP1-007] together	<u>Use of migration-free breeding season for gannet, kittiwake and lesser black-backed gull</u> These concerns were not addressed by the Applicant in the representations noted above, and hence this area is still 'not agreed'. <u>Construction and operational displacement and mortality rates – red throated diver</u> The Applicant presented revised displacement assessment outputs in Appendix 3.1 Red-throated diver displacement	We broadly agree with RSPB (with the exception of the appropriate avoidance rate to use for gannet), although we note that Natural England has not yet been in a position to reach any conclusions regarding the levels of cumulative impacts due to methodological issues.

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		with the information submitted by the Applicant at D1, specifically Appendix 3.1 Red-throated diver displacement, Appendix 3.2 Collision Risk Modelling: update and clarification, Appendix 3.3 Operational Auk and Gannet displacement: update and clarification [REP1-008 collectively], has now overcome the concerns you had previously raised in regard to these particular matters and which are reflected in the relevant topic areas that are defined as 'not agreed' in the Statement of Common Ground submitted at Deadline 1 (D1) [RSPB REP1-058].	[REP1-008]. These incorporated a 4km buffer and were based on the displacement and mortality rates recommended by Natural England and supported by us. However, the Applicant also presented an assessment based on their preferred values of 90% displacement and 1% mortality. We therefore agree with the assessment based on the Natural England recommended displacement and mortality rates, but disagree with the assessment based on the Applicant's preferred rates. We also do not agree that cumulative impacts on the red-throated diver biogeographic/BDMPS populations should be considered to be of minor significance. Given the levels of mortality predicted using the recommended parameters, these impacts should be considered to be of moderate significance. <u>Construction and operational displacement – auks</u> The Applicant presented revised displacement assessment outputs in Appendix 3.3 Operational Auk and Gannet displacement: update and clarification [REP1-008]. We supported the recommendations of Natural England which state that the displacement assessment for auks should incorporate a 2km buffer and be based on worst case scenario (WCS) displacement of 70% and mortality of 10%. Whilst this was acknowledged in the update, outputs based on these figures were not discussed. However, the tables provided indicate that at these levels, cumulative mortality is predicted to result in a rise in background mortality of over 1% for all auk species, with the rise for guillemot and razorbill being over 3%. Given the WCS levels of mortality predicted using the recommended parameters, we do not agree that impacts on the biogeographic/BDMPS populations can be considered to be of minor significance; these should be considered to be of moderate significance. <u>Collision risk modelling methodologies</u>	We note and agree with RSPB's suggestion regarding the merits of raising turbine draught heights to mitigate collision mortality impacts.

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			Following the Applicant's response to the First Examination Questions (ExQ1) [PD-008] and Appendix 3.2 Collision Risk Modelling: update and clarification, we still have significant concerns about the methods used in the collision risk modelling and the subsequent conclusions regarding impact significance. In particular, • We do not agree with the justification provided for using median values for bird density in the collision risk model and continue to recommend that mean densities are used, as is standard practice. • Insufficient detail is presented to enable comparison with the MSS stochastic model. We therefore continue to recommend the use of the MSS model and disagree with the use of the Applicant's own stochastic model. • We welcome the provision of updated collision mortality figures using the Natural England recommended rates for kittiwake and large gulls. However, as survey timings are not known, the Natural England recommended rates should be used for gannet as well, instead of the Furness et al. (2018) nocturnal activity rates. • Our disagreement with the use of a 98.9% avoidance rate for gannet in the breeding season remains. <u>Concerns regarding the approach to the determination of adverse effects on integrity</u> We disagreed with the Applicant's approach to apportioning of impacts to kittiwakes of the Flamborough and Filey Coast SPA, and recommended that the Applicant should follow the recommendations of SNH (2018), amended, as per the guidance, with additional account of recent tracking data from Flamborough and Filey Coast SPA. Whilst some progress is being made regarding the use of the RSPB tracking data, this area is yet to be resolved. We also disagreed with the Applicant's approach to apportioning of impacts to lesser black-backed gulls of the Alde-Ore Estuary SPA and recommended an alternative approach based on the SNH (2018) guidance and informed	

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			by updated colony numbers and studies of diet preferences (see our Response to the First Written Questions [REP1-110]. The Applicant responded to this in their Comments on Reponses to the First Written Questions [REP2-004], however, our view remains as set out in REP1-110, as we do not agree that their response sufficiently addresses these issues. No updates regarding population modelling have been provided at this stage, hence our disagreement with the use of potential biological removal (PBR) to inform conclusions regarding adverse effects on integrity remains. <u>Significance of collision risk impacts</u> Given our outstanding concerns regarding the collision risk methodologies, we are still unable to agree that adverse effects on the integrity of the following sites and features can be ruled out: • The kittiwake population of the Flamborough and Filey Coast SPA alone and in-combination with other plans and projects; • The gannet population of the Flamborough and Filey Coast SPA alone and in-combination with other plans and projects; • The lesser black-backed gull population of the Alde-Ore Estuary SPA alone and in-combination with other projects. We are also unable to agree that cumulative collision risk impacts for key populations are of minor significance only. The populations of concern are the North Sea populations of kittiwake and great black backed gull. <u>Lesser black-backed gull management measures at the Alde-Ore Estuary SPA</u> The Applicant discussed management measures at the Alde-Ore Estuary SPA in the Information for HRA [APP-045], para. 201 and stated that such measures could 'readily offset' the in-combination collision mortality. We disagreed that measures such as predation management could be regarded as mitigation for collision mortality. Whilst we still disagree with some of the points made regarding the	

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			likely effectiveness of such measures, the Applicant has since confirmed that these measures are not proposed as mitigation, therefore this area of disagreement is resolved. With regard to mitigation, a DML condition was agreed for East Anglia THREE which raised the draught height of a proportion of the turbines. This condition was for the purpose of minimising collision risk, as this reduces the number of birds flying at Potential Collision Height and hence reduces likely collision mortality. We note that the Applicant has stated that this is not necessary as impacts are not predicted to be significant, however, given the concerns regarding the collision mortality predictions, we would welcome exploration of the potential for a similar approach to be taken by Norfolk Vanguard.	
3.20	Applicant	Further to your response to ExQ1 3.3 a) please provide an update on the ongoing discussions regarding the use of potential biological removal versus population viability analysis modelling.	As noted in response to Q3.3 a), the Applicant's intention is to address the question of the most appropriate methods for estimating population consequences of OWF impacts following agreement on impact magnitudes with Natural England (NE). Following the additional work submitted by the Applicant at Deadlines 1 and 3 and the responses to these from NE and the Royal Society for the Protection of Birds (RSPB), the Applicant considers that these agreements are now close for many of the previously outstanding aspects, and therefore population modelling will be one of the next aspects considered. It should be noted that while the Applicant made reference to the results of Potential Biological Removal (PBR) presented for past offshore wind farm applications, where relevant and informative, there is no intention to produce updated PBR. If any additional population modelling is required, it will be in the form of Population Viability Analysis (PVA).	Natural England only considers many of the outstanding aspects to now be closed regarding impacts from Vanguard alone at the EIA scale based on: • Using our preferred rates of displacement and mortality in the displacement assessments (as highlighted in our responses to the Applicant's RTD displacement note, Appendix 3.1; and to the Applicant's auk and gannet displacement note, Appendix 3.3 in REP1-008) [REP3-051]; and, • Using in the collision risk assessments, the deterministic/Band model Option 2 outputs using the mean (plus 95% CIs) bird densities, central avoidance rates (i.e. 98.9% for gannet and kittiwake and 99.5% for large gulls), mean flight height distribution data from Johnston et al. and the upper figure if the Natural England recommended nocturnal activity factors (i.e. 2 or 25% for gannet and 3 of 50% for

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				kittiwake and large gulls) (as noted in our response to the Applicant's CRM update and clarification, Appendix 3.2 in REP1-008) [REP3-051]. We welcome the confirmation that no updated PBRs will be used, and re-iterate our position that no weight should be attached to PBR outputs.
3.21	Applicant	In response to ExQ1 3.3 j) you stated that an update on apportioning rates will be provided as necessary. Please set out when this update will be provided, having regard to NE's comments in its response to ExQ's [REP2-036] in which it requested clarification on how the rates were calculated.	This update will be provided for Deadline 6.	No comments.
3.22	Applicant	In response to ExQ1 3.3 l) [REP1-007] please indicate the timescale for the presentation of the results that incorporate the kittiwake tracking data supplied by the RSPB.	The results of this analysis and the assessment it will inform will be provided at Deadline 6.	No comments.

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3.23	Applicant	Please respond to 'Natural England's comments on Appendix 3.3 – Operational Auk and Gannet Displacement: update and clarification' [REP3-051] in which NE maintains its concerns regarding the cumulative operational displacement for auks	Natural England's concerns about cumulative auk displacement are a combination of uncertainty about projects currently in Examination (e.g. Hornsea Project THREE and Thanet Extension), determination of which figures to use for other projects (e.g. Seagreen Alpha and Bravo) and the origin of reference nonbreeding population sizes for guillemot and puffin. These are discussed in turn below. 1. Figures for projects which are also currently in Examination and for which the relevant applicant and NE remain in disagreement can only be presented on the basis of the best available understanding, and this approach has been applied by the Applicant in the current case. As noted in response to Q14.32, the Applicant will maintain an overview of these projects and will consider the requirement to update the Cumulative Impact Assessment (CIA) following any significant updates to these projects during examination, however it should be noted that this cannot be an open-ended process and 'final' values for other projects will need to be agreed with NE within the near future. 2. NE has recommended that the Applicant should use a different set of tables of auk displacement for the Thanet Extension than those used by the Applicant. The Applicant used those presented in the project's ES ornithology chapter (Thanet Extension Offshore Wind Farm Environmental Statement Volume 2 Chapter 4: Offshore Ornithology, e.g. for razorbill Table 4.17 project alone and Table 4.18 buffer only) and summed the figures for the project alone and buffer as presented in the assessment. NE has advised that the figures should be those presented in a technical annex to the ES (Thanet Extension Offshore Wind Farm Annex 4-3: Range of Displacement Matrices for Seabird Species Recorded in Thanet Extension), again with project and buffers summed. The Applicant will review NE's preferred outputs and update the Norfolk Vanguard cumulative assessment as appropriate. With respect to the population estimates for the Seagreen Alpha and Bravo projects, the Applicant has used figures reported in the 2018 assessment, however these were	1. We welcome the Applicant's commitment to maintain an overview of these projects and we advise that they consider our latest submission at Hornsea Project Three, available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-001892-Natural%20England%20-%20Annex%20E%20-%20Ornithology%20Response.pdf 2. With regard to the figures for Thanet Extension, we note that the main ES for Thanet Extension '*Environmental Statement Volume 2 Chapter 4: Offshore Ornithology. Document Reference: 6.2.4'* only presents the site only tables and tables for the Thanet Extension Applicant's own preferred buffers, namely 500m for razorbill and 1km for guillemot. The ES does not present the numbers displaced out to 2km for auks as recommended in the SNCB guidance note. So for example the razorbill spring migration figures in Table 4.18 only includes birds within a 500m buffer. Therefore, rather than use the figures in the ES, we advise that the Vanguard Applicant use the figures in *'Annex 4-3: Range of displacement matrices for seabird species recorded in Thanet Extension. Document Reference: 6.4.4.3'* as this contains the tables of birds displaced out to 2km, which need to be added to the site only tables for the same period.

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			estimates using data collected between 2009 and 2011 (used in the 2012 assessment) and also additional surveys conducted in 2017. Thus, these are considered to be robust values for use in the cumulative assessment. 3. NE has queried the nonbreeding reference populations for guillemot and puffin used by the Applicant. The estimates presented by the Applicant were those reported by NE for the Hornsea Project TWO wind farm (Natural England 2015, Written Submission for Deadline 6, 26th Nov 2015, Table 2). These figures were used in the Norfolk Vanguard ornithology chapter of the ES (Table 13.68) and repeated in the Applicant's submission at Deadline 1 (Appendix 3.3 – Operational Auk and Gannet Displacement: update and clarification' [REP3-051]). As these figures were those supplied by NE for the cumulative assessment for Hornsea Project TWO, the Applicant assumed these were appropriate to use. This was discussed with NE during a call on the 8th March following which NE will review these figures and advise on their suitability.	With regard to the most appropriate figures to include for the Seagreen projects, we again note our advice provided in our response to the Applicant's auk and gannet displacement note, Appendix 3.3 [REP3-051]. 3. We note that the population scale figures used by the Applicant of 2,045,078 for guillemot and 868,689 for puffin are those used by Natural England in its assessment at Hornsea Project 2 (Natural England 2015[1]). We note that these figures are for the largest population scale (all birds) and are the population estimates for UK colonies within North Sea BDMPS scale (see Table 1 of Natural England 2015). Given that the cumulative auk displacement assessments presented by the Applicant in the auk displacement update, Appendix 3.3, are year round assessments, we consider it appropriate that the levels of impact are assessed against the largest population of individuals for each species predicted to be in North Sea waters in any season, which based on Natural England (2016) are considered to be: • Guillemot - 2,045,078 (breeding – note error in Table 2 of Natural England 2015: this should be breeding and not winter) • Razorbill – 591,874 (migration) • Puffin – 868,689 (breeding)

[1] Natural England (2015) Hornsea Offshore Wind Farm – Project Two Application: Written Submission for Deadline 6. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010053/EN010053-001223-Natural%20England.pdf

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				These figures are consistent with those used by the Vanguard Applicant in the cumulative assessments in the Applicant's Appendix 3.3. With regard to our concerns regarding cumulative operational displacement to auks, we note that Natural England still advises that a range of displacement and mortality rates are considered by the Applicant in reaching its conclusions (i.e. 30-70% displacement and 1-10% mortality) as well as the Applicant's preferred rates, and that Moray West OWF is still not included in the cumulative assessment (as detailed in our response to the Applicant's auk and gannet displacement note, Appendix 3.3; [REP3-051].
3.24	Applicant	In its comments on Appendix 3.3 [REP3-051] NE notes that although it agrees with the overall conclusions, Table 3 of Appendix 3.3 contains an incorrect figure for the mean peak winter abundance for razorbill for Vanguard East. Please clarify this.	NE is correct that this figure was incorrectly entered, using that for November (279) instead of that for December (491). Inclusion of the additional 212 (491-279) individuals at risk of an effect, following application of the displacement rates used, increases the total annual displacement mortality summed across Norfolk Vanguard East and Norfolk Vanguard West as follows: Total annual displacement mortality increases from 9.9 to 10.5 (at the lower estimate of 30% displaced, 1% mortality), from 16.6 to 17.6 (at the Applicant's evidence-based rates of 50% displaced and 1% mortality) and from 230.7 to 245.7 (at the upper estimate of 70% displaced and 10% mortality). As well as noting this error, NE noted that inclusion of this adjustment was expected to result in them agreeing with the Applicant's conclusion of a minor adverse impact on razorbill from operational displacement from the project alone.	Natural England agrees with the Applicant's updated assessment.
3.25	Applicant	Please provide the specific timings for when the bird surveys were	These have been submitted in an appendix to this WQ response (ExA; Further WQApp3.1; 10.D4.6).	No comments.

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		conducted in each year.		
3.26	Applicant	Please respond to the RSPB's contention that as the data in Figure 1 of Appendix 3.2 are binomial then a mean of bird densities is more appropriate than using a median approach.	The specific distributions presented in Figure 1 of Appendix 3.2 were intended to be considered alongside those in Figure 2, to illustrate that using the mean and standard deviation (as suggested by the RSPB) from binomially distributed data generates a poor representation of the original sample (as can be seen in the difference between Figure 1 and Figure 2). This was presented in support of using the bootstrap samples (i.e. data as per Figure 1) instead of random values generated from summary statistics which are a poor representation of the data (as per Figure 2). The most appropriate means to present the outputs from the stochastic model using these data is graphically (as provided in the ES, Technical Appendix 13.1 Annex 6) by means of box and whisker plots. As can be seen from these graphical outputs, the collision estimates are generally highly skewed (i.e. most simulations result in lower values, with high values present as outliers) and as such the median is a better measure of central tendency. The above considerations notwithstanding, following further discussions on this topic with NE during a call on the 8th March, further collision modelling updates will use input values, and present outputs, which include those preferred by the RSPB and NE. It is anticipated that additional collision modelling assessment will be submitted at Deadline 6.	No further comment at this time as we await receipt of the additional collision risk modelling assessment due to be submitted by the Applicant at Deadline 6.
3.27	Applicant	In its Deadline 3 (D3) response [REP3-051] NE maintains the concerns raised in its Relevant Representation (RR) and Written Representation (WR) [RR-106 and REP1-088] regarding the seasonal definitions	NE has maintained this concern because no further updates to the final assessments for these species have yet been provided by the Applicant to date. This is because the focus for additional work has been on the technical details of the assessments and therefore there has been no further presentation of results in relation to biological seasons. This aspect will be addressed by the Applicant in submissions at future deadlines.	No further comment. We welcome the Applicant's commitment to address this issue in further submissions and await these documents.

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		for lesser black-gulled gull and gannet. Please respond to these concerns.		
3.28	Applicant	In its comments [REP3-051] on the Appendix 3.1 red-throated diver displacement that you have submitted at D1, NE advocated an approach similar to that taken by the Thanet Extension project and has commented that at present it is not in a position to reach any conclusion regarding the level of cumulative impact on red-throated diver from the operational phase of Norfolk Vanguard. Please respond to this.	The Applicant has reviewed the cumulative red-throated diver assessment submitted for the Thanet Extension project. This assessment has demonstrated that when a like-for-like approach is applied for offshore wind farm projects in the southern North Sea, those currently in Examination (Norfolk Vanguard, Hornsea Project THREE and Thanet Extension) contribute a very small amount to the predicted cumulative effect, with over 95% of the total effect attributed to existing, operational wind farms. The Applicant does not consider there to be any requirement to repeat the analysis and reporting undertaken for Thanet Extension as this would present the same information and reach the same conclusions. The Applicant discussed this with NE during a call on the 8th March and it was agreed that this was an appropriate approach. The cumulative and in-combination assessment will be updated with reference to the work presented for Thanet Extension. This will be submitted for Deadline 6.	Natural England agrees with the approach outlined by the Applicant, provided the cumulative figure from the Thanet approach is presented by Vanguard and that the Applicant notes what that figure equates to of baseline mortality of the relevant reference population in their conclusion of significance of effect.
3.29	Applicant	In its comments on Appendix 3.3 [REP3-051] NE notes that the figures cited for guillemot and puffin do not correlate with the largest BDMPS figures for the UK North Sea and Channel BDMPS in	The guillemot and puffin population estimates used by the Applicant in the assessment (2,045,078 for guillemot and 868,698 for puffin) which NE has suggested are incorrect are ones which NE proposed for the Hornsea Project TWO assessment (Natural England 2016. Hornsea Offshore Wind Farm - Project TWO Application Written Submission for Deadline 6 Dated 26th November 2015). As these figures were those supplied by NE for cumulative assessment for Hornsea Project TWO the Applicant assumed these were appropriate to use. This was discussed with NE during a call	Please see our response regarding this in point 3 of question 3.23 above.

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		Furness (2015). Please clarify this	on the 8th March following which NE will review these figures and advise on their suitability.	
3.30	Applicant	Please provide the gannet cumulative impact assessment by Deadline 4.	The Applicant notes that, to the best of its knowledge, gannet cumulative displacement is not an impact which has been required for previous OWF applications, and as a consequence there are no previous assessments on which this can build (this aspect was discussed with NE during a call on the 8th March). Instead it is necessary to review the original applications for each project to be included. This work to collate abundance estimates for North Sea OWFs is underway, however it will not be completed for submission at Deadline 4. The Applicant will endeavour to provide this by Deadline 5.	We welcome the Applicant's commitment to undertake this assessment.
4.	**Ecology offshore – marine mammals**			
4.8	WDC	In your Written Representations [REP1-123 and REP1-124 respectively], and also TWT at the offshore environmental matters Issue Specific Hearing 2 (ISH2) [EV-009 and EV-010] and in its Post Hearing Submission [REP3-063], you consider that an approach of setting noise limits should be adopted and that you do not support the current Statutory Nature Conservation Bodies	Papers sent with this response which highlight the concerns over the SNCB approach. Also the workshop reports where the threshold approach was proposed and discussed at a joint stakeholder workshop in 2016, and the approach was objected to by both NGOs, industry and regulators. Additionally in the current Review of Consents, being undertaken by The Department for Business, Energy and Industrial Strategy (BEIS), it is acknowledged the proposed approach by the SNCBs has not been agreed upon.	No comments.

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		(SNCB) advice in this regard. The ExA notes the two reports that TWT has cited in [REP3-063] with attached hyperlinks, but please provide any further relevant scientific evidence or justification that you consider casts doubt on the existing SNCB approach. Also, if you are able to, please provide a copy of the statement that was released on 7 February 2019 that TWT has referred to in [REP3-063].		
4.8	TWT	As above.	The evidence which casts doubt on the proposed SNCB area based thresholds is that the thresholds are not underpinned by any evidence. This is recognised by Natural England in the response to deadline 4 for the Hornsea Three offshore wind farm examination (page 49)1 Therefore, there is a lack of confidence that the chosen thresholds will ensure no adverse effect on site integrity. In contrast, the noise limits used in Germany area based on scientific data and are tried and tested. We reiterate that the proposed SNCB thresholds have still not yet been approved. We are in discussion with JNCC on sharing the statement released on the 7th February.	As above.
4.9	Applicant	At the offshore environmental matters Issue Specific Hearing 2 (ISH2) [EV-009 and	The Site Integrity Plan (SIP) condition relates to mitigating effects on the Southern North Sea Site of Community Importance (SCI). Advice from the SNCBs states that the following impact ranges should be used in assessing effects on the SCI:	No comments.

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		EV-010] the Applicant stated that other offshore construction techniques, such as vibration or downward impulses, were being considered. At present Condition 14(f) of Schedules 9 and 10 and Condition 9(f) of Schedules 11 and 12 of the dDCO only requires the submission of a Marine Mammal Mitigation Protocol (MMMP) in the event that driven or part-driven piles are proposed to be used. Furthermore, Conditions 14(m) of Schedules 9 and 10 and 9(l) of Schedules 11 and 12 contain similar wording in relation to the submission of a Site Integrity Plan (SIP). In the event that the Applicant proposed to utilise any other construction	• 26 km percussive piling; and • 26km unexploded ordnance (UXO) detonation; and • 10km for seismic surveys[2]. Based on this guidance, there is no mechanism to consider any alternative activities in relation to the spatial thresholds advised by the MMO and SNCBs and therefore alternative techniques such as vibration are not included in the SIP requirement. However, it should be noted that the use of an alternative technique such as vibro-piling, may be mitigation identified as a result of the SIP and these are identified as potential mitigation measures in the In Principle SIP (document reference 8.17). The Marine Mammal Mitigation Protocol (MMMP) condition relates to mitigating potential auditory injury as a result of percussive pile driving. Therefore, if an alternative method is adopted to reduce noise levels this would negate the need for a MMMP.	

[2] Geophysical surveys and UXO detonation do not form part of the Norfolk Vanguard DCO and would be licenced separately, as required.

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		techniques, instead of driven or part-driven piling, do you consider that a MMMP and SIP should still be submitted? Please justify your answer.		
4.9	TWT	As above.	Mitigation is essential for any construction technique which could have an adverse effect on the Southern North Sea SCI or European Protected Species. Techniques such as vibration or downward impulses, if not done so already, would need to be assessed to understand the impact of the activity of marine mammals and mitigation put in place where necessary.	As above.
4.9	MMO	As above.	The MMO acknowledge the observation of the ExA on the additional construction techniques and changes within the dDCO. The MMMP is a protocol for the mitigation of potential injury or mortality of marine mammals caused by underwater noise impacts arising from percussion pile driving during Norfolk Vanguard construction. The MMO believe that if alternative offshore construction techniques are used this would not fit with the purpose of the document as it is percussive piling is the only technique assessed which could cause injury or mortality through noise. Vibration pilling and downward impulses do not give off significant noise impacts. The purpose of the SIP is to set out the approach for Norfolk Vanguard Limited to deliver any potential mitigation measures during construction, to ensure the avoidance of significant disturbance of harbour porpoise in relation to the SNS cSAC site Conservation Objectives. The SIP provides a mechanism for the development of technology to be included within the document. The MMO will defer to the advice of Natural England as to if this mitigation should be needed for any other techniques of foundation installation.	As above.

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4.9	WDC	As above.	Due to the location of Norfolk Vanguard lying directly within the SNS SCI, in both summer and winter habitat for harbour porpoises with Norfolk Vanguard West overlapping the year round area (JNCC, 2017, 2016), we strongly recommend that both MMMP and SIP will still need to be submitted to ensure no Adverse Effect on Integrity (AEoI) of the site and the harbour porpoise population it supports. All cetaceans are European Protected Species (EPS), and the requirement to understand and mitigate impacts to ensure strict protection of EPS, including all cetacean species, remains. Whilst the impacts from pile driving remain our primary concern, other construction techniques will result in significantly different impacts on cetaceans and the harbour porpoise population supported by the Southern North Sea SCI (SNS SCI), therefore no matter the construction techniques used, MMMPs and SIPS will still be required.	As above.
4.10	WDC	In your Written Representation [REP1-124] you indicate that you do not wish to see any pile driving, but you also raise concerns about the potential impact on prey species should gravity-based foundations be used. Which of these construction techniques do you consider would have the more significant effects in the long term, and overall which would you prefer to see utilised?	The impacts from pile driving are our primary concern. Research has shown the impacts from piling activities during construction to have significant impacts on harbour porpoise. Less is known about gravity-based foundations, but there are concerns about changes to the sea bed and therefore prey species. We continue to recommend that foundations requiring pile driving are not used, and would prefer to see gravity foundation instead.	No comments.

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4.11	Applicant	A maximum hammer energy of 5,000kJ has now been specified in condition 14(1)(n) of Schedules 9 and 10 of the dDCO [REP2-017]. However, please comment on whether or not there would be any benefits in having a range of maximum hammer energies being specified in the dDCO, for example the 2,700kJ figure that relates to the worst-case scenario for a 9MW pin pile structure?	5,000kJ is the worst case scenario for auditory injury and spatial effects on marine mammals at any one time and has therefore been included in the dDCO. Consideration is also given to disturbance and temporal effects associated with pin-piles in ES Chapter 12 Marine Mammals. A number of methods are used to assess the potential effects, including: • Underwater noise modelling based on a 2,700kJ hammer and various hearing thresholds (e.g. NOAA criteria for temporary threshold shift/fleeing response and possible behavioural responses based on Southall et al., 2007 and Lucke et al., 2009); and • Assessment of disturbance based on the 26km range advised by SNCBs (which does not take account of underwater noise modelling, pile size or hammer energy). Given the range of options for assessing behavioural effects, the Applicant considers that it is not appropriate to define parameters associated with this (e.g. 2,700kJ) in the DCO.	No comments.
4.11	TWT	As above.	TWT confirm that it would be beneficial to include a range of maximum hammer energies specified within the dDCO, including the maximum hammer energy for pin piles.	As above
4.11	MMO	As above.	The MMO would agree that there would be a benefit to have a range of hammer energies within the DCO, this would highlight between the maximum hammer energy for each design parameter. This would also highlight the need for a variation if any increase to the hammer energy for each worst case scenario was required.	As above
4.11	WDC	As above.	WDC can see the benefit of having maximum hammer energies specified in the dDCO, for the different scenarios. This would help ensure that the worst-case scenarios modelled by the applicant aren't breached, which would results in greater impacts than predicted. We agree that	As above.

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			these maximum hammer energies should be based on the worst-case scenarios as modelled by the applicant.	
5.	**Ecology offshore – other**			
5.25	Applicant	Please comment on NE's concerns in Annex C of its WR [REP1-088] about the use of the caveat 'where possible' in regard to micro-siting to avoid areas of Sabellaria spinulosa. How would any disagreements over the final cable route and what is 'possible' be resolved?	The Applicant acknowledges that as a European site, the HHW SAC has a special environmental status. For this reason, the Applicant proposes that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan. This would include proposed mitigation measures and agreement processes associated with the micro-siting of cables within the HHW SAC.	See Natural England's Deadline 4 response to ExA Qu 5.26 [REP4-062], we await for the further information to be provided by the Applicant.
5.26	Applicant	In Annex C of its WR [REP1-088] Natural England advises that a preconstruction sandwave levelling report and assessment is required. Do you consider that this is adequately secured in the dDCO, for example in the wording of Condition 13 of Schedules 11 and 12? If not, then suggest additional wording that you consider should be included.	The Applicant acknowledges that as a European site, the HHW SAC has a special environmental status. For this reason, the Applicant agrees that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan.	As above.

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5.27	Applicant	Further to your response in Appendix 1 [REP3-004] please provide more details regarding what you consider to be the unfeasibility and potential health and safety risks for the removal of cable protection at the decommissioning stage of the project that you have referred to.	Types of cable protection considered as part of the project design are presented in section 5.4.14.1 of ES Chapter 5 Project Description. Based on industry evidence, there are two common forms of surface protection for subsea cables: • Concrete mattressing – Each 'mattress' comprises a rectangular array of concrete blocks or tiles, which are held together by synthetic rope. Mattresses are typically 6m x 3m, and roughly 0.5m thick. They are flexible, and can be laid over the cable (e.g. to provide additional protection where it has not been possible to protect the cable adequately through burial alone) or draped over features such as pipelines or rock outcrops, so that the cable can be laid on top and additional protection applied over it. The placement of mattresses is slow and as such is only used for short sections of cable. • Rock placement – Rock berm can be placed over the cable in the form of loose rock or 'rock bags'. Loose rock would typically be lifted and placed using a 'grab' attached to a hoist or a hydraulic arm; the grab releases the rock close to the seabed in order to achieve accurate placement, and to avoid impact damage to the cable. As the name suggests, rock bags are bags (formed of synthetic rope netting) containing rocks. Each bag would typically cover an area of roughly 3m x 3m with a thickness of roughly 1m. As with mattresses, rock bags can be lifted and then lowered to the seabed using a hoist with a release mechanism. At the point of project decommissioning, cable surface protection would typically have been installed on the seabed for a period of more than 30 years, in line with the approximate design life of the Project. Over this time, it is likely that any synthetic fibres would have degraded and become brittle. This makes the task of removing 'old' mattresses and rock bags difficult and potentially hazardous. While it may be feasible to deploy a Remote Operated Vehicle to attach a lifting line to a mattress or rock bag, the subsequent lifting operation will impose stresses on the degraded synthetic ropes that hold it together and it is	Natural England had a call with the applicant on 8 March 2019 and during that discussion the Applicant stated that they were undertaking further assessment of their survey data to inform an interim cable burial study. Once that is submitted Natural England will provide further advice. Please see our generic cable protection advice note provided at Deadline 4 in the interim.

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			possible that some of the ropes will fail at this point, resulting in an uncontrolled cascade of rocks or concrete tiles. Loose rock could be recovered from the seabed using a grab, however this would be a difficult and expensive operation. By the time decommissioning takes place, some of the rock will have become embedded within the sedimentary structure of the seabed. Therefore, although it might be feasible to recover a proportion of the placed rock, 'full recovery' would likely result in extensive disturbance to the seabed. Chapter 5 of the ES (paragraph 224) also refers to other protection options. Sand bags, grout bags and Uraduct-like systems are mainly used to support and protect cables at the entry to J-tubes or landfall ducts. Removal of frond mattresses presents the same problems as non-fronded mattresses. Offshore decommissioning will be undertaken in accordance with the decommissioning programme to be produced in accordance with Requirement 14 of the dDCO. The scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning.	
6.	**Construction - offshore**			
6.13	Applicant	Further to your responses to the ExQ1 6.1 and 6.2 [REP1-007], and to the discussions in this regard at the offshore environmental matters ISH2 [EV-009 and EV-010], please set out a summary of the key differences to account for the significant range of	In response to the offshore Issue Specific Hearing (ISH2) Action Point 5, a comparison of the Norfolk Vanguard sediment disposal and cable protection volumes with those of Hornsea Project Three and East Anglia THREE is provided at Deadline 4 (document reference ExA; ISH2; 10.D4.5).	Natural England will review and provide further comment during the ISH on 27th March and at Deadline 6

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		predicted for inert material to be disposed of and cable protection required for Norfolk Vanguard, Hornsea Project Three and East Anglia THREE.		
7.	**Offshore archaeology and cultural heritage – not relevant to Natural England**			
8.	**Fishing and navigation – not relevant to Natural England**			
9.	**Marine geology, oceanography and physical processes, marine water and sediment quality – No questions at this time**			
10.	**Construction – onshore - not relevant to Natural England**			
11.	**Traffic, transport and highway safety - not relevant to Natural England**			
12.	**Air quality and human health - not relevant to Natural England**			
13.	**Noise and vibration - not relevant to Natural England**			
14.	**Seascape, landscape and visual impact**			
14.26	Applicant	Please provide paper copies of the additional photomontages showing a 19m box indicating the onshore converter station which were submitted at deadline 3.[REP3-024 to REP3-030 inclusive]	The Applicant has provided paper copies of these photomontages as part of Deadline 4 at full scale, as well as smaller-scale for the purposes of the ASI.	No comments.
14.27	Applicant	You are referred to the further evidence of North Norfolk District Council [REP3-055] in support of its contention that there should be a 10-year maintenance period	The evidence that NNDC submitted to the examination at Deadline 3 to justify a 10 year period of aftercare for replacement planting is based on the soil properties in North Norfolk and the potential success of woodland planting in North Norfolk District. For example: Section 4.2 “The system is designed to match key site factors with the ecological requirements of different tree species and woodland communities”	No comments.

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		for all planting. Please comment further upon the evidence submitted by NNDC at deadline 3.	Section 4.6 “A period of 10 years aftercare and replacement provides for greater formal protection when establishing tree stock. At 10 years growth, a tree will have reached a size where it would be subject to Forestry Commission Felling Licence Regulations (i.e. 8cm girth at 1.3m above ground level). After only 5 years, as proposed by the Applicant, trees would not have reached sufficient maturity…” In addition, 'Appendix 1 Examples from Establishment Management Information System' only lists tree species. Within North Norfolk District the Applicant is not proposing any tree planting. There are no wooded areas that will be directly affected by the onshore cable route in North Norfolk District. The onshore cable route crosses a number of hedgerows, some of which will have occasional individual trees. The Applicant has committed to micrositing the onshore cable route to avoid individual trees in hedgerows where possible – the width of the hedgerow crossings are reduced from 45m to 20m to achieve this, which is captured within the outline CoCP and secured through Requirement 20 of the dDCO. Due to the nature of the installed infrastructure it is not possible to replace individual trees on top of the buried cables. The replacement planting within North Norfolk District is therefore limited to replacement hedgerows only. Hedgerow planting will typically mature within 3-5 years. On this basis, the Applicant is confident that 5 years aftercare is appropriate. The evidence provided by NNDC is focussed on woodland planting in North Norfolk District. The soil conditions described relate to freely draining nutrient poor soils nearer the coast. Whilst these are the predominant soil types in North Norfolk, they are not representative throughout the rest of Norfolk. The woodland planting that is proposed at the onshore project substation will be in soils that are classed as Grade 2 and 3 under the agricultural land classification system (very good and good growing conditions). Whilst this classification is primarily related to agricultural crops it	

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			provides evidence that the land around the onshore project substation falls within the best and most versatile land, with the best growing conditions, and would not be classed as nutrient poor.	
14.28	NNDC	Having regard to the Applicant's post hearing submissions [REP3-003] on the mitigation measures for the impacts of hedgerow removal and proposed replacement measures, do you wish to comment further? (n.b it is not necessary to address the question of the appropriate maintenance period).	NNDC are disappointed that the Applicant considers no replacement trees are to be provided within the NNDC authority area. In respect of replacement planting, it is the expectation of NNDC that where trees are to be removed along the cable route (for example, where removal cannot reasonably be avoided), these should be replaced within reasonable proximity as part of the Provision of Landscaping (DCO Requirement 18) and appropriately managed as part of the Implementation and Maintenance of Landscaping (DCO Requirement 19) for a period of ten years after planting. NNDC would also welcome further clarification as to who will manage and maintain landscape mitigation planting.	No comments.
14.29	Applicant	In your LVIA assessment of potential impacts during construction and operation you categorise the significance of effect as 'significant' or 'not significant' with no further quantification of significant effects. Please explain the reason for this and comment upon how the cumulative assessment has been undertaken in	EIA Regulations require the identification of likely significant effects and the methodology adopted within the Landscape and Visual Impact Assessment (LVIA) complies with this requirement. There is no requirement for significant effects to be broken down into degrees of significance, and therefore these are not included in the LVIA. This methodology was agreed through the Evidence Plan Process (for LVIA the stakeholders included NCC, Breckland Council, NNDC and Historic England) and is consistent with the approach undertaken for other relevant projects, for example East Anglia ONE and East Anglia THREE. An indication of the degree of significance can, however, be extrapolated from the assessment of the sensitivity rating and the assessment of the magnitude of change rating. For example, if both of these criteria are rated as high, then the effect would be at the upper end of a significant effect, and conversely if both are rated as medium then the effect would be at the lower	No comments.

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		light of this. [APP-315]	end of a significant effect. The same principle applies for the CIA in terms of defining the effect as either significant or not significant, without attributing degrees of significance. Again, the sensitivity and cumulative magnitude of change ratings can be used to indicate at which end of the scale of cumulative significance the assessment lies.	
14.30	Applicant	LVIA methodology [APP-315]: are there definitions provided for receptor value, susceptibility to change and overall sensitivity?	Value, susceptibility and sensitivity are difficult to condense into a concise definition owing to the complexity of criteria considered. There are no set definitions, but the criteria used are based on Guidelines for LVIA Third Edition (GLVIA3) criteria combined with professional judgement, which is consistent with the approach taken for other projects. The criteria upon which value, susceptibility and sensitivity have been assessed for Norfolk Vanguard, are set out in Sections 29.4.2.3 to 29.4.2.5 and 29.5.1.2 to 29.5.1.4 of ES Appendix 29.1 Landscape and Visual Impact Assessment Methodology.	No comments.
14.31	Applicant	In the LVIA post-construction mitigation has been taken into account when reaching a conclusion that there are no likely significant effects. How can the ExA be assured that this does not result in the significance of construction effects not being fully taken into account?	The effects during the construction phase are assessed without post-construction mitigation planting. The assessments presented in Tables 29.9, 29.10 and 29.11 of ES Chapter 29 Landscape and Visual Impact Assessment include a column for “significance of effect” which is the assessment of construction impacts in the absence of mitigation planting. There is a further column in each of those tables titled “duration of effect” which reports the residual impact in relation to the time it will take for the mitigation to take effect (rather than simply call it residual effect). This has been presented in this way to be more transparent regarding the length of time planting takes to mitigate effects.	No comments.
14.32	Applicant	Please confirm what efforts you have made in monitoring the examinations of	As stated in response to the ExA’s First Written Questions (Q23.45), the Applicant has and will continue to monitor the examinations of Thanet Extension and Hornsea Project THREE by reviewing examination submission documents	No comments.

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		other projects in the wider area (such as Hornsea Three Project and Thanet) and any actions you have taken in terms of updating the cumulative effects assessment.	and attending hearings where possible. The Applicant also has regular meetings with Hornsea Project THREE (UK) Ltd and the Thanet Extension team within Vattenfall. The Applicant will consider the requirement to update the CIA following any significant updates to these projects during examination. The Applicant also expects that NE would identify potential required updates (e.g. in relation to offshore ornithology in-combination effects) through their direct involvement in the examination of each project.	
14.33	Breckland Council	Please could you provide a response to FWQ14.4 in relation to the methodology, baseline data, assumptions, modelling and conclusions of the LVIA. Please confirm that you accept the assessment of potential cumulative impacts. Please comment on the mitigation and management measures set out in the Outline Landscape and Ecological Management Strategy, the Outline Access Management Plan and the Outline Code of Construction Practice. Please identify any outstanding issues.	No response provided.	No comments.

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14.3 4	Necton Parish Council	NPS EN-3 makes clear that among other things consent for a development should not be refused solely on the ground of an adverse effect on visual amenity unless an alternative layout within the identified site could be reasonably proposed which would minimise any harm, taking into account other constraints that the Applicant has faced such as ecological effects, while maintaining safety or economic viability of the application. Please clarify what alternative layout within the identified site, as opposed to land outside the Order Limits, you propose if any, in relation to the siting of the substation/additional substation or its component parts.	Necton Parish Council asked Vattenfall to consider two alternative sites to the one selected. One was within the 3km 'acceptable circle' and one outside it. The site within the 3km circle is Top Farm. The road to the site chosen for access to the proposed substation site passes through Top Farm, which can potentially accommodate both the converter halls and the National Grid substations. It presents fewer issues as the site contains a significant amount of low ground and there is no contamination from the 1996 plane crash. The current plan for the National Grid substations is to replace one pylon with two pylons to allow connection to the grid network. We believe the Top Farm site would only require the replacement of one pylon with one new pylon so there would be less effect on the visual amenity of Necton both from the lower construction of the converter halls and National Grid substations. The cable route should be shorter so there should be no effect on the overall economic viability of the project. We are not certain whether the Order Limits include the whole Top Farm site but they certainly include some of it because the proposed access road for the proposed substations runs through Top Farm. It is adjacent to the proposed cable corridor route and was already offered to Vattenfall for sale. In addition, the Environmental Statement, Volume 3 Appendix 4.9, on page 24 shows a dash for any effects on tourism. The harm to the nearest luxury holiday let, on St Andrews Lane, would be significant from the proposed National Grid substation activities. This tourist business has already been subjected to significant light and noise pollution from the previous, smaller Dudgeon substations' construction. Vanguard and Boreas will each be larger and their construction will each take longer than Dudgeon. Necton Parish Council's preferred alternative Top Farm site is further away and in a dip so the effects from construction on Necton in general, and in particular on this tourism business, would be minimized.	No comments.

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15.	**Onshore archaeology and cultural heritage - not relevant to Natural England**			
16.	**Geology, ground conditions, drainage, pollution and flood risk**			
16.30	Applicant	The UK Climate Projections 2018 (UCKP18) was published on 26 November 2018. Do the projections have any implications for the conclusions drawn in chapters 4 and 8 of the ES or on the risk of the development being affected by coastal change?	The emphasis of the UKCP18 marine projections is on changes in coastal sea level, including extreme water levels that arise from storm surges and surface waves. It is noted that the scope of work is different to that presented in UKCP09 (the latest UKCP projections at the time of the application and therefore those which helped inform the assessments, as referenced within the application documents). The UK Climate Projections 2018 (UCKP18) predictions for sea level rise are higher than the previous UKCP09 projections for similar emissions scenarios at 2100. UCKP18 predictions for sea level rise are estimated up to 2100, and although this is beyond the design life of the project, the project is designed considering these projections. There is no increase beyond these conservative projections in the UKCP18 projections within the design life of the project, and as such there is no increase in the potential associated risks. ES Chapter 4 describes the site selection of the landfall infrastructure. Embedded design mitigation measures at the landfall to account for projections on changes in coastal sea level include: • Landfall location being set back beyond the maximum predicted erosion levels at 2105, as shown on Figure 2 of Document ExA; ISH; 10.D3.1D, submitted at Deadline 3; • Landfall compound zone extending a further 200m inland to allow for flexibility as more up to date information and forecasts on erosion levels become available; and • Use of long HDD. Owing to this conservative approach to the landfall site selection and design, the UKCP18 projections do not alter the conclusions drawn in Chapters 4 and 8 of the ES. Document ExA; ISH; 10.D3.1D provides a detailed explanation of considerations of coastal change with regard to the landfall infrastructure. Figure 2 of Document ExA; ISH;	No comments.

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			10.D3.1D shows the predicted beach levels until 2105 with indicative cable depth and angle, which shows that the cables at landfall will remain buried throughout the 30 year design life of the project despite increased projections in UKCP18. Appendix 4.3 provides an assessment of the predicted coastal change and erosion levels for up to 100 years, with sea level rise around Bacton estimated to be approximately 42 cm. However, allowance was made for the potential that projections could change to nearly double that value at 77cm. As sea level rise projections for London (for the high emissions scenario) are 25cm higher for UKCP18 than UKCP09, this is within the allowance of change in Appendix 4.3. As such, the estimates remain conservative with no increased risk to the development due to the new projected rates of coastal change. Chapter 8 of the ES (Marine Geology, Oceanography and Physical Processes) (document reference 6.1.8) details the assessment of potential construction, operation and decommissioning impacts on coastal change in sections 8.7.7.5 and 8.7.8.6. Increases in sea level and storm surges are estimated up to 2100, and although this is beyond the design life of the project, the project is designed considering these projections. There is no increase beyond these conservative projections in the UKCP18 projections within the design life of the project, and as such there is no increase in the potential associated risks. Overall, as the design of the project and associated environmental assessments have taken into account projections far beyond the design life of the project, and conservative embedded mitigation measures have been incorporated into the design, there will be no implications for the conclusions drawn in Chapters 4 and 8 and no increased risk of the project being affected by coastal change as a result of the UKCP18 projections.	
16.31	Applicant	In the event that cables were to	Paragraph 5.510 of (EN-1) states that:	Natural England notes that according to the applicant it is unlikely that cables in the

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		become exposed due to coastal erosion what mitigation or remediation measures may be required? How would this be monitored? Paragraph 5.510 of (EN-1) seeks to ensure that proposed developments will be resilient to coastal erosion and deposition, taking account of climate change, during the project's operational life and any decommissioning period. How has the resilience to costal erosion during the decommissioning period been addressed?	"The IPC should be satisfied that the proposed development will be resilient to coastal erosion and deposition, taking account of climate change, during the project's operational life and any decommissioning period." The design of the landfall infrastructure and construction methods (secured under Requirement 17 of the dDCO) includes embedded mitigation taking into account the potential effects of coastal erosion during the design life of the project, and seeks to minimise the likelihood that these effects will result in exposure of the landfall ducts. Embedded design measures include the landfall being set suitably further back from the maximum predicted erosion at 2105, as shown on Figure 2 of Document ExA; ISH; 10.D3.1D, submitted at Deadline 3, with the compound zone extending a further 200m inland to allow for flexibility as more up to date information and forecasts are produced. Given the criticality of the landfall infrastructure to the Applicant's proposed wind farm project, the rate and extent of coastal erosion at the landfall location will be closely monitored throughout the operation of the project. If the rate and extent of cliff retreat indicates that the landfall ducts could become exposed during operation, the owner of the offshore transmission asset will be able to anticipate this event several years in advance, and take appropriate actions to mitigate any risks to both the project and the public. Possible mitigating actions at this stage may include: • Measures aimed at reducing the ongoing rate of cliff retreat e.g. construction of groynes and/or other defensive structures on the beach or structural reinforcement of sand. If successful, these measures would delay the date at which the ducts were projected to become exposed; or • At the time that ducts to become exposed, to undertake engineering works designed to protect the exposed ducts from the direct effects of wave action while also ensuring that potential hazards to users of the beach are effectively eliminated e.g. rock placement around and over exposed duct sections, at foot of sand cliffs or construction of timber or	nearshore area will become exposed. However, we advise that in the event that cables were to become exposed due to coastal erosion mitigation or remediation options would need to consider potential impacts to Happisburgh Cliffs SSSI, the Greater Wash SPA and be in line with the current Shoreline Management Plan for the area. Natural England's preference would be for the cables to be reburied because any cable protection is likely impact on natural sediment movements. Happisburgh Cliffs SSSI, is a geological site, the key management principle is to maintain exposure of the geological interest allowing natural processes to proceed freely. Any loss of an area of a SPA through mitigation measures could potentially have a LSE and should be assessed in accordance with recent case law.

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			concrete structure(s) around exposed duct sections, at foot of sand cliffs. Given the degree of uncertainty associated with these scenarios and the extent of coastal erosion, it is not considered appropriate to specify in detail at this time the measures that might be undertaken to mitigate the risks to the project. The detailed design of decommissioning activities at the landfall will depend on the coastal geography and topology at the time; these factors will be taken into account in the onshore decommissioning plan submitted under requirement 29 of the dDCO.	
16.32	Applicant	Please provide an update on your discussions regarding the potential options for Cart Gap sea wall	As stated in response to the ExA's First Written Questions (Q16.29), post-consent the Applicant is open to discussing the feasibility of providing spoil to NNDC, should NNDC wish to proceed with seeking a licence to infill the Cart Gap seawall. NNDC has indicated that are happy to work with the Applicant and relevant land owners to take forward this opportunity although discussions have yet to take place. This position is now documented SOCG with NNDC.	No comments.
16.32	NNDC	As above.	NNDC welcomes the Applicant's statement in the SoCG that they are 'open to discussing the feasibility of providing spoil to NNDC post-consent, should NNDC wish to proceed with seeking a licence to infill the Cart Gap seawall'. Given the added potential for re-use of spoil to reduce overall traffic movements, NNDC would be happy to work with the Applicant and relevant land owners to take forward this opportunity. This could be secured within the final DCO either as part of the CoCP (as part of Soil Management, as a Construction Method Statement or as part of the Site and Excavated Waste Management (with a specific new topic covering re-use of clean spoil)) or other relevant documents to be determined between the parties. If the Applicant is prepared to commit to this option, NNDC would be willing to take forward the required licenses to enable this to happen. This will benefit both parties, in terms of cost saving for the Applicant, fewer traffic movements	No comments.

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			transporting material offsite and an increase in clean spoil to help slow down the rate of coastal change.	
16.3 3	Applicant	Please provide an update on your discussions regarding Norfolk County Council's request that the surface water drainage scheme should be subject to a separate requirement.	The Applicant met with NCC on 26th February 2019 to discuss the request for a surface water drainage scheme requirement. The Applicant is happy to accept the wording requested by NCC and it was agreed that this wording would be captured within a plan to be secured through the dDCO requirements. Discussions as to the precise plan and DCO Requirement through which this will be secured are ongoing. The principle of this change has been agreed within the updated SoCG between the Applicant and NCC submitted at Deadline 4 (ref: Rep1 - SOCG - 15.1 version 2).	No comments.
16.3 3	NCC	As above.	The County Council has been in discussion with the applicant regarding the potential need for the County Council's standard condition/requirement covering surface water drainage matters being included in the Development Consent Order (DCO). It has been agreed with the applicant that the outline Code of Construction Practice will be updated to reflect Norfolk County Council's requested wording for flood risk management associated with the operational onshore project substation. For clarity DCO Requirement 20 will also be updated to include specific reference to the onshore project substation operational surface water drainage plan. With these additions, mitigation to manage potential flood risk impacts associated with the operation of the onshore project substation will be adequately secured and the County Council will no longer be seeking a separate Requirement in respect of surface water drainage. Confirmation of the County Council's position will be set out in the updated Statement of Common Ground (SoCG), which will be submitted shortly to the ExA.	No comments.
16.3 4	Applicant, EA	Please provide an update on your discussions regarding	After further consideration, the Applicant is now able to commit to not storing spoil within the functional floodplain as requested by the Environment Agency and NE. Where a topsoil strip is required within existing grassland located	A Clarification Note regarding sediment management was provided by the Applicant on 27 February 2019 and Natural England's full response in this regard has been provided

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		the storage of spoil within the floodplain	within the functional floodplain, this will be undertaken using a turf cutter. Turf rolls will be retained and reinstated after the works to maximise the potential for reinstatement / restoration to be effective. Removed topsoil and turf will be stored outside of the functional floodplain. The OCoCP will be updated to reflect this updated commitment and will be secured through Requirement 20. This has subsequently been agreed within the updated SoCG between the Applicant and the Environment Agency submitted at Deadline 4 (ref: Rep1 - SOCG - 6.1 version 2).	at Deadline 5 (see DAS response letter to Sediment Management in River Wensum Crossing Clarification Note). However, in summary, Natural England welcomes this commitment and have therefore withdrawn our concerns in this regard.
17.	**Aviation and radar- not relevant to Natural England**			
18.	**Land use and recreation**			
18.27	Applicant	Table 5.3.6 included in ES Chapter 5: Project Description, is very high level and provides no detail of how construction will take place. You clarified at ISH3 that pre-construction works could start in 2020 and take two years, followed by duct installation which takes a further two years and then a further two years for the cable pull, joint and commission. Please amend the Table to include a key to the diagram and provide detail as to what Phase 1 and	Phase 1 and Phase 2 reflect the potential annual subdivisions of the up to 2 year 'cable pull, joint and commission' works at the landfall and onshore cable route and 'electrical plant installation and commission' works at the onshore project substation, as shown in Table 5.36 of Chapter 5 Project Description of the ES. As noted in Section 5.5.8.5 and 5.5.8.6, the onshore cables and onshore project substation electrical plant would be supplied and installed in up to two phases, in line with up to two phases of offshore development. Works across the onshore project area will occur over a 6 year period, however works in any specific location will be for much shorter periods within that timescale, such that individual agricultural land parcels are unlikely to be taken out of production for this entire duration. The Applicant refers to paragraph 134 of Chapter 21 Land Use and Agriculture of the ES which notes that "during construction it is unavoidable that land along the onshore cable route would temporarily be taken out of its existing land use, however the embedded mitigation measures reduce the potential impacts as far as practicable." The following outlines the construction methods and works associated with each element of the 6 year construction	No comments.

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		2 is referring to. Do you agree that given the timeline it is possible that agricultural land could be taken out of production for 6 years?	programme and outlines how impacts on a single location will be limited to short periods within the overarching 6 year programme. - 2 year pre-construction: During this period, works will only be conducted where required and as required based on the types of works as detailed in Section 5.5.8.1. Any works at a single location during this period are likely to be completed within short periods of time (in the order of weeks). The 2 year elapsed period for pre-construction allows consideration that some of the works can only be conducted in specific seasons. - 2 year duct installation: During this period, excavations to install the ducts will advance from mobilisation areas at a rate of approximately 150m/week including reinstatement of subsoil and topsoil, with exception to the running track and any associated temporary drainage channels. The running track will be retained between the workfront and mobilisation area for access until duct installation for that section (notional duct installation sections are illustrated in Figure 24.07a of Chapter 24 of the ES) is complete. The running track will then be removed and the land reinstated. In some locations, isolated sections of the running track could be left in place to support the cable pulling works (see below) or be reinstated at the time of the cable pulling works. - Up to 2 year cable pulling: During this period works will be limited to joint pits (notionally 800m separated) and the temporary access to the joint pits (through reinstatement of short sections of running track and/or construction accesses). As detailed in Section 5.5.2.4.1, any one joint pit could be open for up to 10 weeks per annum. The Applicant has also provided this information directly to the NFU/LIG through on-going discussions on the SoCG (Rep1 - SOCG - 5.1), as submitted at Deadline 4.	
18.28	Applicant	It is understood that you intend to lay the ducts and reinstate approximately 150m	i) The most appropriate reinstatement method and timing will be dependent on the type of field drainage in question, however subsurface drainage will likely be reinstated as part	No comments.

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		sections at a time such that areas of land may be able to come back in to agricultural use within the second two-year period when ducting is carried out. Please: (i) detail how field drainage will be reinstated before the sub and top soil is reinstated on these 150m sections; (ii) explain when the joint bays will be constructed and what is the land area required for this construction; (iii) explain what happens if there is a fault on the cables during testing; and (iv) confirm when the cables for the Boreas project will be pulled through the ducts and the joint bays for this project be constructed?	of the subsoil reinstatement process as the corresponding 150m section of the onshore cable route is being completed. ii) Joint bays will most likely be constructed at the time of the cable pulling phase of the works (post duct installation) to maximise the flexibility in their location. With reference to Table 5.33 of Chapter 5 of the ES, a joint bay is a concrete floor of up to 6m x 15m installed at a depth of up to 2m under the ground surface and serves as a stable platform for cable pulling and jointing activities. Joint bays are not required for duct installation activities. iii) Cables will be installed in the two year period post duct installation. If there is a fault on the cables during testing the faulted cable section can be cut and pulled from the duct and a new cable section pulled into the duct and jointed. Norfolk Boreas cables would be pulled through the pre-installed ducts in a subsequent up to two year period after Norfolk Vanguard's up to two year cable pulling period. Joint bays for Norfolk Boreas would be constructed at the time of the Norfolk Boreas cable pulling.	
18.29	Applicant	Please provide further information on:(i) How and when would discussions will take place with	i) Discussions on siting of link boxes will take place post-consent following a cable contractor being appointed by the Applicant, and once the design of the cable specifications has been confirmed. This will include details on the length of cables, location of joint pits and technical requirements for	Discussions with landholders with Stewardship agreements should be held at the earliest opportunity and include discussions with the Rural Payments Agency.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		landowners and occupiers on the location of the link boxes; (ii) What the configuration will be if link boxes are grouped together; (iii) Whether all link boxes will be manhole covers and confirm that no cabinets above ground will be installed.	link boxes, and therefore allowing indicative siting of link boxes to be determined. ii) The configuration of the link boxes could be discussed with the landowner/occupier on any preferences of configuration once detailed design is completed and in accordance with engineering requirements. A cabinet design has been included within the design envelope of the ES (see paragraph 333 of Chapter 5 Project Description) as this may be preferential to some landowners. A final decision will be made post detailed design.	
18.30	Applicant	Taking account of the NFU/LIG's submissions at [REP3-049] including the Appendices thereto, please provide an update on drafting an outline soil management plan which includes details of the Agricultural Liaison Officer (ALO) and the role that will be undertaken, general principles of how soil will be treated and aftercare carried out and for the main principles of how field drainage will be reinstated to be clarified. Please	The Applicant has reviewed the Deadline 3 submission and appendices provided by the NFU/LIG (REP3-049) and has committed to capturing the principles set out in those documents within an update to the OCoCP. The updated OCoCP will include a new section setting out the proposed content of the Soil Management Plan, details of the role of the ALO, how soil will be treated, aftercare carried out, and how field drainage will be reinstated. The principles of the SMP will be captured within the OCoCP and will be secured through DCO Requirement 20(2)(f). This is reflected in the updated SoCG with NFU/LIG submitted at Deadline 4 (Rep1 - SOCG - 5.1).	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		provide an indicative timetable for agreeing an outline soil management plan, linked to the CoCP such that it is binding under the DCO and gives assurance to landowners and occupiers.		
18.31	Applicant	Please comment on the wording that the NFU and LIG would like to see being included in the soil management plan to cover how field drainage and irrigation systems will be treated pre and post construction as set out in [REP3-049] at Appendix B.	The Applicant has reviewed the Deadline 3 submission and appendices provided by the NFU/LIG (REP3-049) and has committed to capturing the principles set out in those documents, including how field drainage and irrigation systems will be treated pre and post construction, within an update to the OCoCP. The principles of the SMP will be captured within the OCoCP and will be secured through DCO Requirement 20(2)(f). This is reflected in the updated SoCG with NFU/LIG submitted at Deadline 4 (Rep1 - SOCG - 5.1).	No comments.
18.32	Applicant	Please comment on the wording that the NFU and LIG would like to see being included in the soil management plan/CoCP to cover preconstruction survey of soils and the detail to be included in a record of condition, and soil storage and treatment as set out	The Applicant has reviewed the Deadline 3 submission and appendices provided by the NFU/LIG (REP3-049) and has committed to capturing the principles set out in those documents, including pre-construction survey of soils, and details of soil storage and treatment, within an update to the OCoCP. The principles of the SMP will be captured within the OCoCP and will be secured through DCO Requirement 20(2)(f). This is reflected in the updated SoCG with NFU/LIG submitted at Deadline 4 (Rep1 - SOCG - 5.1).	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		in [REP3-049] at Appendices C and D		
18.3 3	Applicant	Horizontal Directional Drillling is not proposed at the crossings of two further Norfolk Trails, the Wensum Way and Weaver's Way, nor the majority of the crossing points of the general Public Rights of Way (PRoW) network. Do you agree that the County Council as the Highways Authority should be the relevant local authority to agree the management of PRoW's including the Trails network?	Within the NCC Local Impact Report, the County Council state that "in matters relating to Public Rights of Way (PRoW) and Trails, it is felt that the County Council as the Highways Authority should be the relevant local authority to agree the management of PRoW." The Applicant is content that the County Council would be the RPA. Mitigation related to PRoW is captured in the OCoCP and secured through Requirement 20. Requirement 20 has been updated in the dDCO submitted at Deadline 4 to confirm that the final CoCP must be submitted to and approved by the RPA, in consultation with NCC.	No comments.
18.3 3	NCC	As above.	We agree that NCC is the relevant local authority.	No comments.
18.3 3	NNDC	As above.	Whilst it is of concern that trenchless crossing techniques are not being used to cross the Weavers way near to Aylsham (Blickling Road and Silvergate) given the popularity of this area for tourists in connection with Blickling Hall, this is outside of NNDC's jurisdiction and is therefore a matter for Broadland District Council (BDC). The same applies to any effect on the Wensum Way, which is also in BDC's area. Public Rights of Way (PRoW) are already a function of the County Council and therefore it would make sense that they should be the relevant local authority to agree the management of PRoWs including the trails network. The	No comments.

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			alternative would be for District LPAs to carry out the function but most LPAs would need to consult the County Council PRoW team for advice in any event. It would therefore cut the bureaucratic burden for the Applicant and likely reduce the potential for delay in discharging requirements if the County Council were the relevant authority.	
18.33	Broadland District Council	As above.	Part of the Wensum Way is in Broadland District, and it is agreed that Norfolk County Council as the Highway Authority should be the relevant local authority for these works. The Weaver's Way is outside of Broadland area.	No comments.
18.34	NNDC	Are you content with the measures proposed by the Applicant to ensure that the commitment not to use the beach car park is enforced, as outlined in the Applicant's response to ExQ1 11.32 at Deadline 1?	As previously set out by NNDC, the land is owned by NNDC and leased to Happisburgh Parish Council and used as a car park and public open space. As it is understood that Vattenfall are not intending to use the site, issues of enforcement and monitoring would not be applicable. In any event, Requirements 20 and 21 of the draft DCO (referred to by the Applicant in their response to ExQ1 11.32) should provide the mechanism to discourage use by traffic associated with the proposal. Failing this, it may be possible for the Applicant to come to an arrangement with NNDC/Happisburgh PC should the potential use of this car park be considered agreeable to all parties.	No comments.
18.34	Happisburgh PC	As above.	Happisburgh PC is content with these measures as long as they are included in the DCO and cover the Ramp as well as the Car Park at Beach Road and the said Car Park and ramp are safe from Compulsory Acquisition.	No comments.
18.36	Applicant	In the section of the SoCG with NFU [REP1-051] relating to access to land and the haul road you refer to a commitment of no more than 20% of the	The up to 20% of running track to be required for the cable pulling phase of construction is outlined in Table 5.31 of Chapter 5 Project Description of the ES in relation to the route sections as illustrated in Figure 24.07a of Chapter 24 Traffic and Transport of the ES. The running track requirement has been derived from a transport assessment of accessibility to the cable route for the purposes of cable pulling. In some locations, due to public highway restrictions	No comments.

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		haul road that will need to be left in situ or reinstated during the construction phase of the Project. Please provide more detail as to how this figure is arrived at, whether this takes into account all works that may be necessary to the land due to the Boreas project and how the commitment would be secured within the DCO or elsewhere.	or other constraints, sections of running track may be required to be reinstated or retained to allow cross field access to potential joint bay locations. This assessment is conservative as it assumes that joint bays could be located anywhere feasible along the onshore cable route. However, the siting of joint bays during detailed design will look to locate joint bays in the most accessible locations, typically near field boundaries, which will minimise the running track requirement identified. The same quantity of running track would be required to support the Norfolk Boreas cable pulling construction phase of up to a further two years after Norfolk Vanguard cable pulling construction phase. This commitment is secured in the dDCO under Requirement 20 through the OCoCP under Section 2.5.5. This sets out that during the cable pulling phase, a reduced 12km by 6m strip along the onshore cable route (representing the total coverage of the retained/reinstated running track across multiple locations) is anticipated to be required. At each location where the running track is retained or reinstated during the cable pull, this would only be required for up to approximately 16 weeks.	
18.37	Necton Parish Council	Do you agree with the reply that the Applicant gave to WQ18.21 [REP1007]? If not please comment further	The applicant has identified a number of additional items that have not been included in their assessment of agricultural land loss e.g. mitigation planting, roadways, etc. and states they are not significant. Since the loss of agricultural land is an important issue for the United Kingdom, we request that the applicant be asked to provide a more accurate assessment of the actual land loss.	A clarification note entitled Unresolved issues was provided by the Applicant to Natural England on 27 February 2019. Included in this was further details on ALC land. Natural England's full response in this regard has been provided at Deadline 5 (see DAS response letter to Unresolved Issues Clarification Note).
18.38	Brecklan d Parish Council	With reference to your SoCG [REP1-037] with the Applicant please provide an update as to whether you maintain an	No response provided.	No comments.

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		objection, and if so why, to the Applicant's position set out in Table 7 (land use and agriculture) on the assessment methodology, findings and approach to mitigation		
19.	**Socio-economic, including tourism - not relevant to Natural England**			
20.	**Content of the draft DCO (dDCO)**			
20.119	Applicant	Please consider and comment briefly on the additional wording provided by Trinity House related to Article 38, as set out in [REP3-062], in particular the circumstances in which it would accept the wording including any amendment thereto which it considers expedient to make	The Applicant has considered the amendments suggested by Trinity House (TH) and proposes the following wording (with additional text in red): Arbitration 38.—(1) Subject to Article 41 (saving provisions for Trinity House), any difference under any provision of this Order, unless otherwise provided for, must be referred to and settled in arbitration in accordance with the rules at Schedule 14 of this Order, by a single arbitrator to be agreed upon by the parties, within 14 days of receipt of the notice of arbitration, or if the parties fail to agree within the time period stipulated, to be appointed on application of either party (after giving written notice to the other) by the Secretary of State… The intention of this amendment is to make it clear that the arbitration Article (at Article 38) does not overrule TH's saving provision (at Article 41). This therefore means that the arbitration article cannot be relied upon by the Applicant against TH if it would prejudice or derogate from any rights, duties or privileges of TH. The Applicant has amended the dDCO submitted at Deadline 4 in this respect. It should also be noted that the Applicant has amended Article 38 in light of the MMO's submissions at Issue Specific Hearing 3 and Deadline 3. The Applicant explains the	No comments.

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			rationale and implications of these changes further within Q.20.139 below.	
20.120	Breckland DC	You have suggested [REP3-03] that Requirements be imposed in the DCO relating to the assessment/remediation of contamination at the site of the plane crash near Necton. Please supply wording for the Requirement(s).	No response provided.	No comments.
20.121	Applicant	"Drafting Suggestions for the dDCO" have been submitted by NNDC at [REP3-055]. Please comment on these including with reference to: i) The HVDC export system; ii) The amendments proposed to R18, R19 and R20; iii) Schedule 15, including the tracked changes version of the whole schedule provided at Appendix 5. Given that AC cables are required offshore, as well as between the onshore	i) HVDC export system The Applicant maintains its position as outlined at Issue Specific Hearing 1 (ExA; ISH; 10.D3.1) and Issue Specific Hearing 3 (ExA; ISH; 10.D3.3), that is it is the physical structures (e.g. cable relay station and increased number of cables requiring an increased land take), as opposed to the nature of the Alternating Current (AC), that is the principal issue for Interested Parties in this respect. It should also be noted that: (1) The ES does not assess the additional infrastructure associated with HVAC; (2) The Order limits do not include the additional land which would be required to construct and operate the additional infrastructure; and (3) The works description contained within the dDCO does not consent the additional infrastructure which gives rise to the concerns (e.g. the cable relay station and the additional number of cables which would be required). Therefore, to the extent that the additional infrastructure was subsequently proposed as part of an HVAC solution, this would require a material amendment to the DCO on the basis that new environmental impacts would need to be assessed, additional land take would be required, and significant local	No comments.

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		substation and the existing National Grid substation extension, and this needs to be permitted within the dDCO, how might the dDCO be amended to provide for the necessary savings in that regard, if it is recommended that the use of a HVDC system within the works description is to be explicitly secured within the DCO?	concern would be raised. Importantly, and as previously set out by the Applicant, if technological advancements enable the future use of an HVAC system to be optimised within the parameters assessed and secured by the dDCO (i.e. without additional above ground cable relay stations and further land take), the Applicant should not be restricted to the use of HVDC technology along the cable route. It is noted that NNDC are concerned to ensure the Applicant uses an efficient export system, however this is a matter for the Applicant to determine, provided it remains within the parameters assessed and consented. In summary, the Applicant's position remains that because the dDCO does not consent the additional infrastructure required for HVAC it is not necessary to stipulate HVDC through a Requirement or further secure the use of a HVDC system within the works description. Notwithstanding this, the EExA has asked for the Applicant's views on drafting in the event that the ExA considers that a HVDC export system should be secured. This could be secured through the following changes to the works description: Work No. 4A – up to four subsea HVDC export cables and fibre optic cables between Work No. 2 and Work No. 4B consisting of subsea HVDC cables and fibre optic cables along routes within the Order limits seaward of MLWS including one or more offshore cable crossings; Work No. 4B – up to four subsea HVDC export cables and fibre optic cables between Work No. 4A and Work No. 4C consisting of subsea HVDC cables and fibre optic cables along routes within the Order limits between MLWS and MHWS at Happisburgh South, North Norfolk; Work No. 4C – the onshore transmission works at the landfall consisting of up to two transition jointing pits and up to four HVDC cables to be laid in ducts underground and associated with fibre optic cables laid within cable ducts underground from MHWS at Work No. 4B to Work No.5;	

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			Work No. 5 – onshore transmission works consisting of up to four HVDC cables to be laid in ducts and up to four additional cable ducts for the Norfolk Boreas offshore wind farm laid underground and associated fibre optic cables laid underground within cable ducts from Work No. 4C to Work No. 6; Work No. 6 – onshore transmission works consisting of up to four HVDC cables to be laid in ducts and up to four additional cable ducts for the Norfolk Boreas offshore wind farm laid underground and associated fibre optic cables laid underground within cable ducts from Work No. 5 to Work No. 7; Work No. 7 – onshore transmission works consisting of up to four HVDC cables to be laid in ducts and up to four additional cable ducts for the Norfolk Boreas offshore wind farm laid underground and associated fibre optic cables laid underground within cable ducts from Work No. 6 to Work No. 8A. Article 2 (Interpretation) would also need to be amended to include a definition of HVDC as 'high voltage direct current'. This drafting would allow AC interface cables as required between the onshore project substation and the National Grid extension (Work No. 9) and also offshore AC cables (Work Nos. 1 to 3). The transmission would change to HVDC for the export cables at the offshore electrical platforms. ii) Requirements The Applicant agrees with the proposed changes to Requirement 18 and Requirement 20 and these changes are reflected in the dDCO submitted at Deadline 4. The Applicant does not agree with the suggested change to Requirement 19(2) to amend the replacement planting to a 10 year period. The evidence that NNDC submitted to the examination at Deadline 3 to justify a 10 year period of aftercare for replacement planting is based on woodland planting. As the Applicant outlined at Issue Specific Hearing 1 and has also stated in response to q14.27, the five year period for replacement planting reflects the industry standard and covers the critical initial period during which the majority of	

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			plant failures would occur. In relation to NNDC's specific local authority area, the replacement planting in this area would be limited to hedgerows only. The Applicant is not proposing any tree planting within North Norfolk District and there are no wooded areas that will be directly affected by the onshore cable route in North Norfolk District. On this basis, 5 years of post-planting monitoring is considered to be appropriate across the entire route and, in particular, for planting within NNDC's boundary. iii) Schedule 15 In relation to Schedule 15, the Applicant considers that the majority of amendments are reasonable and, for those amendments considered reasonable, these are included in the revised dDCO submitted at Deadline 4.	
20.1 22	MMO	Considering the Applicant's response at [REP3-005] to the question whether total disposal volumes could be broken down into different disposal activities, and the number of cable crossings to be stated in the Deemed Marine Licence (DML), do you maintain that further changes are required to the dDCO?	The MMO does maintain that further changes are required within the dDCO. Disposal activities – the MMO understand that the applicant does not have any further details to break down the figures further at this stage. The MMO agrees that the relocation of boulders should not be treated as a disposal activity where the boulders were not brought to the surface prior to relocation. However, if this is to be the case then the applicant is limited to techniques which do not classify as disposal. If this changes following consent then a new marine licence for disposal will be required. Cable crossings - The MMO requests all licensed activities should be limited to the maximum parameters assessed within the ES, and these should be clearly defined on the DMLs. This is to ensure proper scrutiny and ensures accountable, transparent and public due process is applied. This approach is consistent with the process that is followed for standard marine licences granted by MMO. The MMO understand the applicant has included the cable crossings in the total cable protection within the dDCOv2. The MMO do not feel that this is detailed enough to be able to adhere with comment 2.1. The specifics relating to the	Natural England agrees with the MMO, We would re iterate that the disposal locations would need to be agreed in consultation with Natural England due to the potential impacts to Annex I Features

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			deployment of cable protection is an important factor and this needs to be acknowledged in the licence. If the applicant does not propose to exceed any of the maximum parameters assessed in the ES, this will result in no additional burden for the applicant from the inclusion of these parameters on the face of the DMLs, whilst providing greater clarity on what is permitted in order for the MMO to ensure compliance. If the applicant does wish to undertake activities that are out with the maximum parameters assessed and considered under the original licence, the appropriate process for dealing with this would be through a request to vary the DML, whereby the MMO can evaluate whether the proposed changes can be permitted.	
20.1 23	Applicant	Have you considered further the drafting of the definition to specifically restrict the reference to further associated development to that development listed at paragraphs (a) to (p) and (a) to (b) in the description of the authorised development at Schedule 1 Part 1 (after the Works descriptions and before paragraph 2)? If so, please provide any proposed change to the dDCO.	The definition of "onshore transmission works" in the dDCO has been amended as follows: "onshore transmission works" means Work Nos. 4C to 12 and any related further associated development and ancillary works described in Schedule 1 part 1 and Schedule 1 part 2 respectively. It is not considered appropriate to refer only to the lists of onshore further associated development at (a) to (p) and (a) to (b) in Schedule 1, Part 1 because these lists are expressed to be inclusive rather than exhaustive.	No Comments
20.1 24	NNDC	In light of the Applicant's stance at the ISH3 regarding	North Norfolk District Council would defer to the advice of Norfolk County Council as Highway Authority on this matter.	No comments.

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		Article 11 [REP3005] and the temporary stopping up of streets, that it would not be possible to provide an exhaustive list of what might be included in a temporary working site and that this should be given its plain meaning, please confirm whether you are content with that approach and if not why not.	However, NNDC would welcome early engagement on proposed activities, duration of works and mitigation measures so as to avoid the potential for any adverse impacts.	
20.1.25	Applicant	Requirement 12 relates to Ministry of Defence (MoD) requirements to maintain defence aviation safety. Please provide an update as to whether timescales for complying with any direction have been agreed with the MoD such that any lighting considered necessary for aviation safety is in place and operational for the wind turbines and any other	As noted in the Written summary of the Applicant's oral case at ISH3 (ExA; ISH; 10.D3.3), some amendments to Requirement 12 of the dDCO have been agreed with the MoD, which enabled the MoD to require lighting considered necessary for aviation safety which was not captured by the Air Navigation Order and also to provide that such lighting should remain operational for the life of the authorised development. Following the ExA's comments as to whether timescales for complying with any direction should be included, a further amendment has been proposed to the MoD and this had been agreed by the MoD and is included in the dDCO submitted at D4 accordingly. "12 (1) The undertaker must exhibit such lights, with such shape, colour and character and at such times as are required in writing by Air Navigation Order 2016(a) and/or determined necessary for aviation safety in consultation with the Defence Infrastructure Organisation Safeguarding and as directed by the CAA.	No comments.

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		relevant structures during and after construction.	It should be noted that a further amendment has been requested by the MoD to Requirement 12 and the Applicant remains in discussions with the MoD in relation to this.	
20.1 26	Applicant	Requirement 13 secures technical mitigation for impacts on Air Defence Radar (ADR). Please provide an update on discussions with the MoD as to including reference to timescales for implementation of the approved mitigation prior to the first use of the wind turbines.	As noted in the Written summary of the Applicant's oral case at ISH3 (ExA; ISH; 10.D3.3), there is a two stage process for agreeing mitigation under Requirement 13. The mitigation would be approved by the Secretary of State following consultation with the MoD, and following this the mitigation would be implemented. Timescales for implementation of the approved mitigation would be detailed in the Radar Mitigation Scheme. However, following the ExA's request, the Applicant has proposed a further amendment to the drafting to clarify this. This amendment has been agreed by the MoD and has been included in the dDCO submitted at D4, together with some updates to other minor typing errors. 13(2)(b)"approved mitigation" means the detailed Radar Mitigation Scheme (RMS) that will set out the appropriate measures and timescales for implementation as agreed with the Ministry of Defence at the time the Secretary of State confirms satisfaction in writing in accordance with sub-paragraph (1);	No comments.
20.1 27	NCC	How, if at all, would you propose to amend Requirement 16(7) of the dDCO to secure that the Traffic Management Plan allows for trenchless installation techniques to be used in other locations than those specified?	The view of the LHA is the list within R16 needs to be expanded to bring it in line with the Outline Traffic Management Plan and to capture outstanding commitments. Accordingly, we recommend an additional item be added to the list under R16(17) as follows: - (t) roads so indicated within the traffic management plan.	No comments.

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20.128	Applicant	Please provide an update as to what further revisions have been agreed with the Relevant Planning Authorities, or are now proposed as to Requirement 20, Code of Construction Practice, in particular: (i) the extent to which pre-commencement works are adequately secured, and (ii) whether to include reference to 'vibration' at Requirement 20(2)(e)	The Applicant has revised the wording of Requirement 20 which is included in the dDCO submitted for Deadline 4 and which reads as follows (with new additions in red text): "20.—(1) No stage of the onshore transmission works may commence until for that stage a code of construction practice has been submitted to and approved by the relevant planning authority, in consultation with Norfolk County Council and the Environment Agency. (2) The code of construction practice must accord with the outline code of construction practice and include details, as appropriate to the relevant stage, on— (a) relevant health, safety and environmental legislation and compliance; (b) local community liaison responsibilities; (c) artificial light emissions; (d) contaminated land and groundwater; (e) construction noise and vibration; (f) soil management; (g) construction method statements; (h) site and excavated waste management; (i) surface water and drainage; (j) materials management; (k) screening, fencing and site security; (l) air quality; (m) invasive species management; and (n) proposals for managing public rights of way. (3) The code of construction practice approved in relation to the relevant stage of the onshore transmission works must be followed in relation to that stage of the onshore transmission works. (4) Pre-commencement screening, fencing and site security works must only take place in accordance with a specific plan for such pre-commencement works which must accord with the relevant details for screening, fencing and site security set out in the outline code of construction practice, and which has been submitted to and approved by the relevant local authority."	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
			The first change to the Requirement 20(1) has been requested by, and agreed with, NCC. NNDC requested that vibration is included within Requirement 20(2)(e). Reference to managing PRoW has been included at new paragraph (n) given that this is also included within the OCoCP. The addition of a new paragraph (4) has been made to address theExA's question at Issue Specific Hearing 3 as to whether the details within Requirement 20(2)(k) (screening, fencing, and site security) were excluded from the definition of commencement. The Applicant has therefore included this paragraph to enable the RPA to approve pre-commencement screening, fencing, and site security works. The Applicant is also in discussions with NCC regarding the operational elements of surface water and drainage at the onshore substation site; it is agreed that the Applicant will meet NCC's request and the Applicant is currently reviewing the necessary updates to the Requirements and any associated plans. The Applicant expects to be able to submit an update in this respect by Deadline 5.	
20.1 29	Applicant	Please provide an update on discussions as to who is to take the lead in relation to discharge of R21 (traffic matters), R22 (highway accesses), R23 (archaeological WSI) and R25 (watercourse crossings).	Further discussions have been held with NCC and it has been agreed that the lead discharging authorities will be as follows: • Requirement 21: the relevant planning authority (in consultation with the highway authority); • Requirement 22 (which links with Requirement 21): the relevant planning authority (in consultation with the highway authority); • Requirement 23: the relevant planning authority (after the Applicant has consulted with Historic England and NCC); • Requirement 25: the relevant planning authority (in consultation with NCC, the Environment Agency, relevant drainage authorities, and NE). The Applicant has submitted a revised dDCO which reflects this at Deadline 4.	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
20.1 30	Applicant	What amendment is proposed if any as to R21 to secure precommencement mitigation referred to in the relevant plans?	The plans referred to within Requirement 21 are the OTMP, the outline Travel Plan and the outline Access Management Plan. Pre-commencement mitigation and surveys will not generate significant traffic that would be subject to the control measures outlined in these plans. However, pre-commencement archaeological investigation, whilst not generating large numbers of associated traffic, will require heavy plant to be delivered to various (yet to be determined) locations along the onshore Order limits. This is associated with undertaking trial trench excavations once those required locations have been confirmed post-consent. In order for heavy plant to reach some of these locations it may be necessary to introduce a number of the construction accesses ahead of the main onshore construction works. On this basis, Requirement 21 has been amended with the inclusion of a new paragraph (3) which identifies that if there is the need for any of the construction accesses to be introduced ahead of the main onshore construction works in order to facilitate the pre-commencement archaeological investigation, a specific plan for such accesses will be produced. The plan must accord with the relevant details set out in the outline Access Management Plan and must be submitted to and approved by the RPA, in consultation with the highway authority, prior to the construction and use of such accesses. The accesses identified must be constructed and used in accordance with the details contained in the specific plan so approved. This amendment to Requirement 21 has been included in the updated dDCO submitted at Deadline 4.	No comments.
20.1 31	NNDC	Please consider and comment on the response of the Applicant in ISH3 [REP3-005] as to construction hours set out in R26 and inform the ExA of any	In respect of HGV deliveries/arrivals, there needs to be a clear procedure in the eventuality of missed booking slots so that HGVs do not wait near to noise sensitive receptors. NNDC would welcome early engagement on proposed activities and mitigation measures so as to avoid the potential for any adverse impacts, with particular reference to daily start up and shut down activities - Requirement 26 (2)(h).	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		further concerns and consequential proposed amendments to R26.		
20.1 32	Applicant	What is understood by the term “non-intrusive” and is it intended to exclude activities that would have some limited but adverse impact? Is there merit in separating out the “essential” and “non-intrusive” activities in R26?	The Applicant agrees that there is merit in separating out essential and non-intrusive activities within Requirement 26 of the dDCO. The Applicant has included revised drafting in the dDCO, submitted at Deadline 4 to reflect this change; the matters outlined in (the revised drafting of) Requirement 26(3) are examples of non-intrusive activities, as shown below: "Construction hours 26.—(1) Construction work for the onshore transmission works must only take place between 0700 hours and 1900 hours Monday to Friday, and 0700 hours to 1300 hours on Saturdays, with no activity on Sundays or bank holidays, except as specified in paragraphs (2) to (4). (2) Outside the hours specified in paragraph (1), construction work may be undertaken for essential activities including but not limited to— (j) continuous periods of operation that are required as assessed in the environmental statement, such as concrete pouring, drilling, and pulling cables (including fibre optic cables) through ducts; (k) delivery to the onshore transmission works of abnormal loads that may cause congestion on the local road network; (l) works required that may necessitate the temporary closure of roads; (m) onshore transmission works requiring trenchless installation techniques; (n) onshore transmission works at the landfall; (o) commissioning or outage works associated with the extension to the Necton National Grid substation comprised within Work No. 10A; (p) commissioning or outage works associated with the overhead line modification works comprised within Work No. 11 and Work No. 11A;	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
			(q) electrical installation; and (r) emergency works. (3) Outside the hours specified in paragraph (1), construction work may be undertaken for non-intrusive activities including but not limited to— (c) fitting out works within the onshore project substation buildings comprised within Work No. 8A; and (d) daily start up or shut down. (4) Save for emergency works, the timing and duration of all essential construction activities under paragraph (2) and undertaken outside of the hours specified in paragraph (1) must be agreed with the relevant planning authority in writing in advance, and must be carried out within the agreed time." By their very nature, the non-intrusive activities are not considered to be impactful from a noise or environmental perspective; it is therefore proposed that these works may proceed outside of the specified construction hours without further LPA approval. The Applicant also refers the ExA to the response to Question 10.5 above for a further explanation of the rationale for this change.	
20.132	Broadland District Council	As above.	Non-intrusive activities would be those activities that are quiet and don't disturb local residents. There is considered to be merit is specifying the activities that would be considered as essential and non-intrusive activities to avoid misunderstanding once works begin. I trust that this response on behalf of the District Council satisfactorily responds to each of the examining authority's questions at this stage, please contact me if you require any further information in this respect.	No comments.
20.132	NNDC	As above.	NNDC consider that this matters does need to be clarified, particularly as the term 'intrusive' could be interpreted as: • either physical construction works; or • having and adverse impact on noise sensitive receptors Further clarification is required on what is considered to be 'essential' and 'non-intrusive' so that there is certainty in any final DCO decision.	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
20.133	NNDC	Have you considered, following ISH3, alternatives to the wording of R26(2) and if so please provide any alternative wording proposed?	NNDC would be happy to consider alternative wording once the issues identified above are clarified by the Applicant in respect of Questions 20.131, 20.132 and 10.5.	No comments.
20.134	Applicant	Please provide an update as to whether the relevant planning authority should be notified of cessation of commercial operations and to include reference to the timing for implementation of the decommissioning plan at R29(2), supplying any proposed amendments to the dDCO.	As the Applicant outlined in response to the ExA's question 20.61 at Deadline 1 (document reference: ExA; WQ; 10.D1.3), the decommissioning process is largely governed by Ofgem and will be dictated through the length of the fixed term transmission licence. Notwithstanding this, the Applicant agrees that it is appropriate to include wording within Requirement 29 to notify the RPA of cessation of commercial operations, and has amended the dDCO for Deadline 4 as follows: "29.—(1) Within six months of the permanent cessation of commercial operation of the onshore transmission works an onshore decommissioning plan must be submitted to the relevant planning authority for approval. (2) The onshore decommissioning plan must be implemented as approved. (3) The undertaker must notify the relevant planning authority in writing of the permanent cessation of commercial operation of the onshore transmission works within 28 days of such permanent cessation." In addition, an amendment has been made to the dDCO to include the following definition: "onshore decommissioning plan" means a plan to decommission Work No. 4B to Work No. 12 which includes a programme within which any works of decommissioning must be undertaken" This is included to clarify that the decommissioning plan must include the intertidal area and to ensure that a timetable for implementation of the decommissioning works is included as part of the decommissioning plan.	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
			This amendment has been included in the updated dDCO submitted at Deadline 4.	
20.1 35	Applicant	In relation to the discharge of consents set out in R31, please explain in more detail why the principle of minimising delays post consent is particularly important for offshore wind projects in the context of meeting Contract for Difference milestones.	It is Norfolk Vanguard Ltd's intention to bid for a CfD at the earliest opportunity following a successful DCO Consent decision. In July 2018 UK Government announced future CfD Auction Rounds in 2021 and 2023. Successful CfD award will enable Vattenfall to progress future investment decisions that will realise the construction onshore and offshore and subsequent commissioning of the windfarm. If successful, the CfD will contain a number of key contractual milestones which must be met by the developer. These Milestone Delivery Requirements are designed to demonstrate commitment and progression of the projects to achieve generation by the dates stated in the CFD contract. By 12 months of signing a CfD, generators must meet the Milestone Delivery Date criteria. These evidence commitment to a project by either spending 10% of pre-commissioning costs or taking a Financial Investment Decision (FID). It would not be possible to evidence these requirements without minimising post-consent delays. Discharging the consent conditions for Norfolk Vanguard at the earliest opportunity and minimising delays post consent is therefore imperative to meet the Milestone Delivery Date of a CfD in order to make a FID and fulfil other subsequent contractual obligations (e.g. the Operational Conditions Precedent, commissioning during the Target Commissioning Window, meeting obligations before the Longstop Date) associated with the construction and operation of the wind farm.	Natural England would request notification of the completion of various stages. Not just an upfront timeline as it is recognised by all parties that things can slip and/or be completed early.
20.1 36	Applicant	Do you agree with the MMO's understanding that notwithstanding the intended inclusion of the intertidal area within R29, there will still be a need for	The Applicant agrees that the intertidal area is within the MMO's jurisdiction and, subject to the nature of the decommissioning works to be undertaken, a separate marine licence may be required for the intertidal decommissioning works. The Applicant has submitted a revised draft of the DCO at Deadline 4 to incorporate the intertidal area within the remit of Requirement 29.	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		permission from the MMO for the decommissioning stage and that a marine licence will be required for decommissioning including the intertidal area?		
20.1 37	MMO	In relation to the transfer of benefit of the DMLs please comment on the Applicant's response in ISH3 to the issue of whether co-operation should be the subject of a condition in the DMLs, on the assumption that the approach to co-operation will deal with confidential or sensitive commercial arrangements between the parties.	The MMO understands that cooperation during transfer of benefit would be in both operators' interests to ensure that there is a clear set of principles outlined between the parties. However, as described these are commercial agreements and not subject to any regulatory oversight. As these transfers would move licenced activities from one undertaker to another, there could be further consequences not considered within the commercial aspects. For example impacts to ongoing monitoring or ongoing agreed mitigation plans.	No comments.
20.1 38	Applicant	Please comment on the MMO's proposed wording at 3.2.1 of [REP3-046] of a cooperation condition within the Schedule 1, Part 3, Requirements, and in relation to the DMLs	The Applicant has reviewed the MMO's proposed Offshore Co-operation condition included in the MMO's Deadline 3 submission. The Applicant notes that a similar condition was included in the East Anglia Three Offshore Wind Farm Order (EA3). However, this was necessary due to the overlap in Order limits for EA3 and East Anglia ONE (EA1), as well as a need to co-operate during the pre-construction phase because EA1 had not been constructed at the point of EA3 consent. The Norfolk Vanguard Order limits do not encroach on the Order limits of another made DCO and the Applicant	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		at Schedules 9, 10, 11, and 12.	understands the purpose of the condition would be to manage co-operation between future operators following a transfer of benefit post-construction (rather than pre-construction). The Applicant therefore considers that this condition is not necessary and can be distinguished from the condition included in the EA3 Order. As previously stated, the Applicant considers that this is best dealt with through commercial arrangements at the point of transfer of benefit, especially given that the nature and extent of any co-operation required is not yet known.	
20.139	Applicant	Conditions 14 (1) and 15 (2) set out the requirements for the Applicant to submit all preconstruction documentation at least 4 months prior to the commencement of the construction works. The MMO has provided detailed reasoning [REP3-046] in particular at points 1.2.6 and 4.1.2, as to why the timescales should be set at least 6 months to allow sufficient time for repeat rounds of stakeholder consultation if required. Please review, including the representations about this matter by NE at	The Applicant notes NE's and the MMO's comments. The Applicant, however, believes that the four month time frame conditioned within the DMLs is appropriate and proportionate to allow the MMO, in consultation with NE where relevant, sufficient time for stakeholder consultation and the provision of comments, whilst ensuring no unnecessary delay to the commencement of development and completion of construction works. This four month time period is contained on a number of other OWF DCOs (including The East Anglia Three Offshore Wind Farm Order 2017 and Hornsea Two Offshore Wind Farm Order 2016) which are not dissimilar in size and principle to Norfolk Vanguard. Four months is well-established as an appropriate time frame for OWF schemes and one that ensures a balance is struck between the expedient discharge of the relevant conditions attached to the DML whilst allowing a reasonable period of time for consideration by the MMO and relevant consultees. The importance of minimising delays post consent for offshore wind projects in the context of meeting Contract for Difference milestones is explained in more detail in response to q20.135. The MMO states, at paragraph 1.2.6 of their Deadline 3 submission, that it is very common that documents require multiple rounds of consultation to address stakeholder concerns. In this respect, the Applicant envisages that discussions will be held with the MMO, and NE where	Natural England would retain its position and support for the position of MMO in this regard.

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		Deadline 3, and confirm whether the timescales proposed are acceptable or list any of the points with which you take issue and explain why.	relevant, once the final Project design has been agreed and in advance of seeking formal discharge of conditions, which would reduce the need for multiple rounds of consultation post submission. The In Principle SIP (document reference 8.17) contains an indicative timeline for consultation and agreement of the SIP post-consent and includes several rounds of consultation with the MMO prior to the formal submission of the final SIP four months in advance of construction. It is expected that other key plans would follow a similar consultation and approval process. Furthermore, it will be in the Applicant's interest to engage the MMO, and NE, at an early stage in this way to ensure the discharge process is as efficient as possible. In practice the Applicant will have engaged in consultation activities with the MMO and NE well in advance of submission of the final version for approval; this means that the relevant stakeholders should be very familiar with its terms and effect at the point an application for discharge is made. The Applicant acknowledges that it has, in some recent cases, taken much longer than 4 months for the MMO to discharge certain DML conditions on other OWF projects and it should be acknowledged that with no mechanism to encourage the MMO to determine applications within a reasonable period (such as arbitration or appeal) the developer is then left in a position which is wholly unsatisfactory. With such highly competitive and fixed CfD milestones, and where offshore construction can only be undertaken in safe and optimal weather conditions, wind farm developers need the certainty and confidence of a reliable and consistent approval process. This is one reason why the Applicant sought to clarify the arbitration provisions in the dDCO. By its own admission at paragraph 2.2.1 of its Deadline 3 submission, the MMO states that the emphasis of the MMO's duties lies in the fact that Parliament has vested public law functions such as discharging marine licence conditions upon the MMO. It should therefore naturally follow that the MMO	

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			does indeed reach a decision on the discharge of a condition, with justifiable reasons (for approval or disapproval), within the timeframes stipulated in a (deemed) marine licence. The MMO has a public duty to do so. This is increasingly pressing in the case of offshore wind. There is a strong public interest argument in favour of timely approvals in order to ensure that nationally significant infrastructure projects (NSIP) are not unduly delayed. Accordingly, the Applicant considers that the dDCO strikes the balance between allowing the MMO (and Natural England) to properly discharge their statutory duties whilst ensuring development is unlocked in a timely manner. However, and notwithstanding the Applicant's view that the MMO should be subject to arbitration for the reasons previously identified, the Applicant is keen to agree a pragmatic solution which is workable for the Applicant and the MMO. Therefore, to the extent that the MMO is willing to agree to the inclusion of a deemed discharge provision in the DMLs, the Applicant will agree to remove the MMO from arbitration under the dDCO. This drafting has been reflected in article 38 (Arbitration) and conditions 15 (Generation DMLs) and condition 10 (Transmission DMLs) of the dDCO submitted at Deadline 4 to allow further discussion on this basis. It will be noted that in applying the deemed discharge period, the Applicant has sought to include drafting which ensures that the MMO is only required to determine the application once it has received all necessary information to do so. The drafting also allows the MMO to request further information from the Applicant within one month of receiving the application. This would extend the period to determination to at least 5 months, and longer once an allowance is made for the Applicant to prepare and provide the information sought. This is considered a reasonable and pragmatic approach given the points identified above.	
20.1 40	Applicant	Do you agree the addition to condition 19 recommended by	The Applicant considers that the timings, methodologies, and details of further actions in the event of unacceptable levels of noise could be included in the construction programme	No comments.

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		the MMO at 4.1.3 of [REP3-046]? If not please explain why not, adding any alternative wording and any desired response to the reasoning adopted in the second paragraph of 4.1.3.	and monitoring plan, which must accord with the offshore IPMP, provided pursuant to Condition 14(1)(b) (Generation DMLs) and/or Condition 9(1)(b) (Transmission DMLs) and which would be approved by the MMO. However, the Applicant has discussed this matter with the MMO and is willing to include the revised wording to Condition 19(3) of the Generation DMLs (Schedule 9-10) as requested by the MMO. Condition 14 of the Transmission DMLs has also been updated accordingly. This is included in the revised dDCO submitted at Deadline 4.	
20.1 41	Network Rail	Please specify in detail what are the outstanding matters concerning 1. Protective provisions for the benefit of Network Rail and 2. Property and asset protection agreements that remain in dispute, with a commentary that enables the ExA to understand exactly what is at issue here. Please refer in the commentary, in particular to paragraphs 2.9, 2.10 and 2.11 of your previous representations in [REP1-063].	1. Protective provisions for the benefit of Network Rail While progress has been made with the Applicant in relation to some of the protective provisions to be included in Part 5 of Schedule 16 to the Development Consent Order (Order) since the submission of Network Rail's Written Representations [REP1-063], several points of difference remain. Network Rail and the Applicant are continuing to discuss these points of difference and Network Rail is hopeful that all matters can be resolved before 28 March, the date reserved for the ISH into the draft Order. We list below the key issues to be resolved between the parties. This not an exhaustive list as we do not include the more minor points of difference and Network Rail will update the ExA as necessary with a full list in advance of ISH5 if these remain unresolved. i) Paragraph 51 - this provision requires the Applicant to obtain consent from Network Rail before exercising a number of powers under the Order in relation to Network Rail, including the exercise of compulsory purchase powers in respect of Network Rail property. Network Rail cannot agree to protective provisions that allow the Applicant to exercise Order powers in respect of Network Rail land without Network Rail's consent. We therefore require that the full list of Order powers that may affect Network Rail property be included. This list is included in the protective provisions at Appendix 1 to Network Rail's Written Representations [REP1-063].	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
			iii) Paragraph 62(3) - similarly, Network Rail cannot be liable for any loss or loss of profits arising from the construction or use of the authorised development and Network Rail requires this paragraph to be amended, as set out in Appendix 1 to the Written Representations [REP1-063]. iv) Arbitration - Network Rail has proposed to the Applicant that some new wording be included in the protective provisions, regarding an arbitration timetable, to ensure that in the event of a dispute being referred to arbitration, any timetable agreed between the parties or set by the arbitrator will take into account Network Rail's clearance process, and other engineering, regulatory and stakeholder consents, including NR governance procedures, which may need to be sought by Network Rail during the course of the arbitration. 2. Property and asset protection agreements Negotiations with the Applicant are ongoing with regards to the other documents referred to in paragraph 2.9 of Network Rail's Written Representations [REP1-063], namely the draft easement, the framework agreement and the asset protection agreements. Network Rail anticipates that these documents will be progressed significantly over the coming weeks and we will update the ExA with regards to these negotiations at the next appropriate Deadline. The final matter referred to in Network Rail's Written Representations requiring further consideration relates to the potential for electro-magnetic interference to be emitted from the authorised development (paragraph 2.11 of REP1-063). Network Rail is assessing whether there is an impact for Network Rail in this regard and hopes to have the results of this assessment in advance of ISH5.	
20.1 42	Applicant	Please provide an update as to whether the position regarding insurance and surety provisions affecting Cadent Gas and as referred to in their D3	The Applicant has been in ongoing discussions with Cadent regarding insurance and surety provisions, and these provisions are now agreed. The parties are yet to finally agree the timescales under the "retained apparatus" provisions. The Applicant is content with the 56 day notice period for the Applicant to provide plans, sections and details under paragraph 8 of the protective	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		submissions [REP3-040] has now been agreed and if not explain the nature of any outstanding dispute.	provisions (retained apparatus). However, the Applicant wishes Cadent to commit to providing its reasonable comments (if any) on the plans, sections and details on a timescale that would more easily allow the period between the Applicant first giving notice and then subsequently commencing works to keep within a 56 day period. The Applicant has been in discussions with Cadent on this point. The Applicant is confident that it can be resolved or a compromise position reached shortly.	
20.142	Cadent Gas	As above.	Cadent have agreed the insurance/surety/indemnity issues with the Promoter now. Cadent are seeking to agree a final version of the Protective Provisions with the Promoter. The recent history of matters is that updated Protective Provisions were returned to the Promoter on the 7th January 2019. Final Neat versions of the Protective Provisions were sent by SHMA on the 3rd of March, reflecting those sent on the 7th January 2019, seeking confirmation that they were agreed. On the 12th March, the promoter's solicitors raised a number of new points on behalf of the Promoter. On the 12th March, SHMA confirm the position in respect of those points Cadent could and couldn't agree. We hope and anticipate that the Protective Provisions are now agreed. However we haven't had Promoters approval to this. Accordingly it is difficult for us to update ExA as to the issue in dispute, if any, because we do not currently know what they are or whether the documents are now finally agreed.	No comments.
20.144	Applicant	In Table 5.6 of Chapter 5, Project Description, relating to the infrastructure seabed footprint, a figure of 157m2 is presented for LiDAR for 2 x monopiles + scour protection. The description of parameters in	The dDCO submitted at Deadline 4 has been updated to include a seabed footprint of 79m2 per Light Imaging, Detection and Ranging (LiDAR).	Natural England welcome this amendment, however, would like to note that a figure of 79m^2 per LiDAR monopile would make a total for both LiDAR of 158m^2. Natural England would question why this figure does no match the figure of 157m^2 originally provided in In Table 5.6 of Chapter 5, Project Description.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		dDCO/DML as currently worded in R10 and Schedules 9 and 10, Part 4, 7(2) allows for 157m2 per foundation. Should this be amended, as suggested by NE in its submissions at D3, [REP3-051], to reflect the figures presented in the ES, i.e. 157m2 in total for both LiDAR measurement buoys, and if not why not?		
20.145	Applicant	Do you agree with NE's comments in [REP3-051] that Schedules 11 and 12, Part 4, 3(1)(b) should be amended to reflect the lower maximum amount of scour protection for the offshore electrical platforms presented in the ES, namely 35,000m3 as in Table 5.15 and Table 5.6 rather than up to 100,000 m3? If not please explain why not.	Table 5.6 and 5.15 refer to an area of 35,000m2 for the total footprint of two offshore electrical platforms with scour protection based on the following: • The footprint per platform without scour protection is 7,500m2 (Table 5.15) i.e. 15,000m2 for two platforms without scour protection • The total area of scour protection is therefore 20,000m2 (35,000-15,000). A conservative assumption of 5m height of scour protection has been adopted in calculating the volume (i.e. 20,000m2 x 5m = 100,000m3). 20,000m2 and 100,000m3 are reflected in the dDCO (Schedules 11 and 12, Part 4 Condition 3(1)(b). It is acknowledged that there is a typing error in Table 5.15 and the maximum area of scour protection per platform (m2) should be 10,000m2 rather than 17,500m2	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
20.1 46	Applicant	Regarding NE's comments in [REP3-051] as to Schedule 1, Part 1, should disposal volumes be split according to type of material, for example drill arisings, boulders, sand and mud? If not please explain why not. Please comment on the recommendation that the maximum volumes taken within the Haisborough, Hammond and Winterton SAC should be detailed separately to ensure the impacts to the designated site remain within the impacts assessed, and whether the wording should also limit the area of impact from removal of substances for disposal to the area assessed	Disposal volumes have been separated into drill arisings and dredged sediment in the dDCO. Any boulders of significant size would be relocated as assessed in the ES. These would not be lifted to the surface and are therefore not considered in the volumes for disposal. The Applicant considers that it is not practicable or necessary to distinguish between sand and mud volumes. As discussed above, the Applicant proposes that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan. This would include proposed mitigation measures and agreement processes associated with sediment disposal within the HHW SAC.	Natural England welcome the change in the dDCO to separate drill arisings and dredged sediment. However, we would advise that within the boundary of HHW SAC sediments are only permitted to be deposited in areas that are >95% similar to the said sediment. Natural England will provide further advise once the Applicant's document has been submitted
20.1 48	Applicant	Schedule 1, Part 1 & Schedules 9-12 Part 3 1(f): please clarify the apparent discrepancy between	The value should be 414,761m3 as listed in the dDCO.	No comments.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		the total of 414,762m3 included in the Change Report and a value of 414,761m3 listed in the draft DCO /DML.		
20.1 49	Applicant	Schedule 1, Part 3, Requirement 2(b) Schedules 9 and 10, Part 4, Condition 2(1)(b): please confirm the maximum height of a wind turbine generator to the centreline of the generator shaft (when measured from HAT) will be revised in the next dDCO from 200m to 198.5m, in accordance with the parameter assessed in the ES.	This has been updated in the dDCO submitted at Deadline 4.	Natural England welcome this amendment and has no further comments.
20.1 50	Applicant	Schedule 1, Part 3, Requirement 5; Schedule 9 & 10, Part 4, condition 3; and Schedule 11 & 12, Part 4, condition 2: please clarify why the ES includes a figure of 222,086m2 for the export cable whereas a total figure of 122,086m2 has	In response to ExA's First Written Questions (Q6.11), the Applicant identified an error in Table 5.23 of ES Chapter 5. The length of export cable protection for potentially unburied cables should be 20km rather than 40km. The removal of 20km length of cable protection equates to 100,000m2 based on a cable protection width of 5m and therefore explains the difference between 222,086m2 and 122,086m2. The values in Revision 2 of the dDCO submitted at Deadline 2 reflect this correction.	No comments.

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		been included in draft DCO.		
20.1 51	Applicant	Natural England note that, for the total amount of scour protection for the offshore infrastructure a figure of 53,095,038m3 is included in the updated draft DCO, but a figure of 53,195,398m3 is included in the Explanatory Memorandum. Please clarify the difference.	53,195,398m3 is the total for the whole project comprising: • 53,095,398m3 is the total for the generation assets • 100,000m3 for the transmission assets Schedule 1 of the dDCO has been amended to reflect the total scour protection volume of 53,195,398m3. The revised dDCO has been submitted at Deadline 4.	Natural England welcomes this amendment and has no further comments.
20.1 52	Applicant	Schedule 14 (paragraph 7(2)). Please comment on the particular status of NE pointed out in its objections to the arbitration provisions in the dDCO [REP3-051] as to whether they affect your position and if not why not.	The Applicant maintains its position as submitted in response to the ExA's question 20.109, and 20.110 at Deadline 1 (document reference: ExA; WQ; 10.D1.3), and as summarised in the Applicant's response to Issue Specific Hearing 3 (document reference ExA; ISH; 10.D3.3). In short, the Secretary of State has already considered the applicability of arbitration to NE as a result of the Triton Knoll Offshore Wind Farm Order 2013 and the Burbo Bank Extension Offshore Wind Farm Order 2014. In both cases, the Secretary of State considered that it was appropriate for arbitration to apply to NE/SNCBs. The Applicant notes NE's comment regarding confidentiality, and the Applicant considers that the revised wording within Schedule 14 of the dDCO (submitted at Deadline 2) will enable NE to comply with their statutory obligations. In this regard, the Applicant also notes that public bodies, such as local planning authorities, are regularly subject to arbitration clauses through mechanisms such as section 106 agreements under the Town and Country Planning regime.	Natural England's concerns regarding arbitration remain. Natural England feel that this is unlikely to change during the examination process without a significant change in position of the Applicant and therefore appreciate that this element may need to remain unresolved. Please also note the following in support of our position: The Tilbury 2 determination from the secretary of state was released at the beginning of March 2019. The determination has removed the same arbitration conditions from the DML and confirms the MMO representation (December 2018) that it is inappropriate for a DML to act differently from any other marine license and therefore should

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			In any event, it is considered unlikely that matters between NE and the Applicant will result in a dispute to be referred to arbitration given that NE's role under the DCO is as a consultee rather than an approval body. The arbitration provisions would not prevent NE from providing its advice, or from meeting its responsibilities when consulted on matters by the MMO, for example. It is therefore considered appropriate that the arbitration article and schedule should apply to NE and other SNCBs.	not be subject to arbitration. Thus Natural England's opinion on marine matters will not be subject to arbitration. This is covered in the recommendation report page 233. In addition: On reviewing the proposed Vanguard dDCO/DML changes, we note that the Applicant is using the same wording as the ExA for Hornsea 3 (copied below); *Any matter for which the consent or approval of the Secretary of State or the Marine Management Organisation is required under any provision of this Order shall not be subject to arbitration*. On further reading of this we believe that it goes beyond just excluding the MMO and BEIS from arbitration. It is our view that it excludes NE and any consultee on these matters as well; because the wording as proposed is not excluding the MMO, but excluding the decision processes which the MMO/BEIS regulate. Thus Natural England's statutory advice would be free from arbitration. We would like to discuss this further during the ISH on 28th March 2019
20.1 54	Applicant	Please provide an update as to whether Condition 12(5) could be clarified to provide that materials other than inert materials of natural origin must be screened out before the inert materials are	The Applicant has updated the wording to address this concern and the condition now reads as follows: "(5)The undertaker must ensure that only inert material of natural origin, produced during the drilling installation of or seabed preparation for foundations, and drilling mud is disposed of within site disposal reference [XX] within the extent of the Order limits seaward of MHWS. Any other materials must be screened out before disposal of the inert material at this site."	Natural England welcomes this amendment and has no further comments.

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		disposed of at the site and supply any proposed amended wording to Condition 12(5) of Schedule 9 and 10, and Condition 7(5) of Schedule 11 and Schedule 12	This wording is duplicated in the respective DMLs at Schedule 9, 10, 11, and 12 of the dDCO submitted at Deadline 4.	
20.155	Applicant	Please provide an update as to the consideration being given to the request from NCC for a skills requirement to be included in the dDCO. In this connection please explain in further detail the statement in your note of ISH3 that CfD eligibility requires Vattenfall to produce a Supply Chain Plan assessed and marked by the Secretary of State for Business, Energy and Industrial Strategy.	As noted in ExA Q. 19.30, the Applicant is working towards the development of a Supply Chain Strategy as required by the CfD process (which is outwith the DCO process). See response to q19.30. Development of the strategy is guided by the BEIS Supply Chain Plan (SCP) guidance (Appendix 19.1 (document reference ExA; FurtherWQApp19.1; 10.D4.6) necessary for the CfD auction process. This guidance comprises specific requirements relating to skills, competition and innovation. Developers must demonstrate adequate scores across the three sections of the SCP in order to be eligible for the bidding process for CfD. The Applicant is committed to collaboration on skills, including with local organisations and establishments whose sole purpose is skills development, in order to maximise the potential of any investment in this area. The Applicant is currently in discussion with NCC regarding their request for a Requirement covering the need for a Skills and Employment Strategy as noted in the SoCG with NCC submitted at Deadline 4 (Rep1 - SOCG - 15.1).	No comments.
20.156	Applicant	NCC proposes a surface water and drainage requirement but you consider that, to the extent that this was not already dealt with by R20, it would	The Applicant met with NCC on 26th February 2019 to discuss the request for a surface water drainage scheme requirement. The Applicant is happy to accept the wording requested by NCC and it was agreed that this wording would be captured within a plan to be secured through the dDCO requirements. Discussions as to the precise plan and DCO Requirement through which this will be secured are ongoing.	No comments.

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		be preferable to include any further detail in the outline CoCP. Please give an update on the position with regard to NCC's proposed wording in its Additional Submission - Accepted at the discretion of the Examining Authority.	The principle of this change has been agreed within the updated SoCG between the Applicant and NCC submitted at Deadline 4 (ref: Rep1 - SOCG - 15.1 version 2).	
20.1 57	Applicant NFFO	Please provide an update as to discussions and any changes agreed to Condition 20(2) and Condition 9(9) and 9(11) which relate to the monitoring of cables and notification of exposed cables.	In order to address the request made by the NFFO and VisNed in their Relevant Representation, the Applicant is currently discussing amendments to Condition 9(11) under the Generation DMLs (Schedule 9 and 10) and Condition 4(11) under the Transmission DMLs (Schedule 11 and 12) with the MMO, TH and the Maritime Coastguard Agency. This amended wording has been included in the dDCO submitted at Deadline 4.	No comments.
21.	**Monitoring, mitigation and management plans - These matters are covered elsewhere**			
22.	**Compulsory acquisition (CA) – not relevant to Natural England**			
23.	**Habitats Regulations Assessment**			
23.6 4	Applicant	Please comment on the views expressed by the RSPB in its Comments on Applicant's Response to Written Questions [REP2-034] in which concerns are maintained over	Following requests from NE and the RSPB, an updated collision assessment was submitted by the Applicant at Deadline 1 (Appendix 3.2, document reference ExA; WQApp3.2; 10.D1.3). This provided clarification and responses to points raised regarding appropriate seabird density input values and a comparison of the results obtained using the Applicant's implementation of the Band model with the Band (2012) Excel version and the Marine Scotland Science (MSS) stochastic Collision Risk Modelling (CRM),	As noted in our response to the Applicant's CRM update, Appendix 3.2 [REP3-051], Natural England does not consider that the outputs from the Applicant's stochastic CRM model should be used in the assessment of collision impacts from Vanguard alone nor in the cumulative and in-combination assessments. Nor do we agree that median bird densities or 'empirically derived' nocturnal

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		elements of the collision risk modelling and consequently they consider that adverse effects on integrity (AEOI) cannot be ruled out for the following: The kittiwake population of Flamborough and Filey Coast SPA (FFC SPA) alone and in-combination; The gannet population of FFC SPA alone and in-combination; The lesser black-backed gull population of the Alde-Ore Estuary SPA alone and in-combination.	which demonstrated the equivalence of each version of the model. In addition, the note presented the collision results obtained for specified upper and lower parameter values (for seabird density, avoidance rates, flight heights and nocturnal activity rates). This note concluded there would be no significant effects from the project alone or cumulatively with other projects. Therefore, this demonstrated that the collision modelling methods and results presented in the original application were robust. As these results were also used in the HRA there is no requirement to reassess impacts in relation to the Flamborough and Filey Coast (FFC) Special Protection Area (SPA) and Alde-Ore Estuary SPA, and the original conclusions of the HRA, that there would be no Adverse Effects on Integrity for any feature, remain valid. Nonetheless the Applicant will continue to seek to address any outstanding concerns raised with respect to the assessment. NE and the RSPB have requested that the MSS model be used in preference to the Applicant's. The Applicant has made several attempts to undertake this, but on each occasion to date has encountered errors in the MSS model which have prevented its use. On each occasion the Applicant has communicated these issues to the developer of the MSS model and a revision has been made available. This has prevented the Applicant from presenting full stochastic results for the MSS model to date. Due to these delays, the Applicant does not consider that the MSS model will be appropriate for use within the time frame of the project examination. It should also be noted that, as a result of further refinement to the Project Design Envelope, the option to use a 9MW turbine (the smallest and most numerous turbine option) has been removed. Relevant parameters have been updated by the Applicant in the revised dDCO submitted at Deadline 4 accordingly. Revised collision risks for the project, using parameters for the 10MW turbine (which will now be the worst case for collision risk), estimated using the Band (2012)	activity rates are appropriate to use in the CRM. Therefore, following the update to the CRM expected at Deadline 6 and in the absence of the Applicant being able to use the MSS stochastic collision risk model, we advise that the CRM assessments for HRA are revised by the Applicant using the updated turbine configuration and the deterministic/Band model Option 2 outputs using the mean (and 95% CIs) bird densities and the recommended avoidance rates (i.e. 98.9% for gannet and kittiwake and 99.5% for large gulls), the mean flight height distributions from the Johnston et al. data and the recommended nocturnal activity rates of 2 (or 25%) for gannet and 3 (or 50%) for kittiwake and large gulls.

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			model and using NE's preferred input parameter values will be provided at Deadline 6. The revision will also include collisions estimated using evidence based input parameter values. Updated cumulative and in-combination collisions will also be presented. This aspect was discussed and agreed with NE during a call on the 8th March.	
23.65	Applicant	In regard to the collision risk Band model, can you revise the input and output spreadsheets using mean densities? Also please run the option 2 as advised by NE.	The Applicant considers that it is important to note that the parameters requested by NE have all been supplied by the Applicant at various stages of the application and this is evidenced in the outputs presented by NE in their response at Deadline 3 (Natural England's comments on Appendix 3.2: Collision Risk modelling update and clarification). In their response, NE presented collision estimates using the Band model (option 2) with their preferred input parameter values and reached a conclusion that for the Norfolk Vanguard project alone impacts are not significant (for all but one highly precautionary case: great black-backed gull upper 95% density estimate assessed against the smaller reference population). On this basis NE stated: 'we conclude that collision risk from Vanguard alone would have no significant impact at the EIA scale for all species, although this conclusion can only be made with low confidence regarding impacts on great black-backed gull at Vanguard East.' Therefore, the Applicant does not consider that any further CRM is required for the 9MW turbine. This was agreed with NE during a call on the 8th March. However, as stated in response to WQ 23.64, as a result of further refinement to the Project Design Envelope the option to use a 9MW turbine (the smallest and most numerous turbine option) has been removed for the Project. Relevant parameters have been updated in the revised dDCO submitted at Deadline 4 accordingly. Revised collision risks for the project, using parameters for the 10MW turbine (which will now be the worst case for collision risk), estimated using the Band (2012) model and using NE's preferred input parameter values will be provided at Deadline 6 (see also the	Natural England notes that the figures presented in Table 1 of our response to the Applicant's CRM update, Appendix 3.2 [REP3-051], were figures taken from the Annex 4 of the Applicant's Appendix 3.2 for the input parameters we advise (i.e. density, avoidance rate, %PCH and nocturnal activity) – we did not calculate them ourselves. In our response to the Applicant's CRM update, Appendix 3.2 [REP3-051], we have noted that the Applicant has not run Option 2 correctly using the Band (2012) model spreadsheets, and that the Applicant's approach gives slightly higher CRM predictions than if Option 2 is run correctly. Therefore, for the updated CRM assessment that is due to be submitted by the Applicant at Deadline 6, we advise that the Applicant runs the deterministic Band model Option 2 correctly.

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			response to Q 23.64). The revision will also include collisions estimated using evidence based input parameter values. Updated cumulative and in-combination collisions will also be presented.	
23.66	RSPB	Can you confirm whether the use of mean density values is advocated in any particular guidance?	The use of mean density values is not explicitly advocated in any guidance, but this is due to the lack of guidance for carrying out a stochastic collision risk assessment in general and not to the specifics of how to input density into the stochastic modelling process. As detailed in Trinder (2017), typically wind farm surveys are carried out over two years and so for each month there are two densities, one for each year. To obtain a final monthly collision rate using the Band (2012) deterministic formulation of the model, a mean of these would be taken. This is true of virtually every consented offshore wind farm since the model was published. The development of a stochastic version of the Band (2012) model, first by Masden (2015) as a proof of concept and then by MacGregor et al., (2018) allowed for uncertainty and variability to be incorporated into the Band model, including that around bird density. This uncertainty can be included in the model as a distribution, described by statistics such as confidence intervals and means or medians. The Masden model version did this using a truncated normal distribution with a mean, following stakeholder consultation and discussion with the project scientific steering group. Subsequent to Masden's work it became accepted that it was desirable to incorporate stochasticity into collision risk modelling, and this was reflected in scoping advice from the SNCBs. In response to such advice from Natural England, for the Hornsea Project Two application bird density was modelled using Generalised Linear Models whereby mean density was presented alongside 95% confidence intervals. This was accepted by the Examining Authority. The MacGregor et al, (2018) model version included the facility to use a revised truncated normal distribution, modified following the recommendations of Trinder (2017)	We agree with RSPB's response and also note our response to this question in REP4-062.

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			with mean and standard deviation, along with two further options for other user specified distributions. The first option is by providing reference points (max, min and selected percentiles) for the user's distribution of mean density, the second is by providing 1000 samples from the user's distribution of mean density. While neither Masden or MacGregor et al., can be seen as formal guidance, their consistent use of the mean, alongside the historical use described above set a strong precedent for using this and can therefore be considered the standard approach. In the guidance accompanying the Band (2012) model, it is said that "Developers and their advisors are encouraged where appropriate to go beyond the core requirements set out in this guidance; but where they do so, the standard approach of this guidance should also be pursued so as to make clear how the results of any improved methods differ from that of the standard approach." The Applicant's discussion of the use of medians is relevant, but incomplete data are presented to support the approach taken, in particular, the mean monthly densities (not, as is presented in Annex 1 of Appendix 13.1, means of medians) are not presented. In not doing so, the Applicant is contravening the guidance detailed above.	
23.67	RSPB	Can you comment on whether AEOI could be ruled out for collision risk for any features of the European sites currently under discussion, should the ExA be minded to agree to the use of median values?	We do not consider that median values provide a robust basis for collision risk modelling, and therefore do not agree that it would be safe to rule out adverse effects on integrity for any features on this basis.	We agree with RSPB regarding the use of median values in CRM.
23.70	Applicant	Having regard to [REP3-038] and impacts to non-	The conclusions of the non-seabird migrant collision assessment (Norfolk Vanguard Offshore Wind Farm Migrant non-seabird Collision Risk Modelling, ExA; AS; 10.D3.6) are	Natural England advises that there is an LSE to those SPAs with the Vanguard project considered in-combination with East Anglia 3.

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		seabird migrants of the Breydon Water SPA, Broadland SPA, and North Norfolk Coast SPA it is not clear whether you have: i. concluded no likely significant effects (LSE); or ii. identified a LSE but concluded no AEOI. Please can you confirm which is the case. If you consider there to be a LSE, please can you provide the integrity matrices for these sites.	that there would be no likely significant effects on the features of these SPAs due to collision mortality either from the project alone or cumulatively with the East Anglia THREE wind farm (paragraphs 16 and 18 of Norfolk Vanguard Offshore Wind Farm Migrant non-seabird Collision Risk Modelling, ExA; AS; 10.D3.6).	However, following the non-seabird migrant collision risk modelling document submitted by the Applicant (not withstanding some methodological issues identified with this by Natural England in REP4-062) we do not anticipate and AEOI for the relevant features of these sites in-combination.
23.71	Applicant	Please comment on NE's ongoing concerns regarding the apportionment figure used for the breeding season for lesser black-backed gull at the Alde-Ore Estuary SPA. In [REP2-034] the RSPB considers that it is not entirely clear how an apportioning figure for the Alde-Ore Estuary SPA of 3.5% for lesser black-backed gulls during the chick-rearing	Further assessment of the potential impacts on the lesser black-backed gull population of the Alde-Ore Estuary SPA will be submitted by the Applicant at Deadline 6. This will provide further consideration of apportioning of lesser black-backed gull impacts among candidate populations. With respect to the estimates presented previously, the HRA used a figure of 25% to apportion impacts to the Alde-Ore Estuary SPA population, which was calculated using relative population sizes (as detailed in the HRA), although noting that the tracking studies conducted on this population indicated much lower connectivity and on which the value of 3.5% was derived. This was calculated as follows: The average number of breeding pairs since 2007 has been just over 2,000 (2,016, rounded down). This represents 4,000 breeding adults, however it was assumed that only one bird from each pair is foraging at any given time, thus 2,000 birds. The tracking data reported that less than 0.5% of adult foraging time was spent in the Norfolk Vanguard site, which	We welcome the commitment by the Applicant to undertaken further work on the apportionment of lesser black-backed gull from the Alde-Ore Estuary SPA in the breeding season, and await receipt of the work to be submitted by the Applicant at Deadline 6.

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		season has been derived from the data, and that the figure of 2,000 pairs quoted for the years in question is inaccurate. Please justify how you have arrived at these figures and explain the extent to which you have had regard to the theoretical approach proposed in SNH 2018 Guidance which takes into account foraging range and colony factors.	indicates a maximum of 10 individuals (2000 x 0.005 =10) would be present at any given time. The average total number of birds was estimated at around 300 individuals in the wind farm and 2km buffer, however this value was originally presented in the PEIR using survey data from 2016 only and was not updated in the final application to include the 2017 survey data. Review of the survey results indicates that inclusion of both 2016 and 2017 data reduces this estimate to around 230 (mean estimates for June: 86, July: 398, August: 212). To estimate the percentage of Alde-Ore SPA birds present on Norfolk Vanguard, the estimates number from this SPA (10) was divided by the average total present (previously given as 300, here updated to 230) to give 10/230 = 4.3%. This is slightly higher than the 3.5% reported in the original application but is still clearly considerably lower than the 25% used for assessment in the submitted HRA. If the population within the wind farm (without buffer) is used, the onsite average is 90, which gives an Alde-Ore SPA proportion of 11% (10/90), which although higher still remains much lower than the 25% used for assessment in the submitted HRA. Thus, while there is evidence that connectivity is indeed very low, a more precautionary estimate was used for assessment. Further consideration of the different data sources will be provided in an updated assessment which will be submitted by the Applicant at Deadline 6. This will include application of the method detailed in the SNH 2018 guidance.	
23.72	Applicant	Please clarify how the seasonal apportionment figures for gannet at FFC SPA that you have cited in response to ExQ1 23.44 have been calculated, as these are slightly lower than the figures	The seasonal apportionment used for Norfolk Vanguard followed the same approach originally developed by MacArthur Green for the Dogger Bank Creyke Beck projects (which was discussed in detail with NE during that project's examination and agreed to be an appropriate method), subsequently updated for the Dogger Bank Teesside projects (used with NE's agreement) and used most recently for the East Anglia THREE project (used with NE's agreement). The method principally differs from that used by NE in that it incorporates evidence on the migration routes taken by birds	As noted in our response to Q23.79 of the 2nd ExA questions [REP4-062], whilst the approach used by the Applicant was accepted at the previous cases, this was not used in the Furness (2015) report that is publically available and we continue to advise that the approach we have set out in our Relevant Representations [RR-106], Written Representations [REP1-088], response to Q23.79 of the 2nd ExA questions [REP4-062]

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		calculated by NE [REP3-038].	from different colonies. The most recent report presenting these methods (MacArthur Green 2015a) is submitted as Appendix 23.1 (ExA; FurtherWQApp23.1; 10.D4.6). Following discussion of this topic with NE during a call on the 8th March the Applicant agreed to also present seasonally apportioned figures using NE's preferred values.	is used. This is consistent with our advice at Hornsea 3 and will ensure consistency in the approaches used for non-breeding season apportionment across projects going forwards, as well as affording a more accurate comparison of the relative impacts of different OWF projects.
23.74	Applicant	Please comment on NE's ongoing concerns regarding the breeding season apportionment figure of 16.8% used for kittiwake at FFC SPA.	The seasonal apportionment used for Norfolk Vanguard followed the same approach originally developed by MacArthur Green for the Dogger Bank Creyke Beck projects (which was discussed in detail with NE during that project's examination and agreed to be an appropriate method), subsequently updated for the Dogger Bank Teesside projects (used with NE's agreement) and used most recently for the East Anglia THREE project (used with NE's agreement). The most recent report presenting these methods (MacArthur Green 2015b) is submitted as Appendix 23.2 to this response (ExA; FurtherWQApp23.2; 10.D4.6). In addition, analysis of kittiwake tracking data supplied by the RSPB will be used to inform this assessment, as requested by NE.	Whilst the approach used by the Applicant was accepted at the previous cases, we note that additional (more recent) kittiwake tracking data are now available and should be considered by the Applicant in its calculation of apportionment to the FFC SPA in the breeding season. We welcome the commitment by the Applicant to review and analyse the RSPB tracking data as advised by Natural England, and we await receipt of the additional analysis by the Applicant.
23.75	Applicant	In your response to ExQ1 23.32, you stated that you would provide a screening response for Bancs des Flandres SPA and Cap Gris-Nez SPA. Please can you provide the screening exercise that you proposed at D1	This screening response will be provided for Deadline 6.	No comments.
23.76	Applicant	Please respond to NE's comments regarding LSE screening for auks at FFC SPA. In	The Applicant does not agree that a likely significant effect (LSE) cannot be ruled out for these species from the FFC SPA and has presented justification for this in the HRA. This conclusion is further supported by the results of the review of evidence of auk displacement submitted at Deadline 1	As noted in our response to the Applicant's auk and gannet displacement note, Appendix 3.3 [REP3-051] Natural England still notes that definitive mortality rates associated with displacement for seabirds, including auks, are

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		particular, do you agree with NE that a LSE should be screened in for guillemot, razorbill and seabird assemblages, including puffin, at the FFC SPA as a result of operational displacement. If so, then please provide an updated integrity matrix for this site.	(Norfolk Vanguard Offshore Wind Farm Offshore Ornithology: Operational Auk Displacement: update and clarification (Appendix 3.3, document reference ExA; WQApp3.3; 10.D1.3). This review concluded that a maximum of 50% displacement was appropriate for these species combined with a maximum consequent mortality of 1%. When these precautionary rates are combined with the percentage of the Biologically Defined Minimum Population Scales (BDMPS) populations which originate from FFC SPA (guillemot 5%, razorbill 3.3% and puffin 0.9%), the proportion of the total impacts for each species will be 50% x 1% x 5% = 0.025% (guillemot), 50% x 1% x 3.3% = 0.016% (razorbill) and 50% x 1% x 0.9% = 0.0045% (puffin). To place these figures in context, for the most abundant of these species (guillemot) for every 4000 individuals present in the nonbreeding season and considered to be at risk of displacement, 2000 would be displaced, of which 20 would die as a result, with one of these predicted to be from FFC SPA. On this basis the risk of an LSE is ruled out for the Project alone.	not known and therefore we advise consideration of a range of mortality rates are used in assessments. Whilst Natural England agrees that the mortality for auks is likely to be at the low end of the range, we do not agree that using 1% mortality for the cumulative/in-combination assessment (with 50% displacement from the OWF and 30% within a 1km buffer) can be considered to robustly reflect a realistic worst case scenario. Therefore, our recommendation remains that a range of mortality rates of 1-10% and displacement rates of 30-70%, with 70% displacement and 10% mortality should be considered to reflect the worst case scenario across the site plus 2km buffer (for both assessments of impacts alone and cumulatively/in-combination). Therefore at present we are currently not in a position to reach any firm conclusions regarding the level of in-combination displacement impact on auks from FFC SPA from the operational phase. Nevertheless we can advise that there is an LSE in-combination for the guillemot and razorbill features of the FFC SPA.
23.78	Applicant	Please respond to NE's concerns regarding impact to the gannet feature of FFC SPA during the non-breeding season as a result of operational displacement from the project alone. Do you agree with NE that there could be a	The Applicant does not consider that this species is at risk of operational displacement effects during the nonbreeding season, and reasons for this have been presented throughout the assessment. The total predicted displacement mortality for gannet presented in the ES, using NE's recommended rates, reported that there would be up to 20 and 3 individuals at risk across both Norfolk Vanguard East and West during the autumn migration and spring migration seasons respectively. Apportioning of impacts to the FFC SPA uses percentage values of 4.2% (autumn) and 5.6% (spring) (see response to	The Applicant's approach to the assessment of operational displacement from Vanguard alone for gannet for EIA has satisfied Natural England. However, for HRA for operational displacement for gannet from FFC SPA a similar approach has not been done and given that Vanguard is located within foraging range of gannet from the FFC SPA, we consider there is an LSE for operational displacement from Vanguard alone. We also note the issues previously raised over the

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		LSE and if not, then please justify your position. If so, please provide an updated integrity matrix for this site.	2nd WQ 23.72 above for reference documents). At these rates less than 1 individual from the FFC SPA (adult population 16,938 between 2008 and 2012, although in 2017 the RSPB reported this to be 26,782: A summary of the FFC SPA 2017 whole colony count and population trends, unpublished RSPB report) would be at risk of displacement mortality across the entire nonbreeding period (i.e. summed across autumn and spring) and this result would only be very slightly altered if NE's estimated apportioning rates were used instead. It is clear from this extremely low level of potential effect that an LSE can be ruled out due to gannet displacement from Norfolk Vanguard alone.	gannet cumulative displacement assessment and once this has been addressed, we suggest that in-combination displacement for FFC SPA for this feature is also considered. As noted in our Relevant Representations [RR-106], as per the assessment undertaken by the Applicant for EIA displacement predictions for gannet at FFC SPA should be added to collision predictions for gannet at FFC SPA, and the combined impacts considered for Vanguard alone and in-combination with other relevant offshore wind farms. This aspect has as yet, not been considered by the Applicant.
23.80	Applicant	Please can you confirm whether the conclusions of the HRA Report with regard to displacement of gannet from the FFC SPA would alter should adult mortality rates be applied to the assessment, and justify this.	The Applicant does not consider that gannet is a species of concern with regard to displacement impacts due to its wide ranging habits, varied prey and the fact that very few gannets were recorded at Norfolk Vanguard during the breeding season. The latter aspect means that: a) any effects would be distributed amongst a large population of which only a small percentage would be apportioned to FFC; b) effects will be even further reduced during the nonbreeding season as most individuals will be passing through the southern North Sea (i.e. not resident in the region) and thus opportunities for displacement effects are minimal; c) birds are much less constrained outside the breeding season, further reducing the risk that displacement would have any effect on survival. Taken together, the above aspects indicate that displacement will be low and consequences lower still, hence the Applicant does not consider it appropriate to take the highly precautionary approach of assigning mortality to this effect taken together, the above aspects indicate that displacement will be low and consequences lower still, hence the Applicant	Please see our response to question 23.78 above.

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			does not consider it appropriate to take the highly precautionary approach of assigning mortality to this effect.	
23.8 1	Applicant	Please can you provide the clarification note regarding in-combination operational displacement of gannet at the FFC SPA?	As stated in response to question 3.30, the Applicant notes that, to the best of its knowledge, gannet in-combination displacement is not an impact which has been required for previous OWF applications, and as a consequence there are no previous assessments on which this can build. Instead it is necessary to review the original applications for each project to be included. This work to collate abundance estimates for North Sea OWFs is underway, however it will not be completed for submission at Deadline 4. The Applicant will endeavour to provide this by Deadline 5.	We welcome the commitment by the Applicant to undertake this work and we await receipt of the assessment.
23.8 2	Applicant	Please respond to the concerns that have been raised regarding the assessment of nocturnal activity rates for gannet and kittiwake at FFC SPA.	Natural England and the RSPB were invited to review and provide comments on the draft manuscript for gannet nocturnal flight activity and this analysis was subsequently published as a peer-reviewed study (Furness et al. 2018), taking into account comments from these organisations and also the anonymous reviewers appointed by the journal. The final version of this work, reflected in the published paper, recommended rates of 8% in the breeding season and 3% in the nonbreeding season, which were judged to be an appropriate balance of evidence and precaution. However, because the Norfolk Vanguard assessment was conducted prior to the final publication, while the datasets used were identical, a slightly less precautionary calculation was used (4.3% in the breeding season and 2.3% in the nonbreeding season). In the CRM update submitted at Deadline 1 (Norfolk Vanguard Offshore Wind Farm Offshore Ornithology: Collision Risk Modelling: update and clarification (Appendix 3.2, document reference ExA; WQApp3.2; 10.D1.3)) the slightly higher published rates were used for the gannet collision estimates. The previously recommended nocturnal rates were derived from a 1 to 5 scale of seabird nocturnal activity presented in Garthe and Hüppop (2004), which was converted to a 0-100% value for use in the Band model. However, Garthe and Hüppop (2004) state that their scale indicates relative activity	Our advice regarding nocturnal activity has been set out in detail in our Relevant Representations [RR-106], Written Representations [REP1-088], our response to first ExA question 3.3 part g) in Annex A of our Written Representations [REP1-088], our response to the Applicant's Section 51 response [REP2-038], and our response to the Applicant's response to question 3.3 part g) of the first round of ExA questions [REP4-062]. Our position on this remains unchanged. However, we note that the Applicant has presented in its CRM update, Appendix 3.2, predicted figures using the range of nocturnal activity requested by Natural England, i.e. 1-2 (or 0-25%) for gannet and 2-3 (or 25-50%) for kittiwake and large gulls.

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			across species and is not intended as a measure of absolute activity, as applied by Band (2012). It is also important to note that these scores were based on existing limited evidence and expert judgement. Consequently, the Applicant considers the rates in Furness et al. (2018), calculated from analysis of gannet tracking data, to provide robust, evidence based alternatives which are therefore more appropriate for use in the collision modelling for this species. The RSPB has noted that, since the nocturnal activity rates reflect the relative rates of activity between daytime (when surveys are conducted) and nighttime, it is important that the daytime estimates of activity are representative. In other words, if the daytime seabird density estimates are derived from surveys conducted during periods of the day when birds are relatively in-active then the nighttime adjustment will underestimate activity. The RSPB cite Figure 3 in Furness et al. (2018) as indicative of an early morning peak in activity which may not be captured by aerial surveys conducted later in the day (and suggest that the surveys were likely to have been conducted at midday). However, what is actually required of the daytime surveys is that they are undertaken during representative periods of the day, covering neither peaks nor troughs. The diurnal activity presented in Figure 3 of Furness et al. (2018) indicates this mid-point of activity is likely to occur between mid-morning and mid-afternoon. The timings of the aerial surveys have been provided in an appendix to these question responses (ExA; FurtherWQApp3.1; 10.D4.6) and provide a clear indication that the surveys covered a wide range of times between 8am and 6pm throughout the year, and thereby these data were collected through the middle of the range of activity levels. There have also been questions raised about the consistency of definitions of sunrise and sunset and twilight across the nocturnal activity analyses and that used in the Band (2012) collision model. This aspect was critical to the study and the same definitions were used in Furness et al. (2019) as by Band (2012) to ensure that the results were compatible.	

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			Preliminary outputs from the analysis of kittiwake data were used in the original Norfolk Vanguard application and it was considered at that time that this work was close to completion and would soon be published. However, following submission of the Norfolk Vanguard application, additional data were offered for inclusion in this analysis. This has delayed publication of this work (while the additional data have been collated, and agreement is reached between the data owners about the most appropriate analytical methods to be used). Thus, while it is anticipated that the final results will be similar to those used in the ES, in acknowledgement that this work has been delayed, the CRM update submitted at Deadline 1 (Norfolk Vanguard Offshore Wind Farm Offshore Ornithology: Collision Risk Modelling: update and clarification (Appendix 3.2, document reference ExA; WQApp3.2; 10.D1.3)) provided calculations using NE's recommended rates of 25% and 50%	
23.83	RSPB	Having regard to the Applicant's response at D1, please can you expand on your concerns regarding nocturnal activity rates?	We welcome the provision of updated collision mortality figures using the Furness et al. (2018) nocturnal activity rates for gannet and the NE recommended rates for kittiwake and large gulls, although these do increase concerns about levels of collision risk. There is also still a need to resolve the query regarding survey timings outlined in section 4.2 of our Written Representations. If survey timings are not known and hence it is not known whether likely peaks in activity at first and last light are accounted for, the more precautionary rates based on Garthe and Huppop (2004) and Furness et al., (2013) should be used for gannet as well. We further welcome the Applicant's statement that the timing of surveys and diurnal patterns of activity are important and that these were given careful consideration. However, no Information is given on these considerations, in particular, actual timings of surveys and details of the sources of information relied upon for the conclusions regarding seabird flight activity during autumn, winter and spring.	No comments.
23.84	Applicant	Please provide an update regarding the kittiwake tracking	The agreement between the Applicant and the RSPB with respect to access to these data specifies that named RSPB staff should be given an opportunity to comment on the	We welcome the commitment by the Applicant to review this data. We await receipt of the updated assessment by the Applicant.

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		data and revisiting the breeding season apportionment at FFC SPA.	proposed analysis of these data. An email was sent in this regard to the RSPB on the 31st January 2019 and a reply was received on the 26th February 2019. Consequently, this is an area of analysis which has not been finalised and further consideration will be given to the appropriate analysis and interpretation of these data. The intention is that this will be completed in time to inform an update of the assessment of effects on the FFC SPA population of kittiwake which will be provided at a future deadline (expected to be Deadline 6).	
23.85	Applicant	What is your response to NE's comments regarding common scoter at Greater Wash SPA? Do you agree or disagree with NE's view that a LSE should be identified, and please justify your conclusion? If you agree then please provide an updated integrity matrix for this site.	Natural England requested provision of a figure over-laying the Offshore Export Cable Corridor with the common scoter distribution used to designate the SPA. This was submitted at Deadline 2 (Norfolk Vanguard Limited Deadline 2 Submission - Appendix 23.1 to the comments on responses to Written Questions - Greater Wash SPA common scoter distribution and Norfolk Vanguard Offshore Windfarm) and this note clearly indicates that based on the best available knowledge, the Offshore Export Cable Corridor does not pass through areas identified as important for this species (Natural England and JNCC 2016: Departmental Brief: Greater Wash potential SPA). The Applicant acknowledges that NEs position is that because the Offshore Export Cable Corridor crosses the SPA there is potential for an effect on this species and hence an LSE cannot be ruled out. However, in this instance the Applicant considers that this approach is unnecessarily precautionary. This is based on the very low likelihood of spatial overlap (even when considering the entire offshore cable route as in the submitted figure, rather than just the zone around a very slow-moving installation vessel), combined with the additional low likelihood of a temporal overlap, with a realistic period of installation through the SPA measured in weeks. It is on this basis, the Applicant considers that the risk of an LSE can be excluded.	Natural England maintains its position that because the Offshore Export Cable Corridor crosses the SPA there is potential for an effect on this species and hence an LSE cannot be ruled out (as noted in our response to Q23.41 of the first round of ExA questions [Annex A of REP1-088].
23.86	Applicant	Please provide an update on the collision risk	The Norfolk Vanguard Information to Support HRA (Norfolk Vanguard Offshore Wind Farm, Information for the Habitats Regulations Assessment, Ref 5.3) assessed the worst case	Natural England has noted in REP3-051 that the most appropriate CRM figures to use for

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		modelling for little gull at Greater Wash SPA.	collision mortality for little gull as 2 individuals, and on this basis concluded there would be no risk of an Adverse Effect on Integrity (AEoI). The CRM update submitted at Deadline 1 (Norfolk Vanguard Offshore Wind Farm Offshore Ornithology: Collision Risk Modelling: update and clarification (Appendix 3.2, document reference ExA; WQApp3.2; 10.D1.3)) provided additional estimates, calculated using NE's preferred input rates. This indicated a maximum mortality of 16.7 individuals. As described in section 6.1.3.2 of the Norfolk Vanguard Information to Support HRA, a precautionary estimate of the population size of little gulls visiting the Greater Wash Area of Search is around 10,000 individuals per year, while a more realistic (but still precautionary) estimate is likely to be around 20,000 individuals per year. The only published estimate of little gull survival suggests a survival rate of adults of 0.8 (Horswill and Robinson 2015). At this survival rate, natural annual mortality for little gull will be between 2,000 and 4,000 birds. The estimated maximum Norfolk Vanguard collision mortality of 16.7 birds represents an increase in mortality of 0.42% to 0.85%. Following SNCB recommendations, an increase in mortality of less than 1% is considered to be undetectable against the range of background variation. Therefore, this increase, which is below the threshold at which increases in mortality are detectable, means that no significant impact can be attributed to this level of impact arising from the proposed Norfolk Vanguard project alone. Thus, the conclusions of the original assessment remain unchanged. The Greater Wash SPA designated population of little gull is 1,255, which is 13% of a population of 10,000 or 6.5% of a population of 20,000. On this basis, and assuming collisions would be distributed uniformly throughout the population, this would imply that a maximum of 2 individuals from the Greater Wash SPA population of little gull could be killed by collisions (13% of 16.7), which would be even reduced further on the basis of the more realistic wider population (of 20,000). The natural mortality of the SPA population (at a mortality rate of	the assessment of collision impacts from Vanguard alone for EIA are those presented in the tables in Annex 4 of the Applicant's CRM update, Appendix 3.2, for the figures from the deterministic model using the mean bird densities (and the 95% CIs) together with the central values for avoidance rates, %PCH and nocturnal activity. However, we note that no figures are presented in Annex 4 for little gull. The figure of 16.7 little gull collisions stated by the Applicant in their response to this question appears to come from figures presented in Annex 3 of the CRM Appendix 3.2. Natural England have noted in REP1-008 of REP3-051 that we are uncertain of what the tables of figures in Annex 3 are showing and clarification is required as to whether these are outputs using the Applicant's stochastic model for the various parameters or if they are for varying each parameter in turn using the deterministic/Band (2012) model. Clarification is also required as to whether the figures presented or median densities. If this 16.7 figure is calculated using the deterministic model and the mean bird density and appropriate avoidance rates, %PCH and nocturnal activity then this figure is appropriate, but if it is based on the Applicant's stochastic model and/or the median bird density then Natural England would not consider the figure appropriate to use in the assessment.

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			0.2) is 251 individuals. The addition of 2 to this would increase mortality by 0.8%, which would be undetectable. Thus, it can be concluded that the maximum additional mortality of 2 individuals from the SPA population will be undetectable and there will be no adverse effect on the integrity of the Greater Wash SPA as a result of collisions at the Norfolk Vanguard project alone. At this level of predicted mortality for Norfolk Vanguard alone the project's potential to contribute to an in-combination effect is considered to be sufficiently small as to be ruled out.	With regard to apportionment to the Greater Wash SPA, Natural England has agreed with the apportionment rates used by the Applicant. Therefore, once the clarifications regarding the EIA alone figure for little gull are resolved, the agreed figure should be used in the assessment of the Greater Wash SPA alone. As noted in our response to the Applicant's Section 51 response [REP2-038], the predicted Vanguard CRM impact to little gulls from the Greater Wash SPA is likely to equate to less than 1% baseline mortality and could be considered non-significant and therefore would not be an AEOI. However, while 1% baseline mortality can be considered to be insignificant in the context of the population, this does not mean that this level of additional mortality should not be added to an assessment of in-combination impacts. Therefore, we advise that the in-combination CRM figures for other relevant North Sea offshore wind farms (OWFs) for little gull from the Greater Wash SPA are presented (where figures are available) and that the overall in-combination CRM figure is presented and assessed in the Appropriate Assessment.
23.87	Applicant	Please respond to NE's comments regarding the construction phase displacement of red-throated diver for the	This question combines two separate potential sources of disturbance impacts for red-throated diver (offshore export cable installation and operational vessel movements) therefore for clarity, separate responses are provided. Offshore export cable installation: Updated assessment of Greater Wash SPA red-throated diver displacement due to	Offshore cable installation We welcome the Applicant's commitment to provide an updated assessment of Greater Wash SPA RTD displacement due to cable

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		Greater Wash SPA from the construction of the offshore export cable (either from the project alone or in-combination), and from the potential displacement as a result of vessel movements during the operational stage. Please explain what implications for construction operations NE's request for seasonal restrictions on cable laying would have?	cable installation from the project alone and in-combination will be provided at Deadline 6. Following completion of this assessment the Applicant will review the requirements for seasonal restrictions, with consideration given to the proportionate nature of such measures in relation to the potential impact magnitude. However, it should be noted that seasonal restrictions can have significant implications for delivery of construction and maintenance programmes, especially offshore where operations can only be undertaken in safe and optimal weather conditions. Operational vessel movements: The Applicant discussed this topic with NE during a call on the 8th March. Following this NE agreed to provide further details of its standard mitigation comprising vessel operation procedures for vessel transit corridors to mitigate impacts to re-throated diver. Once these have been received the Applicant will review them and provide an update at the next opportunity.	installation and await the document to be submitted by the Applicant at Deadline 6. Operational vessel movements Natural England sent details of its standard mitigation comprising advice on vessel operation procedures for vessel transit corridors to mitigate impacts to re-throated diver to the Applicant on 20 March 2019. We welcome the commitment from the Applicant to consider this and await receipt of further updates from the Applicant regarding this issue.
23.88	Applicant	As recommended by NE, please present an in-combination operational displacement assessment for red-throated diver at Greater Wash SPA.	The Applicant has reviewed the cumulative red-throated diver assessment submitted for the Thanet Extension project. This assessment has demonstrated that when a like-for-like approach is applied for wind farm projects in the southern North Sea those currently in Examination (Norfolk Vanguard, Hornsea Project THREE and Thanet Extension) contribute a very small amount to the predicted cumulative effect, with over 95% of the total effect attributed to existing, operational wind farms. The Applicant does not consider there to be any requirement to repeat the analysis and reporting undertaken for Thanet Extension as this would simply present the same information and reach the same conclusions. The Applicant discussed this with NE during a call on the 8th March and it was agreed that it was appropriate for the Applicant to refer to the Thanet Extension work in relation to the cumulative assessment.	Natural England agrees with the approach outlined by the Applicant, provided the in-combination figure from the Thanet approach is presented by Vanguard and that the Applicant notes what that figure equates to of baseline mortality of the relevant reference population in their conclusion of adverse effect or not.
23.89	Applicant	In relation to red-throated diver from the Outer Thames	The Applicant discussed this topic with NE during a call on the 8th March. Following this NE agreed to provide further details of the proposed vessel operation measures. Once	Natural England sent details of its standard mitigation comprising vessel operation

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		Estuary SPA and Greater Wash SPA, NE has commented that it cannot rule out AEOI and has referred to mitigation measures that were secured for East Anglia THREE. Please provide an update on this matter, including what these measures are and whether you would be willing/able to employ them?	these have been received the Applicant will review them and provide an update at the next opportunity.	procedures for vessel transit corridors to mitigate impacts to re-throated diver to the Applicant on 20 March 2019. We welcome the commitment from the Applicant to consider this and await receipt of further updates from the Applicant regarding this issue.
23.90	Applicant	In response to the concerns raised by NE [REP3-051] please provide an update on progress made regarding the assessment of in-combination collision risk at Greater Wash SPA.	The only species from the Greater Wash SPA considered to be at risk of collisions is little gull. An update on the assessment for this species has been provided in response to Q23.86 above.	Please see our response to Q23.86 above.
23.94	Applicant	Do you have any further comments to make regarding the issue of micrositing within the HHW SAC?	The Applicant acknowledges that as a European site, the HHW SAC has a special environmental status. For this reason, the Applicant proposes that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan. This would include proposed mitigation measures and agreement processes associated with the micro-siting of cables within the HHW SAC.	Natural England provided a full response in this regard in our response to second set of Examining Authority questions provided at deadline 4 [REP4-062].

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23.95	Applicant	Please explain whether there is a specific reason why a sandwave levelling, seabed preparation and disposal plan cannot be secured as a separate Condition in the Deemed Marine Licences (DMLs)?	The Applicant acknowledges that as a European site, the HHW SAC has a special environmental status. For this reason, the Applicant agrees that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transition asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan.	As stated in our response to second set of Examining Authority question 23.96 Natural England has no issue with the plans being combined into one document. However, we wish to ensure that such a document includes a thorough sandwave levelling, site preparation and disposal methodology and assessment. Therefore we request that reference is made to these specific elements in the DCO/DML to ensure that they are provided.
23.97	Applicant	What is your response to the mitigation measures suggested by NE at D1 [REP1-088] to decrease impact on the HHW SAC? Are you willing to commit to any of these measures (such as the reduction of footprint associated with vessel stabilisation, through the use of alternative work vessels, the provision of evidence to quantify footprint of rock armouring potentially required and the reuse of existing stabilisation material footprints)?	The Applicant has noted the suggestions made by NE in REP1-088. The Applicant agrees that there may be scope to further mitigate the impacts of the proposed cable installation operations on habitats in the HHW SAC through appropriate consultation, detailed design and vessel procurement. The Applicant acknowledges that as a European site, the HHW SAC has a special environmental status. For this reason, the Applicant proposes that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan. This would include proposed mitigation measures and agreement processes associated with the micro-siting of cables within the HHW SAC.	No comments.
23.99	Applicant	Please respond to NE's comments raised in D2 [REP2-	NE's comments on the Applicant's response to Q5.2 [REP2-036]	Natural England awaits the provision of the Applicants Site Integrity Plan to provide further advice on this.

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		036] regarding the impacts from the disposal of dredged sediment on the HHW SAC?	As discussed above, the Applicant proposes that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan. This would include the location and methodology for sediment disposal within the HHW SAC. The best method would be determined at that time, taking into account the pre-construction survey data and any evidence from other relevant projects. NE's comments on the Applicant's response to Q5.10 [REP2-036] With regards to the following comments by NE: "Natural England does not agree there will be negligible impact. The Applicant has provided information with regard to volume, extent, morphology, however in its Relevant Representation, Natural England suggested the Applicant used all relevant information in the supplementary advice on conservation objectives, which does not appear to have been done. • The Applicant reviewed the supplementary advice and has referred to it throughout the response to the First Written Questions (Q5.10) (document reference ExA; WQ; 10.D1.3). "Also we note that there appears to be no assessment here of the impact of the dredging itself on the attributes." • Given the Applicant's commitment to dispose of sediment arising from sandwave levelling (dredging) in the SAC back into the SAC, the two activities of levelling and disposal are considered together as there would not be one without the other. With regards to the volume of the sandbank features, the Applicant's response to the First Written Questions (Q5.10) explains that this will not change as a result of sandwave levelling (dredging) due to the commitment to dispose of sediment back into the SAC. With regards to the extent of the sandbank feature, the Applicant's response explains that the seabed composition and spatial distribution of the feature would also not change for the same reason.	Please note our response to ExA Q, 20.146 above where we advise that within the boundary of HHW SAC sediments are only permitted to be deposited in areas that are >95% similar to the said sediment.

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			With regards to morphology, the Applicant's response refers to the ABPmer Sandwave Study, provided in Appendix 7.1 of the Information to Support HRA report which considered the effects of sandwave levelling (dredging) and disposal on seabed morphology, sandwave morphology and form and function of the HHW SAC. "Natural England believes that there are two aspects to this a) the combined repetitive impact to the same footprint area over different installation phases/stages and b) the combined repetitive impact to a feature over different stages a) The combined repetitive impact to the same area over different installation phases/projects" a) The combined repetitive impact to the same area over different installation phases/projects "Often impacts from one phase of installation i.e. preparation, installation and operation continue into the next phase especially where recoverability is hindered by the different activities. For example: if mobile sediments are reworked between seabed preparation works such as sandwave levelling undertaken c1 year prior to construction and the cable installation activities, will further sandwave levelling be required throughout the construction phase?" • Cables would not be installed at the same location, the worst case width of disturbance from cable installation is 37m (Section 7.3.2.2.1 of the Information to Support HRA report) and the minimum separation is 75m (Figure 11 of the Export Cable Installation Study, ES Appendix 5.1), therefore there would be no repeated disturbance of the same footprint during construction. • Sandwave levelling would be undertaken at an appropriate period before the installation of each cable pair, likely to be in the order of weeks prior to installation, to ensure that recovery of sandwaves does not occur prior to the installation of cables. "There is also no guarantee that that the sandwave levelling will be sufficiently successful to negate the need for the placement of cable protection immediately after construction	

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			which is considered in a different phase. Therefore the same area may be impacted twice by activities in different phases/stages of the project." • The impact assessment includes a worst case scenario footprint for cable installation and for cable protection. Should there be an overlap between these areas, this would reduce the overall spatial footprint of the project. However, it should be noted that if sandwave levelling is achieved during construction but cables become unburied during O&M, it is likely that cable burial would be possible again, avoiding the need for cable protection. "Similarly if the sandbank restores within the timeframes suggested by the applicant and Operation and Maintenance activities are required will sandwave levelling be required again on those sandbanks to reach the cables?" • Sandwave levelling is not expected to be required for cable maintenance. "This is also true where several different tools are used to achieve cable burial which intensifies the impact to the mixed sediment and/or coarse sediment feature with no guarantee of success, meaning there may still be a requirement for cable protection." • As discussed above, the impact assessment includes a worst case scenario footprint for cable installation and for cable protection. Should there be an overlap between these areas, this would reduce the overall spatial footprint of the project compared with that assessed in the ES. "In addition the cumulative impact to features from all of the proposed site preparation, construction and operational phase my further hinder the recoverability of Sabellaria spinulosa reef." • As discussed above there would be no repeated disturbance to the same footprint and therefore the same area of reef during construction. The period between preparation and cable installation is likely to be in the order of weeks and therefore new reef is not expected to have developed in this period.	

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			• It is acknowledged that reef can be expected to recover following cable installation and therefore has potential to be affected during maintenance if a repair is required at the location of a reef. In this event, the maintenance works would be localised and less than that of construction which the reef would have already been shown to recover from. As discussed above, maintenance works would be discussed with the MMO and NE b) the combined repetitive impact to a feature over different phases/projects "While it is unlikely that sister projects will directly have the same physical disturbance to an area; the impacts are still to the same feature of the site. Therefore this could extend the timeframe of impacts on the feature and overall recoverability of said feature. This should be fully assessed including the implications for the site potentially being in unfavourable condition for 10+ years when considering impacts to sandbanks." • In-combination impacts on sandbanks have been assessed in the Information to Support HRA report. The worst case disturbance width from cable installation is 30m per cable pair (with two 30m swathes for Norfolk Vanguard and a further two for Norfolk Boreas). A 30m disturbance width represents 0.08% of the total SAC area per cable pair (based on 40km length and 30m width in the 1,467.59 km² SAC area). • Cable installation would take approximately 3 months for each cable pair and recovery is expected within approximately 1 year as discussed in Appendix 7.1 of the Information to Support HRA report. • While construction for Norfolk Vanguard and Norfolk Boreas could extend over 10 years in total, each cable installation activity would be spatially and temporally isolated within this period and therefore the Applicant maintains that this would not result in the sandbank feature being in unfavourable condition.	

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			"Conclusion: As we have limited survey data from within the MPAs and the proposed techniques are fairly new for offshore windfarm developments and yet to be deployed on the scale proposed for this project there is uncertainty in relation to WCS because the actual scale of the works required and the likely level of success is unknown. Therefore the timeframes for any recovery are also uncertain." • The Applicant has commissioned studies to support the Application with the aim of addressing uncertainty regarding cable installation as far as practicable at this stage, including the Export Cable Installation Study (ES Appendix 5.1) and ABPmer Sandwave Study (Appendix 7.1 of the Information to Support HRA report). In addition, In response to requests from NE, the Applicant is progressing an interim cable burial study in the HHW SAC with a view to justifying and potentially refining the cable protection requirements. • The worst case scenario included in the assessment is conservative and takes account of the maximum footprint for cable installation (including preparation), as well as the maximum cable protection and frequency of maintenance works, providing a highly conservative assessment. • As discussed above, the Applicant proposes that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan. This would include proposed mitigation measures and agreement processes associated with dredging and sediment disposal within the HHW SAC. NE's comments on the Applicant's response to Q9.3 [REP2-036] With regards to NE's comments regarding exploring how the parameters (i.e. location of sediment disposal in the SAC) could be best assessed to ensure they are habitat regulations compliant, the Applicant maintains that the assessment of a	

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			worst case scenario is compliant with the Habitats Regulations. In addition, and as discussed above, the Applicant proposes that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan. This would include proposed mitigation measures and agreement processes associated with sediment disposal within the HHW SAC. NE's comments on the Applicant's response to Q23.17 [REP2-036] The Applicant does not understand the request to justify a buffer that was advised by NE, however as stated above, the Applicant proposes that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with NE as to the precise wording of the condition and content for the plan. This would include the location and methodology for sediment disposal and the best method would be determined at that time, taking into account the pre-construction survey data and any evidence from other relevant projects.	
23.1 01	MMO	Please comment on any implications of the Southern North Sea SCI: Review of Consents for harbour porpoise, including any additional or amended conditions you would wish to see included in the dDCO.	The MMO defer to Natural England to discuss any implications of the review of consents relating to HRA. The MMO believe the current conditions are appropriate however the MMO notes the ongoing Review of Consents, conducted by BEIS, has produced some standard wording for this condition which the MMO would recommend including for consistency. The MMO considers that the SIP provides a mechanism of control to ensure unacceptable in-combination impacts do not occur.	Natural England disagrees with the MMO that the SIP provides sufficient mechanism to control in-combination impacts.
23.1 02	Applicant	A conclusion of no AEOI on the SNS cSAC relies on	In response to the offshore Issue Specific Hearing (ISH2) Action Point 2, the Applicant has provided a note outlining how the SIP may be delivered (Consideration of Cumulative	Natural England welcomes the note provided by the Applicant regarding how in-combination effects could be managed to

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		appropriate mitigation measures being secured in the final Site Integrity Plan and Marine Mammal Mitigation Protocol. However, these mitigation measures are not yet specified and there remains some doubt over how effective certain measures, such as soft start piling, actually are. Please comment further on this matter.	Impacts on Marine Mammals, Delivery of the SIP, document reference ExA;ISH2;10.D4.4). This demonstrates that there are a range of options to manage in-combination effects and mitigation for harbour porpoise in the Southern North Sea SCI, highlighting the importance of the SIP framework which allows the flexibility to adopt the most appropriate method prior to construction in order to achieve no adverse effect on the integrity of the SCI. In addition, the wording of the DCO (Schedules 9 and 10 Condition 14(1)(m) and Schedules 11 and 12 Condition 9(1)(l)) ensures that construction cannot commence until the MMO is satisfied that there would be no AEOI.	ensure no adverse effect on integrity of the Southern North Sea SCI. Natural England consider the spatial threshold approach to be the most appropriate to undertake an in-combination assessment, as detailed in the SNCB threshold guidance for the Southern North Sea SCI. The SIP framework allows for the most appropriate form of mitigation to be employed based on the outcome of the in-combination assessment. We agree with the conclusion that guidance on the process to discharge the SIP condition should be provided at a strategic level by the Regulator and also consider the mechanism for managing multiple SIPs from multiple projects should be identified by the Regulators.
23.102	TWT	As above.	In relation to the Site Integrity Plan, evidence of the effectiveness of mitigation measures such as bubble curtains may be available from offshore wind farm development in Germany. TWT suggests more evidence is required to give confidence on the effectiveness of mitigation measures. Where evidencing is lacking, monitoring should be put in place. This is supported by European Commission Guidance on Article 6 (page 52)2 which outlines: “For the competent authority to be able to decide if the mitigation measures are sufficient to remove any potential adverse effects of the plan or project on the site (and do not inadvertently cause other adverse effects on the species and habitat types in question), each mitigation measure must be described in detail, with an explanation based on scientific evidence of how it will eliminate or reduce the adverse impacts which have been identified. Information should also be provided of how, when and by whom they will be implemented, and what arrangements will be put in place to monitor their effectiveness and take corrective measures if necessary.”	As above.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
23.102	MMO	As above.	The MMO would defer to Natural England on the effectiveness of the mitigation. The MMO would note that the Site Integrity Plan and Marine Mammal Mitigation Protocol provide the mechanism to incorporate further technological advances and amend the appropriate mitigation at the stage of construction.	As above.
23.102	WDC	As above.	Whilst WDC agree with the Site Integrity Plan (SIP) and Marine Mammal Mitigation Protocol (MMMP) in principle, there is currently a lack of guidance, based on the latest scientific information, on how to undertake these plans, particularly for SIPs which are relatively new. As a result these documents contain very little detail or assessment and have not included the latest research, they are little more than a commitment to use mitigation methods. As a result in their current form the plans cannot remove all reasonable scientific doubt as to the effects of the projects on cetaceans or ensure no Adverse Effect on Integrity (AEoI) on the SNS SCI. To ensure the SIP and MMMPs are fit-for–purpose there needs to be guidance from SNCBs on what to include. We recommend this should include a commitment to proven mitigation methods and modelling of likely mitigation measures to be included to ensure that these plans can reduce uncertainty of the impact of offshore wind farm construction. There are a number of studies demonstrating the benefits of mitigation measures (Brandt et al., 2018; Dähne et al., 2017; Nehls et al., 2016; WWF, 2016). Current embedded mitigation measures included in JNCC guidelines have not been proven in studies, and have been widely criticised as arbitrary and with a lack of supportive evidence (Wright and Cosentino, 2015). Additionally the guidelines have not been updated for a number of years and therefore do not include the latest and increasing body of scientific data of the impacts of noise on marine mammals (Wright and Cosentino, 2015). We would also recommend that there also needs to be a robust assessment strategy that includes strategic monitoring	As above.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
			to ground-truth the modelling results and verify if the mitigation is successful.	
23.1 03	Applicant	Please comment on the view that consultation with TWT and WDC would best be undertaken before the SIP is submitted to the MMO.	Table 2.1 of the In Principle (document 8.17) includes early consultation with The Wildlife Trusts (TWT) and Whale and Dolphin Conservation (WDC) in the initial review of the In Principle SIP post consent. In addition, TWT and WDC will be kept informed of developments throughout the SIP process. At the latter stages of finalising the SIP, prior to submission to the MMO, consultation is likely to be with the MMO and NE. The Applicant notes there are fundamental disagreements between TWT/WDC and NE and as the Applicant will be required to follow the advice of NE and the MMO, the Applicant cannot commit to further consultation with TWT and WDC during this stage. TWT and WDC will have further opportunity to be consulted by the MMO prior to the condition being discharged.	No comments.
23.1 04	Applicant	Please comment on the view that piling operations should cease if monitoring demonstrates that the mitigation measures being employed are not proving to be effective.	As the Applicant outlines in response to Question 20.140 above, the Applicant has now agreed with the MMO to include an amendment to Condition 19(3) of the Generation DMLs (Schedule 9-10) to address this concern. Condition 14 of the Transmission DMLs has also been updated accordingly. This wording is included in the dDCO submitted at Deadline 4.	No further comments
23.1 05	Applicant	The conclusions of no AEOI for all onshore sites presented in the Information to Support HRA report (document 5.3) are not agreed by NE. NE's position is summarised in the SoCG with NE	The Applicant and Natural England have continued to engage on the issues raised by NE in their Relevant Representation and summarised in the SoCG submitted at Deadline 1 (Rep1 - SOCG - 13.1), with a view to progressing matters and reaching common ground on these issues. The Applicant initially submitted two clarification notes to NE (Appendix 2 and 3 of the SoCG submitted at Deadline 1) on 3rd December 2018 in relation to NE's concerns regarding: • Paston Great Barn SAC on issues relating to hedgerow loss; and	Clarification Notes were provided to Natural England by the Applicant on 27 February 2019 with regards to sediment management at River Wensum Crossing, water dependent sites and other unresolved issues. Natural England's full responses to these letters have been provided at Deadline 5 (see DAS response letters). Further updates will be given by the Applicant ahead of the issue specific hearings.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		[REP1-049]. Please provide an update as to the position on this matter.	• Norfolk Valley Fens / The Broads SAC on issues relating to water supply to designated sites. Following feedback from Natural England on these two notes and a conference call held on 22nd January 2019, the Applicant has subsequently submitted further updates to these two clarification notes to NE on 27th February 2019. Clarification has also been provided to NE regarding sediment management at the River Wensum SAC and on a number of other outstanding issues raised by NE. These further clarifications were also provided to NE on 27th February. NE and the Applicant discussed the content of these additional clarifications in a call held on 27th February and NE are considering the information with a view to providing comments in due course. These items remain not agreed in the current SoCG submitted at Deadline 4, however a joint statement has been submitted to the examination to set out where progress has been made (document reference: ExA; AS; 10.D4.8). NE has indicated that a response to the majority of these clarification notes should be provided by Deadline 5 of the examination.	
23.106	NE and Applicant	The conclusions of no adverse effect on site integrity for all onshore sites presented in the Information to Support HRA report (document 5.3) are not agreed by NE. NE's position is summarised in the SoCG with NE [REP1-049]. Please provide an update as to the position. In particular:	As noted in response to Q23.105, ongoing dialogue is currently taking place between the Applicant and NE on these issues. In relation to the specific points raised, the Applicant has issued further information to NE in updated clarification notes provided on 27th February 2019. The notes provided to NE provide further clarification to the points raised in this question. In summary: Norfolk Valley Fens SAC (Booton Common SSSI) • A conceptual model of local hydrogeological conditions for Booton Common SSSI (Norfolk Valley Fens SAC) has been provided to NE which describes the water supply mechanism to the site (based on the site's WetMecs account). The conceptual model indicates that there is no groundwater pathway of effect between trenched / and trenchless construction activities associated with the project and Booton Common SSSI (Norfolk Valley Fens SAC).	Clarification Notes were provided to Natural England by the Applicant on 27 February 2019 with regards to sediment management at River Wensum Crossing, water dependent sites and other unresolved issues. Natural England's full responses to these letters have been provided at Deadline 5 (see DAS response letters). Further updates will be given by the Applicant ahead of the issue specific hearings.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		• Can the Applicant provide a comparison of the impact of trenched and trenchless crossing techniques on the flow of water to Botton Common SSSI and Norfolk Valley Fens SAC, as requested by NE? • What is the Applicant's response to NE's comments regarding the need for sensitive restoration within the River Wensum floodplain north of Penny Spot Beck? • Can the Applicant provide an update on the assessment of impacts to River Wensum SAC, Norfolk Valley Fens SAC and The Broads SAC when considered in-combination with the Hornsea 3 cable route?	Sensitive restoration within River Wensum floodplain Updated mitigation measures have been presented within a clarification note provided to NE on 27th February. These measures specifically relate to construction activities within the functional floodplain adjacent to the River Wensum and include: • The preferred way of accessing works within the functional floodplain will be to use geotextile and not to topsoil strip, to improve grassland recovery time; • Where a topsoil strip is required, this will be undertaken as a turf cut with turf rolls stored outside the functional floodplain; • Surface Water Drainage will be installed in advance of construction; • A bentonite breakout contingency plan will be implemented. These measures are considered appropriate to minimise the risk of sediment release during construction and to improve the success of post-construction reinstatement/restoration. Once these measures have been agreed with NE the outline CoCP will be updated (as secured through Requirement 20 of the dDCO). In-combination effects Natural England raised concerns of potential in-combination effects at Norfolk Valley Fens SAC (Booton Common SSSI) due to the proximity of both Norfolk Vanguard and Hornsea Project 3 buried cables. NE also raised concerns about the Norfolk Vanguard alone effects associated with the River Wensum SAC and The Broads SAC. NE has not requested further information regarding in-combination effects for the River Wensum SAC or The Broads SAC. The following information has been submitted to NE to address their concerns: • The Applicant has provided a conceptual model of local hydrogeological conditions and the interaction of Norfolk Vanguard with groundwater dependent sites (Norfolk Valley Fens SAC and The Broad SAC). The conceptual model demonstrates that there is no pathway for an effect. On this	

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
			basis, no impacts are predicted to these water dependent sites associated with the construction, operation or decommissioning of Norfolk Vanguard alone or in-combination with Hornsea Project 3. • The updated commitments related to sediment management and reinstatement associated with the trenchless crossing of the River Wensum SAC outlined above, provide further assurance that the risk of sediment release will be reduced to as low as reasonably practicable and that there will be no adverse effect upon site integrity associated with Norfolk Vanguard alone. As detailed within the Information to Support Habitat Regulations Assessment (ref: 5.3) if no adverse effect upon site integrity has been determined with respect to the River Wensum SAC for Norfolk Vanguard alone then no in-combination effect occurring with another plan or project, including Hornsea Project Three, would occur. Natural England is currently reviewing the information provided in the clarification notes referred to in response to Q23.105 and are aiming to provide a response by Deadline 5.	
23.108	Applicant	NE remain concerned as set out in [REP2-037] that there is likely to be an impact on the Paston Great Barn SAC due to loss and severance of foraging and commuting habitat over at least 7 years but is unable to assess the significance of the impact without further information on habitat to be lost and fragmented as a	As noted in the Applicant's response to Q23.105, ongoing dialogue is currently taking place between the Applicant and NE on this issue. In relation to the specific point raised, the Applicant has provided an updated clarification note to NE on 27th February 2019 which provides further information in relation to the potential habitat lost or fragmented, specifically: • Details of habitat value of the hedgerows located within the onshore project area which are to be temporarily lost during construction (and up to 7 years during the aftercare period), including height, gaps/solid hedge ratio, aspect, species composition of hedgerow shrubs and non-woody plants, width of hedge; • A plan indicating the location of the hedgerows located within the onshore project area which are to be temporarily lost during construction (and up to 7 years during the aftercare period);	Clarification Notes were provided to Natural England by the Applicant on 27 February 2019 with regards to sediment management at River Wensum Crossing, water dependent sites and other unresolved issues. Natural England's full responses to these letters have been provided at Deadline 5 (see DAS response letters). Further updates will be given by the Applicant ahead of the issue specific hearings.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		result of the proposed development. Please provide an update as to any further information provided to NE and of discussions relating to the matter.	• Details of the habitat value of the 11ha of habitat potentially fragmented during construction; • A plan showing the location of the suitable alternative foraging habitat within the study area which is available to the Paston Great Barn bat colony and the location of the 11ha of habitat potentially fragmented during construction; • Confirmation that the hedgerow planting (but not standard trees) will take place over the cable easement; and • Commitment to a Mitigation Plan to be included within the ecological management plan (EMP) to be consulted on with NE post-consent. Natural England is currently reviewing this further information and is aiming to provide a response prior to the environmental matters issue specific hearing (27th March).	
24.	**Onshore Ecology**			
24.20	Applicant	NPS EN-1 Sections 5.3.16 – 5.3.17 requires the ExA to have regard to the protection of legally protected species and habitats and species of principal importance for nature conservation and to refuse consent where harm to the habitats or species and their habitats would result, unless the benefits (including need) of the development outweigh that harm, and to give substantial weight to any such harm to the detriment of	As noted in the Applicant's response to Q23.105, ongoing dialogue is currently taking place between the Applicant and NE on these issues. Natural England are currently reviewing further information provided by the Applicant in the form of updated clarification notes circulated on 27th February 2019 and is aiming to provide a response by Deadline 5.	Clarification Notes were provided to Natural England by the Applicant on 27 February 2019 with regards to sediment management at River Wensum Crossing, water dependent sites and other unresolved issues. Natural England's full responses to these letters have been provided at Deadline 5 (see DAS response letters). Further updates will be given by the Applicant ahead of the issue specific hearings.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		biodiversity features of national or regional importance which it considers may result from a proposed development. Please provide an update as to the final position set out in Table 12, Statement of Common Ground - Onshore ecology and ornithology [REP1049], specifically commenting on legally protected species and habitats and species of principal importance for nature conservation.		
24.23	Applicant	NE in its Response to WRs and Other Supporting Documents submitted by other parties, 30 January 2019 [REP2-037] considers there is insufficient detail in the CoCP for measures to safeguard the designated site in relation to sediment control and reinstatement of all	As noted in the Applicant's response to Q23.105, ongoing dialogue is currently taking place between the Applicant and NE on these issues. Updated sediment management measures which will be implemented within the functional floodplain adjacent to the River Wensum have been set out in a clarification note provided to NE. These measures set out in the clarification note include: • The preferred way of accessing works within the functional floodplain will be to use geotextile and not to topsoil strip, to improve grassland recovery time; • Where a topsoil strip is required, this will be undertaken as a turf cut with turf rolls stored outside the functional floodplain;	Clarification Notes were provided to Natural England by the Applicant on 27 February 2019 with regards to sediment management at River Wensum Crossing, water dependent sites and other unresolved issues. Natural England's full responses to these letters have been provided at Deadline 5 (see DAS response letters). Further updates will be given by the Applicant ahead of the issue specific hearings.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		work areas. In addition, detailed management and monitoring procedures should be provided in the CoCP in case of 'breakout' (where the drilling fluid leaves the bore and escapes into the surrounding substrate). Please comment with reference to any further changes proposed to the content of the CoCP to meet these concerns.	• Surface Water Drainage will be installed in advance of construction; • Details of the content of a bentonite breakout contingency plan, including management and monitoring procedures. These measures are considered appropriate to minimise the risk of sediment release during construction and to improve the success of post-construction reinstatement/restoration. Natural England is currently reviewing the information provided in the clarification notes referred to in response to Q23.105 and is aiming to provide a response by Deadline 5. Once these approaches have been agreed with NE the outline CoCP will be updated and the measures will be secured through Requirement 20 of the dDCO.	
24.24	Applicant	NE identifies in its SoCG [REP1-049] what it considers to be significant limitations to the onshore ecological surveys identified in Paragraphs 8283 of Chapter 22 ES [APP-347].	The Applicant agrees that access for field surveys was only granted by landowners for approximately 50% of the survey area, which is clearly stated in the assumptions and limitations section (section 22.5.3) of ES Chapter 22 Onshore Ecology. The data coverage on which the EIA is based was discussed with the ETG (which included Natural England) during July 2017 and January 2018 meetings as part of the Evidence Plan Process. In light of the survey coverage achievable, the EIA has adopted a precautionary approach (as set out in section 22.5.3 of Chapter 22 Onshore Ecology) and where access was not available, aerial imagery from 2017 and the Norfolk Living Map remote sensing dataset have been used to identify broad habitat types. Where suitable habitat was identified via this remote sensing dataset, ecological receptors have been assumed to be present. A commitment to survey these areas post-consent has been included in the OLEMS (doc ref: 8.7), once access is available. This approach was presented to and agreed with	Discussions in relation to the Statements of common ground are ongoing.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
			stakeholders during the July 2017 and January 2018 ETG meetings. The Applicant acknowledges that the optimum period for Phase 1 Habitat Survey for identifying plant species is between March and September. This is of particular importance where identification of plant species is required to identify habitats to as high a degree of accuracy as possible. The purpose for the Extended Phase 1 Habitat Survey for Norfolk Vanguard was to identify broad habitat types for either their own value or as UK Habitats of Principal Importance, and for their suitability to support legally protected and notable species. This information can be gathered during any time of year and is not constrained by seasonal restrictions. Therefore, the Applicant agrees that the survey, which was undertaken in February, was undertaken marginally outside of the optimal survey period, but does not agree that this in any way undermines the value of the results obtained. The Applicant agrees that the procedure outlined in OLEMS for badger main setts within the onshore project area which require to be closed and destroyed should include other types of setts which may be found within (previously un-surveyed) areas of the onshore project area. The OLEMS will be updated to reflect this. This was agreed within the SoCG between the Applicant and NE submitted at Deadline 1 (Rep1 - SOCG - 13.1). The OLEMS states that works will cease immediately if any protected species are unexpectedly found (section 12.1 – actions to be undertaken by the Environmental Clerk of Works (ECoW)). All ground nesting birds are protected and so are captured by the commitment stated above. The Applicant has not sought to include an exhaustive list of every protected species where the ECoW would request works to cease if they were unexpectedly found. The commitment is simply that works will cease if any protected species is unexpectedly found.	

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
24.28	Applicant	In light of NE's comments as to the residual impact for birds including impacts to wintering / on passage bird species, to breeding bird species and bird species during operational lighting and noise, do you intend to conduct a noise survey?	The Applicant does not intend to conduct further noise surveys or noise assessment work and considers its approach to identifying residual impacts for birds to be appropriate. As noted in the Applicant's response to Q23.105, ongoing dialogue is currently taking place between the Applicant and NE on these issues. In relation to the specific point raised, the Applicant has provided an updated clarification note on 27th February 2019 which provides further information in relation to the potential noise impacts upon birds, specifically: • The 300m buffer used for screening potential disturbance effects arising from noise and lighting disturbance was used within the assessment following agreement on the methodology with NE in January 2017. One designated site is located within this 300m buffer, the River Wensum SSSI, and was subject to breeding bird surveys to establish the baseline. No bird species (for which the site is designated) were recorded breeding within the site within 300m of the onshore project area, and as such the site was not considered further. As no other designated sites with ornithological interest features were identified within this 300m buffer, no further assessment was undertaken. Natural England is currently reviewing this further information and is aiming to provide a response by Deadline 5.	Clarification Notes were provided to Natural England by the Applicant on 27 February 2019 with regards to sediment management at River Wensum Crossing, water dependent sites and other unresolved issues. Natural England's full responses to these letters have been provided at Deadline 5 (see DAS response letters). Further updates will be given by the Applicant ahead of the issue specific hearings.
24.29	Applicant	Please provide an update on the position regarding mitigation of impacts outlined in WQ24.28 above including what further changes if any are proposed to the CoCP or OLEMS to deal with the risk of damaging or destroying ground	The OLEMS submitted with the application included measures for managing the risk of damaging or destroying ground nesting birds during construction. Paragraph 230 of the OLEMS states: "If protected species are unexpectedly found, or trees and hedges specified to be retained are damaged during construction, the following action would take place: works would cease immediately… works would restart once the ECoW, Natural England, Norfolk County Council and or North Norfolk, Broadland or Breckland Council (as appropriate) are satisfied with the works proposed."	Natural England looks forward to receiving the updated OLEMS and will provide comment, where necessary.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		nesting birds (i.e. skylarks) during construction.	This commitment within the OLEMS covers all protected species, including ground nesting birds. Additional mitigation measures for skylarks are included in section 10.3.1 of the OLEMS, which include: • Keeping winter crop stubble low during the nesting season; • Where possible and subject to separate landowner agreements, set aside ground nesting bird areas outwith the onshore cable route prior to construction – note that the findings of the assessment are not reliant on the delivery of this measure; and • Vegetation removal will take place outside of the nesting bird season. The Applicant acknowledges that pre-construction nesting bird checks are not specified within the OLEMS. This is standard practice and will be included in an update to the OLEMS. With this additional inclusion, the Ecological Management Plan produced in accordance with the OLEMS, on which NE would be consulted, will include details of a pre-construction check of all arable habitats for ground nesting birds prior to construction.	
24.30	Applicant	FWQ 24.16 and 24.17 related to the Applicant's approach to assessment of impacts to sand martins. NE highlighted at DL2 in its comments on the Applicant's FWQ responses that mitigation within the OLEMS should include method statements on reducing light, vibration and noise impacts on sand	As noted in the Applicant's response to Q23.105, ongoing dialogue is currently taking place between the Applicant and NE on this issue. In relation to the specific point raised, the Applicant has provided an updated clarification note on 27th February 2019 which provides further information in relation to the potential impacts upon sand martins at Happisburgh, specifically: • Chapter 25 Noise and Vibration considered the potential construction activities that may give rise to significant vibration effects (typically percussive activities – piling, compacting etc). HDD was not identified as a significant source of vibration. As such no pathway of effect has been identified. In addition, as set out in the Applicant's response to Q10.3 an Artificial Light Emissions Management Plan will be submitted to the relevant authority for approval prior to construction commencing, which is captured in the outline CoCP and	Unresolved Issues Clarification Note was provided to Natural England by the Applicant on 27 February 2019. Natural England's full response to this letter has been provided at Deadline 5 (see DAS response letters), however, in summary we can confirm that our concerns with regard to sand martins has been withdrawn. Further updates will be given by the Applicant ahead of the issue specific hearings.

Qu No.	Question to	Question	Other Consultee Response	Natural England Comments
		martins nesting in the cliff face. If HDD works are undertaken during breeding season it recommends that an Ecology Clerk of Works monitor for vibration effects to ensure works do not damage or destroy the nest of any wild bird while it is in use or being built, with a remit to stopping the works if necessary. Please comment.	secured through Requirement 20. The plan will detail the location, height, design and luminance of all lighting to be used during the construction of the project, together with measures to limit lighting disturbance. Site lighting will be directional and positioned so that it is directed at the work areas to minimise light spillage and skyglow. All construction lighting will be designed in line with the Bat Conservation Trust (BCT)'s guidance on lighting. On this basis, the Applicant does not consider that further mitigation is necessary in relation to the sand martins potentially nesting in the cliffs at Happisburgh. Natural England is currently reviewing this further information and is aiming to provide a response by Deadline 5.	

THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

NORFOLK VANGUARD OFFSHORE WIND FARM

Planning Inspectorate Reference: EN010079

Natural England's Comments on changes made to draft Development Consent Order as submitted by the Applicant at Deadline 4

20 March 2019

Norfolk Vanguard Offshore Wind Farm – Comments on changes made to draft Development Consent Order as submitted by the Applicant at Deadline 4.

Following submission of revised draft Development Consent Order by the Applicant at Deadline 4 regarding the construction and operation of Norfolk Vanguard Offshore Wind Farm, Natural England has reviewed this document, and provided comment within the remit of Natural England. These comments are colour coded as:

Green Comments – Comments support/agree with Natural England position or does not impact on Natural England concerns

Amber Comments – Natural England comments may be in contradiction further advice needed, or potential new issue not included in Natural England comments

Red Comments – Comments in direct contradiction/argument with Natural England position or represents a significant issue not mentioned by Natural England

Table 1: Natural England Comments on changes made to draft Development Consent Order as submitted by the Applicant at Deadline 4. This table only includes responses to comments made by Natural England or Natural England has concerns with change.

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
7.	Article 37(1)(x)	N/A	Added to ensure the plan is certified as referred to in condition 9(1)(n) of the Transmission DMLs (Schedule 11 and 12).	(x) the outline Norfolk Vanguard Haisborough, Hammond, and Winterton Special Area of Conservation site integrity plan (xx)	No comments.
9.	Article 38	MMO	To address comments and concerns raised by the MMO as to the relevance of arbitration to the MMO. The Applicant proposes the amendments subject to acceptance of a deemed discharge provision in the DMLs, included at Condition 15 of the Generation DMLs and Condition 10 of the Transmission DMLs. This is further explained through response to Q20.139.	~~(2) Where the referral to arbitration under paragraph (1) relates to a difference with the Secretary of State, in the event that the parties cannot agree upon a single arbitrator within the specified time period stipulated in paragraph (1) either party may refer to the Centre for Effective Dispute Resolution for appointment of an arbitrator,~~ Any matter for which the consent or approval of the Secretary of State or the Marine Management Organisation is required under	Natural England's concerns regarding arbitration remain. Natural England feel that this is unlikely to change during the examination process without a significant change in position of the Applicant and therefore appreciate that this element may need to remain unresolved. Please also note the following in support of our position:

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
				any provision of this Order shall not be subject to arbitration.	The Tilbury 2 determination from the secretary of state was released at the beginning of March 2019. The determination has removed the same arbitration conditions from the DML and confirms the MMO representation (December 2018) that it is inappropriate for a DML to act differently from any other marine license and therefore should not be subject to arbitration. Thus Natural England's opinion on marine matters will not be subject to arbitration. This is covered in the recommendation report page 233. In addition: On reviewing the proposed Vanguard dDCO/DML changes, we note that the Applicant is using the same wording as the ExA for Hornsea 3 (copied below); Any matter for which the consent or approval of the Secretary of State or the Marine Management Organisation is required under any provision of this Order shall not be subject to arbitration. On further reading of this we believe that it goes beyond just excluding the MMO and BEIS from arbitration. It is our view that it excludes NE and any consultee on these matters as well; because the wording as proposed is not excluding the MMO, but excluding the decision processes which the MMO/BEIS regulate. Thus Natural England's

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
					statutory advice would be free from arbitration. We would like to discuss this further during the ISH on 28th March 2019
10.	Schedule 1, Part 1, Authorised Project, Schedule 9-10, Part 3, paragraph 2	Various including concerns from NFFO	Total number of WTGs updated due to removal of 9MW turbine option	Work No. 1 (a) an offshore wind turbine generating station with an electrical export capacity of up to 1,800 MW at the point of connection to the offshore electrical platform(s) referred to at Work No. 2 comprising up to ~~200~~ 180 wind turbine generators each fixed to the seabed by one of the following foundation types: monopile (piled or suction caisson), jacket (piled or suction caisson), or gravity base fitted with rotating blades and situated within the area shown on the works plan and further comprising (b) to (e) below;	Natural England welcomes this amendment, however, would like to note that the **Applicant we need to re-run all collision risk modelling as a result of this change.**
11.	Schedule 1, Part 3, requirement 2(3) Schedule 9-10, Part 4, condition 1(d)	Various including concerns from the NFFO	Wind Turbine Generator (WTG) spacing updated due to removal of 9MW turbine option	be less than ~~680~~720 metres from the nearest wind turbine generator in either direction perpendicular to the approximate prevailing wind direction (crosswind) or be less than ~~680~~720 metres from the nearest wind turbine generator in either direction which is in line with the approximate prevailing wind direction (downwind)	As above.
12.	Schedule 1, Part 3, requirement 3(1) Schedule	Various including concerns from NFFO	Total number of WTGs updated due to removal of 9MW turbine option	The total number of wind turbine generators forming part of the authorised project must not exceed ~~200~~180.	As above.

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
	9-10, Part 4, condition 8(b)				
13.	Schedule 1, Part 3, requirement 10(2) Schedule 9-10, Part 4, condition 7(2)	NE	To correct an error identified by NE and in response to ExA WQ 20.144	In relation to any LIDAR measurement buoys, each foundation must not have a seabed footprint area (excluding scour protection) of greater than ~~157~~ 79 m² per buoy and 157m² in total.	Natural England welcomes this amendment However, we note that a figure of 79m2 per LiDAR monopile would make a total for both LiDAR of 158m2. Natural England would question why this figure does no match the figure of 157m2 originally provided in In Table 5.6 of Chapter 5, Project Description.
14.	Schedule 1, Part 3, requirement 11	NE	To correct an error identified by NE and to respond to ExA WQ20.151	The total amount of scour protection for the wind turbine generators, accommodation platform, meteorological masts, offshore electrical platforms and LIDAR measurement buoys forming part of the authorised project must not exceed 10,639,080m2 and 53,~~0~~1095,398 m3	Natural England welcomes this amendment and has no further comments.
19.	Schedule 1, Part 3, requirement 16(17)	N/A	To correct an error – Wendling Bure is an incorrect reference. There is no watercourse named Wendling Bure.	(17) Trenchless installation techniques must be used for the purposes of passing under— (a) the River Wensum (Work No. 7); (b) King's Beck (Work No. 5); (c) Wendling Beck (Work No. 7); (d) River Bure (Work No. 6);	No comments.

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
				~~(e) Wendling Bure (Work No. 7);~~ (f) North Walsham and Dilham Canal(Work	
20.	Schedule 1, Part 3, requirement 18(2)(d)	North Norfolk District Council ExA	Requested by NNDC and to respond to ExA Q20.121	(d) details of existing trees and hedgerows to be retained with measures for their protection during the construction period	Natural England would support this amendment.
21.	Schedule 1, Part 3, requirement 20(1)	Norfolk County Council (NCC)	Requested by NCC at ISH3, and to align matters identified in the OCoCP, which the Applicant has responded to at ExA WQ 20.128.	(1) No stage of the onshore transmission works may commence until for that stage a code of construction practice has been submitted to and approved by the relevant planning authority, in consultation with Norfolk County Council and the Environment Agency (2) … (m) invasive species management; and (n) public rights of way.	No comments.
23.	Schedule 1, Part 3, requirement 20(4)	ExA	Included to address ExA's questions at ISH3 that 2(k) was excluded from the definition of commencement and therefore was not secured by the CoCP. This is now included so that a separate plan will need to be submitted for prior approval for screening, fencing and site security works. The Applicant has also responded to this at ExA Q20.128.	(4) Pre-commencement screening, fencing and site security works must only take place in accordance with a specific plan for such pre-commencement works which must accord with the relevant details for screening, fencing and site security set out in the outline code of construction practice, and which has been submitted to and approved by the relevant local authority.	Natural England welcomes this amendment.

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
27.	Schedule 1, Part 3, requirement 25(1)	NCC & ExA	Requested by NCC and in response to ExA WQ 20.129	No stage of the onshore transmission works involving the crossing, diversion and subsequent reinstatement of any designated main river or ordinary watercourse may commence until a scheme and programme for any such crossing, diversion and reinstatement in that stage has been submitted to and, approved by the relevant planning authority in consultation with Norfolk County Council, the Environment Agency, relevant drainage authorities and Natural England.	Natural England would support this amendment.
30.	Schedule 1, Part 3, requirement 29	ExA	Arising from discussions at ISHs, and to address ExA Q.20.134.	(1) Within six months of the permanent cessation of commercial operation of the onshore transmission works an onshore decommissioning plan must be submitted to the relevant planning authority for approval. (2) The onshore decommissioning plan must be implemented as approved (3) The undertaker must notify the relevant planning authority in writing of the permanent cessation of commercial operation of the onshore transmission works within 28 days of such permanent cessation.	No comments.
33.	Schedule 9-12 Part 1	N/A	Added for clarification that cable protection will also be required where cables are not buried because they are approaching turbines, offshore electrical stations and offshore	"cable protection" means measures for offshore cable crossings and where cable burial is not possible due to ground conditions or approaching offshore structures, to protect cables and fibre optic cables and prevent loss of seabed sediment by use of grout bags, protective aprons,	No comments.

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
			accommodation platforms. This has been assessed in the ES.	mattresses, flow energy dissipation (frond) devices or rock and gravel dumping	
34.	Schedule 9-12 Part 1	N/A	New definition as this is referred to in condition 14(1)(m) but without a definition	"relevant site" means a European offshore marine site and a European site;	No comments.
35.	Schedule 9 and 10, Part 4, condition 7(3)	NE	Added to be consistent with the Requirements in Schedule 1 and to address comments from NE	In relation to any wave measurement buoys, each foundation must not have a seabed footprint area (excluding scour protection) of greater than 150m² per buoy and 300 m2 in total	No further comments.
40.	Schedule 9 and 10, Part 4, condition 12(5) Schedule 11 and 12, Part 4, condition 7(5)	ExA	To clarify intentions in response to ExA Q20.154.	The undertaker must ensure that only inert material of natural origin, produced during the drilling installation of or seabed preparation for foundations, and drilling mud is disposed of within site disposal reference [XX] within the extent of the Order limits seaward of MHWS. Any other materials must be screened out before disposal of the inert material at this site.	Natural England support this amendment. However, please see comments about similarity of particle size when depositing within designated sites.
44.	Schedule 9 and 10, Part 4, condition 14(1)(j) Schedule 11 and 12, Part 4,	N/A	Wording deleted as it duplicates condition 15(2) of the Generation DMLs and condition 10(2) of the Transmission DMLs.	(j) An offshore operations and maintenance plan, in accordance with the outline offshore operations and maintenance plan, ~~to be submitted to the MMO at least four months prior to commencement of operation of the licensed activities and~~ to provide for review and resubmission every three years during the operational phase.	No comments.

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
	condition 9(1)(j)				
47.	Schedule 9 and 10, Part 4, condition 15(3)-(6) Schedule 11 and 12, Part 4, condition 10(3)-(6)	MMO, NE, and ExA	Added in view of removal of the MMO from arbitration and in order to provide an adequate and appropriate discharge mechanism under the DMLS. This also responds to ExA Q.20.139.	(3) No licensed activity may commence until for that licensed activity the MMO has approved in writing any relevant programme, statement, plan, protocol or scheme required to be approved under condition 14 or approval has been deemed in accordance with sub-paragraph (5). (4) Unless otherwise agreed in writing with the undertaker, the MMO must determine an application for approval made under condition 14 within a period of four months commencing on the date the application is received by the MMO or if the MMO reasonably requests further information to determine the application for approval, within a period of four months commencing on the date that the further information is received by the MMO. For the purposes of this paragraph (4), the MMO may only request further information from the undertaker within a period of one month from receipt of the application for approval. (5) Save in respect of any plan which secures mitigation to avoid adversely affecting the integrity of a relevant site, where the MMO fails to determine the application for approval under condition 14 within the period referred to in sub-paragraph (4), the programme, statement, plan, protocol or scheme is deemed to be approved by the MMO.	Please see comments above with regards to arbitration.

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
				(6) The licensed activities must be carried out in accordance with the ~~approved~~ plans, protocols, statements, schemes and details approved under condition 14 or deemed to be approved under sub-paragraph (5) above, unless otherwise agreed in writing by the MMO.	
48.	Schedule 9 and 10, Part 4, condition 19(3)	MMO	Requested by the MMO at Deadline 3 and in response to ExA WQ 20.140.	The results of the initial noise measurements monitored in accordance with sub-paragraph (1) must be provided to the MMO within six weeks of the installation of the first four piled foundations of each piled foundation type. The assessment of this report by the MMO will determine whether any further noise monitoring is required. If, in the opinion of the MMO in consultation with Natural England, the assessment shows significantly different impacts to those assessed in the environmental statement or failures in mitigation, all piling activity must cease until an update to the marine mammal mitigation protocol and further monitoring requirements have been agreed.	Natural England welcome this amendment.
49.	Schedule 9 and 10, Part 4, condition 20(2)(a) Schedule 11 and 12, Part 4,	N/A	Amended for clarity and consistency with requirements under condition 18 of the Generation DML and condition 13 of the Transmission DML which refer to pre-construction surveys in the Order limits	(2) The post-construction surveys referred to in sub-paragraph (1) must, unless otherwise agreed with the MMO, have due regard to, but not be limited to, the need to undertake— (a) a survey to determine any change in the location, extent and composition of any benthic habitats of conservation, ecological and/or economic importance constituting Annex 1 reef habitats identified in the pre-construction survey in the parts of the ~~wind~~	No comments.

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
	condition 15(2)(a)			~~farm area~~ Order limits in which construction works were carried out. The survey design must be informed by the results of the pre-construction benthic survey;	
50.	Schedule 11 and 12, Part 4, condition 9(1)(n)	NE, ExA	New wording to address comments from NE at Deadline 3 and in response to ExA questions (including Q.5.26). The Applicant acknowledges that as a European site, the Haisborough Hammond and Winterton (HHW) SAC has a special environmental status. For this reason, the Applicant agrees that there is benefit in securing the mitigation associated with the HHW SAC in a single plan and through a separate condition in the transmission asset DMLs. The Applicant is engaging with Natural England as to the precise wording of the condition (which is as proposed in the drafting for the Deadline 4 dDCO as shown in red) and content for the plan.	The licensed activities, or any phase of those activities must not commence until a site integrity plan which accords with the principles set out in the Outline Norfolk Vanguard Haisborough, Hammond and Winterton Special Area of Conservation Site Integrity Plan has been submitted to the MMO and the MMO (in consultation with the statutory nature conservation body) is satisfied that the plan, provides such mitigation as is necessary to avoid adversely affecting the integrity (within the meaning of the 2017 Regulations) of a relevant site, to the extent that sandbanks and *Sabellaria spinulosa* reefs are a protected feature of that site.	Natural England awaits the provision of the Applicants Site Integrity Plan to provide further advice on this. Please note our response to ExA Q, 20.146 (also provided at Deadline 5) where we advise that within the boundary of HHW SAC sediments are only permitted to be deposited in areas that are >95% similar to the said sediment.
51.	Schedule 11 and 12, Part 4, condition 14		To reflect the changes to Condition 19(3) of the Generation DMLs within the corresponding condition in the Transmission DMLs (as requested by the MMO at Deadline 3) and in response to ExA WQ 20.140.	14.—(1) The undertaker must, in discharging condition 9(1)(b), submit details (which accord with the offshore in principle monitoring plan) for approval by the MMO in consultation with the relevant statutory nature conservation bodies of any proposed monitoring, including methodologies and timings, to be carried out during the construction of the authorised scheme. The survey proposals must specify each survey's	Natural England welcome this amendment.

Ref	DCO Ref.	Consultee	Comments from stakeholder (rationale for the change)	Change made by the Applicant	Natural England Comments
				objectives. In the event that driven or part-driven pile foundations are proposed, such monitoring must include measurements of noise generated by the installation of the first four piled foundations of each piled foundation type to be installed unless the MMO otherwise agrees in writing. (2) The undertaker must carry out the surveys approved under sub-paragraph (1), including any further noise monitoring required in writing by the MMO, and provide the agreed reports in the agreed format in accordance with the agreed timetable, unless otherwise agreed in writing with the MMO in consultation with the relevant statutory nature conservation bodies. (3) The results of the initial noise measurements monitored in accordance with sub-paragraph (1) must be provided to the MMO within six weeks of the installation of the first four piled foundations of each piled foundation type. The assessment of this report by the MMO will determine whether any further noise monitoring is required. If, in the opinion of the MMO in consultation with Natural England, the assessment shows significantly different impacts to those assessed in the environmental statement or failures in mitigation, all piling activity must cease until an update to the marine mammal mitigation protocol and further monitoring requirements have been agreed.	

THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

NORFOLK VANGUARD OFFSHORE WIND FARM

Planning Inspectorate Reference: EN010079

Copies of Natural England's Discretionary Advice Service (DAS) response letters to the Applicant on various clarification notes in relation to onshore ecology provided by the Applicant on 27 February 2019

20 March 2019

Date: 18 March 2019
Our ref: 275160
Your ref: Appendix 2

Royal Haskoning DHV on behalf of Norfolk Vanguard Ltd.

BY EMAIL ONLY

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Dear Gemma,

Planning consultation: Norfolk Vanguard Offshore Windfarm Appendix 2 Clarification Note - Water Dependant Designated Sites
Location: Norfolk

Thank you for your consultation on the above dated 25 February 2019 which was received by Natural England on 27 February 2019. The following advice is provided under Natural England's Discretionary Advice Service (DAS).

Appendix 2 Clarification Note - Water Dependant Designated Sites

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to the assessment of impacts to water dependant designated sites have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that *'further information is obtained from Environment Agency and used in a detailed appraisal of groundwater effects, e.g. WETMEC data showing the water supply mechanism for all the component sites and/or EA's groundwater modelling. If the installation of the cable route would affect the groundwater supply to these sites, then a detailed assessment should be undertaken and mitigation measures implemented to minimise any identified effects*.'

The updated Clarification Note dated 25 February 2019 provides sufficient detail regarding potential hydrological impacts on the sites where Natural England are particularly concerned. The updated Clarification Note now considers the EA's WETMEC data showing the water supply mechanism for all the component sites and provides a conceptual model to consider the risks of ground water supply to the sites from the development of the cable route. Natural England is happy that this is in line with the EA conceptual model.

Natural England agrees with the conclusion of no Likely Significant Effect to Booton Common SSSI and the Norfolk Valley Fens SAC from open cut trenching and dewatering or directional drilling based on the conceptual model and the mitigation measures, which have enabled a conclusion of low or negligible risk. Therefore we agree with the conclusions of no adverse effect on integrity.

We welcome the commitment to develop a scheme and programme for each watercourse crossing, diversion and reinstatement, which will include site specific details regarding sediment management and pollution prevention measures, as secured through Requirement 25 (Watercourse Crossings) of the draft DCO. Natural England looks forward to commenting on the scheme for each water course in due course.

For any queries relating to the content of this letter please contact me using the details provided

below.

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely,

Jessica Taylor
Marine Lead Adviser

Date: 18 March 2019
Our ref: 275160
Your ref: Sediment Management at the River Wensum crossing

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Royal Haskoning DHV on behalf of Norfolk Vanguard Ltd.

BY EMAIL ONLY

Dear Gemma,

Planning consultation: Norfolk Vanguard Offshore Windfarm Clarification Note - Sediment Management at the River Wensum crossing
Location: Norfolk

Thank you for your consultation on the above dated 20 February 2019 which was received by Natural England on 27 February 2019. The following advice is provided under Natural England's Discretionary Advice Service (DAS).

Clarification Note: Sediment Management at the River Wensum Crossing

Most concerns withdrawn. However further information is required regarding some elements.
Following receipt of further information on 27 February 2019 Natural England is broadly satisfied that the specific issues we have raised in previous correspondence relating to the assessment of sediment management at the River Wensum crossing have been resolved.
However, further clarification is still required with regards to:

1. Restoration plan outside of functional floodplain;
2. Reinstatement of work areas; and
2. Number of HDD's

Within the Relevant Representations of Natural England dated 31 August 2018 we raised several concerns with regards to the assessment on River Wensum SAC / SSSI. The Sediment Management at the River Wensum Crossing clarification note attempts to address each of these concerns; so, for ease of tracking, this advice letter has been broken down by each comment and whether or not through provision of the clarification note Natural England's concerns can be withdrawn.

1. Restoration of the site should be undertaken sensitively: deep turf stripping and reinstatement is more appropriate than natural regeneration or reseeding.

Most concerns withdrawn. However further information is required regarding some elements.
Following receipt of further information on 27 February 2019 Natural England is broadly satisfied that the specific issues we have raised in previous correspondence relating to restoration of the site have been resolved. However, some further clarification is required.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that: *'Works to facilitate the trenchless crossing of the River Wensum may take place within the River Wensum floodplain north of Penny Spot Beck which we advised should be avoided as it is part of a Countryside Stewardship agreement to improve the site integrity of the River Wensum SAC. We are content with the mitigation proposed if this location has to be used, i.e. works will take place outside of the winter period (October – February inclusive) (para 1166). However, restoration of this site*

should be undertaken sensitively: deep turf stripping and reinstatement is more appropriate than natural regeneration or reseeding. We would be happy to agree a restoration plan when more information is known.'

Natural England welcomes the commitment that, within the functional floodplain, where a topsoil strip is required for existing grassland located within the functional floodplain, this will be undertaken using a turf cutter and these turf rolls will be retained and reinstated after the works are complete (approximately eight weeks). Natural England also welcomes the commitment to store removed topsoil and turf outside of the functional floodplain.

However, Natural England note that a similar practice will not be employed in areas outside of the functional floodplain. In these areas where surface vegetation has been removed (with the exception of arable crops), this will simply be reseeded to prevent future runoff. Reseeding will only be effective when carried out in suitable growing conditions, otherwise it risks extended periods of bare ground, liable to erosion. The applicant has committed to providing a detailed scheme and programme which will include site specific water course crossing, with consultation with Natural England. We would expect the detailed design to demonstrate that reseeding of bare ground within the River Wensum catchment would not have a detrimental effect on water quality within the River Wensum SAC. If a negative impact on water quality cannot be ruled out at the detailed design stage then turf stripping may be necessary within a wider area of the catchment, not just the floodplain. Natural England look forward to commenting on the detailed design.

2. Sediment Control and reinstatement of work areas

Most concerns withdrawn. However, further information is required regarding some elements. Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to sediment control have been resolved. However, some further clarification is required with regards to reinstatement of work areas.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that: *'There is insufficient detail in the Code of Construction Practice (CoCP) for measures to safeguard the designated site in relation to sediment control and reinstatement of all work areas.'* and

'Details of actual methods employed are needed in relation to sediment control, and reinstatement of all work areas.'

The clarification note provides sufficient details with regards to sediment control and therefore Natural England withdraw their concerns in this regard.

However, whilst the clarification note states that 'any damage to ground conditions caused by vehicle tracking will be rectified prior to the reinstatement of topsoil/turf', there are no details on how this will be done. Natural England would request further information in this regard.

3. Permanent Access Tracks

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to permanent access tracks have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that: *'Location of permanent access tracks is not provided and is needed. These would require the retention and maintenance of sediment and surface water control measures.'*

Natural England welcomes the confirmation in the clarification note that there are no new permanent

access tracks required for operation across the functional floodplain with existing tracks and roadways being utilised for access where possible. Temporary construction accesses within the functional floodplain will only be required if the third trenchless crossing compound (north of Penny Spot Beck) is used.

However, Natural England notes that if the third compound is chosen it is still not known what the temporary new construction accesses will be formed of (e.g. protective matting (geotextile), temporary metal road or permeable gravel aggregate). Norfolk Vanguard Ltd. has committed to providing a detailed scheme and programme which will include site specific water course crossing, with consultation with Natural England. Natural England would expect further detail to be provided as to the location of temporary access (this is not illustrated In Figure 1 in the Clarification Note), design, materials, and post construction reinstatement. Natural England looks forward to receiving and commenting on the site specific crossing plan.

In addition, it should be noted that Natural England advises that if possible the area north of Penny Spot Beck should be avoided as it is part of a Countryside Stewardship agreement to improve the site integrity of the River Wensum SAC.

4. Further detail on the ongoing management of silt traps and screens and decommissioning / disposal of retained sediment

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to management of silt traps and decommissioning/disposal of retained sediment have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that: *'Further detail on the ongoing management of silt traps and screens and decommissioning/disposal of retained sediment is required.'*

The clarification note confirms that the sediment traps will be monitored weekly (visual inspection) during the trenchless crossing works (with increased monitoring during inclement weather) and when required the traps can be pumped via settling tanks to remove sediment, based on a pre-defined level / depth of sediment. When the interceptor drains and associated sediment traps are decommissioned any standing water within the drains would be pumped out to settling tanks as described in the clarification note. Sediment that has settled out within the interceptor drain would be left in place. Soils would be replaced in the reverse order that they were removed and turf reinstated.

Natural England welcomes this confirmation and are satisfied that the clarification note provides sufficient information to withdraw our concerns in this regard. Natural England looks forward to receiving the updated CoCP, with mitigation measures as outlined in the clarification note included.

5. Interceptor Drains

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to interceptor drains have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that: *'Interceptor drains are an important part of sediment control and therefore need to be combined with sediment management measures in 11.1.1 Para 103'.*

Natural England welcomes the confirmation in the clarification note that the surface water drainage introduced in advance of construction will include interceptor drains for surface water flows and that

these interceptor drains will include areas for the settlement of sediment (sediment traps). Natural England therefore withdraw our concerns in this regard.

6. Detailed management and monitoring procedures should be provided in the CoCP in case of 'breakout'

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to the need for detailed management and monitoring procedures in case of 'breakout' have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that:
'In addition, detailed management and monitoring procedures should be provided in the CoCP in case of 'breakout' (where the drilling fluid leaves the bore and escapes into the surrounding substrate).'

The clarification note provides a brief overview of the steps that will be in any break-out contingency plan, including measures to ensure drilling stops once a breakout is reported (there will be a drop in pressure at the drill head).

As bentonite is an inert substance Natural England's preference is to consider allowing natural processes to winnow the substance away over more intrusive/damaging options. However, should a more proactive approach be required then the following can also be considered:

- Where appropriate, deploy measures to contain the breakout, for example sand bags, to minimise the extent of any smothering. However, sandbags shouldn't be placed where they will cause significant damage to vegetation or sediment.
- Measures to remove the released bentonite if a significant volume of material is contained – for example pumped back to the bentonite lagoon within the trenchless crossing compound, or pumped to the interceptor drains, or pumped to the mobile settling tanks that will be used for managing sediment traps.

The exact specification for the contingency plan will be informed by further ground investigation and the specific design of the trenchless crossing.

Natural England welcome the commitment to ensure a break-out contingency plan is included in the final CoCP and will provide further advice, if necessary, when this and the crossing site specific plans are produced.

7. Number of HDD's if location north of Penny Spot Beck is used

Further information required to determine impacts on designated sites/landscapes.
Following receipt of further information on 27 February 2019, there remains insufficient information to enable Natural England to provide a substantive response to this consultation. We expect this to be provided in the site specific crossing plan.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that: '*It is unclear whether there would be 2 HDD's or 1 if the location north of Penny Spot Beck is used.'*

The clarification Note states that 'two trenchless crossings may be required due to local ground conditions, i.e. one to cross the Wensum north of the Penny Spot Beck, and a second one to cross the Penny Spot Beck.

Natural England expects confirmation on the exact number of HDD crossings to be provided in the detailed scheme and programme which will include site specific water course crossing.

Please note that whilst this clarification note broadly allays Natural England's concerns with regards

to impacts on River Wensum SAC / SSSI we would defer to the Environment Agency with regards to its suitability to allay any concerns regarding flood risk. Therefore, Natural England recommends that this clarification note is also provided to the Environment Agency for comment if this hasn't already been done.

For any queries relating to the content of this letter please contact me using the details provided below.

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely,

Jessica Taylor
Marine Lead Adviser

Date: 18 March 2019
Our ref: 275160
Your ref: Outstanding Issues Clarification Note

Royal Haskoning DHV on behalf of Norfolk Vanguard Ltd.

BY EMAIL ONLY

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Dear Gemma,

Planning consultation: Norfolk Vanguard Offshore Windfarm Other Outstanding Issues Clarification Note
Location: Norfolk

Thank you for your consultation on the above dated 27 February 2019 which was received by Natural England on 27 February 2019. The following advice is provided under Natural England's Discretionary Advice Service (DAS).

Other Outstanding Issues Clarification Note:

1. Sand martins at Happisburgh

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to the assessment of impacts to sand martins at Happisburgh Cliffs have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that *'Sand martin are known to nest in Happisburgh Cliffs which may be affected by noise, vibration and 24hr working (i.e. works involving lighting). It would be preferable to avoid the breeding season during construction. However, the stated distance between nest sites and landfall (130m), Chapter 25 Onshore Noise and Vibration Table 25.17 Predicted distances at which vibration levels may occur, shows that some vibration may be felt at this distance and the significance of this for birds should be evaluated. We agree that lighting should follow good practice guidance for wildlife.*'

The clarification note dated 27 February 2019 confirms that none of the activities potentially giving rise to a vibration effect are anticipated within the landfall works area, with the running track leading up to the landfall compound approximately 450m from the cliff edge. Natural England is therefore satisfied that under the current project design there is no pathway for vibration effects to impact upon sand martin nests at the landfall.

However, please note if the project design changes Natural England would expect this issue to be revisited.

2. One year of survey data in relation to Broadland SPA / Ramsar site wintering birds

Further information required to determine impacts on designated sites/landscapes
Following receipt of further information on 27 February 2019 there remains insufficient information to enable Natural England to provide a substantive response to this consultation. Therefore, Natural England is not satisfied that the specific issues we have raised in previous correspondence relating to the need for one year of survey data in relation to Broadland SPA / Ramsar site wintering birds have been fully resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that *'Broadland SPA/Ramsar site: This site was scoped out of the HRA on the basis that there was evidence of low levels of wintering birds associated with the SPA/Ramsar using the study area. However, this may have been due to the cropping regime at the time of survey. We requested that this point was taken account of by including additional measures, e.g. survey and/or WeBS data and information about predicted crop patterns at the time of the proposed work. We suggest that the Outline Landscape and Ecological Management Strategy (OLEMS) is amended to include further survey and provide suitable mitigation measures if required.*'

Natural England agrees with the assertion in the clarification note that it was agreed during the Evidence Plan Process (Norfolk Vanguard - Onshore Wintering Bird Surveys Survey Methodology Approach Update Response February 2017 (Document Reference: PB4476.003.038) that one year of baseline surveys was appropriate.

However, during the same plan meeting Natural England suggested that the reason that no focal species selected from the qualifying species of the Broadland SPA and Ramsar site for the agricultural land transect (Bewick's Swan, Whooper Swan, Bean Goose, Greylag Goose, Pink-footed Goose and White-fronted Goose) were recorded may be linked to crop rotations. Crop rotations may mean that crops that the birds will feed on may not have been grown in these fields in that particular survey year. However, in another year if such crops were grown, then higher numbers of birds may be recorded in these fields. Natural England therefore questioned whether this was representative for the available habitat during construction and recommended that consideration was given to this.

The clarification note states that the potential for local cropping patterns to influence the findings of the surveys was considered and that whilst some fields were recently ploughed the majority of crops in place over winter within the wintering bird survey area (winter crop, fallow (grass)) would still provide suitable foraging habitat for pink-foot geese. Therefore it was concluded that the survey results recorded over winter in 2016/2017 provided a robust estimate of the use of these habitats by qualifying features of the Broadland SPA and Ramsar site, i.e. that there are low levels of wintering birds associated with the SPA / Ramsar using the study area.

Natural England welcomes the commitment to not undertake winter works in any one area in consecutive years to attempt to account for changes in cropping patterns for wintering birds to use different habitats for foraging and resting on an inter-annual basis.

However, as per our original query, Natural England would expect to see an assessment of cropping rotation and how this may impact bird species present across several years so as to assess whether or not the low numbers of birds was due to the cropping regime of that particular year or genuinely represents low usage of those areas. Until this has been done Natural England cannot agree with the conclusions regarding wintering birds at Broadland SPA / Ramsar.

3. Use of the 300m disturbance buffer in relation to designated sites

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to the use of the 300m disturbance buffer in relation to designated sites have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that: *'For the assessment of noise disturbance on birds which are features of designated sites, we suggest designated sites within 500m are screened in for assessment, namely River Wensum SSSI; Dereham Rush Meadow SSSI; Dillington Carr, Gressenhall SSSI. However, it is stated in Chapter 25 Onshore Noise and Vibration (Table 25.3 Consultation responses) that 'no sites are located within the noise and vibration study area'. However, Figure 25.1 Noise and Vibration Study Area rather confusingly does not appear to show a noise and vibration study area. However in the report, Dillington Carr, Gressenhall SSSI and Dereham Rush Meadows SSSI are scoped out from further assessment as they are located more than 300m from the onshore project area (paragraph 169) but we are unclear as to how this distance criteria was derived. Therefore, no detailed assessment of noise on bird features appears to have been carried out, i.e. noise modelling. We advise that a detailed noise assessment is carried out for sites within 500m of the project area and mitigation provided for any impacts identified or evidence is provided to demonstrate that there will be no additional noise experienced from construction at the designated site boundary.*'

Natural England has reviewed all documents submitted as part of this application and which are relevant to this point and can confirm that we agree with the use of 300m as a disturbance buffer in relation to noise disturbance on birds which are features of onshore designated sites. Natural England, therefore withdraw our concern in this regard.

4. Grade 3 Agricultural Land Classification (ALC) soils need to be split to allow an assessment of impact to Best and Most Versatile (BMV) to be undertaken

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to the Agricultural Land Classification have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that: *'Grade 3 ALC soils need to be split into Grade 3a and Grade 3b, so that the assessment of loss of BMV land can be properly made (Table 21.10). The amount of BMV land that would be permanently lost to the development, i.e. by buildings etc., and the time it would take for the recovery of soils that are disturbed by the construction should be quantified in the ES.*
We note that the total permanent land take for the footprint of the onshore project substation and National Grid substation extension zone is approximately 10.5ha according to the worst case scenario (Table 21.16). These will be on ALC grades 2 and 3 land; the amount of BMV land should be estimated.'

Natural England welcome the information supplied within the clarification note 'Other unresolved issues' provided 27 February 2019. We note that all Grade 3 land has now been assessed as best and most versatile agricultural land. We note the reassessment within the Errata document 9.4 and that the effects to BMV have been reassessed as minor adverse. Natural England confirm that our concerns with regard to Agricultural Land Classification and the assessment of impact to Best and Most Versatile (BMV) are withdrawn.

5. Topsoil should be reinstated where it originated

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to the need to ensure topsoil is reinstated where it originated have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that: *'Topsoil should be reinstated where it originated. There are significant differences between topsoil in*

arable and grassland, valley bottom and valley sides and natural, semi natural and managed land. This will need clearly addressing in the SMP mentioned in Para 154.'

Natural England welcomes the commitment made in the clarification note to update Section 8 (soil management) of the Outline Code of Construction Practice (OCoCP) to confirm that topsoil will be stored adjacent to the excavated trench and will be reinstated where it originated in sequential order. Natural England, therefore, withdraw our concerns in this regard.

Natural England also welcome the commitment that the SMP will be produced post-consent in accordance with the principles set out in section 8 of the OCoCP.

For any queries relating to the content of this letter please contact me using the details provided below.

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely,

Jessica Taylor
Marine Lead Adviser

Date: 20 March 2019
Our ref: 275160
Your ref: Appendix 3

Royal Haskoning DHV on behalf of Norfolk Vanguard Ltd.

BY EMAIL ONLY

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 3900

Dear Gemma,

Planning consultation: Norfolk Vanguard Offshore Windfarm Appendix 3 Clarification Note – Bat Impact Assessment – Paston Great Barn SAC
Location: Norfolk

Thank you for your consultation on the above dated 27 February 2019 and received by Natural England on the same date. The following advice is provided under Natural England's Discretionary Advice Service (DAS).

Appendix 3 Clarification Note – Bat Impact Assessment

Concerns withdrawn
Following receipt of further information on 27 February 2019 Natural England is satisfied that the specific issues we have raised in previous correspondence relating to the assessment of bats at Paston Great Barn SAC have been resolved.

Within the Relevant Representations of Natural England dated 31 August 2018 we advised that from the information provided, we considered that there was likely to be an impact on the Paston Great Barn Special Area of Conservation (SAC) due to loss and severance of foraging and commuting habitat over at least 7 years.

In order to assess the impact we requested more information about each hedgerow to be removed plus an accurate estimation of the timescale for recovery to previous condition (or better) following installation of the cable trench. We did not feel that the assessment had sufficiently assessed the importance to bats from Paston Great Barn of the 11ha of woodland that will be fragmented by the hedgerow removal.

The information provided within Appendix 3 contains sufficient information regarding the hedgerow quality for bats, and illustrates the availability of habitat in the area. Therefore we agree with the conclusions with regards to Bats at Great Paston Barn SAC.

We advise that, as a requirement of the development, that prior to removal of hedgerows, a OLEM/EMP is developed in consultation with Natural England. The plan should include for the improvement of the hedgerows either side of the section to be removed including any gapping up, tree management and the development of scrub/rough grassland margins. The mitigation plan should be in place for 7 years or until the original hedgerow has recovered fully. Consideration could be given within the OLEM/EMP to the planting of more mature hedge plants, that could reduce the time required for these hedgerows to return to their original state/or better.

Natural England recommends that the developer incorporate Net Gain for bats within the final design and suggests consultation with the Norfolk Barbastelle Study Group/ Norwich Bat Group, as they will be the best placed to recommend local enhancement for the species.

For any queries relating to the content of this letter please contact me using the details provided below.

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely,

Jessica Taylor
Marine Lead Adviser

THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

NORFOLK VANGUARD OFFSHORE WIND FARM

Planning Inspectorate Reference: EN010079

Natural England's advice in relation to red-throated diver mitigation measures

20 March 2019

1.1. Examples of relevant best practice in relation to red-throated diver (RTD) mitigation measures include:

- The potential impacts during works can be addressed through avoiding and minimising traffic where possible during the most sensitive time period in January/ February/ March and putting mechanisms in place to control boat traffic;
- Restricting vessel movements where possible to existing navigation routes (to areas where RTD are likely to be lowest);
- Maintaining direct transit routes (to minimise transit distances through areas used by RTD);
- Avoidance of over-revving of engines (to minimise noise disturbance); and,
- Developers have a responsibility to make vessel operators aware of the importance of the species (tool box talk), avoiding rafting birds either in-route to array from operational port and/or within the array (dependent on location) and where possible avoid disturbance to areas with consistently high diver density.