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 first written questions.

30 January 2019

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

Following submission of Natural England's and other consultees responses to the Examining Authority's first 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

Grey Comments – Comments that are not relevant to Natural England

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

Qu No.	Qu. To.	Question:	Response	NE Comments
1.	**General**			
1.1	Applicant	Please confirm whether the additional material contained in the Change Report [AS-009] and Errata document [AS-010] falls within the parameters that have been assessed in the ES. If any of the proposed changes/corrections fall outside the assessed parameters, please highlight these and explain how they have been subject to further assessment and the results of that assessment. In the event that the changes are accepted please confirm how they would be secured in the dDCO, giving a clear indication of all consequential amendments to the dDCO.	In preparing the Change Report and the Errata, the Applicant has considered whether each amendment has the potential to give rise to any significant impacts beyond those which have been assessed in the Environmental Statement (ES). In addition, the Applicant has considered the potential implications of the amendments on the application documents as submitted in June 2018. Following a thorough review of these potential implications, none of the proposed amendments have been found to result in any change to the impacts assessed in the ES or any relevant Development Consent Order (DCO) application documents as submitted. Table 2.16 of the Change Report lists the relevant application documents which will require updating if the changes are accepted.	Natural England provided comments on the Change Report [AS-009] as part of its submission at Deadline 1. Natural England have now reviewed Errata document [AS-010] and have no further comments.

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			This table also makes it clear that there are no changes to the significance of the impacts assessed in the ES. The relevant amendments to the Order Limits will be captured in the Land Plans (document reference 2.02), Works Plans (document reference 2.04), and other relevant Plans (e.g. Access to Works Plans) which will be secured through the draft Development Consent order (dDCO) (in particular through Schedule 1, Authorised Project). These changes will also be explained further in the Statement of Reasons and Explanatory Memorandum, as well as outlined in an updated version of the Book of Reference. A full list of the documents to be updated can be found in the Applicant's Guide to the Application, submitted at Deadline 1 (document reference 1.4 (Version 2)). The Applicant intends to submit revised versions of the relevant application documents at Deadline 2. The Errata document provides information on inconsistencies and errors identified in the DCO application documents. These inconsistencies are all considered to be non-material. Table 2.1 and Table 28.27 of the Errata provides a full list of the errata identified in the ES and how the changes impact on other application documents.	
1.3	Applicant	Chapter 5, paragraph 289 of the Environmental Statement [APP-329] states that the temporary landfall compound shown in Figure 5.3 of the ES [APP-378] would be 60m long by 50m wide. However, Figure 5.3 depicts two indicative landfall compounds. Please clarify this.	With reference to paragraph 295 of ES Chapter 5 Project Description, the Rochdale envelope for Norfolk Vanguard includes the option of concurrent drilling with two parallel drilling rigs. Therefore, two indicative landfall compounds, each of 50m x 60m are depicted in Figure 5.3.	No comments.
1.4	Applicant	Please supply a full, up-to-date and unabridged copy of the Horlock Rules.	A full version of the Horlock Rules is provided in Appendix 1.1 (document reference ExA; WQApp1.1; 10.D1.3). Table 4.3 of ES Chapter 4 Site Selection Alternatives presents how the Horlock Rules	No comments.

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			have been taken into consideration as part of the development of the onshore project substation location.	
1.5	Applicant	Please comment upon the concerns raised by interested parties at the Open Floor Hearing (OFH) in relation to the deliverability of the project having regard to your commitment to use HVDC technology.	Vattenfall considers that the project as defined in the application and including the commitment to high voltage direct current (HVDC) technology is fully deliverable, given the current state of the art in offshore wind technology and construction practice. This applies to the HVDC export system in addition to the offshore wind farm itself. Vattenfall is currently working with a number of HVDC technology providers, to evaluate a range of HVDC solutions for the export infrastructure for both Norfolk Vanguard and Norfolk Boreas. This activity has reinforced Vattenfall's confidence in the breadth and depth of the supply chain for HVDC solutions, and in the deliverability of the HVDC export systems for these projects.	Not relevant to Natural England.
2.	**Principle and nature of the development, including alternatives**			
2.1	Applicant	Chapter 4 of the ES [APP-328] and the Strategic Approach to Selecting a Grid Connection Point document [AS-007]. Having regard to the Horlock Rules and NPS EN-1 paragraph 5.9.8, as well as the concerns expressed by Interested Parties in the RRs and at the OFH with regard to why Necton was chosen for the location of the proposed substation, could you provide further and more detailed information regarding the site selection process and the decisions taken within that process, with full justification for each decision.	Paragraph 5.9.8 of the National Policy Statement (NPS) EN-1 addresses landscape impacts. *"Virtually all Nationally Significant Energy Infrastructure Projects will have effects on the landscape. Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints the aim should be to minimise harm to the landscape, providing reasonable mitigation where possible and appropriate".* Chapter 4 Site Selection and Assessment of Alternatives of the ES (along with Appendices 4.1 to 4.9 of the ES) (document 6.1.4, and 6.2.4.1-6.2.4.9) and the report titled Strategic Approach to Selecting a Grid Connection Point (document Pre-ExA; OCP Report; 9.2) provide	Not relevant to Natural England.

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			detailed information on both the approach to identifying a grid connection point and the process for identifying, at the identified connection point, preferred locations for the onshore project substation and national grid extension. A summary of this process is provided below. The process of identifying a grid connection point was a joint process with National Grid plc aimed at providing, in line with National Grid's statutory duties, an efficient coordinated and economic assessment of available options to connect the project to the national transmission system, looking at technical, commercial, regulatory, environmental, planning and deliverability aspects to identify the preferred connection to the consumer. A long list of potential onshore connection points (OCP) was identified and included Walpole, King's Lynn, Necton, Shipdham, Dereham, Brandon Parva, Norwich Main, Diss, Eye and Bramford, and coastal connection points at Bacton, Gorleston-on-Sea, Lowestoft and Sizewell. Locations requiring longer transmission distances (with higher costs and environmental impacts) were eliminated from the list, as were inland locations that did not make use of existing (or proposed) 400kV substation infrastructure. This left a shortlist comprising inland locations at Norwich Main, Necton and Eye, and coastal locations at Bacton, Gorleston-on-Sea and Lowestoft. An offshore cable route screening exercise identified three possible landfall areas (Bacton to Cart Gap, Gorleston-on-Sea and Lowestoft to Kessingland). Lowestoft was removed at this stage due to the length of the offshore cable route and number of offshore cable crossings. Bacton to Cart Gap was considered more	

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			favourable than Gorleston-on-Sea due to the presence at the latter location of highly mobile sandwaves and proximity to dredging grounds. Bacton to Cart Gap was therefore taken forward as the landfall search area. (Due to the exclusion of these landfall areas, inland locations at Eye, as well as the two coastal locations at Gorleston and Lowestoft were eliminated). At this point, it was also determined – through discussions with National Grid – that the provision of a new coastal connection point within the required project time-frames would be unlikely. This was largely due to the long timescales involved in the planning and consenting of new overhead lines. This resulted in the elimination of the coastal location at Bacton. Following this, the only options remaining were Necton and Norwich Main for OCPs. Two study areas were developed for these OCP options. A constraints mapping exercise identified Necton as the preferred of these two options due to an increased interaction with designated sites, roads, rivers, and populated areas and particularly the proximity to the Broads National Park associated with a connection to Norwich Main from the landfall search area. Whilst information was provided by Norfolk Vanguard Limited to contribute to the joint process of identifying an OCP, the final decision and offer of a connection point was determined by National Grid plc. To refine the scoping area and identify the most appropriate location to site the onshore project substation, the National Grid's Guidelines on Substation Siting and Design (Horlock Rules) were taken into consideration, and specific applications of these guidelines and how they	

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			have been considered by the Applicant is detailed in Table 4.3 of Chapter 4 Site Selection and Assessment of Alternatives. In order to minimise the distance between the OCP (existing Necton National Grid substation) and the onshore project substation a 3km substation search area was identified. Distances beyond 3km from the OCP are considered unacceptable due to transmission losses. The Horlock Rules also prioritise the grouping of existing electrical infrastructure. This 3km study area was consulted on as part of the Scoping Report, through formal and informal community consultation, and during community drops in, meetings with landowners, stakeholders and regulators. The Applicant undertook extensive pre-application engagement over a 20-month period with stakeholders, communities and landowners to seek input for refining the project design. This is detailed in the Consultation Report (document 5.1). As per the Horlock Rules section 4.1, *'consideration must be given to environmental issues from the earliest stage'*. NPS EN-1 para 5.9.8 (referred to above) also points to the need to take account of the potential impact on the landscape, to minimise harm to the landscape, and to provide reasonable mitigation where possible and appropriate. Therefore, areas with relatively fewer environmental constraints were preferred. Areas taken forward for consideration within the 3km search area were those with an absence of Public Rights of Way and environmental designations, as well as those being sufficient distance from residential areas to minimise noise impacts. Additional benefits associated with those areas progressed included existing natural screening, aggregation of electrical infrastructure, and the most direct	

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			cable corridors (to reduce transmission losses). This assessment (along with stakeholder feedback) allowed for refinement to a keyhole search area which was presented in March 2017 as part of community and stakeholder consultation, and then further refinement to an onshore project substation search area (Plate 7 in ES Appendix 4.9 document reference 6.2.4). Within this search area 4 potential footprint options were identified. These footprints were subject to a detailed environmental appraisal, taking into account flood risk, ground conditions, archaeology, noise, traffic, land use, air quality, ecology, ornithology, landscape and visual impacts, socio-economics and tourism. Option 4 was discounted due to concerns over visibility from nearby properties and Necton village, option 3 was less favourable due to likely presence of buried archaeology as well as visibility concerns and option 1 was considered to have slightly greater noise, ecology, traffic and access issues. Therefore footprint option 2 (as presented in the ES (document 6.1) and works plans (document 2.5)) was considered the preferred option for the following reasons: • It provides a site within the original substation search area (in proximity to the Necton National Grid substation) and allows a comparatively simple alignment of cables coming from the onshore cable corridor, through the onshore project substation site and joining to existing infrastructure at the Necton National Grid substation; • The site has good ground conditions, with comparatively low risk from flooding; • The site is deemed to have comparatively less potential impact associated with known buried archaeology; It poses the lowest potential noise impacts;	

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			• It has good potential for the development of screening planting and other mitigation measures that will be provided to help to mitigate the impacts of the development; and • Existing mature hedge lines will be retained and used as natural screening. The NPS is clear that '*from a policy perspective this NPS EN-1 does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option'*, however it does state that '*Applicant's are obliged to include in their ES...information about the main alternatives they have studied*.' ES Chapter 4 Site Selection and Assessment of Alternatives, along with ES Appendices 4.1 to 4.9 provide a detailed narrative of the siting, design and refinement process the project has followed during site selection. Using a multi-disciplinary design team, the site selection process as described above took into account environmental, physical, technical, commercial and social considerations as well as engineering requirements, with the aim of identifying a site that will be environmentally acceptable whilst also enabling benefits of the lowest energy cost to be passed on to the consumer. A full landscape assessment of the proposed substation is set out in Chapter 29 of the ES together with proposed mitigation measures.	
2.2	Applicant	In Para 56 of [APP-071] (Consultation Report Appendix 9.8 Water Resources, Flood Risk, and Ground Conditions Outgoing Documents), it is noted that the Happisburgh South landfall site is the only landfall option which can a ccommodate 12 ducts. The requirement for 12 ducts appears to have been predicated upon the	The preferred landfall site at Happisburgh South was identified and presented at PEIR (October 2017), prior to the decision to commit to HVDC technology. However the sites suitability was reviewed following the commitment to HVDC technology (February 2018) as part of the refinement of the onshore cable route (see Section 4.11 of Chapter 4 Site Selection and	No comment

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		use of HVAC technology. When was the landfall site finally chosen and was the need to accommodate 12 ducts determinative in that decision? If it was before the decision to commit to HVDC technology please confirm whether or not the decision to choose Happisburgh for landfall was revisited and set out details of the decision making process.	Alternatives). The ability of the Happisburgh South landfall site to accommodate up to 12 ducts (sufficient for Norfolk Vanguard and Norfolk Boreas with high voltage alternating current (HVAC) technology) was a consideration in the site selection, however it was not a determining factor. With reference to Para 57 of ES Chapter 4 Site Selection and Alternatives and with further detail in ES Appendix 4.6, Happisburgh South was selected as the preferred landfall location for the following key reasons: • Avoids the nationally designated Marine Conservation Zone (MCZ) (the Cromer Shoal Chalk Beds); - this was the only shortlisted landfall site to achieve this • Allows co-location of Norfolk Vanguard and Norfolk Boreas landfall and reduces total amount of area directly impacted; • Avoids populated areas as far as possible; • Avoids areas at risk of flooding as far as possible; • Provides opportunities associated with Happisburgh archaeology - consultation ongoing with Natural History Museum, British Museum, Queen Mary University of London and Norfolk County Council Historic Environment Service; and • Avoids technical engineering and feasibility risks associated with locating infrastructure in the brown field site within the Bacton Gas Terminal land.	
2.3	Applicant	Please set out the full extent of the proposed 'enabling works' for Norfolk Boreas [APP-029], and confirm whether these have been fully assessed in the ES.	Para 5 of ES Chapter 5 Project Description notes that in order to minimise impacts, Norfolk Vanguard Limited will include within its DCO application some enabling works for the Norfolk Boreas project. These are clearly defined within	No comments.

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			Chapter 5 and are assessed in the relevant technical chapters. Para 281 of Chapter 5 outlines these enabling works as: • Installation of ducts to house the Norfolk Boreas cables along the entirety of the onshore cable route from the landward side of the transition pit at the landfall to the onshore project substation; and • Overhead line modifications at the Necton National Grid substation for both projects. The installation of additional ducts for Norfolk Boreas throughout the onshore cable route is described within the dDCO under Work No. 5, 6 and 7. Overhead line modifications will be required for Norfolk Vanguard (as described in Work No. 11) and will benefit Norfolk Boreas. Pre-construction works detailed within Section 5.5.8.1 of Chapter 5 also consider the requirements of Norfolk Boreas to minimise future disruption and therefore cover a cable route width of up to 45m. These pre-construction works include: • Road modifications for access; • Hedge and tree netting / removal; • Ecological preparations; • Archaeological preparations; and • Pre-construction drainage These Norfolk Boreas enabling works have been fully assessed in the ES as part of the Norfolk Vanguard design envelope. Other aspects of the Norfolk Boreas project not classified as enabling works, are considered within cumulative assessments of the ES.	
3.	**Ecology offshore - ornithology**			
3.1	RSPB	Can you confirm that you are content that	We have not commented on this matter and	Natural England provided comment

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		the baseline environment for ornithology along the offshore cable corridor has been sufficiently well informed and has been characterised correctly?	therefore defer to Natural England's view on this point.	on this matter in our responses to Examining Authority's first written questions provided at Deadline 1 see Annex A of our Written Representations [REP1-088].
3.3	Applicant	Can an update be provided on the progress that has been made since NE's RR [RR-106] and RSPB's RR [RR-197] in resolving the outstanding areas of disagreement regarding the following offshore ornithology matters for Norfolk Vanguard alone and in-combination, and in particular in regard to the following matters: The use of potential biological removal (PBR) versus population viability analysis (PVA) modelling; The mean peak seasonal abundances for red-throated diver that have been used in the operational displacement assessments and matrices in Tables 13.27 to 13.29 of ES Chapter 13 [APP-337]; The displacement and mortality rate levels that have been used for red- throated diver; The use of the Applicant's own stochastic collision modelling (CRM) rather than that advocated by the RSPB and NE (ie the Marine Scotland Science Model, MacGregor *et al* 2018); As requested by NE, please can the Applicant please provide the CRM input data that it has used in its own stochastic CRM, including the R code; The use of median bird densities within the CRM, and the overall derivation of bird densities used in the CRM;	The Applicant has been working on assessment clarifications and updates which address the points raised by Natural England and the Royal Society for the Protection of Birds (RSPB) in their Relevant Representations (RRs). The following updated assessments are attached as appendices to this response: • Norfolk Vanguard Offshore Wind Farm Offshore Ornithology: Red-throated diver displacement (Appendix 3.1, document reference ExA; WQApp3.1; 10.D1.3) • Norfolk Vanguard Offshore Wind Farm Offshore Ornithology: Collision Risk Modelling: update and clarification (Appendix 3.2, document reference ExA; WQApp3.2; 10.D1.3) • Norfolk Vanguard Offshore Wind Farm Offshore Ornithology: Operational Auk Displacement: update and clarification (Appendix 3.3, document reference ExA; WQApp3.3; 10.D1.3) Work to address further comments from Natural England (NE) and the RSPB is ongoing and updates will be submitted for later Examination deadlines. Further responses to the specific questions are provided below. a) No further discussion has been had on this topic due to an initial focus on addressing the questions raised by NE and the RSPB on the estimated mortalities due to collisions and displacement. Once these aspects have been resolved, the appropriate means to predict the consequences (i.e. population modelling) will be	Due to the size of the documents provided at Deadline 1 and the limited time between upload of documents to PINS website and Deadline 2 Natural England has not had the opportunity to review Appendices 3.1 – 3.3. Natural England will therefore provide comment on these submissions at Deadline 3. However, significant areas of concern still remain with the Applicant's assessment. Details of these are provided in Natural England's responses to the Examining Authority's first written questions provided at Deadline 1 as Annex A of our Written Representations [REP1-088]. In particular we draw the attention of the ExA to our response to 3.3 m) regarding predator control at Alde-Ore Estuary SPA.

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		The Nocturnal Activity Factor that has been used in the CRM; Can the Applicant explain its reasoning for using displacement assessments for Norfolk Vanguard East using birds in flight and birds on the water, but only birds on the water for Norfolk Vanguard West, and clarify whether any corrections if made would be likely to alter the conclusions reached; The differences between the deterministic model and the Applicant's model in terms of collision mortality; The apportioning of mortality to SPAs; Having regard to the evidence from Cleasby *et al* (2015) that the RSPB has cited, the appropriateness of the gannet avoidance rate in regard to the breeding season; The kittiwake tracking data, including the availability of the RSPB data; The effectiveness of predator management at the Alde-Ore Estuary SPA as a mitigation measure in regard to lesser black-backed gull.	considered in order to reach agreement on the most appropriate means to predict impact consequences. b) The mean peak estimates for Norfolk Vanguard West used in the original assessment mistakenly omitted birds in flight. This error has been corrected and the revised estimates have been presented in Appendix 3.1: Red-throated diver displacement. c) A comprehensive review of red-throated diver displacement at operational offshore wind farms has been undertaken and is provided in Appendix 3.1 Red-throated diver displacement. The revised assessment provides predictions using the NE advised range of rates of displacement and mortality and also evidence-based ones derived from the review of data collected at operational offshore wind farms. d) The Marine Scotland Science (MSS) Collision Risk Model (CRM) was not available at the time of the Norfolk Vanguard assessment. Appendix 3.2 (Collision Risk Modelling: update and clarification) provides comparisons of the outputs from the MSS model with those presented in the Norfolk Vanguard ES and also other collision risk input parameters and outputs as requested by Natural England. The report clearly demonstrates that the Applicant's stochastic model, the MSS model and the Band deterministic model all calculate collisions in the same way and (given the same input parameters) produce the same collision estimates. e) The Collision Risk Modelling: update and clarification (Appendix 3.2) provides the complete input data as requested by NE in their RR to allow them to calculate deterministic collision mortalities. Data files containing input data to allow NE to use the MSS model can also	

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			be supplied on request, however the Applicant's R code was not written to be accessible for others to use and is embedded within a much larger piece of code which runs the complete analysis of the data. It would take considerable effort to modify the code and input data to make it a standalone piece of analysis code and this would simply replicate the MSS model. Therefore, the Applicant considers that this is not an efficient or appropriate use of time or resources. The above considerations notwithstanding, the Applicant can submit the R code to NE in confidence and subject to an agreement that it would only be used to confirm the modelling methods and would not be shared with third parties. f) This aspect is discussed in the Collision Risk Modelling: update and clarification (Appendix 3.2) which provides further explanation for why this measure has been used for the deterministic CRM. It is also important to note that the stochastic CRM is not based on median densities but rather samples across the complete range of densities estimates from the survey data. g) Nocturnal activity factors have not been subject to further discussion, although the rates for gannet are now available in Furness et al. 2018. However alternative outputs using the NE recommended rates have been provided in the Collision Risk Modelling: update and clarification (Appendix 3.2). With respect to kittiwake nocturnal flight activity, this is an area of ongoing research and discussion with the RSPB and further updates will be provided when they become available. h) As noted in response to Q3.3b above, this refers to a mistake in the assessment of red-throated diver displacement which has been	

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			corrected in Appendix 3.1: Red-throated diver displacement. It should be noted that taking all the available evidence into account and including the corrected abundance estimates Appendix 31: Red-throated diver displacement reaches the same conclusions as those presented in the ES. i) The Collision Risk Modelling: update and clarification (Appendix 3.2) presents the outputs from the deterministic CRM which are the same as those obtained using the Applicant's model when run using the same input parameters. This demonstrates that there is no inherent difference between the models. j) Apportioning of mortality to Special Protected Areas (SPA) colonies was conducted for the Habitats Regulations Assessment (HRA) using a variety of sources including recent assessments and available evidence. The apportioning rates have not been reviewed at this stage, but this aspect will be considered during the Examination and an update provided as necessary. k) Cleasby *et al*. (2015; Appendix 3.8) showed that gannets fly higher when searching for fish and fly lower when commuting. They did not suggest that there is any difference in behaviour of breeders and nonbreeders in this respect (and their study was only of breeding adult gannets). It seems likely from the results in Cleasby *et al*. (2015; Appendix 3.8) that collision risk will be lower for gannets that are commuting than for gannets that are foraging. That raises questions about the behaviour of gannets at the Norfolk Vanguard site. If gannets forage at the Norfolk Vanguard site, then risk of collision may be higher than if they just commute through the area. However, Cleasby *et al*. (2015; Appendix 3.8) did not	

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			provide any evidence that breeding gannets forage more than nonbreeding gannets. So there is no evidence to suggest that avoidance rates should be considered to be different between nonbreeders and breeders based on data in Cleasby *et al*. (2015; Appendix 3.8). It would be necessary to compare behaviour of breeding and nonbreeding gannets in order to assess whether birds forage more during the breeding season or during the nonbreeding season. The Applicant is not aware of any studies which present such evidence. It is possible that gannets forage more during the nonbreeding season because fish are less readily available than during the breeding season (one reason for gannets breeding in summer is thought to be that they have better food supplies at that time of year so breeding is timed to coincide with best availability of food). However, breeding gannets may forage more during chick-rearing than during incubation because they then have a chick to feed as well as themselves. This may tend at least in part to cancel out the likely lower availability of fish during winter. The Applicant cannot see any evidence in Cleasby et al. (2015; Appendix 3.8) to suggest that breeding and nonbreeding gannets should be considered to differ in their avoidance rates. However, based on Cleasby et al. (2015; Appendix 3.8) it is highly likely that collision risk varies spatially depending on whether an area is important for foraging or is not important for foraging. In that regard, the Applicant expects that the Norfolk Vanguard site is likely to be less important for gannet foraging, because numbers of gannets at the site are low in most months of the year, except during the migration period when birds are commuting through the area	

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			towards their preferred wintering areas such as off West Africa. Indeed, Cleasby et al. (2015; Appendix 3.8) specifically state 'in the southern North Sea where gannets are mainly seen during migration, when they may spend little time foraging'. On that basis, the Applicant considers that collision risk at Norfolk Vanguard is likely to be lower than in areas where gannets regularly forage. The Applicant would note that the avoidance rate recommended for collision risk modelling by the Statutory Nature Conservation Bodies (SNCBs) (98.9%) is itself precautionary, as recognised by the SNCBs. That avoidance rate is lower than the rate recommended by the SNCBs for large gulls, despite the fact that there is strong evidence that gannets show much higher macro-avoidance than shown by large gulls. Furthermore, the recent ORJIP study (Skov et al. 2018*) has calculated a gannet empirical avoidance rate of 99.9%. The RSPB provides no evidence to support use of an avoidance rate of 98% for breeding gannets, and the Applicant cannot find any evidence to suggest that an avoidance rate of 98% would be appropriate. The Applicant does, however, think that it is relevant to consider whether an area may be used predominantly for foraging or predominantly for commuting, as that is more likely to affect collision risk, through differences in the distribution of flight heights. It is important to note that this would not necessarily have anything to do with the avoidance rate, but rather would relate to differing proportions of birds at potential collision height in areas used for foraging and areas used for commuting. *Skov, H., Heinänen, S., Norman, T., Ward, R.M., Méndez-Roldán, S. and Ellis, I. 2018.	

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			ORJIP Bird Collision and Avoidance Study. Final Report – April 2018. The Carbon Trust, United Kingdom. l) The RSPB has supplied the kittiwake tracking data to the Applicant and preliminary analysis has been undertaken. However, further work is required and this will be discussed with the RSPB and NE. Following this the results will be presented and used as appropriate. m) Breeding numbers of lesser black-backed gulls at Orfordness (part of the Alde-Ore Estuary SPA) fell from 23,000 pairs in 2000 to 5,500 pairs in 2001 Joint Nature Conservation Committee (JNCC) SCM database) and this decrease was attributed to fox predation; 75% of nests in 2000 failed as a result of fox predation and many breeding pairs abandoned the colony as a consequence (Mavor et al. 2001). Breeding numbers remained around 4,500 to 6,500 pairs from 2001 to 2006, then declined further to 1,678 pairs in 2007, 1,584 pairs in 2008, 900 pairs in 2009, 550 pairs in 2010, 550 pairs in 2011 and 640 pairs in 2012 (JNCC SCM database). The main cause of this further decrease also appears to have been fox depredations at the colony. The Applicant simply made the point that excluding foxes from this colony could have a much greater beneficial effect for lesser black-backed gull conservation than any other single conservation measure associated with this site. Foxes can be controlled by shooting, but protection of the colony area with fox-proof fencing would be a practical measure and is well established as a successful method to protect ground nesting birds from foxes, without the need for lethal control. Predator proof fences have been used in several locations with great success. One example is	

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			successful deployment of predator proof fence around 20 ha of coastal habitat within Ka'ena Point Natural Area Reserve, Hawaii (Young et al. 2012). By 2006, in total, around 109 km of predator proof fencing had been erected in various areas of mainland New Zealand to exclude predators from sites with important populations of native animals and birds (Scofield et al. 2011, Innes et al. 2012, Scofield and Cullen 2012). A predator proof fence was established in 2007 for 10.6 km across Cape Kidnappers Peninsula, New Zealand, to protect burrow-nesting seabirds from predators (Cooper 2013). A predator proof fence was used at Pitt Island (Chatham Islands) to protect 36 ha of breeding seabird habitat from feral pigs and cats (Furness 2013). Cooper (2013) lists further examples of highly successful deployment of predator proof fencing around seabird colonies at 50 sites around the world. Less expensive is deployment of electric fence around gull colonies which can exclude foxes, although not with complete success, so that monitoring of fox presence and the integrity of the electric fence needs to be reviewed regularly. It is clear that the collapse of the Alde-Ore lesser black-backed gull population can be attributed primarily to depredations by foxes over many years since 1999 (Mavor et al. 2001 and subsequent annual reports), but there appears to have been little work done yet to prevent these depredations by foxes (Natural England 2017); no predator-proof fencing has yet been erected at the site as far as the Applicant is aware. Natural England has defined the status of lesser black-backed gulls at the Alde-Ore Estuary SPA as requiring to be restored, with an objective to restore the population to above 14,074 pairs. The Applicant understands that Natural England (2017) has been developing a	

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			predator control management plan for this colony (but the Applicant has not yet seen that published or put into action) which is intended to return the colony to a positive population trajectory. This appears sensible given the evidence that this form of management is highly likely to be successful and would have a much greater conservation gain for this site than any other management measure. It is also important to note that, irrespective of the proposed Natural England led management action, the impact on the SPA population due to the Norfolk Vanguard wind farm is predicted to be negligible and therefore not significant (see Applicant's response to Q23.35 for further supporting discussion on this impact) and consequently there is no requirement for project level mitigation.	
3.3	RSPB	Can an update be provided on the progress that has been made since NE's RR [RR-106] and RSPB's RR [RR-197] in resolving the outstanding areas of disagreement regarding the following offshore ornithology matters for Norfolk Vanguard alone and in-combination, and in particular in regard to the following matters: The use of potential biological removal (PBR) versus population viability analysis (PVA) modelling; The mean peak seasonal abundances for red-throated diver that have been used in the operational displacement assessments and matrices in Tables 13.27 to 13.29 of ES Chapter 13 [APP-337]; The displacement and mortality rate levels that have been used for red- throated diver; The use of the Applicant's own stochastic collision modelling (CRM) rather than that	Significant areas of concern remain regarding the assessments of displacement and collision risk. We have not seen any revisions of these assessments to allay these concerns and so would welcome further dialogue with the Applicant to enable the appropriate information to be provided. **PVA vs PBR** We agree with Natural England's position (as stated in their Relevant Representations, doc. RR-106), that PVA models should be used in preference to PBR for the assessment of the effects of collision mortality on SPA populations. PBR was designed to manage whaling quotas by detecting unsustainable mortality in a population leading to risk of its extinction and therefore indicates the maximum acceptable mortality in this context. PVA enables comparison of the change in population size with and without a windfarm project after several years, thereby presenting an indication of the	Natural England broadly agree with comments raised by RSPB. However, please see our response to this question provided at Deadline 1 as Annex A of our Written Representations [REP1-088] for full details.

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		advocated by the RSPB and NE (ie the Marine Scotland Science Model, MacGregor *et al* 2018); As requested by NE, please can the Applicant please provide the CRM input data that it has used in its own stochastic CRM, including the R code; The use of median bird densities within the CRM, and the overall derivation of bird densities used in the CRM; The Nocturnal Activity Factor that has been used in the CRM; Can the Applicant explain its reasoning for using displacement assessments for Norfolk Vanguard East using birds in flight and birds on the water, but only birds on the water for Norfolk Vanguard West, and clarify whether any corrections if made would be likely to alter the conclusions reached; The differences between the deterministic model and the Applicant's model in terms of collision mortality; The apportioning of mortality to SPAs; Having regard to the evidence from Cleasby *et al* (2015) that the RSPB has cited, the appropriateness of the gannet avoidance rate in regard to the breeding season; The kittiwake tracking data, including the availability of the RSPB data; The effectiveness of predator management at the Alde-Ore Estuary SPA as a mitigation measure in regard to lesser black-backed gull.	magnitude of change attributable to the proposal and is therefore more suitable for assessing the effects of a project on an SPA. We also agree that, where population modelling is required, new PVA models for the Norfolk Vanguard project should be developed to allow robust assessment of this project's impact levels using project-specific input data. **Mean peak seasonal abundances for red-throated diver** We note Natural England's comments in their Relevant Representations (RR-106) that the mean peak seasonal abundances for red-throated diver in Norfolk Vanguard West are based on birds on the water only. We agree that this requires revision to incorporate birds in flight as well as those on the water, as has been used for Norfolk Vanguard East. **Displacement and mortality rates for red-throated diver** We agree with Natural England's stated position in their Relevant Representations (doc. RR-106), that displacement of up to 100% and mortality of up to 10% should be considered within the assessment of displacement impacts on red-throated diver. **The Applicant's stochastic CRM** As explained in our Relevant Representations (RR-197) and our Written Representations, we still have serious concerns regarding the adequacy of the Applicant's own unverified stochastic CRM. We recommend that, if a stochastic CRM is to be presented, that the modelling should be rerun using the tested and verified Marine Scotland (McGregor et al. 2018) model. **Applicant requested to provide CRM input data and R code**	

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			This question is directed at the Applicant but we confirm that we would welcome provision of this information. **Bird densities within the CRM** We remain concerned that the values for bird densities within the deterministic CRM (Band, 2012) are based on median values, resulting in lower mortality predictions than if the correct mean values are used. We also note that, while mean monthly bird densities appear to be presented in Annex 1 of Appendix 13.1 Offshore Ornithology Technical Appendix (doc. 6.2.13.1), that para. 6 of that document states that the means presented are actually means of the median values and therefore their use in CRM would again result in lower predicted collisions than if true mean values were used. **Nocturnal Activity Factor** Our concerns around the revised Nocturnal Activity Factors presented by the Applicant remain (explained in full in our Written Representations). In particular, the figures presented for gannet do not align with those recommended in the recently published review (Furness et al. 2018) and those for kittiwake are based on unpublished work. We agree with Natural England's position (doc. RR-106) that the revised values should not be applied to the cumulative/in-combination assessment. It is unlikely that survey timings for other windfarms will be known, and therefore peaks in foraging activity at first and last light may not be represented in the survey data and the use of the revised Nocturnal Activity Factors could therefore result in underestimates of collision risk. **Displacement assessments for Norfolk Vanguard East and West**	

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			This question is directed at the Applicant, but we would welcome sight of a revised assessment. **Differences between the deterministic model and the Applicant's model** We consider that there will be differences in predicted collision mortality arising from the following approaches: • The Applicant's calculation of the deterministic outputs based on median monthly bird densities • The deterministic outputs based on the correct mean monthly bird densities • The Applicant's stochastic CRM • The Marine Scotland (McGregor et al. 2018) stochastic CRM In our view, the Applicant's calculations of collision mortality using both deterministic and stochastic modelling are likely to underestimate collision mortality when compared to the standard versions of these respective models. We have attempted to recalculate collision risk using the correct versions of the deterministic and stochastic models. Whilst some CRM input data are missing from the information provided by the Applicant meaning there are some caveats to our calculations (see our Written Representations for full details), these recalculations do give an indication that the Applicant's approaches significantly underestimate mortality. **The apportioning of mortality to SPAs** We still do not agree with the apportioning of 16.5% of kittiwake mortality to the Flamborough and Filey Coast SPA or the apportioning of 25% of lesser black-backed gull mortality to the Alde-Ore Estuary SPA. We consider that the kittiwake apportionment is likely to underestimate	

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			mortality as it does not take account of recent tracking data which shows that parts of the Norfolk Vanguard site are within important foraging areas for kittiwakes from this colony. We also consider that the figure presented for lesser black-backed gull is unlikely to be suitably precautionary, as it is based on an assumption that urban birds will forage in the offshore marine environment to the same extent as coastal birds is not substantiated. We discuss suitable alternative apportioning rates in our answers in the 'Habitats Regulations Assessment' section of this document. **Breeding season gannet avoidance rate** We maintain our position that, whilst we agree with the use of a 98.9% avoidance rate for non-breeding gannets, in the breeding season, a 98% avoidance rate is appropriate. Cleasby et al., (2015), while not discussing avoidance rates, demonstrated that foraging birds are at more risk of collision than commuting birds. In order to provision chicks, gannets will need to forage more during the breeding season and will also be constrained by central place foraging. Such behavioural differences are likely to result in changes in avoidance behaviour (Cook et al., 2018), and since the figures used for the calculation of avoidance rates advocated by the SNCBs are largely derived from the non-breeding season for gannet (Cook et al., 2014 and Cook et al., 2018) we recommend a more precautionary avoidance rate for the breeding season. **Kittiwake tracking data** The kittiwake tracking data from Flamborough and Filey Coast SPA were supplied to the Applicant's consultants in November 2017. Historical tracking data from the FAME/STAR tracking was also provided to the consultants in	

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			February 2017. The more recent data request required RSPB to obtain permission from partners in the project, whereas the FAME/STAR data is publicly available upon submission of a data request. **Predator management as mitigation at the Alde-Ore Estuary SPA** As explained in our Written Representations, we do not agree that predator management can be accepted as mitigation for impacts on lesser black-backed gull of the Alde-Ore Estuary SPA. Predator control is already in place in the main areas supporting lesser black-backed gulls, and it is not clear that further efforts in this regard would raise productivity significantly. We also question whether these measures within an SPA could lawfully be adopted as mitigation.	
3.4	Applicant	Can you please provide an assessment of the significance of disturbance and displacement effects to red-throated diver within a 4km buffer and with a range of displacement rates up to 100% and mortality rates of up to 10%?	Additional assessment of red-throated diver displacement has been provided in Appendix 3.1: Red-throated diver displacement (document reference ExA; WQApp3.1; 10.D1.3) using the displacement and mortality rates advised by Natural England (i.e. 100% displacement, 10% mortality within the wind farm and 4 km buffer). The note also provides a comprehensive review of studies conducted at operational wind farms and ecological studies of this species. Evidence based rates have been derived from this review and these have also been used for the assessment.	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review this document. Natural England will therefore provide comment on this submission at Deadline 3.
3.5	Applicant	In its RR [RR-106] NE has stated that the population data of red-throated diver pre-dates installations of some wind farms. Therefore please can you provide bird abundance estimates that are summed for each applicable offshore wind farm and inserted into a displacement matrix with 100% displacement and 10% mortality?	Additional assessment for red-throated diver has been presented in Appendix 3.1: Red-throated diver displacement (document reference ExA; WQApp3.1; 10.D1.3) includes estimates of the abundance in the applicable wind farms (where these could be obtained). The cumulative assessment has been undertaken using the rates advised by Natural England and also the evidence based rates derived from the review of	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review this document. Natural England will therefore provide comment on this submission at Deadline 3.

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			studies at operational wind farms and ecological studies of this species. This updated assessment reaches the same conclusions regarding the magnitude and significance of predicted impacts.	
3.6	RSPB	Can you clarify what information you consider is required to rule out cumulative operational displacement to North Sea populations of red-throated diver?	A revised assessment for Norfolk Vanguard alone based on mean bird densities based on birds in flight and on the water, as advised by Natural England is required, and the outputs incorporated into a revised cumulative assessment. The assessment should then consider cumulative mortality based on displacement rates of up to 100% and mortality rates of up to 10% and, given that it would be expected that this would result in an increase of 2% or more on baseline mortality, PVA may then be required to assess the effect on the population. In order to rule out cumulative effects, density independent PVA outputs in the form of counterfactuals of population size must be presented to be considered alongside contextual information such as population status and importance, other potential sources of mortality and the extent of uncertainty in assessment.	Natural England broadly agree with comments from RSPB.
3.7	Applicant	Please comment on how the results of the collision risk assessment for seabirds would be altered should the mean density values be used.	The Collision Risk Modelling: update and clarification note (Appendix 3.2, document reference ExA; WQApp3.2; 10.D1.3) provides comparisons of the collision predictions obtained using the mean densities alongside the median densities and those for the upper and lower 95% confidence interval density estimates. There is a direct relationship between the input density value and the output mortality, so if the density is doubled the mortality is doubled. Since the mean densities are higher than the medians (in many instances, although not all) this results in higher collision predictions. However, the Collision Risk Modelling: update and clarification	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review this document. Natural England will therefore provide comment on this submission at Deadline 3.

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			note (Appendix 3.2) also includes additional discussion and presentation of survey data which provides further support for the use of the median densities rather than the mean densities for collision risk assessment. In summary, this is because the distribution of seabird densities obtained from the analysis of survey data are very strongly skewed in most months, with large numbers of low values and occasional high ones. It is standard practice with such data to consider the median as the more reliable indicator of central values than the mean, since the latter is heavily influenced by the occasional high numbers. For example, Fowler and Cohen (1990) state that when the distribution of data is skewed (as in these seabird counts), 'the median provides a more realistic description of the centre of the distribution than the mean'. Sokal and Rohlf (1969) similarly point out that 'an example of the preferred application of a median over the arithmetic mean may be in populations showing skewed distribution', as the median provides a more representative measure than the arithmetic mean when data distribution is skewed. They present the often quoted example from economics; the very high salaries of the few senior executives shift the arithmetic mean to a completely unrepresentative value for employees as a whole. The median, on the other hand, is little influenced by the few very high outlying and unrepresentative values as it identifies the point on the salary scale where half of employees earn above and half earn below the value.	
3.8	Applicant	In relation to NE's RR [RR-106], and having regard to the non-stochastic model, please can you provide the full set of input parameters in order to be able to run the	The Collision Risk Modelling: update and clarification note (Appendix 3.2, document reference ExA; WQApp3.3; 10.D1.3) provides the full set of CRM input data and also presents	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural

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		Band (2012) spreadsheets, including the multiple tables of non-stochastic outputs where each parameter in turn is varied?	copies of the spreadsheet outputs. Tables of the deterministic CRM obtained using the upper and lower input parameter values have also been provided.	England have not had the opportunity to review this document. Natural England will therefore provide comment on this submission at Deadline 3.
3.9	Applicant	Can you please explain why you have used different displacement rates and mortality rates for the displacement of auks for the project alone and cumulatively?	The assessments presented displacement matrices which covered a very wide range of both displacement (10% - 100%) and mortality (1% to 100%) for both the project alone and cumulatively. For the project alone a highly precautionary combination of 70% displacement and 10% mortality were discussed as the worst case maximum impact. For the cumulative assessment, the 70% displacement was considered with 1% mortality. The lower mortality rate was considered appropriate for consideration of cumulative auk displacement as this more closely reflects the evidence base than the arbitrary precautionary value advised by NE. Evidence on auk displacement at operational wind farms has been reviewed in the Operational Auk Displacement: update and clarification note (Appendix 3.3, document reference ExA; WQApp3.3; 10.D1.3). This supports the use of the lower rate used in the cumulative assessment.	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review this document. Natural England will therefore provide comment on this submission at Deadline 3.
3.10	Applicant	Can you comment on how the results of the cumulative displacement assessment for auks would be altered should the same displacement and mortality rates be used as for the project alone?	Use of higher rates of displacement and mortality in the cumulative assessment would increase the significance of predicted impacts. However, following a comprehensive review of auk displacement provided in the Operational Auk Displacement: update and clarification note (Appendix 3.3, document reference ExA; WQApp3.3; 10.D1.3) it is clear that the Natural England advised rates are highly precautionary and are likely to considerably over-estimate predicted impacts.	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review this document. Natural England will therefore provide comment on this submission at Deadline 3.

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3.11	Applicant	Can you comment on how the results of the assessment of displacement to gannet would be altered should an adult annual survival rate of 0.912 be used?	The ES used an all ages gannet survival rate of 0.81 in the assessment of displacement calculated from demographic data to reflect the range of age classes expected to be at risk of collisions and displacement, an approach which recognises that mortality would be likely to affect all age classes, and not just adult gannets. The worst case gannet displacement presented in the ES was an estimate for combined displacement mortality from both Norfolk Vanguard East and West (which is unrealistic since this would only occur if both sites were fully developed) summed across the whole annual cycle. The total mortality assessed in this manner was 25 individuals, which was calculated to raise the background mortality rate (defined as 0.191) of the largest Biologically Defined Minimum Population Scales (BDMPS) population and biogeographic population by 0.03% and 0.01% respectively. If the lower adult mortality rate of 0.088 (based on survival of 0.912) is used, the increases in background mortality would be 0.06% and 0.024% respectively. These remain well below the 1% increase threshold at which effects are considered detectable and therefore this would not alter the conclusions of the assessment.	No further comments.
3.12	RSPB	Please set out what information you consider is required to enable cumulative operational displacement to North Sea populations of auks (guillemot, razorbill and puffins) to be ruled out?	The cumulative assessment should be based on displacement rates of up to 100% and mortality rates of up to 10%. Given that it is likely that this would result in an increase of 2% or more on baseline mortality, PVA may then be required to assess the effect on the population. In order to rule out cumulative effects, density independent PVA outputs in the form of counterfactuals of population size must be presented to be considered alongside contextual information such as population status and importance, other potential sources of mortality and the extent of	Natural England broadly agree with comments from RSPB.

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			uncertainty in assessment.	
3.14	Applicant	NE notes in its RR [RR-106] that the figures presented within the ES for gannet at Neart na Gaoithe Offshore Wind Farm differ from those presented for EA THREE in terms of being lower. Can you please explain this apparent discrepancy?	The gannet collision estimates presented for Neart na Gaoithe (NNG) in the Norfolk Vanguard ES assessment were taken from the NNG assessment and are therefore considered to be reliable. The figure reported in the East Anglia THREE ES assessment is cited as that presented in the Hornsea Project Two assessment (SmartWind 2015c. Hornsea Offshore Wind Farm Project Two, Clarification Note – Apportioning of predicted gannet mortality to the Flamborough and Filey Coast potential Special Protection Area (pSPA) population.). It is not therefore clear what the origin of this discrepancy is, however the figure presented in the Norfolk Vanguard assessment is correct as far as the Applicant can determine. The Applicant also notes that the collision predictions for all the Forth and Tay wind farms (NNG, Inch Cape and Seagreen Alpha and Bravo) have decreased following revised assessments which were submitted after the Norfolk Vanguard ES was submitted.	Natural England will provide further comment on this at Deadline 3 to ensure consistency with our response in this regard for Hornsea Project Three.
3.15	RSPB	Can you please explain what information is required to rule out cumulative collision mortality to North Sea populations of kittiwake and great black-backed gull?	**Kittiwake** Given the level of collision mortality predicted, we do not consider that it will be possible to rule out cumulative collision risk mortality for North Sea populations of kittiwake. Using the density independent PVA model produced for East Anglia THREE, a decline of 10.3-10.9% in this population is predicted over 25 years, based on mortality of 4000 per year. We also consider that the Applicant's assessment of impacts for Norfolk Vanguard alone underestimates the project's contribution to cumulative collision risk, and that the revisions to the CRM discussed above would result in a higher contribution. **Great black-backed gull**	Natural England broadly support comments made by RSPB in this regard.

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			Given the level of collision mortality predicted, we do not consider that it will be possible to rule out cumulative collision risk mortality for North Sea populations of great black-backed gull. Using the density independent PVA model produced for East Anglia THREE, a decline of 21.3-21.5% in this population is predicted over 25 years, based on mortality of 900 per year. We also consider that the Applicant's assessment of impacts for Norfolk Vanguard alone underestimates the project's contribution to cumulative collision risk, and that the revisions to the CRM discussed above would result in a higher contribution.	
3.16	Applicant	Can you confirm for which species of non-seabird migrants you consider cumulative CRM is required?	The assessment of non-seabird collision risk has not been updated at this stage so the Applicant is not in a position to provide an answer to this question at present. This aspect will be addressed for subsequent submissions. However, the Applicant anticipates that as a minimum such an assessment would need to consider the inclusion of the same species assessed for the nearby East Anglia ONE and THREE wind farms, with the addition of those species identified by Natural England in their RR (Bewick's swan and avocet). In the first instance a screening exercise would be undertaken to ensure that all relevant species are considered and that those at risk are taken forward to assessment.	Natural England broadly agree with the suggested approach in the response by the Applicant, however, would refer the Examining Authority to our response to the same question provided at Deadline 1 [REP1-088].
3.17	Applicant	Can you comment on the need for cumulative CRM for non-seabird migrants?	As noted in response to the previous question (Q3.16), the request for an updated non seabird collision risk assessment has not yet been addressed by the Applicant. The first stage of this will be to screen species for both project alone and cumulative collision risks, and it is anticipated that this will determine the need for a cumulative assessment.	Natural England broadly agree with the suggested approach in the response by the Applicant, however, would refer the Examining Authority to our response to Qu. 3.16 provided at Deadline 1 [REP1-088].

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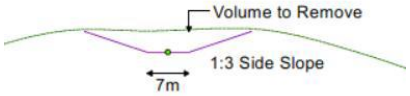
3.18	Applicant or RSPB or NE	Please provide the following papers that have been referred: Cleasby *et al* (2015), Furness (2015), Furness *et al* (2013), Furness *et al* (2018), Garthe *et al* (2004), Green *et al* (2016), MacGregor *et al* (2018), O'Brien *et al* (2017), Wade et al (2016).	The requested documents are provided in the following appendices to this submission.	We understand that copies of these documents have been provided by the Applicant.
4.	**Ecology offshore – marine mammals**			Natural England have no further comments on any of the questions raised in this section.
5.	**Ecology offshore – other**			
5.1	Applicant	Please clarify the uncertainty regarding the dredge corridor that is specified in Appendix 7.1 ABPmer Sandwave Study [APP-048] which NE has referred to in its RR [RR-106]	NE [RR- 106] states "*it is unclear whether the dredge corridor is 7m per cable – so 28m in total or 7m per pair so 14m in total.*" In relation to pg5 of Appendix 7.1 of the Information to Support Habitats Regulations Assessment (HRA) report (document reference 5.3). A width of approximately 7m is required at the base of the dredge profile in order to install each cable pair (up to two cable pairs will be installed for Norfolk Vanguard). Taking account of the sloping sides of the dredge profile, the disturbance width on the seabed surface would be approximately 20m for each cable pair (see figure below, also provided as Figure 7 of ES Appendix 5.1 Export Cable Installation Study)  **Indicative Cross Section** N.B. A maximum seabed disturbance width of 30m per cable pair (i.e. 60m in total for the two cable pairs) has been assessed in the ES (e.g. Chapter 10 Benthic Ecology). This is based on the worst case disturbance associated with potential ploughing to install cables. The	Natural England remain unclear what size the dredge corridor is. Could the Applicant please detail this in a simple sentence, e.g. the dredge corridor is Xm.

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			footprint of dredging would therefore be encompassed within this 30m disturbance width. The dredge profile shown above has been used in ES Appendix 5.1 to calculate the volumes that may arise from dredging within the offshore cable corridor. These volumes have been used in Appendix 7.1 of the Information to Support HRA report in assessing the effects of dredging and disposal on sandwaves.	
5.2	Applicant	Please justify your assertion in Appendix 7.1 [APP-048] that there is no difference in deposition following surface or near bed release of disposal material.	The comment relates to the second paragraph in Section 4.3.3 of Appendix 7.1 of the Information to Support HRA Report, where it is stated that "*Theoretically there is very little difference in the potential deposition thickness associated with either [a surface release or disposal at the bed via a downpipe] disposal method*". The same paragraph (also discussed in more detail in the preceding Section 4.3.2 of Appendix 7.1) notes that the shape of individual deposits (including the area, shape and thickness) is likely to be naturally variable and cannot be reliably predicted. The shape will be dependent on several factors, including the disposal method, but also the ambient current conditions at the time of the release, the local water depth, and the pattern in which the main deposit spreads as it settles to the seabed. During surface release disposal, the majority of material descends to the seabed rapidly as a single mass and so is only subject to limited additional advection or dispersion, in comparison to near bed release methods. The dimensions of any resulting sediment deposit are in any case limited by the finite volume of sediment being released (which is the same for either surface or near bed release methods). The full range of realistic worst case scenarios (from maximum thickness and minimum area, to minimum potentially significant	Natural England advises that an assessment is completed in order to ensure that the best method is used to minimise the impacts as much as possible

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			thickness and maximum area) are provided in Table 8 of Appendix 7.21 (Document Reference 5.3.7.1) and are considered in the Information to Support HRA report. Therefore, although individual deposits are realistically expected to vary in shape and thickness, the assessed range of potential deposition thicknesses applies equally to either a surface release or near bed release of disposal material.	
5.3	Applicant	Please set out your methodology for ascertaining whether one dredge spoil disposal zone will be sufficient or whether multiple zones will be needed, and set out how this is to be secured in the dDCO.	Indicative spoil zones were identified by CWind (ES Appendix 5.1 Export Cable Installation Study) and analysed by ABPmer (Appendix 7.1 of the Information to Support HRA report) to determine the effects of disposal on sandwaves. Analysis based on disposal in one indicative location provides a worst case scenario (as stated in Section 3.3.2 of Appendix 7.1). Should sediment disposal be spread more widely or in multiple locations, the sediment would re-enter the natural system more rapidly. The final approach to cable installation, including the methodology for pre-sweeping must be agreed with the MMO (in consultation with the relevant statutory bodies) through the Cable Specification and Monitoring Plan, as required under dDCO Schedules 11 and 12, Part 4 condition 9(1)(g). The methodology for the cable installation strategy and sediment disposal (if required) will be determined following pre-construction surveys (required under dDCO Schedules 11 and 12 condition 13(2)(b)). The method and location for sediment disposal will be dependent on the installation strategy and cable route, taking into account the location of *Sabellaria* reef at that time (as established by pre construction surveys), in order to provide the required buffer between disposal and reef.	No comments.
5.4	Applicant	Please respond to NE's concerns in its RR	NE [RR-106] sets out the following comments:	Natural England has no further

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		[RR-106] regarding your assessment in Tables 8.21, 8.22 and 8.29 of Chapter 8 of the ES [APP-332] for the Near-field effects being classified as 'low' in scale.	• Table 8.21 – "*Natural England does not agree that near field effects are low in scale due to the large volume of proposed dredging and material released*". o The Applicant acknowledges that the scale of suspended sediment should be classified as high. This results in a medium magnitude of effect, taking into account the duration, frequency and reversibility which are classified as negligible. This has no change to the resulting negligible impact significance concluded for Marine Geology, Oceanography and Physical Processes receptors. o This revised position is agreed in the Natural England SoCG (document Rep 1 – SOCG – 13.1) o The Applicant acknowledges that the scale of changes to seabed level should be classified as medium in response to this comment by Natural England. This has no change to the overall magnitude classification which remains low, taking into account the duration, frequency and reversibility which are classified as negligible based on the analysis presented in Appendix 7.1 of the Information to Support HRA report which shows that Sandwaves are expected to recover within approximately 1 year. As a result, the Applicant proposes that there is no change to the impact significance presented in the ES.	comments.
5.5	Applicant	Paragraph 144 of Chapter 10 of the ES [APP-334] identifies seven out-of-service cables in the offshore cable corridor. Please set out the measures that would be taken should agreement to cross these cables not be agreed with the cable owners, and please respond to NE's view that all of these out-of-service cables should be cut rather than being covered.	Vattenfall is a member of European Subsea Cables Association (ESCA). Most cable owners (telecoms, power and renewables) have representation within this association and therefore Vattenfall anticipate that most owners, as per Vattenfall, will be aware of and adhere to the codes of practice established by this body and the International Cable Protection Committee (ICPC) in relation to cable installation	Natural England continues to advise that where there are out of service cables **in the Haisborough Hammond and Winterton SAC** it would be better to reduce impacts by cutting cables rather than introducing unnecessary hard substrate to cross redundant cables. This should be further

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			(including clearance of route corridors - notably Recommendation 01 - Management of redundant and out of service Cables). Vattenfall are currently in the process of identifying and making contact with all cable owners of both in service and out of service cables in order to progress proximity agreements. In the event that Vattenfall fail to obtain written approval to clear the offshore cable corridor of an out of service cable, either from a documented owner or via other official process then the cable would be treated in the same way as an in-service cable and crossed with similar engineering to other in service crossings. In these circumstances, whilst it would be Vattenfall's preference to cut and recover out-of-service cables so as to avoid the need for unnecessary crossings and associated surface protection, it would not be possible do so. A scour protection and cable protection plan, providing details of the need, type, sources, quantity and installation methods is secured under Schedules 9 and 10 Part 4 Condition 14(1)(e), and Schedules 11 and 12 Part 4 Condition 9(1)(e) of the dDCO.	investigated.
5.6	Applicant	Chapter 10 of the ES [APP-334] states that cable would be micro-sited through areas of *Sabellaria spinulosa* reef, where possible. Please comment on the effectiveness of this micro-siting technique as a mitigation measure.	Micrositing will provide an effective mitigation technique to avoid disturbance to *Sabellaria* reef, provided there is sufficient space to route the cables around areas of reef. As stated by NE (comment 194, section C of Appendix 2 in RR-106), based on available data to date, micrositing around *S. spinulosa* reef is likely to be possible. Section 7.3.1.2.1 of the Information to Support HRA report (document 5.3) shows that there is approximately 1.05km to 3.75km available for micrositing within the offshore cable corridor, taking account of Norfolk Vanguard and Norfolk Boreas cables. In addition, low to medium	Natural England supports the mitigation measure to avoid impacts to *Sabellaria spinulosa* reef through micro siting/routing cables. However, our concern relates to the phrase 'where possible'. Natural England is aware of a large area of Annex I reef straddling the export cable corridor. Therefore the 'wiggle' room available to avoid reef within the Development Consent Order (DCO) boundary of the cable is limited. NE welcomes the reduced

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			'reefiness' (based on Gubbay, 2007) was recorded in the Norfolk Vanguard offshore project area. This level of reefiness is characterised by 10-30% coverage (Gubbay, 2007) which further supports the likelihood that micrositing will be possible. The Applicant acknowledges that *S. spinulosa* reef extent may change prior to construction of Norfolk Vanguard and therefore pre-construction surveys are required under dDCO Schedules 11 and 12 Part 4 condition 13(2)(a) to determine the extent of *S. spinulosa* reef at that time. In the unlikely event that micrositing around *S. spinulosa* reef is not possible during cable installation, a small proportion of *S. spinulosa* reef may be temporarily disturbed. *S. spinulosa* reef is known to be ephemeral and opportunistic and can be expected to recover/recolonise within the range of natural variation (e.g. Tillin and Marshall4, 2015; OSPAR Commission5, 2010; Holt6, 1998; Cooper7 *et al*., 2007; Pearce8 *et al*., 2007). If it is determined through the pre-construction surveys that *S. spinulosa* reef has developed to such an extent that it does not allow micrositing around the reef within the 2 to 4km width of the offshore cable corridor, a small proportion of temporary disturbance to *S. spinulosa* reef would not cause an adverse effect on the restoration objective of the Haisborough, Hammond and Winterton Special Area of Conservation (SAC). The magnitude would be low if micrositing is not possible due to the small proportion of temporary disturbance to reef. There would be no temporary habitat loss of *S. spinulosa* reef if micro-siting is possible. The dDCO, Schedules 9 and 10 Part 4 condition 14(g) and Schedules 11 and 12 Part 4 condition 9(g), states that a cable specification, installation	number of export cables from 12 to 4 with the High Voltage Direct Current (HVDC) electrical system proposed for Norfolk Vanguard and Boreas which helps to free up more space within the cable corridor. However, we continue to advise that all reef is avoided within HHW SAC. That recoverability of reef is not guaranteed as evidence is presented for individual *Sabellaria* tubes and not reef or recovery from unrelated activities to that of cable installation. It should also be noted that Natural England is currently advising Eastern Inshore Fisheries Conservation Agency on a fisheries byelaw closure area to protect the area of *Sabellaria* reef within the Vanguard cable corridor from repeated damage from fishing gear. It is anticipated that the closure will not only maintain the areas of known reef, but in the absence of fishing pressures restore *S. spinulosa* reef across any closure area. Therefore it is highly likely that the presence of Annex I *S. spinulosa* reef will have significantly changed prior to any OWF construction activities. Therefore, whilst we continue to advocate that the standard mitigation measure / marine licence conditioned to avoid reef features is included in the Projects DML it may not be feasible to do so. To address this the Applicant has included the caveat 'where

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			and monitoring plan, must be agreed with the MMO. This includes a detailed cable laying plan. This gives the MMO and their advisors the opportunity to input to the cable laying plan including the cable route and potential for micrositing.	possible', but Natural England has concerns about the increased level of risk to the integrity of the site such a caveat would endorse as there are no parameters to assess and agree what is "possible".
5.7	Applicant	Please set out your methodology and criteria for assessing the type of cable protection that is to be selected.	At locations where surface protection is required, the following criteria will be applied to select the most appropriate solution for cable protection. • The solution must afford an adequate degree of protection for the cables against potential threats at the location in question. • The solution must minimise hazards to other seabed users (e.g. potential for snagging). • The solution must minimise scour and other adverse impacts on seabed stability. Cable protection requirements will be ascertained through studies related to potential threats to the cable and/or to other seabed users, alongside an assessment of the prevailing conditions at a particular site in view of seabed stability, scour potential, sub-surface wave energy and other factors, to determine the most appropriate form of cable protection in a given location. Where applicable, i.e. at crossing locations, such engineering will be shared with and agreed with the owner of the infrastructure to be crossed. A scour protection and cable protection plan, providing details of the need, type, sources, quantity and installation methods is secured under Schedules 9 and 10 Part 4 Condition 14(1)(e), and Schedules 11 and 12 Part 4 Condition 9(1)(e) of the dDCO.	Natural England has provided further comments on cable protection in Annex C of our Written Representation and in our response to Examining Authority's first written questions [REP1-088].
5.8	Applicant	Please account for NE's assertion that paragraph 159 of Chapter 10 of the ES [APP-334] does not account for cable repairs	The process and associated impact of cable repairs under cable protection is comparable with that described in ES Chapter 5 Project	Natural England still has uncertainties in relation to removal of cable protection to repair cables

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		for stretches that are under any of the cable protection options.	Description (section 5.4.18.3, paragraphs 254-256) and assessed in the relevant technical chapters. The cable would be cut and a new segment of cable inserted. The replacement section of cable will be deployed by the installation vessel and jointed to the existing cable, laid in a bight to one side of the original cable route, by-passing the failed section. Additional cable protection would be installed where necessary (not exceeding the total values included in the dDCO or assessed in the ES). The worst case scenario for the relevant impact assessments (e.g. ES Chapter 10 Benthic Ecology, Table 10.12 includes the permanent loss of habitat as a result of the maximum amounts of cable protection (Operation, Impact 1A and 1B) and the temporary disturbance associated with cable repairs (Operation, Impact 2A and 2B).	and the implications of this.
5.9	Applicant	Chapter 8, paragraph 169, of the ES [APP-332], provides a contingency estimate of 20 km of cable protection within the whole offshore cable corridor, of which 8km of cable would be within the Haisborough, Hammond and Winterton SAC (HHW SAC), being required due to cable burial not being possible to achieve. Please comment on the view expressed in NE's RR [RR-106] in regard to the following matters: • cable protection should not be permitted within the HHW SAC unless a method can be found that does not lead to habitat loss; • a justification of why the amount of cable protection proposed is realistic;	a) It is the Applicant's preference to use surface protection only where necessary at crossings and at locations where cable burial is not possible due to the presence of hard substrate close to the surface. The assessment presented in the Information to Support HRA report provides a conservative assessment of potential habitat loss: • Section 7.4.1.1.2 of the Information to Support HRA report provides an assessment of permanent habitat loss of Annex 1 Sandbank, showing that the potential loss equates to less than 0.002% of the area of sandbanks within the SAC. The assessment therefore concludes that there would be no adverse effect on the integrity of the HHW SAC in relation to the conservation objectives for Annex I Sandbanks and therefore the Applicant proposes that the proposed cable protection should be permitted.	NE notes that the applicant considers the amount included in the HRA is conservative, but that doesn't mean that it is acceptable within the SAC The site condition is currently under review with a restore objective due to existing infrastructure. Therefore the placement of rock protection is unlikely to aid in the recovery of the site. In addition the impacts to a particular sandbank may mean that it no longer contributes to the overall sandbank system. It is not just about extent of impact area compared to the entire site but

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		• an estimation of the amount of cable protection to be used for each benthic habitat type; • an analysis of the types of cable protection to be used on each benthic habitat type and an assessment of the impacts on each feature in terms of habitat loss or change, increase in suspended sediment/siltation and the interruption to physical transport processes; • an assessment of the likelihood and associated impacts of secondary scouring around cable protection; and • an estimate of the likelihood of exceeding the proposed amount of cable protection, with an assessment of any impacts that may arise as a result.	• It was agreed with Natural England in the Expert Topic Group on 31 January 2018 (Appendix 25.6 of the Consultation Report) that there would be no permanent loss of Annex I Reef due to the embedded mitigation to microsite where possible to avoid reef and the fact that *S. spinulosa* is ephemeral and can be expected to recover/recolonise. Therefore there would be no adverse effect on integrity (AEoI) of the Haisborough, Hammond and Winterton SAC in relation to the conservation objectives for Annex I Reef and therefore the Applicant considers that the proposed cable protection should be permitted. The Scour Protection and Cable Protection Plan required under dDCO Schedules 11 and 12 Part 4 condition 9(e), in accordance with the Outline Scour Protection and Cable Protection Plan (document reference 8.16), provides the mechanism to agree cable protection requirements prior to construction. This document will be updated as the final design of the project develops and will include justification of the location, type, volume and area of cable protection, based on crossing agreements and pre-construction survey data to ensure only essential cable protection can be installed in the HHW SAC and to confirm there will be no AEoI. b) The maximum total volume of cable protection in the Haisborough Hammond and Winterton SAC is 0.003% of the SAC area, as shown in Table 7.4 of the Information to Support HRA report. Pre-construction surveys will inform the detailed design, including the need for cable protection, therefore, at this stage, the resolution of seabed data cannot confirm that there are no areas of hard substrate in the offshore cable corridor.	should also take into account objectives relating to form and function. Please note that Natural England believes that it is likely that *Sabellaria spinulosa* will recolonise an area of disturbance, but the evidence presented doesn't support the recovery of 'reef' and therefore the recoverability is unknown. Also Natural England doesn't consider reef on artificial structures and reef as defined at the time of designation and therefore we don't agree with the applicant's comment in relation to cable protection. The provision of a principle Cable Specification and installation plan has been a minimum expectation for cable routes through designated sites since the Triton Knoll (Electrical System) NSIP examination. However, this is not the same thing as a cable burial risk assessment which utilises detailed geotechnical and geophysical data to fully understand the ability to bury the cables using all of the potential installation techniques and scenarios. Therefore, while we welcome the applicant's commitment to provide a cable burial specification and installation plan and would

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			As a result, a contingency of 10% of the cable length requiring cable protection has been included in order to provide a conservative assessment following advice from Natural England regarding lessons learned from other offshore wind farms (reported in Natural England9, 2018). c) This detail would be determined in the final Scour Protection and Cable Protection Plan as part of agreeing the need, type, sources, quantity and installation methods of cable protection. As outlined in response to point b above, the contingency has been identified in order to take a conservative approach to uncertainty therefore the locations of potential cable protection are not yet known. d) As per response to point c. e) Secondary scour has the potential to arise where tidal flows accelerate over a structure and then decelerate on the 'down-flow' side, returning to baseline values a short distance from the structure. The interruption to flows due to the presence of a structure could induce local turbulence in the flow field which could cause secondary scour in a 'down-flow' direction. Cable protection proposed for Norfolk Vanguard would be a maximum of 0.5m high for unburied cable and 0.9m high for cable crossings. The changes to tidal current flows caused by a structure that is only 0.5-0.9m high above the surrounding seabed, in the context of sandwaves of approximately 3m height, would be minimal. In addition, tidal flows in this area are of relatively low velocity, as the project is close to the amphidromic point. In relation to scour protection, which is of greater dimensions to cable protection, it was agreed with Cefas during the Expert Topic Group on the 5 July 2017, that secondary scour is unlikely to be an	welcome the inclusion of this commitment in the conditions of the DCO/DMLs, it doesn't allay Natural England's concerns in relation to ability to bury. Please see Natural England's comments in Annex C of our Written Representations in relation to our position on cable protection for further details [REP1-088].

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			issue. f) The Applicant has identified a contingency that is expected to be appropriately conservative in response to advice from Natural England with regards to experience from other offshore wind farms. Having incorporated a contingency into the Norfolk Vanguard project design, no further cable protection requirement is expected.	
5.10	Applicant	Please comment on NE's disagreement in its RR [RR-106] with your finding in paragraph 278 of Chapter 8 of the ES [APP-332] of a negligible impact for the Haisborough, Hammond and Winterton SAC.	The RR response refers to potential changes to volume, extent and morphology of the SAC caused by the disposal of sediment from levelling of sand waves along the cable corridor. Volume Norfolk Vanguard is committed to disposing of all the sediment excavated from the SAC during sand wave levelling back into the SAC, so that no sediment is lost from the sand bank system associated with the SAC. The total volume of sediment in the SAC would therefore not change. This meets the target in the Supplementary Advice which is to 'Maintain the existing or best-known volume of sediment in the sandbank, allowing for natural change'. Extent Even though dredging of sediment from the SAC would take place, the overall area of the sand bank habitat would not change. This is because the sea bed composition would not change and so the spatial distribution and integrity of the feature would be unaffected. This meets the target in the Supplementary Advice which is to 'Restore the total extent and spatial distribution of subtidal sandbanks to ensure no loss of integrity, while allowing for natural change and succession'. Morphology The Supplementary Advice indicates that the total sand bank volume within the SAC is likely	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. Also we note that there appears to be no assessment here of the impact of the dredging itself on the attributes. 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** Often impacts from one phase of

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			to be at least 1,113 x 106m3 (the combined volumes estimated for Hewitt Ridge, Winterton Ridge, Hammond Knoll, Haisborough Sand, North and Middle Cross Sand, South Cross Sand). The excavated sediment amounts to a volume of 0.5 x 106m3, which is only 0.05% of the total sand bank volume. The sand wave study provided in Appendix 7.1 of the Information to Support HRA report concluded that, although the absolute changes in morphology of the sea bed due to disposal cannot be predicted with certainty, they are likely to be within the existing elevation range already at the disposal area (sand waves up to 3m high with wavelengths of about 100m). The technical assessment also indicated that any disposal mounds that may be created that are higher than the natural elevation variation would be re-distributed and lowered by tidal currents to levels like the existing bedforms, within a period of days to a year. The re-distribution of the disposal mounds to bedforms like those existing at present meets the target in the Supplementary Advice which is to 'Maintain the presence of topographic features, while allowing for natural responses to hydrodynamic regime, by preventing erosion or deposition through human-induced activity'. Summary The overall impact of sand wave levelling activities under a worst case scenario on bed level changes (volume, extent and morphology) in the SAC due to sediment disposal is considered to be negligible.	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? 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 which is considered in a different phase. Therefore the same area may be impacted twice by activities in different phases/stages of the project. 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? 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.

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				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. 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. 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.
5.11	Applicant	Please can you confirm that the figures you have quoted in paragraph 387 of ES Chapter 8 [APP-332] are correct?	NE [RR-106] states "If there is 4km cable protection per cable pair should this not be 8km in total as there are 2 pairs? So the overall	No further comments.

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			amounts presented here are wrong? Also if 20% as quoted in other chapters (not 10%) is to be protected would that not be 8km per cable?" Para 387 of ES Chapter 8 is correct which includes reference to: "A contingency of up to 4km of cable protection per cable pair, resulting in a footprint of 40,000m2 (0.04km2) based on 5m wide cable protection". There would be 8km in total (2 x 4km) and this has been used in the calculation described in para 387 i.e.: 2 cable pairs x 4000m length x 5m width = 40,000m2.	
5.12	Applicant	Please comment on NE's contention in its RR [RR-106] that as cable protection has not been assessed for cable repairs or reburial, no such cable protection in this regard should be permitted to take place.	Cable protection may either be installed during installation or maintenance, up to the total volume. This has been assessed in ES Chapter 10 Section 10.7.5 Potential Impacts during Operation (including Section 10.7.5.1, Permanent loss of seabed habitat through the presence of seabed infrastructure in the Offshore Windfarm (OWF) sites and Section 10.7.5.2, Permanent loss of seabed habitat through the presence of seabed infrastructure in the offshore cable corridor). Therefore, the Applicant proposes that cable protection for cable repairs and reburial should be permitted up to the maximum values in the dDCO and does not agree that cable protection has not been assessed for cable repairs or reburial. This is the approach that has been taken on other consented offshore wind farms, e.g. East Anglia THREE.	Natural England is happy with the approach taken at EA3 in relation to EIA. However, this is not an appropriate approach to undertake works over the life time of the project within a designated site and be assessed as such. We acknowledge that based on previous cable installations (requiring c6% of their cable lengths to be protected) the Applicant has presented reasonable justification for the WCS of 10% along the entire export cable length requiring cable protection and this could potentially meet EIA requirements . However, it doesn't take into account the localised diversity of sediment types and structure, which would result in cable protection being concentrated in particular areas/habitats rather than a uniform distribution. Therefore

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				assessing WCS of 10% of the cable length within an SAC requiring protection, based on evidence from entire export cable routes measuring 10s of kilometres, with multiple sediments types, is not appropriate for HRAs. For example the ability to bury the Race Bank cables to the optimum depth is proving to be more challenging, if not impossible, in areas of mixed sediment and coarse sediment located in specific areas along the export cable route. The ability to bury cables and thus the need for cable protection should be based on project specific information on the habitats/features present and the underlying substrata and allow for sufficient contingency around changing installation tools and/or technical hiccups. This data set are currently not available for this project. This can only be addressed through further data collection which is unlikely to be available in the examination timeframe In addition does 10% relate to 10% of the 'volume' of rock armouring or 'area' as these are very different and could have different impacts? This needs to be clearly defined in the DCO/DML. Please note that this should not relate to the total

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				amount of rock protection applied for across the project including that requested for scour protection and should be made clear in the DCO/DML.
5.13	Applicant	In light of NE's comments in its RR [RR-106], please comment on how you consider the Scour Protection and Cable Prevention Plan should be updated to take account of any additional requirements post-consent once the project parameters are more clearly defined, and how this would be secured in the dDCO.	The Scour Protection and Cable Protection Plan is required under dDCO Schedules 9 and 10 Part 4 condition 14(e) and Schedules 11 and 12 Part 4 condition 9(e). This will be updated as the final design of the project develops and must be agreed with the MMO prior to construction. The Scour Protection and Cable Protection Plan will include details of the need, type, sources, quantity and installation methods for cable protection based on crossing agreements and preconstruction surveys.	The provision of a principle Scour protection and Cable protection plan have been a minimum expectation for cable routes through designated sites since the Triton Knoll (Electrical System) NSIP examination. However, this is not the same thing as a cable burial risk assessment which utilises detailed geotechnical and geophysical data to fully understand the ability to bury the cables using all of the potential installation techniques and scenarios. Therefore, while we welcome the applicant's commitment to provide a Scour Protection and Cable Protection plan and would welcome the inclusion of this commitment in the conditions of the DCO/DMLs, it doesn't allay Natural England's concerns in relation to ability to bury.
5.14	Applicant	Please explain how you have arrived at a worst case scenario of cable protection/scour prevention being required for 10% of the export able, array and interconnector cables.	When installing subsea cables, it is important to ensure that the cables are protected from mechanical damage (e.g. beam trawling) and from the long-term effects of sediment mobility. Failure to do this will tend to result in higher rates of cable failure, and consequential cable repair operations. Where the sea-bed is sedimentary, burial of cables within the sedimentary layer is the preferred way to achieve the required degree of protection.	Natural England notes that the cable protection/scour prevention requirement is presented as 10% of the export cable, array and interconnector cables, but it is still not clear how this estimated WCS has been derived. Further justification of these figures should be provided with reference to the findings of the geotechnical and

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			Surface protection will only be used in areas where cable burial cannot be achieved - typically where hard substrates or obstructions (natural or man-made) are present at, or close to, the surface of the sea-bed. At present, survey data collected by the Applicant for the wind farm site and the export cable corridor indicates that the seabed in these areas is predominantly overlain with sands and silts and therefore burial of cables will be largely possible. However, it is possible that more detailed surveys undertaken post-consent will reveal the presence of hard substrates in some limited areas; it is therefore not possible to rule out the option of using surface protection where cables cross these areas at this stage. The 10% figure for cable protection contained in the application is therefore a realistic worst case, given the limited survey data available at present.	geophysical surveys mentioned in Appendix 8.16 Scour Protection and Cable Protection
5.15	Applicant	Having regard to the variable spatial and temporal distribution of *Sabellaria spinulosa* reef, please clarify the methodological approach you have used with regard to mapping *Sabellaria spinulosa* as opposed to the methods as described in Limpenny *et al* 2010, that NE has referred to in its RR [RR-106].	The data review has been undertaken to better understand the distribution of *Sabellaria* reefs within the area, maps have been produced using geophysical data sets and associated sample data from the Norfolk Vanguard 2016 survey (reported in ES Appendix 10.1) but as mentioned, this a snapshot in time and the methods employed did not distinguish *Sabellaria* biotopes (which could include individuals and reef) from *Sabellaria* reefs. The review provided in Appendix 7.2 of the Information to Support HRA report examines the data from the 2016 survey and also incorporates sample data from other data sources, with the aim being to show a consensus. Where *Sabellaria* reef is consistently found within sample data and maps derived from this bottom up approach there is greater confidence. *S. spinulosa* reef is variable in space and time and using an ensemble	As highlighted in our Relevant Representations [RR-106] and subsequent Written Representation submitted at Deadline 1 [REP1-088]. Natural England has significant doubt regarding the evidence presented to support the successful avoidance of reef. The maps presented in relation to extent of *Sabellaria spinulosa* reef are hard to interpret because no evidence is presented in relation to the ability to distinguish reef from surrounding substrata. Furthermore there are differences in extent of the surveys and timing of the surveys.

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			approach aims to combine multiple 'snapshots', some of which are produced using methods which were developed after Limpenny *et al* 2010 to produce a combined spatial and temporal map. The process does not ignore Limpenny *et al* but aims to build on this approach to provide more confidence in a map rather than relying on individual 'snapshot' maps which can be contradictory or inconsistent. Despite the comments from Natural England regarding the methodology used to derive the maps, it is agreed that the resulting maps of potential *S. spinulosa* reef by Envision on behalf of the Applicant (presented in Appendix 7.2 of the Information to Support HRA report) identify potential reef areas which are largely consistent with areas Natural England has identified as outlined in the Natural England SoCG (document reference Rep1-SOCG-13.1).	
5.16	Applicant	Please clarify whether NE's query regarding the extent of *Sabellaria spinulosa* at the time of the pre-construction surveys and its view that *Sabellaria spinulosa* has a medium sensitivity to heavy smothering would alter the conclusions you have reached.	As discussed in response to Q5.6, based on available data, micrositing around *S. spinulosa* reef is likely to be possible. However, it is acknowledged that *S. spinulosa* reef extent may change prior to construction of Norfolk Vanguard and therefore pre-construction surveys are required under dDCO Schedules 11 and 12 Part 4 condition 13(2)(a) to determine the extent of *S. spinulosa* reef at that time. As requested by Natural England during the Expert Topic Group (ETG) meeting on 31 January 2018 (Appendix 25.6 of the Consultation Report, document reference 5.1), an assessment of potential impacts on *Sabellaria* reef, should it not be possible to microsite around all reef, has been undertaken (section 7.4.2.1.1 of the Information to Support HRA report). Therefore, an increase in the extent of *Sabellaria* reef compared with the baseline conditions would not alter the assessment conclusions. As stated in ES	Natural England's position on this remains unchanged. Full details can be found in our Relevant Representations [RR-106] and Annex C of our Written Representations [REP1-088].

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			Chapter 10 Benthic Ecology, Tables 10.14 and 10.16 *S. spinulosa* reef has been identified as having medium sensitivity in accordance with the Marine Life Information Network (MarLIN) Marine Evidence based Sensitivity Assessments (MarESA). Therefore there is no change to the conclusions of the assessment as this information has already been incorporated.	
5.17	Applicant	Please explain why you have not considered the potential effects on *Sabellaria spinulosa* due to cable repairs.	Section 7.4.2.1.2 of the Information to Support HRA report (document reference 5.3) considers impacts on *Sabellaria spinulosa* during operation and maintenance based on the worst case scenario outlined in Table 7.4 which includes cable repairs.	Natural England acknowledge that the Applicant has attempted to assess the impacts of cable repair and reburial on *Sabellaria spinulosa*. However, we remain concerned that areas of *S. spinulosa* reef may be impacted during construction and again by cable repair or reburial activities, limiting the reefs ability to recover in these areas due to repeated impacts. As stated in Section 7.4.2.1.1 of the Information to Support HRA report provided by the Applicant: *'In general, whilst S. spinulosa reef is able to recover, this recovery may take some time, and is dependent on the prevailing environmental conditions (Pearce et al. 2007; Limpenny et al., 2010; Hendrick et al., 2011). It can be inferred from this that recovery of reefs from significant impacts (such as physical loss or abrasion of the substratum surface) may take between 2 and 10 years for full pre-impact recovery (Tillin and Marshall, 2015).'* Therefore, Natural England are concerned that repeated impacts may lead to areas of reef being damaged

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				before they have time to fully recover which would hinder the rate of restoration of *S.spinulosa* reef in the site.
5.18	Applicant	Please address the comments made by NE in its RR [RR-106] that a single ground truthing sample, compared to a map, is not sufficient to determine whether an area will support *Sabellaria spinulosa* reef in the future.	See response to Q5.15 and Q5.20.	Natural England continue to have significant concerns with the evidence collected to inform impacts on *Sabellaria spinulosa* reef.
5.19	Applicant	Having regard to the Gubbay criteria, please explain why areas with 'low reefiness' have been mapped as sediment rather than reef.	Areas with low 'reefiness' have not been mapped as sediment. Figure 7.2 of the Information to Support HRA report presents a map of potential *Sabellaria* reef extent based on medium to high confidence of reef presence (N.B. this includes reef of any reefiness score, including low reefiness). This map is based on the data analysis presented in Appendix 7.2 of the Information to Support HRA report. *Sabellaria* reef identified during the Norfolk Vanguard benthic surveys in 2016 (reported in ES Appendix 10.1) was found to be of low or medium reefiness as shown in section 5.1.1 of ES Appendix 10.1 Benthic Characterisation Report based on the reefiness characteristics from Gubbay, 2007 outlined in section 3.1.1 of ES Appendix 10.1. It should be noted that *Sabellaria* reef is rarely continuous and is characteristically patchy; low reefiness is characterised by only 10-20% coverage (Gubbay, 2007) and therefore increases the potential for micrositing. Medium reefiness also has high potential for micrositing, being classified by 20-30% coverage.	Natural England would like to see justification to support the final paragraph in relation to the ability to micro site through patchy reef. We would also like to see evidence on the feasibility to do so without damaging the features
5.20	Applicant	Please respond to the issues NE has raised in its RR [RR-106] in relation to the datasets and maps that are described in Section 2.7 of Appendix 7.2 Sabellaria reef mapping [APP-049].	Within the mapping process the data which were collected as part of the Fugro 2016 survey (reported in ES Appendix 10.1) are used as the primary driver within the data analysis (Figure 13 of Appendix 7.2 of the Information to Support	Natural England continue to have significant concerns with the evidence collected to inform impacts on Sabellaria spinulosa reef.

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			HRA report), other sample data which are separated either temporally or spatially are incorporated by using probability images which refine the mapping process and add prior knowledge in to the mapping process (Figure 14 of Appendix 7.2 of the Information to Support HRA report). This means the non-contemporary sample data and geophysical data are not compared or related to directly but only used to influence the likelihood of a habitat occurring. Using an ensemble mapping method aims to address this temporal distribution of habitats by incorporating maps produced from different sample data it attempts to show where a habitat is consistently found or where there may be variability within a habitats distributions, hence Figure 16 of Appendix 7.2 shows a confidence map which indicates where habitats are consistently mapped or where there is variability.	
5.21	Applicant	Please confirm whether the sensitivity definitions in Table 10.3 of ES Chapter 10 [APP-334] are taken from Marlin sensitivity or are bespoke for the ES.	The sensitivity definitions presented in Table 10.3 of ES Chapter 10 Benthic Ecology are more refined and conservative than those presented in the latest MarLIN Marine Evidence based Sensitivity Assessment.10 Appendix 5.1 (document reference ExA; WQApp5.1; 10.D1.3) provides an overview of the approach used by MarLIN10 to define sensitivity along with a comparison of the Norfolk Vanguard definitions presented in Table 10.3 of ES Chapter 10.	Natural England have looked at the Applicant's sensitivity definitions (App 5.1). Whilst we agree that the timescales in the applicants sensitivity definitions are generally more precautionary, the levels of impact are qualitative rather than quantitative as for the MarLIN definitions and therefore could be open to misinterpretation. Natural England would advise that the Applicant uses the MarLIN sensitivity definitions as these are considered standard practice (and underpin our conservation advice). This allows for equal assessment and comparison of impacts across industries and developments.
5.22	Applicant	Comment on NE's view [RR-106] that the boulder clearance figure cited in Table	The Applicant has reviewed the site specific geophysical survey data collected by Fugro in	Natural England remains concerned about how the potential

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		10.21 of ES Chapter 10 [APP-334] does not take account of disturbance elsewhere arising from the placement of cleared boulders.	2016 and, given the low proportion of boulders in the area, it is likely that micrositing around boulders would be possible. However, as requested by Natural England and the MMO in their respective Preliminary Environmental Information Report (PEIR) responses, the impact assessment includes the potential for boulder clearance in order to be highly conservative. A conservative allowance for clearing up to 75 boulders (53 in the offshore wind farm sites and 22 in the offshore cable corridor) of up to 5m in diameter has been included in the assessment. Boulders would be relocated within the offshore project area, outside the route of cable installation or the location of foundations. The area vacated by the boulder is highly likely to become consistent with the wider area and that lost by the new boulder location and therefore there is no net change in habitat availability resulting in a temporary effect. The area of temporary disturbance as a result of boulder clearance in the offshore wind farm sites assessed in the ES based on these assumptions is 0.001km2, which the Applicant deems to be conservative. However, if this were to be 0.002km2 as suggested by Natural England, to reflect the area vacated plus the area on which each boulder is placement, the total overall temporary disturbance footprint would be 16.120km2 rather than 16.119km2 (either way, rounded to 16.1km2 as per ES Chapter 10 Benthic Ecology, Table 10.12 Impact 1A). Likewise, the area of boulder clearance in the offshore cable corridor assessed in the ES is 0.0004km2. However, if this were to be 0.0008km2 as suggested by Natural England, the total overall footprint in the offshore cable corridor would be 6.0729km2 rather than	impacts to surrounding Annex I habitats will be avoided and that boulders are placed in similar sediments.

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			6.0724km2 (either way, rounded to 6.1km2 as per ES Chapter 10 Benthic Ecology, Table 10.12 Impact 1B). There would therefore be no change to the conclusions of the assessment as the temporary effect associated with boulders is negligible. Pre-construction surveys required under dDCO Schedules 9 and 10 Part 4 condition 20(2)(b) and Schedules 11 and 12 Part 4 condition 13(2)(b) would identify any requirement for boulder clearance within the offshore project area.	
5.23	Applicant	Please justify why you consider the 11% figure as quoted in paragraph 317 of ES Chapter 10 [APP-334] would give rise to a low impact magnitude.	The footprint of Norfolk Vanguard temporary disturbance within the Haisborough, Hammond and Winterton SAC would be up to 4.86km2 as shown in Table 10.12 of ES Chapter 10. The footprint for Norfolk Boreas in the SAC would also be 4.86km2. It should be noted that recovery is likely to have occurred, or at least commenced, following the first cable installation before subsequent phases of temporary disturbance from cable installation occur. The total area of the Haisborough Hammond and Winterton SAC is 1,468km2. Given the temporary nature of impacts associated with cable installation the ES concludes that the effect would be of low magnitude. Paragraph 317 of ES Chapter 10 refers to the proportion (11%) of the area within the Order limits of the offshore cable corridor, where it overlaps the SAC, that could potentially be subject to temporary disturbance, noting that the offshore cable corridor is 2 to 4km wide to provide space for micrositing and therefore a significant proportion of the area within the offshore cable corridor would remain undisturbed.	Natural England continues to disagree that in- combination there will be a low impact magnitude in terms of HHW SAC when Boreas is considered in combination as the export cable footprint will be 11% of the cable corridor running through the SAC and doesn't take into account the interest features impacted.

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6.	**Construction - offshore**			
6.1	Applicant	Part 3, 1(d) of Schedules 11 and 12 of the dDCO for Norfolk Vanguard refers to the disposal of up to 39,732,566m3 of inert material of natural origin within the offshore Order limits. Please explain any significant differences between this figure and the corresponding figures proposed for other similar offshore windfarm projects that have either been consented or are currently proceeding through the examination process. For example, the made DCO for East Anglia THREE, Part 1, 2(d) of Schedules 10 and 11 respectively, refers to the disposal of a total of 1,646,347m3 of inert material of natural origin.	The Applicant has taken a conservative approach to calculating potential sediment disposal by assuming that 100% of the array cable length and foundation locations could require pre-sweeping/sandwave levelling, up to a sediment depth of 5m. It is acknowledged that other projects (e.g. Hornsea Project Three and East Anglia THREE) have lesser disposal volumes, however the Applicant cannot comment on the approach taken by other projects.	No comments
6.2	Applicant	Requirement 4 of the dDCO proposes a 400km length for the export cable and an associated 119,836m3 of cable protection. Please explain any significant differences between this figure and the corresponding figures proposed for other similar offshore windfarm projects that have either been consented or are currently proceeding through the examination process.	The Applicant suggests that the proposed 119,836m3 of export cable protection (equivalent of 300m3 per km of cable) is not materially different to that presented in other projects. For example the cable protection proposed for Norfolk Vanguard lies within the range of that proposed for East Anglia THREE and Hornsea Project Three: • Hornsea Project Three (as presented in the application documents) o Length of export cable: 1,146km. o Cable protection volume: 1,146,000m3 (equivalent of 1000m3 per km of cable) o Length of export cable: 664km o Cable protection volume: 81,260m3 (equivalent of 122m3 per km of cable)	No comments
6.3	Applicant	Condition 8(1)(g) of the DMLs contained in both Schedules 9 and 10 of the dDCO [APP-005] refers to 53,198,398m3 of scour protection for the WTGs, accommodation platform, meteorological masts and	The Applicant has taken a conservative approach to calculating potential scour protection by assuming that 100% of the foundation locations could require scour protection and that the area of scour protection	No comments

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		measurement buoys. Please explain any significant differences between this figure and the corresponding figures proposed for other similar offshore windfarm projects that have either been consented or are currently proceeding through the examination process.	could be up to five times the foundation diameter. The volume is also calculated based on a conservative height of scour protection of 5m. It is acknowledged that other projects (e.g. Hornsea Project Three and East Anglia THREE) have lesser scour protection volumes, however the Applicant cannot comment on the approach taken by other projects.	
6.4	Applicant	Condition 8(1)(h) of the DMLs contained in both Schedules 9 and 10 of the dDCO [APP-005] states that the total amount of inert material of natural origin disposed within the offshore Order limits as part of the authorised scheme must not exceed 39,732,566.73m3. In addition, Condition 3(1)(c) of the DMLs contained in Schedules 11 and 12 of the dDCO states that the total amount of inert material of natural origin disposed of within the offshore Order limits as part of the authorised scheme must not exceed 11,475,000m3. Therefore please confirm whether the maximum amount of inert material of natural origin that could be disposed of within the entire offshore Order limits would be a combination of these two figures, ie a maximum of 51,207,566.73m3.	39,732,566m3 reflects the disposal volumes associated with the generation assets. 11,475,000m3 reflects the disposal volumes associated with the transmission assets. Therefore, it is correct that the total for the entire offshore Order limits would be 51,207,566.73m3. The Applicant will update the dDCO accordingly for submission at Deadline 2. This total has been assessed in the ES (e.g. ES Chapter 10 Benthic Ecology, Table 10.12 which includes 50,607,566m3 disposal in the offshore wind farm sites and 600,000m3 disposal in the offshore cable corridor, totalling 51,207,566m3).	No comments
6.5	Applicant	Please set out the methodology for calculating the amount of inert material of natural origin that is to be disposed within the offshore Order limits, the measures to monitor this disposal, and how this is to be secured in the dDCO.	The calculation of disposal volumes is presented in relevant worst case scenario tables of the ES (e.g. ES Chapter 10 Benthic Ecology, Table 10.12) which includes: • 50,607,566m3 disposal in the offshore wind farm (OWF) sites based on: o 90 x 20MW turbines on floating tension leg platforms with gravity anchors (based on a preparation area of approximately 90 x 90m and levelling depth of up to 5m) = 3,645,000m3. o Two offshore electrical platforms based on a	Natural England would defer to MMO on this subject.

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			preparation area of approximately 75m x 100m per platform and 5m depth = 75,000m3 o Two accommodation platforms based on a preparation area of approximately 75m x 100m per platform and 5m depth = 75,000m3 o Two met masts with a preparation area of 40m diameter and 5m depth = 12,566m3 o Array cable trench of 600km length with an average 20m pre-sweeping width and 3m depth = 36,000,000m3 o Interconnector cable trench of 150km length with an average 20m pre-sweeping width and 3m depth = 9,000,000m3 o Export cable of 30km length in the OWF sites with an average 20m pre-sweeping width and 3m depth = 1,800,000m3 • 600,000m3 disposal in the offshore cable corridor has been informed by the Cable installation study provided in ES Appendix 5.1. A construction programme and monitoring plan, in accordance with the In Principle Monitoring Plan (document reference 8.12) is required under dDCO Schedules 9 and 10 Part 4 condition 14(1)(b) and Schedules 11 and 12 Part 4 condition 9(1)(b) and must be agreed with the MMO prior to construction. It is agreed in the MMO SoCG (document reference Rep 1-SOCG-11.1) that the In Principle Monitoring Plan (IPMP) provides an appropriate framework to agree monitoring of changes in seabed topography, including any changes as a result of sand wave levelling.	
6.5	MMO	As above	The maximum volumes of material to be disposed are based on the estimated volumes of material that are requested to be removed, as described by the applicant in the Environmental Statement.	Natural England would support this position.

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			Condition 12(5) of Schedule 9 and 10 and Condition 7(5) of schedule 11 and 12 states that all non-inert material of natural origin must be screened out before disposal at this site. The MMO advises the maximum disposal volumes and footprints for should be clearly set out on the DMLs for each disposal activity. This should be further split out into estimated volumes for each substrate type (e.g. silt, sand, clay, etc.).	
6.6	Applicant	Please comment on the concern raised by NE in its RR [RR-106] that some of the volumes and figures presented in the dDCO are not always represented in the ES project description and please provide evidence to demonstrate that the figures as presented in the dDCO have been fully considered.	Appendix 6.1 of this submission (document reference ExA; WQApp6.1; 10.D1.3) provides an explanation of the relationship between design parameters in the draft DCO and ES	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review this document. Natural England will therefore provide comment on this submission at Deadline 3.
6.7	Applicant	Please comment on NE's request to be named as a formal consultee in regard to the design plan that is referenced in Condition 14(1)(a) of the DMLs contained in Schedules 9 and 10 of the dDCO.	In accordance with DML Condition 14(1)(a) (Generation DMLs (Schedule 9-10) and Condition 9(1)a) (Transmission DMLs (Schedule 11-12), the Design Plan will be agreed in writing with the MMO in consultation with Trinity House (TH) and the Maritime and Coastguard Agency (MCA). NE have requested to be listed as a consultee for the Design Plan in relation to micrositing requirements, however it is considered that micrositing requirements of relevance to NE (i.e. the offshore cable corridor) will be detailed in the Cable Specification, Installation and Monitoring Plan (dDCO, Schedules 9 and 10 Part 4 condition 14(g) and Schedules 11 and 12 Part 4 condition 9(g)) which includes a detailed cable laying plan. This condition gives the MMO and their advisors (i.e. NE) the opportunity to input to the cable laying plan including on the cable	Natural England would retain its request to be named as a formal consultee in regard to the design plan that is referenced in Condition 14(1)(a) of the DMLs contained in Schedules 9 and 10 of the dDCO.

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			route and potential for micrositing.	
6.8	Applicant	In relation to Condition 14 of the DMLs contained in Schedules 9 and 10 of the dDCO [APP-005] please comment on NE's request in its RR [RR-106] for the pre-construction monitoring to be agreed more than 4 months prior to the first survey, and for a discussion on monitoring timelines to take place.	The Applicant notes NE's comment. 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. This four month time period is contained on a number of other offshore wind farm DCOs (including The East Anglia Three Offshore Wind Farm Order 2017 and Hornsea Two Offshore Wind Farm Order 2016); it is established as an appropriate time frame and one that ensures the expedient discharge of the relevant conditions attached to the DML. In any event, the Applicant will endeavour to submit plans, programmes, protocols, schemes and/or statements to the MMO in good time and in advance of the four month minimum period. It should also be noted that Condition 15(2) (Generation DMLs) and Condition 10(2) (Transmission DMLs) allows for the determination period to be extended if agreed between the parties.	Condition 14 (1) (b) (iii) and (aa) these conditions cover the requirement for pre-construction monitoring to be agreed 4 months prior to the first survey. The standard approach of submitting monitoring plans 4 months prior to the first survey may not be the best approach. Natural England would like to discuss the possibility of the pre-construction monitoring plans and methodology being required 6 months prior to construction. The benefits would be a clearer deadline, the 4 months prior to the first survey leaves the decision on when the first survey should commence to the undertaker and the risk to the undertaker that that decision is wrong. Which could potentially lead to delays in construction programme. Some discussion on monitoring timelines would be useful and this condition should be reworded to capture more appropriate timescales.
6.9	Applicant	Can you clarify whether a separate marine licence would be required for UXO clearance, and the mechanism through which the production of a MMMP for UXO clearance would be secured in the dDCO?	Unexploded Ordnance (UXO) clearance is not included within the dDCO, it would be licenced separately once the nature and extent of UXO clearance is known following preconstruction surveys. A UXO MMMP would be a condition of the UXO clearance Marine Licence. This is the approach that has been taken on other offshore wind farms to date.	Natural England agrees with the Applicant's response. As previously stated the removal of UXOs is not covered under the DCO/DML and therefore is not licenced. A MMMP is therefore likely to be required to support an application for a separate Marine Licence and possible EPS licence for disturbance.
6.10	Applicant	Please respond to NE's contention in its RR [RR-106] that it is not possible to mitigate	As outlined in Section 12.7.1.2.2 Chapter 12 of the ES: The MMMP for UXO clearance will	This response does not allay the concerns of Natural England that it

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		against the effects of the largest UXOs, and that you will therefore need to identify appropriate mitigation in order to rely on your assessment.	ensure there are adequate mitigation measures to minimise the risk of any physical or permanent auditory injury to marine mammals as a result of UXO clearance. The MMMP for UXO clearance will be developed in the pre-construction period, when there is more detailed information on the UXO clearance which could be required and the most suitable mitigation measures, based upon best available information and methodologies at that time.	is not possible to mitigate against the effects of the largest UXOs. Natural England still require the Applicant to identify appropriate mitigation in order to rely on their assessment. There is also possible requirement for an EPS licence for disturbance
6.11	Applicant	Please clarify whether the figures given in paragraph 225 of ES Chapter 5 [APP- 329] represent a worst-case estimate of cable that it would not be able to bury at the construction stage, or cable that would become unburied at some time of the project and thus would require protection. Explain how the figures cited in paragraph 225 relate to those contained in paragraph 21 and Table 2 of the Outline Scour Protection and Cable Protection Plan [APP-040].	Section 5.4.14 refers to the total cable protection for the project, this could be installed during the construction or maintenance phases of the project and therefore paragraph 225 covers both the unlikely event that cables cannot be buried during construction and that cables become unburied during the life of the project. The following values of cable protection are assessed in ES Chapters 8, 10, 11 and 14: • Array cable protection based on: o 60km length based on up to 10% of the total length potentially being unburied (as stated in para 225 of ES Chapter 5) x 5m cable protection width; plus o 100m length unburied per turbine x 200 turbines (as stated in para 225 of ES Chapter 5) x 5m cable protection width; plus 10 crossings with 250m3 of protection per crossing o 15km length based on up to 10% of the total length (as stated in para 225 of ES Chapter 5) x 5m cable protection width; plus o 100m length unburied per offshore electrical platform x 2 platforms (as stated in para 225 of ES Chapter 5) x 5m cable protection width o 28km length potentially being unburied x 5m cable protection width; plus o 22 crossings (11 per cable pair) with 250m3 of protection per crossing; plus	This should be secured in the DCO/DML.

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			o 36m2 cable protection at the landfall exit points o 20km length (based on 10km length per cable pair potentially being unburied) x 5m cable protection width; plus o 22 crossings (11 per cable pair) with 250m3 of protection per crossing; plus o 36m2 cable protection at the landfall exit points	
6.12	MMO	Do you agree with the contingency estimate of 10% of the total cabling for unburied cables that the Applicant has applied?	The MMO agrees that the estimate of 10% of cables being unburied is a sufficiently precautionary estimate, noting that this does not appear to be supported by site specific data. The MMO does, however, note that this could have implications if all of the estimated 10% of exposures occurred within a designated site. MMO would defer to the SNCBs for further advice on whether this would be acceptable.	Natural England would agree that 10% is conservative, however would reiterate that this doesn't make it acceptable in terms of impact to nature conservation and Marine Protected Areas (MPAs). We acknowledge that based on previous cable installations (requiring c6% of their cable lengths to be protected) the developer has presented reasonable justification for the WCS of 10% along the entire export cable length requiring cable protection and this could potentially meet EIA requirements . However, it doesn't take into account the localised diversity of sediment types and structure, which would result in cable protection being concentrated in particular areas/habitats rather than a uniform distribution. Therefore assessing WCS of 10% of the cable length within an SAC requiring protection, based on evidence from entire export cable routes measuring 10s of kilometres, with multiple sediments

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				types, is not appropriate for HRAs.
7.	**Offshore Archaeology and Cultural Heritage**			This section is not relevant to Natural England
8.	**Fishing and Navigation**			This section is not relevant to Natural England
9.	**Marine geology, oceanography and physical processes, marine water and sediment quality**			
9.1	Applicant	In light of concerns raised at the Open Floor Hearing, please comment on the robustness of the coastal erosion predictions for the Happisburgh area. Please clarify whether you have used the most up to date information regarding the current rates of coastal erosion, and if not then please provide such information, if available.	The Coastal Erosion Study (ES Appendix 4.3) takes account of various available data and information sources, including local knowledge and the Shoreline Management Plan; modelling of the longshore interactions; consideration of a range of coastal management scenarios, including a scenario that matches current intentions, both locally and in neighbouring frontages; and the most recent upper end estimate of sea level rise from the Environment Agency's Guidance (Environment Agency, 2011). Future erosion rates at Happisburgh are predicted to be between 50m to 110m by 2065 (ES Appendix 4.3). The Horizontal Directional Drilling (HDD) entry point will be set back from the existing cliff-line by at least 125m. Furthermore, the landfall compound zone extends a further 200m inland, to allow further flexibility in the siting of the landfall post consent, using the most up to date information and forecasts. This is considered embedded mitigation by design to ensure that the landfall cable ducts do not become exposed under a worst case scenario during the project lifetime. The Applicant has, and will continue to consult with North Norfolk District Council throughout the development of the project design, including taking account of coastal erosion. A SoCG has been prepared with North Norfolk District Council (document reference Rep1 - SOCG - 17.1) which includes matters of agreement	Natural England has reviewed additional submissions from the applicant and are happy with the applicant's approach to quantifying coastal erosion at Happisburgh. A copy of our response in this regard was provided as Annex D of our Written Representations [REP1-088].

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			relating to coastal erosion.	
9.2	Applicant	North Norfolk District Council [RR-258] commented that there has been a significant loss of cliff in recent years for this part of the coast. Therefore please set out how you have considered how the project could contribute towards, or be affected by, coastal change.	The response to Q9.1 shows the consideration that has been given to how the project could be affected by coastal change. With regards to the consideration the Applicant has given to the potential for the project to impact the coast, the project design will avoid impacts on coastal erosion. This is summarised in ES Chapter 8 and further in North Norfolk District Council's position stated in the SoCG (document reference Rep1 - SOCG - 17.1): "*NNDC welcome the position set out by Vattenfall at paragraph 384 of Chapter 8 of the Environmental Statement which states:* *'The HDD will be secured beneath the surface of the shore platform and the base of the cliff, drilled from a location greater than 150m landward of the cliff edge. The material through which the HDD will pass, and through which the cables will ultimately be located, is consolidated and will have sufficient strength to maintain its integrity during the construction process and during operation. Also, the cable will be located at sufficient depth to account for shore platform steepening (downcutting) as cliff erosion progresses, and so will not become exposed during the design life of the project (approximately 30 years). Hence, the continued integrity of the geological materials and the continued depth of burial of the cables mean that they will have no impact on coastal erosion during both construction and operation'.* *This represents the best option for North Norfolk District Council (NNDC)*."	Natural England has reviewed additional submissions from the applicant and are happy with the applicant's approach to quantifying coastal erosion at Happisburgh. A copy of our response in this regard was provided as Annex D of our Written Representations.
9.3	Applicant	Please comment on the view expressed by Natural England [RR-106] that the best practice would be to deposit any dredged material immediately upstream of where it is	As discussed in response to Q5.3, analysis based on disposal in one indicative location provides a conservative worst case scenario, therefore any further spreading of sediment	Natural England notes that this includes a level of uncertainty and would like to explore with the Applicant how the parameters

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		removed, and that material from the offshore cable site should be deposited in that area rather than being removed. Would there be any implications for the conclusions reached in the ES if this approach was taken?	disposal would represent a lesser impact on the sandbank system and would remain within the envelope of the impact assessment and would not alter the conclusions. The Applicant is open to the possibility of disposal close to the area of removal, however the separation would have to be sufficient to ensure that infilling does not take place prior to cable installation. The final approach to cable installation, including the methodology for pre-sweeping and sediment disposal must be agreed with the MMO (in consultation with the relevant statutory bodies) prior to construction through the mechanism of the Cable Specification and Monitoring Plan, as required under dDCO Schedules 11 and 12, Part 4 condition 9(1)(g).	could be best assessed to ensure they are habitat regulations complaint.
10.	**Construction - onshore**			
10.1	Applicant	A number of concerns have been raised by interested parties regarding light pollution during the construction phase and during periods of maintenance. Could the applicant provide details of proposed lighting during the construction phase and that required during maintenance periods? What impact would this have on local residents and how would this be mitigated and secured within the dDCO?	Proposed lighting and assessed impacts during the construction phase are outlined at the following locations: Mobilisation areas. As detailed in para 370 of ES Chapter 5 Project Description, site lighting and secure fencing around the perimeter of the mobilisation areas would be utilised for safety and security purposes. Bat Conservation Trust's (BCT) Artificial lighting and wildlife guidance (2014) will be adhered to when designing temporary lighting for the construction works. This will include minimising the height of lighting rigs and directing lighting at the area of works to avoid light spillage. Onshore Project Substation. As detailed in para 398 of ES Chapter 5, perimeter and site lighting would be required during working hours in the winter months and a lower level of lighting would remain overnight for security purposes. The impacts of construction lighting at this location	In addition, Natural England welcomes the commitment by the Applicant to ensure that lighting follows good practice guidance for wildlife.

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			are considered and explicitly noted for the most impacted viewpoints as detailed in Table 29.11 of ES Chapter 29 which states that construction lighting would add to the prominence of the project in winter months when working days would extend into hours of darkness. National Grid Substation Extension. As detailed in para 425 ES Chapter 5, perimeter and site lighting would be required during working hours and a lower level of lighting would remain overnight for security purposes. Proposed lighting and assessed impacts during the operation phase (i.e. maintenance) are outlined at the following locations: Onshore Project Substation. As detailed in para 400 of ES Chapter 5, normal operating conditions would not require lighting at the onshore project substation, although low level movement detecting security lighting may be utilised for health and safety purposes. Temporary lighting during working hours will be provided during maintenance activities only. With reference to Table 29.7 of ES Chapter 29, the lighting requirements detailed within Chapter 5, are referenced as an embedded mitigation measure such that the onshore project substation has been designed so that it does not require permanent lighting and this has been noted as part of the visual impact assessment. National Grid Substation Extension. As detailed in para 427 of Chapter 5, the Necton National Grid substation would be unmanned and not normally illuminated. However, lighting would be used when conducting inspection and maintenance activities (during working hours only) typically involving monthly visual inspections and maintenance activities every three years.	

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			As detailed in Section 3.7 of Document 8.1 Outline Code of Construction Practice (CoCP), an Artificial Light Emissions Management Plan will be prepared in accordance with Requirement 20(2)(c) of the DCO. The plan will detail the mitigation measures to be taken to manage emissions from artificial light in accordance with good practice, such as the use of directional beams, non-reflective surfaces and barriers and screens, to avoid light nuisance whilst maintaining safety and security obligations. Details of the location, height, design and luminance of all floodlighting to be used during the construction of the project, together with measures to limit obtrusive glare to nearby residential properties, will be set out in the Artificial Light Emissions Management Plan which will be submitted to the local authorities for approval prior to construction commencing. The approved scheme will be maintained throughout the construction of the relevant works. Site lighting will be positioned and directed to minimise nuisance to footpath users and residents, to minimise distractions to passing drivers on adjoining public highways and to minimise skyglow, so far as reasonably practicable. Lighting spillage will also avoid or minimise impacts on ecological resources, including nocturnal species.	
11.	**Traffic, Transport and Highway Safety**			This section is not relevant to Natural England
12.	**Air Quality and Human Health**			This section is not relevant to Natural England
13.	**Noise and Vibration**			This section is not relevant to Natural England

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14.	**Landscape and visual impact**			
14.1	Applicant	Please explain how the concept of good design as set out in National Policy Statement (NPS) EN-1 has been taken into account in relation to both onshore and offshore components of the project.	The concept of good design as set out in NPS EN-1 emphasises the importance of siting at paragraph 4.5.3. '*Whilst the applicant may not have any or very limited choice in the 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.'* The NPS EN-1 also states that 'good design' should also be *'sensitive to place'* and *'in terms of siting and use of appropriate technologies can help mitigate adverse impacts such as noise'*. ES Chapter 4 Site Selection and Assessment of Alternatives sets out principles and objectives that have been implemented in the site selection process, including those relating to good design. ES Chapter 29 Landscape and Visual Impact Assessment in Section 29.7.1, specifies the embedded mitigation implemented through the siting of the onshore project infrastructure that is of particular relevance to the Landscape and Visual Assessment. This details how sites were selected and layouts developed to optimise the assets of the natural landform and screening of existing vegetation. For example, the proposed location of the onshore project substation is on a relatively level plateau with screening afforded by existing woodland to the north and east. Good design is an ongoing process and a further level of design will be undertaken through preparation of the detailed plans for the construction of the project and implementation of associated landscape works. These will cover issues such as the colour selection for structural components and plant species and mixes for the structural landscaping. These decisions will be captured in a Landscaping Management	No comments.

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			Scheme secured through DCO Requirements 18 and 19. The seascape assessment of the offshore electrical transmission works has been scoped out of the Landscape and Visual Impact Assessment (LVIA) owing to the distance of these works offshore. This approach was agreed with the Secretary of State via the Scoping Opinion in November 2016.	
14.2 – 14.3	Applicant	Requests for links to documents or provision of smaller versions of documents.		Not relevant to Natural England.
14.4	Various Councils	Do you agree with the methodology, baseline data, assumptions and modelling used to assess landscape character and visual amenity impacts in the ES Chapter 29? Do you accept the conclusions reached in tables 29.9, 29.10, 29.11, 29.12 of Chapter 29 of the ES [APP-353]? Do you accept the conclusions reached in relation to the assessment of potential cumulative impacts? Are you content with all mitigation and management measures set out in the Outline Landscape and Ecological Management Strategy (OLEMS), the Outline Access Management Plan and the Outline Code of Construction Practice? Please identify any outstanding issues.		Not relevant to Natural England.
14.5	Applicant	Figures 29.9a and b depict the Indicative Onshore Project Substation Mitigation Planting. There is a 10 metre band of woodland mix to the south of the project substation with two further 7 metre bands of woodland planting to the north-east and adjacent to the western boundary of the proposed substation site. It is noted that 5	The planting in the visualisations is shown at 20 years post-planting, such that the height is within an approximate range of 6.75m to 9.05m. The growth rates applied are conservative to ensure a worst case scenario is represented and it is considered likely that faster growth rates of all species, but especially the nurse species, would be achieved.	Not relevant to Natural England.

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		metres to 7 metres growth would take 20 years and for the nurse species (assuming planting height of 1 metre) 7.25m to 9.75 metres after 25 years. Paragraph 118 confirms that the heights after 20 years would be 6.75metres and 9.05 metres respectively and 9.25metres and 12.55 metres after 30 years. What are the assumed heights of the mitigation planting within the photomontages in figures 29 entitled 'with mitigation planting'? In other words, which year, post completion of construction, do the photomontages represent?		
14.6	Applicant	ES 29.7.1.3 refers to the possibility of advance planting (at the start of construction) in some areas so as to achieve 3 years growth prior to the completion of construction. Please identify the areas suitable for such advance planting. Do they include the mitigation planting associated with the substation? How is the advance planting secured in the dDCO and how far in advance would it be?	The opportunities for advanced planting, including mitigation planting areas associated with the onshore project substation, are currently being explored as part of discussions with landowners and will be carried out where practicably possible once detailed design is finalised post-consent. The possibility of advanced planting is noted within section 6.5 of document 8.07 Outline Landscape Ecological Management Strategy and where possible, would be proposed to be implemented at the start of the construction phase, allowing approximately three years of growth prior to completion of construction and commencement of operation. However, the Applicant is not reliant on advanced planting to deliver the described mitigation. It is therefore not the Applicant's intention to specifically secure this aspect of the delivery. The detail of the advanced planting will be presented in the Landscape Management Scheme to be produced in line with Requirement 18 of the DCO and in accordance with the Outline Landscape and Ecological Management	Not relevant to Natural England.

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			Strategy (OLEMS).	
14.7	Applicant	ES 29.7.1.3 please indicate the location and visual effects of the 2 metre earthwork bunds along the western side of the project substation. Are these works within the redline Order limits? Is the 7 metre woodland planting shown in figure 29.9b on top of this earthwork bund, and, if so, set out the measures you would take to ensure this planting would become properly established?	The potential 2 m earthwork bund would be created from any surplus of soil. The bund would be located on the western side of the onshore project substation and wholly within the Order limits. Woodland proposed to the west of the substation would be planted on top of the bund. The assessment undertaken is not reliant on the inclusion of the earth bund, but it would help to give an incremental increase to the overall height of screening along this sensitive boundary. To ensure the stability of the earthwork bund, the specification for its construction, to be included in the Landscape Management Plan, would include measures such as constructing it up from 0.8m below ground level, compacting the soil in layers during construction, integrating an effective drainage system to reduce risk of soil slip and restricting slopes to a less than 1 in 3 gradient. Tree whips would be planted individually in pits, as would larger specimens which would be staked with stakes orientated from downslope to upslope. Grass seed would not be used owing to the risks of seeds being washed away. Along edges turf may be used to stabilise the soil. Tree planting would be thinned and tree guards removed at the appropriate stages of development to ensure successful establishment. The detail of the earth bund construction and associated planting will be presented in the Landscape Management Scheme to be produced in line with Requirement 18 of the DCO.	Not relevant to Natural England.
14.8	Applicant	ES table 29.8: Worst case assumptions, the running track is assumed to be 6 metres wide and 60 km in length, to remain *in situ* for 2 years and the cable route enclosed by stock fencing.	The visual impacts of the running track and stock fencing associated with the onshore cable route have been minimised by the carefully considered siting of the onshore cable route, which sought to form the largest separation	Not relevant to Natural England.

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		Please explain how the visual impacts of such works would be minimised and how it would be controlled through the dDCO?	distances from settlements, roads and core paths as was practically possible (see Chapter 4 Site Selection and Assessment of Alternatives (document reference 6.1.4)). This approach ensured that the impacts on visual receptors, such as residents, road-users and walkers would be minimised. The visual impacts of the running track and stock fencing would be limited by the small scale nature of the components, the cultivated and settled nature of the landscape within which they would occur and the relatively flat and enclosed nature of the landscape which generally limits the extent to which the cable route would be visible from any one location. The presence of a 60km length over a 2 year period has been applied to represent the worst case scenario and it would be likely that sections would be removed within shorter periods of time. On the basis that the siting of the onshore cable route itself has minimised potential visual impacts, no further controls are proposed by way of DCO Requirements.	
14.9	Applicant	Worst case assumptions: the worst case in terms of the substation is some 19metres height for the buildings and 25 metres height in relation to the lightning protection masts. The photomontages indicate the Rochdale Envelope for the onshore project substation. Is the height of the box that is depicted set at 19m or 25m? Fences of 3.4metres around the substation are worst case assumptions in relation to the substation. Are these indicated on the photomontages? Are they permanent or temporary?	The height of the box in the photomontages that indicates the Rochdale Envelope around the onshore project substation is set at 25 metres to ensure the worst case scenario is represented. The 3.4m fences around the substation represent the permanent operational security fencing. These are indicated on the photomontages.	Not relevant to Natural England.
14.10	Applicant	The worst case scenario indicates that road widening associated with the A47 access junction would require the removal of existing roadside vegetation over a	The area of Dudgeon planting to be removed and replacement planting that is shown on Figures 29.11a and 29.11b of ES Chapter 29 Landscape and Visual Impact, which appear	No comments.

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		300metre length for a construction window of 24 months. Figure 29.11a depicts planting removals on the A47. The plan depicts areas of Dudgeon planting to be removed, some of which fall outside the onshore red line boundary of this project. How would these removals be controlled and how would replacement planting be secured? Have the effects of removal of Dudgeon mitigation planting been assessed in terms of the exposure of the existing substation and potential visual impacts?	outside of the Order limits, is incorrect. The extent of vegetation clearance required adjacent to the A47 – a sliver of land extending 300m eastwards along the A47 from the proposed new access junction - is fully captured within the Order limits. The majority of this vegetation to be removed is located within an existing 6m wide band of vegetation between the A47 and the Dudgeon planting. Figure 29.11a incorrectly depicts the vegetation clearance occurring within the Dudgeon planting only. As such, the vegetation that requires removal and the areas of replacement planting are fully captured within the Order limits. An updated copy of Figure 29.11a and 29.11b are provided as Appendix 14.1 to this submission (document reference ExA; WQApp14.1; 10.D1.3). The corrections to Figures 29.11a and 29.11b do not change the assessment findings presented within ES Chapter 29 Landscape and Visual Impact. The effects associated with the removal of Dudgeon mitigation planting within the Order limits have been considered in the visual assessment from the A47, considering the potential visual impacts of the onshore project substation, the National Grid substation extension and the existing substations. The impact assessment therefore remains valid.	
14.11	Applicant	The worst case assumptions for the construction of the onshore project substation indicate a construction window of 24 months, with road widening associated with A47 access junction requiring removal of roadside vegetation over 300m in length (see above). Paragraph 126 of ES 29.7.4 indicates that the onshore project substation ground preparation works would be done in one phase anticipated to take two years for pre-construction works and	The new access junction with the A47 at Spicers Corner will not be in place prior to the commencement of the pre-construction works, but will be the first works to be completed within the pre-construction works period, to facilitate access to the onshore project substation site. As outlined in response to question 14.11 the extent of vegetation removal and replacement required along the A47 is fully captured within the Order limits. Figure 29.11a of ES Chapter 29 Landscape and Visual Impact incorrectly depicts	No comments.

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		two years for primary works. Please confirm whether the access improvements would need to be in place prior to the commencement of the pre-construction works to facilitate HGV movements? Please also confirm the implications for replacement roadside planting and the likely timescales for such planting.	some of the vegetation clearance and replacement planting being required outside of the Order limits (within the Dudgeon planting east of the proposed new A47 junction access). The Dudgeon planting outside of the Order limits will in fact be untouched. As such there is no requirement to introduce any replacement planting in that location.	
14.12	North Norfolk District Council	See ES Chapter 29, table 29.9: do you agree with the assessment of likely effects relating to the landfall elements of the project?	Agree.	No comments.
14.13	Applicant	ES 29.7.5.2 refers to the effect on the landscape due to the temporary presence of the onshore cable route to include 4 trenches, construction of a running track and the formation of spoil heaps. Please indicate the likely locations (in broad terms) of the spoil heaps, their likely frequency along the route, their likely duration and whether they would be planted or seeded. Does the dDCO afford any control over such matters, as well as the maximum size and height of any spoil heap?	With reference to Section 5.5.2.3.1 of Chapter 5 Project Description, the onshore cable duct installation strategy is proposed to be conducted in a sectionalised approach in order to minimise impacts. Construction teams would work on a short length (approximately 150m section) at a time. Topsoil would be stripped and temporarily stored within each 150m section and subsoils stored separately also within the same 150m section. A typical cross section of the onshore cable route, including indicative locations of topsoil and subsoil storage, is shown on Plate 5.15 of ES Chapter 5 Project Description (section 5.5.2.2, document reference 6.1.5). As described within ES Chapter 21 Land Use and Agriculture the Soil Management Plan will be developed adhering to the following guidance - Defra (2009) Construction code of practice for the Sustainable Use of Soils on Construction Sites. This sets out that spoil heaps would not exceed 2m in height. Once the ducts have been installed in a 150m section the trenches would be back-filled with subsoils, and the stored topsoil re-distributed over the area of the 150m workfront, with the exception of the running track and any associated drainage.	Natural England are pleased to see that a Soils Management Plan, including method statements for soil handling, will be produced and agreed in advance and this should be legally binding on contractors. Please note that Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites has been withdrawn; our current advice is that you should continue to refer to the Construction Code as the best good practice guidance until further notice.

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			The time from topsoil strip to reinstatement would typically be two weeks in each 150m section. Spoil heaps would only ever store the soil from each 150m section being worked on and soil would be temporarily stored adjacent to the excavated trenches. The temporary nature of spoil heaps does not necessitate any requirement to seed or plant them. The approach to duct installation and commitment to developing a Soil Management Plan are set out in sections 2.5.1 and 8.1 respectively of the OCoCP (document reference 8.1) and secured through Requirement 20.	
14.14	Applicant	ES 29.7.5.2. The ES confirms that the reinstatement of ground at the mobilisation areas, trenchless crossing compounds, cable relay easements and haul roads and the reinstatement of hedgerows and trees would take place at the end of construction. This effectively means that earlier construction phases could potentially be left un-remediated until the end of all of the construction. It is appreciated that some elements would need to remain pending completion of construction but would it be necessary to leave all elements un-reinstated For example it is noted that the recreational route of the Wensum Way would undergo significant effects over localised areas, would these effects remain until the end of construction or could earlier reinstatement take place? In any event how would such works be secured in the dDCO?	Please refer to the response to question 14.13. The time from topsoil strip to reinstatement in each 150m section of the onshore cable route would typically be two weeks. The assessments have assumed a worst-case scenario that reinstatement would be conducted at the end of construction as the timing for interim/earlier reinstatement will be dictated by programming, construction progress and other factors. However, the construction method proposed allows for local reinstatement, where possible, prior to the completion of the overall constriction period. With reference to Section 5.5.2.3.1 of Chapter 5 Project Description, the sectionalised installation of the ducting allows for the land to be reinstated as far as possible (with exception to the running track for access) after each work section is complete (approximately 150m per week). With reference to response to Q11.29, each mobilisation area will be removed, and the land reinstated, when the duct installation works are completed for the associated cable route section. Similarly, with reference to paragraph 291 of Chapter 5 Project Description, trenchless crossing compounds, such as those in the vicinity of the Wensum Way, will be reinstated	No comments.

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			once the duct has been installed. Hedgerows, which are temporarily removed to enable the project, will also be reinstated as soon as possible. Replanting will be implemented, where possible, in the first winter after completion of the duct installation phase works in the associated cable route section, with the exception of the 6m gap required for the running track, where these need to be retained for cable pulling works. The 6m gap will be replanted following the cable pull phase. The approach to duct installation, including a commitment to reinstate each 150m section at a time, is set out in section 2.5.1 of the CoCP (document reference 8.1) and secured through the draft DCO Requirement 20.	
14.15	Applicant	ES 29.7.5.2: link boxes would be 1.5m x 1.5m per circuit and either buried to ground level or above ground as cabinets set along field boundaries. In the event that the link boxes are above ground; how would the design, colour and location of such infrastructure be controlled in the dDCO?	Link boxes are required approximately every 5km along the onshore cable route and would be positioned for ease of access typically adjacent to field boundaries or roads, in agreement with the relevant landowner. This is captured within the Design and Access Statement (document reference 8.3). The potential impact of the presence of above ground link boxes (as a worst case scenario) upon landscape and visual receptors has been assessed within ES Chapter 29 Landscape and Visual Impact Assessment (document reference 6.1.29). This determined that any impact would be limited by their small scale, their typically discreet locations and the infrequency at which they would occur across the landscape. As no significant impacts were identified, no specific mitigation was identified with regard to their design.	Not relevant to Natural England.
14.16	Applicant	ES table 29.10 identifies the most 'susceptible' hedgerows at highway crossing points near Aylsham (x3), on the crossing at Elsing Road and two crossing points on the	Onshore duct installation will be undertaken in a sectionalised manner with workfronts operating from mobilisation areas distributed along the cable route. Each workfront will work on a short	Natural England note that the loss of hedge trees in these locations is assessed as significant. We agree with the proposals to

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		B1145. The impact on these hedgerows is assessed as significant. If there are mature hedgerows on both sides of the highway these effects would be exacerbated. Please set out in detail the measures to be taken to mitigate these impacts over the immediate and longer terms. At these crossing points what is the length of hedgerow which would not be replaced due to an inability to replant over cable easements?	length (approximately 150m) each week to excavate, install ducts, backfill and reinstate, i.e. areas can be reinstated within 1-2 weeks of the works occurring. Following completion of the installation of the ducts, the hedgerows would be reinstated to infill the gaps. There is no requirement for a long-term easement to be retained and hedgerows can be planted directly above the buried cables. In some locations, a 6m gap in hedgerows will need to be retained for access for the subsequent cable pull phase. See further details in Section 5.5.3.1 of Chapter 5 Project Description with respect to crossing of hedgerows. Replanting will follow guidance within the Norfolk hedgerow Biodiversity Action Plan (BAP), i.e. species composition for north-east Norfolk (if on an existing line, and that line is straight: mostly hawthorn, with blackthorn, field maple; if curving or on a roadside or parish boundary: hawthorn, with blackthorn, field maple and occasional crab apple, hazel, spindle, ash and holly) (NBP, 2009). Guidance on hedgerow reinstatement is set out in the Norfolk Vanguard OLEMS (document reference 8.7) and will be detailed further in the Ecological Management Plan (EMP) and Landscape Management Scheme (LMS) which are secured under DCO Requirement 18, 19 and 24.	replant hedgerows with locally relevant species and with 2m margins to encourage biodiversity. Note that protection against browsing animals will need to be in place until the shrubs are established. We note that a moderate adverse residual effect on hedgerows and bats has been identified for the project as a whole (Table 22.32).
14.17	Applicant	Table 29.10: identifies trees most susceptible to the proposed project at three crossing points and confirms that significant effects would occur: Colby Road, north of Banningham Minor road near Hackford Hall Norwich Road, Swanton Morley In relation to each of these crossing points	Where the crossing points occur a width of 20m to 25m of tree planting would be removed from the tree belts. The 20m width of removal is indicative, depending on the angle of crossing. This width assumes that the onshore cable route bisects the tree belt in a perpendicular fashion. In reality, some tree belts would be crossed at an angle, therefore increasing the maximum width of the gap required up to a possible 25m in	No comments.

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		please provide further details regarding the quantum of tree planting likely to be affected, the proposed mitigation measures and identify those areas over cable easements where tree replanting would not be permitted.	some locations. With reference to Section 5.5.3.1.of Chapter 5 Project Description, the replanting of trees would not be permitted within the 20m to 25m cable easement. The replanting of hedgerows would be permitted within the cable easement and would follow guidance in the OLEMS and subsequent EMP and LMS as described in response to Q14.16. Mitigation measures are provided in the OLEMS in section 6.8.3, and include measures such as removal of vegetation timed to avoid bird breeding season (March to August inclusive). Where this is unavoidable, a check by the ECoW would be undertaken immediately prior to habitat removal to confirm there are no occupied nests. Outside of the cable easement, replanting of trees will be on a one for one basis with native species, preferably local origin. If required, drawings will be produced to show where replacements for trees will be provided, including details of species. If any tree or shrub planted within the first five years is removed, dies or becomes damaged or diseased, it will be replaced within the first available planting season. There will be an agreed procedure for joint annual inspection of all the planting areas by representatives of the relevant planning authority and the Applicant at the end of each growing season and for each year of the five year aftercare period. Areas found not to be thriving would be treated with additional works to rectify the situation. The total quantum of woodland that would be felled during the onshore works is 0.15ha of semi natural broadleaved woodland. This includes approximately four trees at each of the three crossing points listed opposite.	
14.18	Historic England	Do you concur with the assessment of the effects of construction of the onshore cable route (including mobilisation areas) upon	Our view is that the onshore cable route would result in harm to the significance of these assets during the construction phase, but consider that	Not relevant to Natural England.

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		heritage assets Salle Park and Blickling Hall as set out in table 29.10 in ES Chapter 29?	the impacts would be limited to the construction period and can be mitigated by ensuring the landscape is restored to its current or to an enhanced condition. Further mitigation would potentially be possible through careful management of the construction process, i.e. by limiting the construction activities in these areas. This would need to be detailed by the applicant in the construction management plan. Ensuring suitable application of any mitigation, and the successful restoration would also be a matter for the Local Planning Authority (LPA) and the landowners. The balance as to whether any enhancements offered by the applicant would offset the harm to the significance of these designated landscape assets would need to be determined by the examining authority as set out in Planning Policy.	
14.19	Applicant	Localised significant landscape character effects are predicted for visual receptors along highway routes where mobilisation areas would be visible from the roadside. For example road users of a section of approximately 800m of the B1146 would experience localised significant effects due to the open nature of the eastern roadside and the proximity of the mobilisation area to the roadside coupled with its extent along the roadside. The Outline Landscape and Ecological Management Strategy (OLEMS) confirms that hedgerows would be reinstated where possible post construction. Please confirm what efforts would be made to minimise the extent of hedgerow removal and any mitigation measures to ameliorate the visual effects of the mobilisation areas during their period of use.	The extent of hedgerow removal would be minimised with removal kept to the specified width of 20m to 25m. This width is reduced from the standard 45m width of the onshore cable corridor by omitting the soil storage areas from where hedgerow crossings occur. The mitigation measures to ameliorate the visual effects of the mobilisation areas during the period of use would relate to the careful planning of these sites, using existing vegetation to screen the larger components such as the fenced compounds, site offices, welfare facilities, heavy plant and material stores. The mobilisation areas are currently identified as mobilisation zones within which the mobilisation area will be located, thereby allowing a degree of flexibility to micro-site the final layout. Micro-siting will be used to mitigate visual effects, as well as respond to other environmental and technical constraints.	Replanting of hedgerows should take account of the requirement to protect against browsing mammals.
14.20	Norfolk County	Please comment upon the assessment of	Section 29.8.1 of ES Chapter 29 Landscape and	Not relevant to Natural England.

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	Council	effects of the onshore cable route as well as mobilisation areas and trenchless drilling compounds upon visual receptors (footpath users) in relation to Wensum Way, Marriott's Way and Paston Way, as well as the cycle routes, as summarised in table 29.10 ES 29. Do you consider that the provisions in the OLEMS and dDCO adequately secure mitigation and replacement planting measures?	Visual Impact Assessment sets out a detailed assessment of the potential cumulative impacts of the onshore cable route in combination with the Hornsea Project Three onshore cable route. No significant cumulative impacts have been identified related to the construction of both Norfolk Vanguard and Hornsea Project Three. As such, the Applicant has not identified any necessity to control the sequencing of the two projects in relation to landscape and visual impacts.	
14.21	Applicant/Orsted/Norfolk County Council	The onshore cable route would cross with the proposed Hornsea Project Three cable route to the north of Reepham. Please provide an assessment of the potential landscape impacts arising from the simultaneous construction of both projects in the same vicinity with compounds being located in the same vicinity and outline any measures which may be required to mitigate any impacts. Would it be possible to secure appropriate sequencing of construction activities? If so, how could this be achieved in the dDCO?	Section 29.8.1 of ES Chapter 29 Landscape and Visual Impact Assessment sets out a detailed assessment of the potential cumulative impacts of the onshore cable route in combination with the Hornsea Project Three onshore cable route. No significant cumulative impacts have been identified related to the construction of both Norfolk Vanguard and Hornsea Project Three. As such, the Applicant has not identified any necessity to control the sequencing of the two projects in relation to landscape and visual impacts.	No comments.
14.22	Applicant	See question 11.19 earlier Appendix 24.21 A47 Access Technical Note The different access options have differing environmental effects. Access A does not require any significant vegetation clearance whereas A1 requires the removal of 772m^2 of vegetation to allow for widening of the A47 and additional visibility splays. Access B requires vegetation clearance of the visibility envelope and A47 widening works. To what extent have these matters, and the different options, been taken into account in the LVIA and ecological effects	Option B has been considered in the LVIA in order to represent the worst case scenario. Option B would give rise to the most notable magnitude of change as a new junction would be created and this would involve the loss of an area of the Dudgeon mitigation planting as well as areas of the longer established road-side planting. Furthermore, it would create an opening which would increase visibility of the onshore project substation in the views of road-users on the A47, although closer range mitigation planting associated with the Norfolk Vanguard project would mitigate these effects within the first ten years post planting.	No comments.

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		assessments? Figure 29.11a depicts planting removals on the A47- to which option do these removals relate?	The planting removals on Figure 29.11a relate to Option B, however, as outlined in response to question 14.11 the extent of vegetation removal and replacement required along the A47 is fully captured within the Order limits. Figure 29.11a of ES Chapter 29 Landscape and Visual Impact incorrectly depicts some of the vegetation clearance and replacement being required outside of the Order limits (within the Dudgeon planting east of the proposed new A47 junction access). The Dudgeon planting outside of the Order limits will in fact be untouched. Updated versions of Figure 29.11a and Figure 29.11b are included as Appendix 14.1 to this submission (document reference ExA; WQApp14.1; 10.D1.3).	
14.23 - 25	The Applicant & Various Councils	Questions regarding visual receptors.		Not relevant to Natural England
15.	**Onshore Archaeology and Cultural Heritage**			This section is not relevant to Natural England
16.	**Geology, Ground Conditions, Drainage, Pollution and Flood Risk**			Natural England would defer to Environment Agency on this section.
17.	**Aviation and Radar**			This section is not relevant to Natural England
18.	**Land Use and Recreation**			This section is not relevant to Natural England
19.	**Socio-economic, Including Tourism**			This section is not relevant to Natural England
20.	**Content of the draft DCO (dDCO)**			
20.1	Applicant	The questions below refer to the submitted dDCO [APP-005]. Please provide an updated Explanatory Memorandum with each submitted update to the draft DCO (dDCO) in order to assist	The Applicant acknowledges this request and will provide an updated Explanatory Memorandum with each submitted update to the dDCO.	No comments.

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		everyone involved in the examination of the application.		
20.2	Applicant	The Project is proposed by the Applicant after consultation as a result of which it is proposed to deploy HVDC export infrastructure, however the dDCO does not stipulate the use for this technology. Justify the omission of such a requirement in the dDCO, and comment on whether if anything other than HVDC were to be used that would result in a different scheme which has not been assessed.	The draft DCO does not stipulate the use of HVDC export infrastructure. The Applicant considers that it is not necessary to do so as it would not be physically possible to construct an HVAC export system within the Order limits, as defined by the Work Plans and the Land Plans. For example, an HVAC transmission system would require a much wider cable corridor for the additional cables required. In addition, the description of the authorised development contained in Part 1, Schedule 1 of the dDCO does not refer to (or consent construction of) the additional infrastructure which would be required for an HVAC export system, such as a cable relay station and the additional number of cables which would be required. Further, whilst both HVAC and HVDC export systems were assessed for the preliminary environmental information report, only the HVDC export infrastructure was assessed under the Environmental Statement. Accordingly, the project to be consented is for an HVDC export infrastructure system only and an HVAC export system could not be constructed under the terms of the draft DCO, notwithstanding that there is no express requirement which restricts this.	No comments.
20.3	Applicant	Comment on the general criticism levelled by Natural England (RR's Appendix 5) at the volumes and figures presented in the dDCO relative to the content of the Environmental Statement, and the suggestion that the project description should contain tables clearly highlighting all worst case scenarios and reflecting the figures in the DML's.	Appendix 6.1 (document reference ExA; WQApp6.1; 10.D1.3) provides a summary of the relationship between design parameters in the draft DCO and Environmental Statement. The worst case scenarios are specific to the receptor and impacts and are therefore detailed in the relevant technical chapters.	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review this document. Natural England will therefore provide comment on this submission at Deadline 3.
20.4	MMO	Unexploded Ordnance (UXO) detonation is	The MMO recognises that this question was not	Whilst not raised in our response to

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		detailed within the ES (cf Appendix 5.2 - Norfolk Vanguard Detonation Effects of UXO and Appendix 5.4 - Underwater noise from UXO) but not referenced in the dDCO/DMLs. Explain in detail why you consider that a separate Marine Licence will need to be sought prior to construction, and why it is likely that a European Protected Species (EPS) licence will need to be applied for prior to any UXO detonation works.	directed the MMO, but wishes to note that the applicant has confirmed that it does not intend to seek permission for UXO clearance as part of the DCO application. However, part, 3, condition 2(5) of the transmission assets DMLs states: "In connection with such Works No. 2, 3, 4A and 4B and to the extent that they do not otherwise form part of any such work, further associated development comprising such other works as may be necessary or expedient for the purposes of or in connection with the relevant part of the authorised scheme and which fall within the scope of the work assessed by the environmental statement and the provisions of this licence." This implies that any activities associated with these works could be undertaken as long as they have been assessed in the ES, which could be interpreted as including UXO clearance. MMO considers that this wording should be reviewed to make it clear that UXO clearance is not permitted under the DCO application.	the same question, Natural England would support MMO position that that the wording should be reviewed to make it clear that UXO clearance is not permitted under the DCO application.
20.5	Applicant	Comment on NE's relevant representations (Appendix 5) as to the need for licences as suggested by NE in relation to UXO.	As discussed in the response to Q6.9, UXO clearance would be licenced separately once the nature and extent of UXO clearance is known. This would include European Protected Species (EPS) licencing as required. This is the approach that has been taken on other offshore wind farms to date e.g. East Anglia ONE and East Anglia THREE.	This response does not allay the concerns of Natural England that it is not possible to mitigate against the effects of the largest UXOs. Natural England still require the applicant to identify appropriate mitigation in order to rely on your assessment.
20.6	Applicant	Neither the dDML's nor the rest of the dDCO refer to an upper limit on hammer pile energy. Should the maximum hammer energy assessed in the ES be specified within the design parameters in the dDCO and all dDML's, and if not why not, having regard to Natural England's comments in their	The Applicant agrees that hammer energy should be referred to within the conditions in the DMLs. The Applicant is reviewing the proposed wording and the Applicant will submit a revised dDCO at Deadline 2 of the Examination timetable.	Natural England welcome the applicant's confirmation that this will be addressed at Deadline 2, however, we will hold comment on whether this has addressed our concerns until the document submitted for Deadline 2 can be reviewed.

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		RR's, suggesting that this is the best available means to ensure the noise generated from piling does not exceed that assessed within the ES?		
20.7	Applicant	Article 2 There appears to be no definition of "onshore transmission works". Please comment. Is it intended that they comprise those onshore transmission works identified in Works Nos 5, 6, 7, 7A, 7B, 7C, and 7D?	Article 2 of the dDCO defines "transmission works" as "Work Nos. 4C to 12 and any related further associated development in connection with those works". The Applicant is considering updating the definition to "onshore transmission works" in the revised dDCO to be submitted at Deadline 2.	No comments.
20.8	Applicant	Article 2 In the Interpretations section (p7) there is a different definition of 'maintain' than in the Model Order. Explain and justify the different text.	For offshore works, within the definition of 'maintain' contained in the dDMLs at Schedules 9 to 12 of the dDCO, the Applicant has adopted the definition of 'maintain' used in the recently made East Anglia THREE Offshore Wind Farm Order 2017. This definition clarifies that the ability to 'remove, reconstruct and replace' only applies for ancillary works in Part 2 of Schedule 1 and any component part of any wind turbine generator, offshore electrical station, accommodation platform or meteorological mast, but that it does not include the alteration, removal or replacement of foundations. This is consistent with the approach to maintenance assessed in the Environmental Statement and set out in the Outline Offshore Operations and Maintenance Plan (Document 8.11). The Applicant notes that this definition is not consistent with the definition of 'maintenance' contained in Article 2 of the draft DCO and therefore the definition of 'maintenance' in Article 2 will be amended to limit the ability to 'remove, reconstruct and replace' in the next version of the dDCO to be submitted at Deadline 2. This will be in line with the definition in the dDMLs for offshore works and will also seek to define the extent of onshore components which may be removed, reconstructed or replaced.	No comments

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20.9	Applicant	Article 2 Definition of "undertaker". In order to ensure that the DCO is binding upon any person to whom the benefit of the order is transferred the definition of 'undertaker' would need to be extended. Can the Applicant provide an updated definition or if not, justify why this would not be necessary?	Under Section 156 of the Planning Act 2008, an Order granting development consent made in respect of any land has effect for the benefit of the land and all persons for the time being interested in the land subject to any contrary provision made in the Order. The definition of "undertaker" is therefore defined as "Norfolk Vanguard Limited" in order to limit the application of Section 156 of the Planning Act 2008 accordingly. Article 6 deals with transfers of the benefit of the DCO and Article 6(8) states "where an agreement has been made in accordance with paragraph (1) or (2) references in this Order to the undertaker, except in paragraph (9), (10), or (12), include references to the transferee or lessee". Therefore, Article 6(8) has the effect of amending the definition of 'undertaker' and it is not necessary to replicate this in the definitions contained at Article 2 of the dDCO. The same approach has been adopted on other DCOs, for example in the case of the East Anglia THREE Offshore Wind Farm Order 2017 and the Hinkley Point C (Nuclear Generating Station) Order 2013.	No comments.
20.10	Applicant	Article 4 The dDCO provides for variations to accommodate an eventual project at Boreas. Justify the parameters set for the Authorised Development by explaining how in particular the extent of parameters relevant to Norfolk Boreas are not so wide ranging as to effectively represent different schemes in the terms of Advice Note 9.	Paragraph 4.16 of Advice Note 9 'Using the Rochdale Envelope' states, 'At the time the application is submitted, the parameters within the DCO should not be so wide ranging as to represent an effectively different Proposed Development from that which was consulted on and assessed in the ES. The Applicant is encouraged to make effort to limit the parameters applicable to the Proposed Development. The parameters used for the assessment need to be clearly defined in the DCO and therefore in the accompanying ES. This will simplify the assessment and give confidence that the Proposed Development	Natural England would support the applicant's response.

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			within the DCO (as built) would not result in significant effects beyond those assessed in the ES.' Whilst the parameters for the Authorised Development allow for enabling development for Norfolk Boreas, this enabling development has always been part of the Proposed Development and was consulted upon and assessed within the ES accordingly. Therefore the parameters will not permit a project, other than that consulted on and environmentally assessed as part of the Proposed Development to be built out.	
20.11	Applicant	Please provide a definition of "circuit" in Article (1) and include it within the dDCO.	Article 4(1) of the dDCO refers to limits of deviation "in carrying out the replacement of circuits as part of Work No. 11". In this context, the term 'circuit' refers to a set of three conductors (which together constitute a three-phase AC circuit) mounted onto a series of overhead line towers. The Applicant proposes to amend Article 4(1), replacing the phrase "replacement of circuits" with "overhead line modification". A definition of the latter term is already given in Article 2 of the dDCO. The term 'circuit' is also referred to in Schedule 1, Part 1, to describe the works which can be carried out in connection with Work No. 11 as follows: "the temporary diversion of overhead line circuits onto the temporary pylons" This will be amended in the dDCO to read: "the temporary diversion of the overhead line onto the temporary pylons"	No comments.
20.12	Applicant	Article 6 Article 6(5) requires the Secretary of State to determine an application for consent to	The Applicant refers to its response to Q20.110 below, which outlines reasons why the revised arbitration process is seen as fit for purpose and should be binding on all parties.	With regard to the arbitration provision in the DCO, arbitration conditions in the DML and the arbitration rules schedule, Natural

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		transfer the benefit of the Order within eight weeks from receipt of the application and Article 6(6) provides for arbitration in accordance with Article 38 if no such consent is received. Justify these provisions with particular reference to the discretion that resides in the Secretary of State to approve or not to approve an application to transfer the benefit of development consent orders and the public law remedies available in the event of dissatisfaction with a decision made by the Secretary of State.	In relation to the Secretary of State in particular, as the Applicant outlines in response to Q20.110, the arbitration article contained in Article 42 of the Infrastructure Planning (Model Provisions) (England and Wales) Order 2009 applies to "any difference" and all parties under a DCO. Section 120 (by way of reference to paragraph 37 of Part 1 of Schedule 5) of the Planning Act 2008 also prescribes that the submission of disputes to arbitration may be included in an order granting development consent. This reference is not qualified or conditioned and it does not exclude any party to a dispute. The Applicant considers that the ability to refer non-determination or refusal under Article 6(5) to arbitration reflects the guidance within the Planning Inspectorate's Advice Note 15 (Good practice point 3) which, amongst other things, states that: "It is recommended that a mechanism for dealing with any disagreement between the Applicant and the discharging authority is defined and incorporated in a draft DCO Schedule. For example, including arrangements for when the discharging authority refuse an application made pursuant to a DCO Requirement, or approve it subject to conditions or fail to issue a decision within a prescribed period. The mechanism could also address the fees payable for discharging the Requirements." The Applicant considers that the option to resort to judicial review (JR) does not provide for a suitable alternative mechanism for dispute resolution. In the case of non-determination, it is questionable whether the remedy of JR would be available to pursue given that no decision will have been made. In any event, a JR procedure can be very time consuming and costly for all	England does not believe the provision made for arbitration within this DCO is appropriate. As an SNCB appointed by the government through the NERC Act, Natural England cannot be bound by the findings of another organisation or individual such as is proposed within this provision. It is Natural England's responsibility to ensure that the natural environment is conserved, enhanced and managed. Within this role it is Natural England's duty to provide regulatory bodies with advice on plans or proposals with regard to their impact and nature conservation. Natural England is, therefore, unable to agree to a mechanism whereby its advice may be compromised or its ability to meet its responsibilities fettered by a third party. It is also noted that, within this provision, an award of costs may be made against Natural England. While it is acknowledged that the wording used is reasonably standard for arbitration agreements, Natural England considers that it is inappropriate for a Statutory Body to be subject to additional outside costs while performing the function government and legislation requires of it. In relation to the confidentiality clause of the arbitration schedule: Natural England is subject to the

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			parties. This is particularly relevant for offshore wind developments, which will be under strict time constraints to meet CfD milestones and who are working to meet the Government's ambition to achieve the lowest cost of energy whilst ensuring energy security and meeting carbon reduction commitments. The timescales for approval are referred to further in answer to Q.20.13 below; in this context, it is also worth noting that the parties can agree an extension to the 8 week determination period. This in itself would reduce the requirement for non-determination within agreed timescales which, in turn, would minimise the need to refer to arbitration.	requirements of the Code of Practice on Access to Government Information ("Code"), Freedom of Information Act 2000 ("FOIA") and the Environmental Information Regulations 2004 ("EIR"). Therefore Natural England may be obliged to release documents in response to an FOIA or EIR request including any file notes. In respect of any FOIA or EIR request, Natural England is responsible for determining at its absolute discretion whether any information it holds, whether commercially sensitive information or otherwise, is exempt from disclosure in accordance with the provisions of the Code, FOIA or the EIR or is to be disclosed in response to a request for information. Natural England cannot therefore guarantee confidentiality or agree to be bound by such a requirement.
20.13	Applicant	Explain separately why a period of eight weeks is stipulated in Article 6(5)	The timescale of eight weeks has been adopted from the Town and Country Planning Act 1990 (TCPA) regime. Section 27 of the Town and Country Planning (Development Management Procedure) (England) Order 2015 stipulates that local authorities (i.e. governmental statutory bodies who act in a similar role to the Secretary of State) must give notice of its decision (in relation to an application for any consent, agreement or approval required by a condition or limitation attached to a grant of planning permission) within a period of 8 weeks from the date the request was received. The position is similar in this regard as Article	Please see response to Qu 20.12 above.

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			6(5) acts as a condition or limitation attached to the grant of permission. The Applicant therefore considers that the time period for the Secretary of State to discharge an application for the transfer of the benefit of the Order under Article 6(5) should contain the same timescales as that provided for local planning authorities. This time period is designed to provide for an expeditious procedure in a nationally significant infrastructure project regime which, previously, provided little provision for the exact process for determination. It is worth noting that the TCPA wording also provides for appeals for non-determination to be made after the statutory time limit has expired with the agreement of the person making the application. The Applicant has therefore included this same provision ("unless otherwise agreed in writing with the undertaker") within Article 6(5). The same timeframe has also been stated within the Hornsea Project Three draft Development Consent Order.	
20.14	Applicant	Article 7 Article 7(2) excludes the operation of the Neighbourhood Planning Act 2017 relating to temporary possession or use of land and bespoke temporary possession provisions are written into the DCO. The 2017 Act appears to be designed among other matters to bring the general law into line with DCO orders and other orders that commonly make such provisions. Explain and summarise the significance of the differences in the bespoke provisions including the extent to which, if at all, they would adversely affect those who would otherwise be entitled to rely on provisions as	The relevant provisions of Part 2 (sections 18 to 23) of The Neighbourhood Planning Act 2017 (for this question only, the Act) are not yet in force and it is unclear whether or when they will be brought into force. No landowners, occupiers or third parties would be able to benefit from the Act's provisions if the dDCO did not exclude it. In any event, the Applicant has applied for provisions that are standard in most DCOs, and are well understood by practitioners, agents and contractors. The key difference between the provisions of the Act and the dDCO is the minimum notice period to be given before temporary possession can be taken. In Section 20 of the Act (which is not in	No comments.

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		drafted in the 2017 Act and to compensation.	force), the minimum notice period is three months. The dDCO requires a minimum of 14 days. As the Act is not yet in force, it is not yet clear that Parliament intends this notice period to be applied. The Act also provides, at Section 23, a counter-notice procedure for the benefit of freehold owners or leaseholders with a right to occupy. This may result in the land not being taken temporarily; being temporarily possessed for a maximum of 12 months if it forms part of a dwelling; or being temporarily possessed for no more than 6 years in other cases. In those circumstances the acquiring authority has the option to take permanent compulsory acquisition of the land rather than accept the counter-notice. The dDCO does not provide a counter-notice procedure. Those provisions of the Act are not in force so are not considered appropriate to apply to the dDCO. The Applicant is in discussions with all landowners and relevant occupiers to negotiate property agreements, which will include access provisions to allow for the surveying of land upon giving notice to the landowner; this should reduce or eliminate the need for counter-notices.	
20.15	Applicant	Article 7(2) refers to the temporary use of land for carrying out the authorised project and for maintaining the authorised project: should the articles referred to read, respectively, Article 26 and Article 27?	Yes, Article 7(2) should refer to Article 26 and Article 27 respectively with reference to the temporary use of land for carrying out the authorised project and for maintaining the authorised project. This will be corrected in the next version of the dDCO to be submitted at Deadline 2.	No comments.
20.16	Applicant	Article 11 Please explain how it is intended that stopped up streets will be used for mobilisation areas and identify what	The Applicant refers to its response to Q20.18 with respect to the intention for stopped up streets to be used for temporary working sites and the proposed amendment of the dDCO to	No comments.

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		consideration has been given to detailed design parameters, including control of such matters as stockpiling of materials, access, traffic management and boundary treatments, activities (such as crushing and sorting) undertaken within the mobilisation areas and the times during the day when such areas would be in use	amend the reference from 'mobilisation area' to 'temporary working site' to clarify the Applicant's intention Requirement 26 of the dDCO (document 8.01) outlines the secured construction hours associated with the onshore transmission works which includes the mobilisations areas. Furthermore, with respect to access and traffic management, the Applicant refers to Document 8.08 Outline Traffic Management Plan, Document 8.09 Outline Travel Plan and Document 8.10 Outline Access Management Plan. These plans are secured under Requirement 21 of the dDCO.	
20.17	Norfolk County Council	Regarding Article 11 have you considered the list of streets specified in column 1 of Schedule 4 for which there is a requirement for consultation, but not consent, that may be temporarily stopped up? Please comment thereon.	**Temporary stopping up of streets** This accords with the general principles for TTROs for closures etc. There is no requirement for vehicle access to property to be maintained, only pedestrian access. However, consideration must be made for emergency vehicles, and access for things such as medical supplies/services. Similarly access to businesses (farms etc) must be made, or alternatives agreed.	No comments.
20.18	Applicant	Article 11 Are Articles 11(2) and 11(5) effective to secure that sufficient notice will be given and consultation will take place with the relevant street works authority of any area proposed to be used as a mobilisation area not already identified within the Order? In relation to all mobilisation areas, please explain how the order would ensure that adequate details of the plant and equipment proposed to be installed in that location and the activities undertaken and duration of use would be controlled.	The main purpose of Article 11 is to allow the temporary stopping up of streets to enable ducts to be laid within the onshore cable corridor. Typically, only one carriageway of the street will be temporarily stopped up with traffic control measures (i.e. traffic lights) to minimise impacts on the highway network. Where streets are less than 7.2m kerb to kerb, it may be necessary to temporarily stop up the entire width of the street. However, the duration of the works will be limited to short periods, typically less than two weeks.	No comments.

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			Further details on this approach are set out in section 1.7.2 of the Outline Traffic Management Plan (Document 8.8). The purpose of Article 11(2), which allows the street temporarily stopped up to be used as a mobilisation area, is to enable the storage of materials and equipment required for those immediate works (i.e. as a temporary working area). Any storage of materials and equipment will be limited in scale by reference to the limitations on the areas identified in Schedule 4 and the period of temporary stopping up. Given the minimal scale and temporary nature of storage proposed it is considered that notification for locations which fall within Schedule 4, or the consultation period of 28 days for locations falling outside of Schedule 4, is reasonable and would be effective. Article 8 of the Hornsea Project One Offshore Wind Farm Order 2014 permits the use of any temporarily stopped up street as a temporary working site in this way. It is proposed to amend the next version of the dDCO (to be submitted at Deadline 2) to amend the reference from 'mobilisation area' to 'temporary working site' to clarify the Applicant's intention. It is considered that details of plant and equipment proposed to be installed at locations specified in Schedule 4, and activities undertaken and duration of use, can be controlled through the final Traffic Management Plan to be submitted in accordance with Requirement 21(1)(a) of the dDCO, and which must accord with the Outline Traffic Management Plan. Locations outside of Schedule 4 will be controlled in the same way, or through conditions which can be attached to the street authority's consent under Article 11(5)(b).	

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20.19	Applicant	Article 12 Article 12 appears to give the Undertaker power to form and lay out means of access to Works in predefined locations and otherwise in accordance with Requirement 22. Confirm whether it is intended that possession will have been taken of the requisite land or rights will have been acquired in accordance with the compulsory acquisition schedule before any such means of access is formed	In the first instance, the Applicant will seek to enter into voluntary agreements with landowners affected by means of access to works. Where voluntary agreements cannot be reached, temporary powers will be exercised to enable the construction of means of access (unless freehold acquisition is proposed, in which case temporary powers are not available). In some cases, for example the running track along the onshore cable route or other construction accesses, means of access will only be required during the construction period and compulsory powers to obtain permanent rights will not be exercised as it will be sufficient to rely on temporary powers alone. Where permanent means of access are created under temporary powers (and to the extent that a voluntary agreement cannot be reached), compulsory rights will be sought following construction of the means of access. This ensures that permanent rights are acquired only over the as built means of access. Where freehold acquisition is proposed, for example the means of access to the onshore project substation, temporary powers will not be exercised and, to the extent that a voluntary agreement cannot be reached, compulsory acquisition powers for the freehold of the land will be exercised prior to construction of the means of access.	No comments.
20.20	Norfolk County Council	Please comment on Article 12 and the 28 day deemed approval period set out in Article 12(2) with regard to the implications of a worst case scenario with regard to the safety and efficiency of the highway network. Do you accept that a deemed approval provision is appropriate?	28 day approval period We are able to confirm 28 days is an acceptable time scale to us.	No comments.
20.21	Applicant	Article 15	It is assumed the ExA refers to Requirement 15	No comments

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		Article 15 allows for the onshore transmission works to be carried out in one or two phases. Explain why the works could not be completed in a single phase, and comment on, and explain the extent to which, remedial and mitigation works carried out after an eventual first phase may have to be revisited on implementation of a second phase of works.	of the DCO relating to stages of authorised development onshore. As discussed in the Applicant's response to Q19.4, the key reasons for maintaining a two phase installation for the electrical works onshore (cable pulling along the cable route and population of electrical equipment at onshore project substation) is with respect to CfD auctions and potential supply chain capability, (also discussed further in Q20.22). The separation between the first and second phases onshore will be dictated by these aspects and aligned with the offshore construction works. Section 5.5.2.4.1 of ES Chapter 5 Project Description outlines the cable pulling process associated with the onshore transmission work phasing. Remedial and mitigation works carried out after an eventual first phase and which may have to be revisited on implementation of a second phase of works would involve the 20% of running track length that will be required to be reinstated between the phases and any temporary hardstanding at joint locations for pulling and jointing activities. The 20% of the running track which may require reinstatement for cable pulling is outlined in Table 5.31 of ES Chapter 5 Project Description and is derived from a review of the accesses required from the local public highways to accommodate the type and quantum of vehicles required for cable pulling activities.	
20.22	Applicant	Provide a Gantt chart or similar plan that illustrates the Project schedule and explains the dependency relationships between the possible phases and stages of the authorised development for onshore Works, and a single or twin offshore phase of Works including the possible transfer of generation assets. The plan should include	The following notes should be read together with the Gantt chart provided as Appendix 20.1 (document reference ExA;WQApp20.1;10.D1.3). Vattenfall intends to construct the Norfolk Vanguard and Norfolk Boreas projects using a sequential, modular approach. The two projects (3,600MW of capacity in total) will comprise either 3 or 4 similar but distinct offshore wind	No comments

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		remediation and compensatory measures and other contingency provisions and the overall timescale of the Project.	farm 'units'; each unit is independent from the other units, and each unit can be brought into service at a different time. The construction of each unit will take up to 4 years. It is likely that construction of consecutive units will be phased, with an interval of 12 months between the start of works for each unit. Each 'unit' will comprise its own HVDC transmission link to the onshore transmission system, as well as the wind turbines themselves. The transmission link will be constructed and commissioned before the turbines are installed. This ensures that all WTGs can be commissioned and brought into service quickly after installation. In order to minimise the onshore impacts of the two projects, Vattenfall is proposing to execute some strategic onshore enabling works at the start of the construction process. These works are detailed in response to Q2.3. Following these enabling works, the electrical infrastructure installation onshore (e.g. cable pulling and electrical plant at the onshore project substation) may be completed in one or two phases, in line with offshore electrical works. Requirement 15 of the dDCO secures the requirement that the onshore transmission works may not be commenced until notification has been submitted to the relevant planning authority detailing whether the onshore works will be constructed in a single onshore phase or in two onshore phases.	
20.23	Applicant	Article 16 appears to overlap with Section 53 Planning Act 2008 which provides for entry onto land for surveys to be undertaken in connection with, in effect, this dDCO. Summarise and explain the differences in the bespoke provision justifying where	Section 53 of the Planning Act 2008 includes a process to obtain access for land to carry out surveys in respect of a proposed DCO and also once a DCO has been made, subject to obtaining authorisation from the Secretary of State. Article 16 in the dDCO provides a survey power to be used at the Applicant's discretion	No comments.

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		relevant the need for the additional provisions.	(within the limitations of the power) once the DCO has been made. These survey powers are standard practice in DCOs. The Applicant's experience is that Section 53 would most likely be used where there was a need to carry out extensive environmental surveys on land, but the owners of that land were resistant to permitting this in a sufficient timescale. The power in Article 16, in contrast, will only apply to land that has already been the subject to land referencing, the service of all appropriate statutory notices, and compliance with the relevant procedures to assess and approve the DCO application. Section 53 of the PA2008 requires a further Secretary of State approval whereas including Article 16 in the dDCO means that if made in that form the Secretary of State in making the DCO will have approved the power to enter onto land for surveys. There are no substantive differences between the power in Section 53 and Article 16 save that Section 53 applies a criminal sanction for parties who wilfully obstruct the exercise of the powers whereas Article 16 does not.	
20.24	Applicant	Article 16 The onshore detailed design parameters make references to ground level and define the level differently for different parts of the Works. Please justify this approach and comment on whether ground levels should be defined before commencement of works and at the end of the works all levels to be same as original ground levels, and if so how this should be secured.	The Applicant has assumed that the Examining Authority is referring to Requirement 16 – Detailed design parameters onshore, rather than Article 16. Existing ground levels have been defined within Requirement 16 of the dDCO for the proposed locations of the onshore project substation (Work No. 8A), the National Grid substation extension (Work No. 10A), and the east and west overhead line towers (Work No.11). The need to refer to existing ground levels in these instances is because the installed height of each	No comments.

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			of these pieces of infrastructure has been assessed and defined in relation to the existing ground level. For example, the dDCO defines that the installed onshore project substation must not exceed 19m above existing ground level, which means 71 metres above ordnance datum (Requirement 16(5) and 16(8)). As such, it is essential to define the existing ground level at this stage through the dDCO to ensure that the height of the installed onshore project substation remains within the assessed envelope. The existing ground levels are not specified with a view to reinstating ground back to that original level, as these locations will have new permanent above ground infrastructure located on them. The Applicant therefore considers that the wording should remain as is currently drafted.	
20.25	Applicant	Confirm whether a topological or contour survey has been undertaken in respect of any of the Order Limits and if so which parts. Please provide a topological survey of the areas proposed for the substation and extension to the existing substation.	An aerial photogrammetry topological survey was undertaken in February 2017 of the onshore cable corridor as identified at that time, including additional ecology survey buffer widths. This survey in relation to the onshore project substation and extension to the existing National Grid substation is provided in Appendix 20.2 of this submission (document reference ExA; WQApp20.2; 10.D1.3).	No comments.
20.26	Applicant	Article 23 amends for the purposes of the Order, Schedule 2A of the Compulsory Purchase Act 1965, such that the counter-notice provisions in that schedule that are available to landowners, where only part of land is acquired compulsorily, do not apply where the land has only been taken possession of under the temporary possession powers set out in Article 26 or Article 27. Justify the inclusion of this	The wording is intended to provide clarity. The new Schedule 2A is intended to apply to permanent compulsory acquisition, as it refers (for example in part 1, paragraph 1(a) and (b)) to notices to treat, but refers in a number of places to "possession". The Applicant considers that if Parliament currently intended for counter-notice provisions to apply to temporary possession powers, the clear way to do this would be to bring into force	No comments.

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		additional provision.	Part 2 of the Neighbourhood Planning Act 2017.	
20.27	Applicant	Article 27 Under Article 27 any land within the Order Limits, except (a) any house or garden belonging to a house; or (b) any occupied building (other than a house) which is reasonably required for the purpose of maintaining the authorised project may be entered and/or temporarily possessed. Provide a plan or plans that show the extent of land excluded from the scope of Article 27.	No land is currently excluded from temporary powers for maintenance as a result of the scope of Article 27. This is because, to the Applicant's knowledge, there is no land within the Order limits which includes (a) a house or garden belonging to a house, or (b) an occupied building other than a house, for which entry and/or temporary possession will be required for maintenance purposes. Notwithstanding this, the Article is required in case this position changes over time. Accordingly no plan has been provided. However, it should be noted that: 1. new rights are sought over an entrance driveway at Plot 02/20 (this is not considered to fall within the term 'house or garden'); and 2. temporary rights are sought over an area used for storage of grain at Plot 18/15 and 18/16, as shown by blue shading on sheet 18 of the Land Plans (Document Reference 2.2). The Applicant proposes to use these plots temporarily for the storage of cable pulling equipment and cable drums during construction. This process is outlined in more detail in response to Q11.25. The Applicant is currently seeking heads of terms with both of the above land interests. Save for the inclusion of a new paragraph (4) relating to the requirement for notice in the case of emergency, Article 27 follows the form of Article 29 (Temporary use of land for carrying out the authorised project) contained in the Infrastructure Planning (Model Provisions) (England and Wales) Order 2009.	No comments.
20.28	Applicant	Clarify what is meant by “garden” in Article 27 with reference to the concept of domestic curtilage, and whether or not it is	It is the Applicant's intention to seek powers of temporary possession where required over the curtilage of non-domestic buildings. The	No comments.

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		intended that land forming part of the non-domestic curtilage of a building is to be excluded from the scope of Article 27.	intention is to exclude the availability of temporary possession powers over domestic houses, the gardens of domestic houses which would be within the curtilage, and occupied non-domestic buildings. In any event, as is explained in response to question 20.27, to the Applicant's knowledge, there is no land currently within the Order limits which includes (a) a house or garden belonging to a house, or (b) an occupied building other than a house, for which entry and/or temporary possession is required during maintenance.	
20.29	Applicant	The Explanatory Memorandum [APP-006] appears to state that Article 27 would operate for a period of five years from the date on which "that part of the authorised development is first used". Is it intended that more than one maintenance period may occur in respect of use commencing of separate parts of the Project, bearing in mind that Article 27 (12) appears to refer to a single date, being that when the authorised project first exports electricity to the national electricity transmission network?	The maintenance period is intended to be the single date referred to in Article 27(12).	No comments.
20.30	Applicant	Provide examples of scenarios in which it is envisaged that temporary works would be necessary over the land affected and confirm where the worst case scenario in terms of the nature and maximum duration of works has been evaluated in the Environmental Statement.	Temporary works may be necessary for the maintenance of the cables within the Order limits in the event of a cable fault and subsequent repair requirement. These works would be similar in nature to a single cable pull and joint exercise at the faulted cable which is assessed within the Environmental Statement and detailed within Section 5.5.2.4.1 of Chapter 5 Project Description. Where relevant, potential effects of maintenance activities have been considered within the assessment of operational impacts. For example ES Chapter 21 Land Use and Agriculture section	No comments.

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			21.7.6.2 which discusses operational changes to land use. The worst case scenario for these potential maintenance works is described therein and evaluated.	
20.31	Applicant	Article 29 Should Article 29(a) read “limits of the land” instead of “limits to the land”?	The Applicant is content to amend the dDCO to state "limits of the land".	No comments.
20.32	Applicant	Article 38 Is it intended that any dispute or non-approval in relation to any matter referred to in the deemed marine licences be referred to arbitration in accordance with Article 38 and if not please explain why?	Yes, the dDCO allows for any dispute or non-approval in relation to any matter referred to in the deemed marine licences to be referred to arbitration in accordance with Article 38.	With regard to the arbitration provision in the DCO, arbitration conditions in the DML and the arbitration rules schedule, Natural England does not believe the provision made for arbitration within this DCO is appropriate. As an SNCB appointed by the government through the NERC Act, Natural England cannot be bound by the findings of another organisation or individual such as is proposed within this provision. It is Natural England’s responsibility to ensure that the natural environment is conserved, enhanced and managed. Within this role it is Natural England’s duty to provide regulatory bodies with advice on plans or proposals with regard to their impact and nature conservation. Natural England is, therefore, unable to agree to a mechanism whereby its advice may be compromised or its ability to meet its responsibilities fettered by a third party. It is also noted that, within this provision, an award of costs may be made against Natural England. While it is acknowledged that the

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				wording used is reasonably standard for arbitration agreements, Natural England considers that it is inappropriate for a Statutory Body to be subject to additional outside costs while performing the function government and legislation requires of it. In relation to the confidentiality clause of the arbitration schedule: Natural England is subject to the requirements of the Code of Practice on Access to Government Information ("Code"), Freedom of Information Act 2000 ("FOIA") and the Environmental Information Regulations 2004 ("EIR"). Therefore Natural England may be obliged to release documents in response to an FOIA or EIR request including any file notes. In respect of any FOIA or EIR request, Natural England is responsible for determining at its absolute discretion whether any information it holds, whether commercially sensitive information or otherwise, is exempt from disclosure in accordance with the provisions of the Code, FOIA or the EIR or is to be disclosed in response to a request for information. Natural England cannot therefore guarantee confidentiality or agree to be bound by such a requirement.
20.33	Applicant	Article 40 What provision is made for abatement of	Onshore decommissioning is controlled under Requirement 29 of the dDCO which provides as	No comments.

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		works or site restoration in relation to abandoned or decayed onshore works?	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 decommissioning plan must be implemented as approved." In relation to reinstatement and restoration following construction, certain requirements of the dDCO relate to restoration and reinstatement proposals to be submitted for approval. For example, Requirement 18(2)(e) requires the Landscape Management Scheme (which must accord with the Outline Landscape and Ecological Management Strategy (document 8.07)) to include 'retained historic landscape features and proposals for restoration, where relevant'. Requirement 25(1) requires a scheme and programme for crossing, diversion and reinstatement of any designated main river or ordinary watercourse. In addition, some outline plans note that restoration may be required in certain circumstances. For example, paragraph 56 of the Outline Written Scheme of Investigation (Onshore) (document 8.05) states that, "Built heritage / historic building surveys and recording may also be required at certain targeted locations as part of the post-consent initial informative stages mitigation, and could result in subsequent, additional mitigation, as required, in the form of further conservation and restoration requirements". The OLEMS also refers to restoration and reinstatement in the context of [various sections listed in original response]. In relation to the exercise of temporary powers for possession of land, restoration is controlled under Article 26(4). This requires the removal of	

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			temporary works and restoration of the land to the landowner's reasonable satisfaction before possession of the land is given up.	
20.34	Applicant	Schedule 1 The project is not subject to a requirement to carry out all or any of the Authorised Development, for example Schedule 1 Part 1 refers to “up to 200 wind turbine generators” comprised within Work No 1. The Explanatory Memorandum [APP-006] at 4.28 states it is lawful for less than the full extent of the consent to be constructed, as long as what is constructed is in accordance with the requirements of the consent. Justify this statement in 4.28, distinguishing long standing principles from legal authority relied on	Paragraph 4.28 of the Explanatory Memorandum (document 3.02) referred to is part of a section which addresses the question of whether a minimum number of turbines should be specified. There are a number of reasons why specifying a minimum number of turbines would not be appropriate. The capacity of the project itself is "an offshore generating station with an electrical export capacity of up to 1,800MW…comprising up to 200 wind turbine generators" and "up to two accommodation platforms", "up to two meteorological masts" and so on. The project definition does not set out the full extent of consent to be constructed. The Undertaker will therefore have freedom within the specified parameters as to the number of wind turbines installed, the size of turbines, the resulting electrical export capacity of the generating station (up to 1,800MW), the extent to which the area within the Order limits is used, the precise layout of turbines, accommodation platforms, meteorological masts and offshore electrical platforms, and the arrangement of cabling between turbines, accommodation platforms, meteorological masts and offshore electrical platforms. The Undertaker will also have flexibility with regard to the configuration and specification of the HVDC export infrastructure. It is inherent in this type of project that there will be variations in turbine numbers and scheme layout and this flexibility, which has previously been critical to the development of wind farms in the UK, is fundamental to whether the Order is fit for purpose.	No comments.

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			The use of flexibility in project details within an Order is expressly endorsed by National Policy Statements EN-1 (at paragraphs 4.2.7 – 4.2.10) and EN-3 (at paragraphs 2.6.42 – 2.6.45) provided the resulting variables are fully assessed in terms of worst case effects. Even if the project were to specify the full extent, it would be open to the Applicant to implement the project in part provided (as Advice Note 9 states) the parameters are not "so wide ranging as to represent effectively different schemes". Reference is made to the Planning Encyclopaedia P94.04. In R (Robert Hitchins Limited) v Worcestershire County Council (2015) EWCA CIV 1060, Richards LJ explained that "where a development has been begun in accordance with planning permission but has not been completed, Section 94 of the 1990 Act permit the local planning authority in defined circumstances to serve a completion notice stating that the planning permission will cease to have effect at the expiration of a further period specified in the notice. This implies that a development may be commenced but not completed yet still remain lawful, since otherwise there would be no need for the notice provisions: the local planning authority could rely instead on its normal powers of enforcement in respect of unlawful development". It is not necessary to impose a minimum to ensure the project exceeds the Nationally Significant Infrastructure Project (NSIP) threshold of 100MW as that threshold is defined on what the capacity of the scheme is expected to be at the point of application and consent. It must be open to doubt whether setting a minimum number of turbines as a parameters	

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			would either be reasonable or enforceable. Government Guidance on Planning Conditions 6 March 2014 advises that "conditions requiring a development to be carried out in its entirety will fail the test of necessity by requiring more than is needed to deal with the problem they are designed to solve. Such a condition is also likely to be difficult to enforce due to the range of external factors that can influence a decision whether or not to carry out and complete a development." There can be no EIA justification for seeking to impose a minimum turbine requirement since the fewer the number of turbines the lesser the impact. No DCO consent for an offshore wind farm has been granted with a minimum number of turbines specified for all the above reasons.	
20.35	Applicant	The inter-tidal area, in which Work No 4B is proposed, appears to fall within the jurisdiction of the MMO and North Norfolk District Council (Ex Memo 4.12). (i) Confirm whether jurisdiction only exists and is to be exercised in relation to the discrete powers and duties of the respective bodies including those that stem from the DCO, explaining the remit of the respective bodies. (ii) Identify any concurrent jurisdiction over aspects of the Work, or possible exercise of independent jurisdictions over the same subject matter, and if there are any, provide details.	The discrete powers and duties of the relevant planning authority pursuant to the DCO requirements relate to the "onshore transmission works" which are defined as "Work No's. 4C to 12 and any related further associated development in connection with those works". Work No. 4C is "landfall transmission works consisting of up to two transition jointing pits and up to four cables to be laid in ducts underground and associated fibre optic cables laid within cable ducts underground from Mean High Water Springs (MHWS) at Work No. 4B to Work No. 5". In general therefore, the relevant planning authority's jurisdiction under the DCO requirements extends landward of MHWS. The only exception is Requirement 17 (Landfall method statement) which provides for prior approval by the relevant planning authority of a method statement for construction of Works No. 4A, 4B and 4C (i.e. including works below	No comments.

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			MHWS in the form of 4B – export cables between MHWS and Mean Low Water Springs (MLWS), and 4A – export cables seaward of MHWS) to include measures for long horizontal directional drilling below the coastal shore platform and cliff base at the landfall. The discrete powers and duties of the MMO pursuant to the DML conditions extend seaward of MHWS. They relate to the "authorised scheme" which is defined as "Work Nos. 2, 3, 4A and 4B", and the "licensed marine activities" set out in paragraph 1 of Part 3 of the DML.	
20.36	Applicant	Comment on the RYA's concerns [RR-019] as to (i) a possible reduction in water depth at the cable landfall area where the cable comes within the 10m contour; (ii) issues where the cables cross other wind farm export cables and other inland waterways on route to the onshore Grid connection and the request for RYA to be consulted with respect to this matter.	Within ES Chapter 15 Shipping and Navigation, the Applicant commits to a Cable Burial Risk Assessment to be undertaken post-consent. The Cable Burial Risk Assessment is secured in DML Condition 14(1)(g) (Generation DMLs, Schedule 9-10) and Condition 9(1)(g) (Transmission DMLs, Schedule 11-12) - Cable Specification, Installation and Monitoring Plan. The Cable Burial Risk Assessment will be under taken pre-installation of the offshore cables and will include consideration of under keel clearance including at sensitive cable crossing points. All subsea cables will be suitably protected based on the risk assessment, and the protection monitored and maintained as appropriate. As noted in the SoCG with the RYA, the RYA are content that the post-consent Cable Burial Risk Assessment will address concerns associated with reductions in water depth by ensuring that an effective assessment is undertaken, and burial/protection is in line with MGN 543.	No comments.
20.37	Applicant	Justify the need for ongoing operational safety zones for floating offshore wind turbines outside of construction, major	As discussed in response to Q8.1, the Applicant is not proposing to apply for operational safety zones for any of the wind turbine foundation	No comments.

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		maintenance and decommissioning periods, or manned structures during operation.	types. As stated in Section 4.6 of ES Chapter 15 Shipping and Navigation, an application will be made for the following standard safety zones (to be submitted post consent and as detailed in the Safety Zone Statement (document reference 7.2)) which may comprise the following: • A 500 metre radius around individual OREI and their foundations whilst work is being performed as indicated by the presence of construction vessels; • A 500 metre radius around all major maintenance works being undertaken around the wind turbines and their foundations, and • A 50 metre radius around individual OREI and associated foundation structures whether they be installed and operational, or complete or incomplete but awaiting commissioning. As stated in the SoCG with the RYA (Rep1 - SOCG - 14.1), the Applicant may also include the provision within the safety zone application for 500m operational safety zones around accommodation platforms. As per the SoCG, the RYA does not generally support operational safety zones, however they do not object to their use around permanently manned accommodation platforms. No other operational safety zones are being considered once the wind farm is operational.	
20.38	Applicant	Works Nos. 6 – 7D refer to "onshore transmission works consisting of up to four cables to be laid in ducts and up to four additional cable ducts for the Norfolk Boreas offshore wind farm". However Chapter 5 of the ES [APP-329] refers in multiple locations, including at Table 5.32 which summarises the onshore cable route parameters, to a maximum of four cable trenches to be installed in	With reference to Plate 5.16 of ES Chapter 5 Project Description, each trench will accommodate two ducts to house an electricity power cable in each. With reference to Table 5.32 of ES Chapter 5 Project Description, a maximum of four cable trenches are to be installed in relation to both Norfolk Vanguard and Norfolk Boreas, each trench comprising of two ducts for electricity power cables. There will therefore be up to four	No comments.

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		relation to both the Proposed Development and the Norfolk Boreas project, likely to be two ducts for the four cables of the Proposed Development and two ducts for Norfolk Boreas. Please clarify the apparent discrepancy.	ducts for four electricity power cables installed in two trenches associated with Norfolk Vanguard and up to four ducts for four electricity power cables installed in two trenches associated with Norfolk Boreas. Plate 5.15 of ES Chapter 5 Project Description depicts this arrangement with two ducts per trench and two trenches for each of Norfolk Vanguard and Norfolk Boreas. It should be noted that there is an error at Work No.5 of the dDCO, which refers to 'two additional cable ducts for the Norfolk Boreas offshore wind farm', and this will be corrected to 'four additional cable ducts' in the revised draft DCO to be submitted at Deadline 2.	
20.39	Applicant	Schedule 1, Part 2 Of the Ancillary works referred to in (a) (b) and (c) clarify precisely which works or structures are intended to be temporary, by what periods will they be defined as temporary, and explain what assessment has been made of their impacts as recorded in the Environmental Statement.	Schedule 1, Part 2 refers to the following Ancillary works: (a) temporary landing places, moorings or other means of accommodating vessels in the construction and/ or maintenance of the authorised development; • The footprint associated with vessel anchors and jack-up barges has been assessed in the relevant offshore technical chapters as a component of the total footprint of temporary habitat disturbance during construction and maintenance (e.g. see Table 10.12 of ES Chapter 10 Benthic Ecology). (b) beacons, fenders and other navigational warning or ship impact protection works; • Navigational warning aids constitute mitigation of impacts in relation to shipping and navigation and are considered in ES Chapter 15, Section 15.7.1 Embedded Mitigation. The assessment takes account of the following mitigation by design: o Final site design to include consideration of lighting and marking. Suitable lighting and marking of the OWF sites complying with International Association of Marine Aids to	No comments.

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			Navigation And Lighthouse Authorities (IALA) Recommendations O-139 (IALA, 2013), to be finalised in consultation with TH and the MCA; o Structures and all cables (offshore export and array) to be clearly marked on appropriately scaled nautical charts and electronic charts; o Use of guard vessel during the deployment of safety zones, and during any other key construction periods. (c) temporary works for the benefit or protection of land or structures affected by the authorised development. • As discussed in response to Q20.30, temporary works may be necessary for the maintenance of the transmission works within the Order limits in the event of a cable fault and subsequent repair requirement. These works would be similar in nature to a single cable pull and joint exercise at the faulted cable which is assessed within the Environmental Statement and detailed within Section 5.5.2.4.1 of Chapter 5 Project Description and typically concluded within five weeks per repair. Where relevant, potential effects of maintenance activities have been considered within the assessment of operational impacts. For example Environmental Statement Chapter 21 Land Use and Agriculture section 21.7.6.2 which discusses operational changes to land use. The worst case scenario for these potential maintenance works is described therein and evaluated. Such activities would be highly localised, temporary and of short duration.	
20.40	Applicant	Requirement 2 states that the wind turbines will not exceed a height of 200m when measured from HAT. However Table 5.7 of the ES states that the maximum hub height of the turbines will be 198.5m above HAT. If	The dDCO will be updated to reflect a turbine hub height of 198.5m and resubmitted at Deadline 2.	Natural England raised similar concerns in its Relevant Representation [RR-106} and acknowledge that the applicant will seek to amend this for Deadline 2.

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		198.5m is what has been assessed should this not be inserted into the dDCO?		
20.41	Applicant	In Requirement 5 with regard to cable protection, should the area of impact be stated as well as the volume, and in respect of scour protection?	The Applicant notes this question and the Applicant will amend the table at Part 3, Requirement 5 of the dDCO to include a further column detailing the maximum parameter for the area (in m2) of cable protection and scour protection. This will be reflected in the next version of the dDCO which will be submitted at Deadline 2 in accordance with the Examination timetable.	Natural England raised similar concerns in its Relevant Representation [RR-106} and acknowledge that the applicant will seek to amend this for Deadline 2.
20.42	Applicant	Explain (i) why Requirement 11, with regard to scour protection, does not provide figures for individual turbines, and (ii) whether scour protection should be defined, as suggested by MMO [RR-186] for individual structures and aligned with the ES, and if not why not?	(i) The impacts of scour protection are assessed in Chapter 8 Marine Geology, Oceanography and Physical Processes of the ES, and Chapter 10 Benthic and Intertidal Ecology of the ES. The ES considers scour protection and foundation structures combined in order to provide a conservative and meaningful assessment (i.e. scour protection would never be installed in the absence of the foundation structure). The figure in Requirement 11 of the dDCO is the total volume of scour protection provided for the wind turbine generators, accommodation platform, meteorological masts, offshore electrical platforms and LIDAR measurement buoys. The volume must not exceed 53,195,398m3. This figure is based on the assessment of the worst case scenario. Up to a maximum of 200 wind turbine generators have been assessed in the ES but it is not yet known how many turbines will be constructed (up to the maximum of 200). It is therefore not necessary or feasible, at this stage, to define the exact parameters for each turbine. (ii) Indicative details of scour and cable protection are included in the Outline Scour Protection and Cable Protection Plan (document 8.16). The details within the outline plan are based on information which is currently	Schedule 1 Part 3 Requirement 11. Scour protection is given as a total volume for the entire project 53,195,398m2 however ES project description page 24 table 5.6 has total worst case OWF footprint as 11,597,165m2. Given this second figure includes scour protection as a worst case figure for the OWF clarification is required on the figure within the DCO. Additionally the DCO and DMLs should further split maximum scour protection areas out for individual structures. A mass total is not appropriate to ensure scour protection is installed within the predicted maximums. The amounts of scour and cable protection permitted should be recorded and limited on the consents using both volume of material and area of impact. Natural England has recent experience on a UK offshore windfarm where the developer only adhered to volume on the licence. This led to an impact that was several times the area assessed

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			available. The precise detail of the scour and cable protection will be secured, prior to commencement of licensed activities, through the final Scour Protection and Cable Protection Plan pursuant to Condition 14(1)(e) of the Generation DMLs (Schedule 9 and 10) and Condition 9(1)(e) of the Transmission DMLs (Schedules 11 and 12). The Scour Protection and Cable Protection Plan must be submitted to the MMO for approval. Comments regarding cable protection are also addressed in the Statement of Common Ground with Natural England (Rep1 - SOCG - 13.1) and the MMO (Rep1 - SOCG - 11.1) respectively.	(but within the volume assessed). Therefore, the use of volume alone is no longer considered appropriate. This also applies to figures given within the DMLs.
20.43	Applicant	Requirement 13 (2) Mitigation is offered in respect of wind turbine generators that may affect Ministry of Defence surveillance operations. If the Examining Authority concludes that there will be some adverse effects, and the mitigation offered or agreed with MoD is deemed acceptable, is the drafting adequate to allow for such appropriate mitigation that will not necessarily "prevent or remove" in their entirety those effects?	Requirement 13 of the dDCO restricts development until a suitable mitigation scheme for the Remote Radar Head (RRH) Trimingham is agreed and implemented for the lifetime of the project. The Secretary of State must determine, in consultation with the MoD, whether the mitigation is appropriate. Appropriate mitigation is defined in the dDCO as "measures to prevent or remove any adverse effects which the operation of the authorised development will have on the air defence radar at Remote Radar Head (RRH) Trimingham and the Ministry of Defence's air surveillance and control operations." Accordingly, the Secretary of State may only confirm satisfaction of the mitigation if it prevents or removes adverse effects in their entirety. This decision will be a matter of judgement for the Secretary of State, in consultation with the MoD. The Applicant does, however, take on board the Examining Authority's comment and the Applicant agrees that the wording of the Requirement should be amended to allow for such appropriate and agreed mitigation that will not necessarily prevent or remove in their	No comments.

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			entirety those adverse effects. The Applicant will seek to clarify in the next iteration of the dDCO at Deadline 2 of the Examination. The Applicant proposed a mitigation solution to the MoD on 23 December 2018 and is currently in discussions with the MoD in relation to this and to agree a suitable form of wording for the amended DCO Requirement. This is noted in the SoCG with the MoD (Rep1 - SOCG - 28.1). The mitigation proposal offered to the MoD is aimed at removing entirely any effect that wind turbine generators will have on MoD surveillance operations.	
20.43	MMO	Requirement 13 (2) Mitigation is offered in respect of wind turbine generators that may affect Ministry of Defence surveillance operations. If the Examining Authority concludes that there will be some adverse effects, and the mitigation offered or agreed with MoD is deemed acceptable, is the drafting adequate to allow for such appropriate mitigation that will not necessarily "prevent or remove" in their entirety those effects?	This requirement refers to a DCO requirement rather than DML, therefore presently, compliance with this requirement would not fall within the MMO's remit. If the ExA seeks to secure any mitigation agreed with the MoD through a condition on the DMLs, the MMO would be happy to review any proposed wording that the applicant provides. This could be included in the following conditions: Condition 1: Design parameters Condition 14 :Pre-construction plans and documentation	No comments.
20.44	Applicant	Requirement 14 prevents offshore works commencing until a written decommissioning programme in compliance with any notice served upon the undertaker by the Secretary of State (SoS) pursuant to section 105(2) of the 2004 Act has been submitted to the SoS for approval. The decommissioning programme set out in the Energy Act 2004 does not cover the inter-tidal zone (the area of the shore between the high and low tide water marks), however, decommissioning of any	Since the decommissioning programme referred to in Section 105 of the Energy Act 2004 relates to waters between the mean low water mark and the seaward limits of the territorial sea (see Section 105(1)(a)), Work No. 4B will not be covered by the decommissioning programme as it relates to "subsea cables and fibre optic cables along routes within the Order limits between MLWS and MHWS". Decommissioning of Work No. 4B will therefore need to be included in the onshore	No comments.

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		infrastructure in this zone should be carried out in accordance with any removal conditions attached to a Marine Licence issued under the Marine and Coastal Access Act 2009. How will any decommissioning programme apply to Work 4B, the inter-tidal area?	decommissioning plan to be submitted to the relevant planning authority (whose jurisdiction extends to MLWS) under Requirement 29(1), unless otherwise agreed between that relevant planning authority and the Secretary of State.	
20.45	Applicant	Confirm whether it is intended that Article 15(1) requires notification but not approval of the number of onshore phases of construction.	The Applicant has assumed that the Examining Authority is referring to Requirement 15 – Stages of authorised development onshore, rather than Article 15. The Examining Authority is correct in that Requirement 15 of the dDCO requires notification, rather than approval, of the number of onshore phases of construction. As part of the EIA, the Applicant has assessed up to two phases of onshore construction. It will therefore be for the Applicant to decide how many phases (up to a maximum of two) to use to construct the onshore works. This will be dependent upon, amongst other things, construction timetables and associated commercial agreements.	No comments.
20.46	Applicant	Should Article 15(2) be amended such that approval of the relevant planning authority is required to the written scheme setting out the stages of the onshore transmission works? (Article 15(5) requires the scheme to be implemented as approved)?	The Applicant has assumed that the Examining Authority is referring to Requirement 15 – Stages of authorised development onshore, rather than Article 15. It will be for the Applicant to decide on the number of stages of onshore construction (within a larger phase). As currently drafted, the dDCO defines the relevant planning authority (RPA) as a district council for the area in which the relevant provision of the Order relates. Given that the onshore cable route passes through three district council areas, it would be unworkable to give each respective RPA control over the stages of construction as each RPA may have a different view on where the boundary of a stage should start and finish. The stages will therefore need to be determined by the Applicant and will be influenced by,	No comments.

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			amongst other things, construction timetables and associated commercial agreements. The wording at Requirement 15(5) will be amended in the next iteration of the DCO, to be submitted at Deadline 2 pursuant to the Examination timetable.	
20.47	Applicant	In Requirement 16(5) and (9) should there be a definition of "external electrical equipment"? (Cf definition of "onshore project substation" which does not distinguish external from internal equipment)	The Applicant considers that "external electrical equipment" should remain undefined and be given its plain English meaning. Notwithstanding, the restrictions on height in Requirement 16(5) and 16(9) are the principal factors for determining acceptability of the external electrical equipment in accordance with the parameters assessed in the ES.	No comments.
20.48	Applicant	Requirement 19 specifies a period of five years during which trees or shrubs should be replaced in specified circumstances. Should in addition a period of ten years be specified in the case of all structural planting and if so, how should the DCO be amended?	A five year replacement / maintenance period is referred to in the OLEMS (document 8.7) and Requirement 19(2) of the dDCO. Five years is seen as a standard practice for replacement planting. This is because most defects will occur in the first five years after planting, and trees or shrubs that survive the first five years tend to be robust and well established. Similar requirements with a five year timeframe have been used on other DCOs including The East Anglia THREE Offshore Wind Farm Order 2017, Hornsea Project Two Offshore Wind Farm Order 2016, and Dogger Bank Creyke Beck Offshore Wind Farm 2015. The Applicant therefore considers that the wording of the Requirement should remain as is currently drafted.	No comments.
20.49	Norfolk County Council	Requirement 20 Explain why, in relation to this requirement, Norfolk CC as the Highways Authority should be the designated relevant local authority for construction affecting rights of way and trails and how, if at all the requirement should be amended to reflect	This question is addressed solely to NCC. As the Highways Authority and organisation responsible for Norfolk Trails and the England Coast path in the county, Norfolk CC will need to have a significant role in managing impacts and mitigation during construction works, and in agreeing reinstatement of PRoW and Trails	Natural England support this position. In addition, we seek confirmation from the Applicant that there will be no temporary closures of ECP during construction, operation or decommissioning. If there will be a

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		this.	post-construction. The County Council will also be responsible for processing all Traffic Regulation Orders in relation to the project, including those affecting PRoW. However, this does not necessarily mean that NCC should be the designated relevant local authority, although we would need to be consulted.	requirement for a temporary closure of the National Trail, we will be happy to give further advice about the implications of this for the project. Note that coastal access rights normally apply to all land that is coastal margin, including any land seaward of the route.
20.50	The Applicant	The Environment Agency [RR-117] seeks prior approval for soil management, construction method statements, site and excavated waste management, and surface water drainage plans to ensure that all areas within its remit are adequately addressed and that areas of crossover between environmental elements are captured. Should there be a requirement for it to be consulted and to approve detailed CoCPs to safeguard areas within their remit and if not why not? Please comment on how the CoCP should be structured and managed and whether Requirement 20 should provide that, for each phase a CoCP and associated pollution control plans are submitted to and approved by the Environment Agency prior to works on that phase commencing?	The wording of Requirement 20 will be updated to reflect this request from the Environment Agency. The new wording will read: "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 the Environment Agency." The Applicant does not propose to alter the proposed structure of the CoCP. The Environment Agency would only be expected to respond to the elements that fall within its remit when consulted on the contents of the final CoCP for each stage of the works.	Natural England support this amendment.
20.51	The Environment Agency	Comment on how, if at all, Requirement 20 should be varied in light of your concerns to safeguard areas within your remit.	Following assurances that are documented in the Statement of Common Ground we are content that the areas in our remit are adequately safeguarded and as such variation to Requirement 20 is no longer necessary.	No comments.
20.52	Applicant	Please comment on Requirement 20 in light of Norfolk CC's relevant representations [RR-123], including whether the definition of relevant local authority, (defined as the district authority), needs to be altered, and	The Applicant considers that the district planning authorities will be in a position to seek advice and/or sign-off on any relevant matters that concern the County Council – for instance, in relation to public rights of way. Concerns	No comments.

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		are there other instances where a change to substitute or add the local highways authority is appropriate?	regarding DCO requirements are also addressed in the SoCG with Norfolk County Council (Rep1 - SOCG - 15.1). The Applicant therefore considers that it is not necessary to amend the wording in Requirement 20 at this stage.	
20.53	Applicant	Should Requirement 20(1) be amended to add wording such as “and authorities in whose area the stage or stages fall”?	Requirement 20 requires a CoCP, for that stage of development, to be submitted to and approved by the relevant planning authority prior to commencement of works for that stage. The stages of the onshore transmission works will be defined and submitted to the relevant planning authority pursuant to Requirement 15. The relevant planning authority is defined as: "the district planning authority for the area in which the land to which the relevant provision of this Order applies is situated." Accordingly, the submission of the CoCP under Requirement 20 will only apply to the district council in whose area that stage of the works fall. The Applicant therefore considers that the suggested wording would be superfluous.	No comments.
20.54	Applicant	Should Requirement 20 be amended to ensure that fencing and screening is in place prior to commencement of substantive operations?	Full details of the fencing and screening will be contained in the CoCP, as required by Requirement 20(2)(k) of the dDCO. The EIA has not been reliant on the need to screen the onshore cable route construction works. The visual effects of the works are considered to be short-lived in any one location and the Applicant considers that it would be more disruptive to introduce screening or temporary fencing along the cable route. The Applicant therefore considers that it is not necessary to amend the wording in Requirement 20 at this stage.	No comments.
20.55 – 20.60		Questions regarding archaeology		No comments.

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20.61	Applicant	Requirement 29 Explain how the permanent cessation of commercial operation of the onshore transmission works will be verified.	The onshore transmission assets will be transferred to an Offshore Transmission Owner (OFTO). The OFTO operates under a transmission licence, which is regulated by Ofgem. The transmission licence will have a fixed term. When the licence comes to an end, Ofgem will determine whether a new licence should be made available or whether the transmission connection should be decommissioned. The future owner of the transmission works will be able to provide evidence of a renewed licence application (or otherwise) to the relevant planning authority to verify its intentions for ongoing commercial operations or permanent cessation of commercial operations.	No comments.
20.62	Applicant	Comment on whether it is necessary and/or desirable for the undertaker to notify the relevant planning authority within 28 days of its determination to cease commercial operations	Requirement 29 states that the relevant planning authority must be provided with an onshore decommissioning plan within six months of the permanent cessation of the commercial operation of the onshore transmission works. The relevant planning authority will therefore be notified in due course through submission of the onshore decommissioning programme. Accordingly, the Applicant does not consider it necessary to provide a separate advance notification to the relevant planning authority.	No comments.
20.62	Broadland Council	As above	Desirable.	No comments.
20.63	Applicant	Justify why a period of 6 months from the date of permanent cessation of operations is necessary within which to submit an onshore decommissioning plan.	The decommissioning plan needs to consider and take account of consultation with relevant bodies (for example stakeholders, landowner and the local councils) together with engagement with the supply chain, who will ultimately conduct the works, before the decommissioning plan is ready for submission. The decommissioning plan must be implemented as approved so it will likely be in	No comments.

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			the Applicant's (or their successors') interest to submit this at their earliest convenience.	
20.64	Applicant	ES Chapter 5 – paragraph 5.5.2.9 identifies that the cabling can simply be pulled from the ducting for recycling. What assessment has been made of the risk that the seaward, and, over the long term, landward ducts and infrastructure will be exposed and will require removal, identifying what funded mechanisms are proposed if any for the removal of historical/redundant infrastructure.	The design of the landfall works will adopt a highly conservative approach to ensure cables and infrastructure do not become exposed as a result of erosion during the operation of the wind farm (as outlined in response to Q16.27 and in the Landfall Info Sheet, Additional Submission document reference ExA_AS;10.D1.8B). A construction method statement, including for cable landfall, must be agreed with the MMO prior to construction, as required under the DML Schedules 11 and 12 Part 4 Condition 9(c)(iv). Decommissioning of the landfall works will be included in the onshore decommissioning plan to be submitted to the relevant planning authority (whose jurisdiction extends to MLWS) under Requirement 29(1), and must then be implemented as approved. The appropriateness of removing the ducts at the point of decommissioning the landfall works or at a later point, would be agreed as part of the decommissioning plan approved by the relevant planning authority under Requirement 29.	Following receipt of a coastal erosion clarification note provided by the applicant Natural England are satisfied that this element has been addressed. Full details of this letter are provided in Annex D of Natural England's Written Representation [REP1-088].
20.66	Broadland Council	Please comment on the acceptability of Article 31 which deals with amendments to approved details	Unsure what this relates to as Article 31 of the draft DCO is concerned with the operation of generating station.	No comments.
20.67	Broadland Council	Requirement 31 can be read in conjunction with Schedule 15 which relates to consultation periods for discharge of Requirements. Do you intend to consult persons/bodies for the purposes of discharging any Requirement or agreeing to an amendment or variation, who are not named in the Order as "requirement consultees"? If so consider and comment as to whether they should be added as a "requirement consultee", specifying where in	No	No comments.

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		the Order any such change is necessary and why.		
20.68	Applicant	Schedules 9 to 12 Deemed marine licences In the event that a transfer of benefit takes place, (i) what mechanisms would be in place to ensure that two different windfarm developers working in the same area will work in co-operation especially with regard to in-combination effects and (ii) what consideration has been given to securing such mechanisms within the dDCO/DML's?	In the event that a transfer of benefit of the Order or DMLs takes place, the transferee will remain subject to the relevant obligations of the Order or DMLs. Article 6(9) provides that "the exercise by a person of any benefits or rights conferred in accordance with any transfer or grant under paragraph (1) or (2) are subject to the same restrictions, liabilities and obligations as would apply under this Order if those benefits or rights were exercised by the Undertaker". Article 6(14) requires notice of any transfer to be given to the MMO and relevant planning authority if such transfer or grant relates to the exercise of powers in their area. Both the MMO (under DML Condition 14) and the relevant planning authority (under Requirements 16 and 17) would respectively have the right to approve the manner of implementation of the works offshore and onshore. It would also be in the commercial interests of the transferor to ensure that the transfer agreement contains appropriate provisions on cooperation between the two wind farm developers.	No comments.
20.69	Applicant	Schedules 9 to 13 A condition in each draft licence is concerned with driven or part-driven pile foundations and harbour porpoise as a protected feature of the Southern North Sea candidate Special Area of Conservation. Comment on the relevant representations of 03 August 2018 from Whale and Dolphin Conservation [RR-013], and in particular each of its key recommendations, explaining what consideration has been	Section 2 of Appendix 20.3 (document reference ExA;WQApp20.3;10.D1.3) provides the Applicant's response to the WDC Relevant Representation. In summary: • The Information to Support HRA report (document reference 5.3) provides the assessment of effects on the Southern North Sea candidate cSAC/SCI; • As discussed in responses to Q4.3, based on current technology and market availability, a monopile solution is likely to be the most economical solution available for the size of	No comments,

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		given to such matters, where they are included within the dDCO, and, where the Applicant considers it appropriate, how the dDCO could be amended to secure the recommendations or otherwise justifying their non-inclusion.	wind turbines proposed and water depths within the Norfolk Vanguard offshore wind farm sites. Removing piled foundations from the consent envelope for Norfolk Vanguard would therefore increase the cost of energy to the consumer and significantly affect the commercial viability of the project. • The SIP, required under DCO Schedules 9 and 10 Part 4 condition 14(m) and Schedules 11 and 12 Part 4 condition 9(l), in accordance with the In-Principle SIP (document reference 8.17), provides the framework for agreeing mitigation measures with the Marine Management Organisation (MMO) prior to construction. The SIP will be based on the best available information and guidance at that time. • Reduction of noise at source is included as a potential mitigation measure in the In-Principle SIP (document reference 8.17). • DCO, Schedules 9 and 10 Part 4 Condition 14(f) and Schedules 11 and 12 Part 4 condition 9(f), requires a MMMP, based on the draft MMMP (document reference 8.13) to be agreed with the MMO prior to construction. This provides the framework to identify appropriate marine mammal mitigation based on the best available information at that time. • In relation to the discharge of Conditions in the DMLs, the MMO will be the relevant authority and it is considered that the MMO would consult relevant nature conservation bodies where appropriate. • The current JNCC guidance for minimising the risk of injury to marine mammals from piling noise (2010) states: “When piling at full power, there is no requirement to cease piling or reduce the power if a marine mammal is detected in the mitigation	

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			zone." The MMMP provides the framework to identify appropriate marine mammal mitigation based on the best available information and guidance prior to construction. • The IPMP (document 8.12) provides an appropriate framework to agree monitoring requirements with the MMO prior to construction. Section 4.5.2 of the IPMP acknowledges that there may be little purpose or advantage in site specific monitoring and a strategic approach may be more appropriate in providing answers to specific questions where significant environmental impacts have been identified at a cumulative/in-combination level. • Noise monitoring would be undertaken as stated in Condition 19(1) of the DML. Section 4.6 of the IPMP outlines the proposals for construction noise monitoring (if pile driving is required) of the first four piled foundations of each foundation type to be installed. If required, underwater data will be recorded that allows a comparison with the assessed underwater noise modelling with analysis using un-weighted metrics, such as peak sound pressure level, sound exposure level and peak to peak pressure level. • No mortalities of marine mammals are expected as a result of Norfolk Vanguard. In the unlikely event that a post mortem showed Norfolk Vanguard to be the cause of death, the MMO would have the power to issue a stop notice under Section 102 of the Marine and Coastal Access Act, should they determine that this represents serious harm to the environment. • Reporting of monitoring results will be submitted to the MMO at a timeframe agreed through the Construction Programme and	

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			Monitoring Plan (as required under DCO Schedules 9 and 10 Part 4 Condition 14(1)(b) and Schedules 11 and 12 Part 4 Condition 9(1)(b).	
20.70	Applicant	Comment on the Wildlife Trust's recommendation [RR-172] that all offshore wind farm developments should be conditioned as part of their DCO to pay into an underwater noise levy which would fund and deliver strategic mitigation and monitoring and establish an implementation group. Clarify the position with regard to ES Appendix 12.6 which suggests there is potential for tens of thousands of harbour porpoise to be impacted by underwater noise disturbance. What mechanisms are appropriate to deliver strategic monitoring and mitigation to understand and manage in-combination underwater disturbance impacts, or if none explain why?	(i) There is currently no mechanism for a levy to deliver strategic mitigation, this is a recent draft proposal by The Wildlife Trust that has not yet been fully consulted on with the Industry, Regulators or Statutory Nature Conservation Bodies. Therefore it is not considered appropriate to condition this in the DMLs contained within the draft DCO. (ii) The assessments in ES Appendix 12.6 are, as stated, theoretical worst-case scenarios, however it is considered logistically impossible for 26 offshore wind farms to all undertake piling at exactly the same time, e.g. due to the availability of suitable vessels to undertake pile driving. Therefore, the 'likely overlap' worst-scenario presented in Chapter 12 of the ES is deemed to be highly conservative and this has been used to define the cumulative disturbance magnitude as a realistic worst-case scenario. The approach to the marine mammal Cumulative Impact Assessment (CIA) is agreed through the following SoCGs: • Natural England • MMO (iii) The SIP which is required under dDCO Schedules 9 and 10 Part 4 condition 14(1)(m) and Schedules 11 and 12 Part 4 condition 9(1)(l), in accordance with the In Principle SIP (document reference 8.17), will set out the approach to deliver any project mitigation or management measures in relation to the Southern North Sea cSAC/SCI and must be agreed with the MMO prior to construction. Strategic mitigation, managed by the Regulator,	No comments.

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			is a potential option outlined in section 6.1.3 of the In Principle SIP.	
		Schedules 9 and 10		
20.71	Applicant	Comment on whether, in Part 3 condition 2 (1) (e) the number of cable crossings should be limited to the number assessed in the ES.	The Applicant considers that it is not necessary to define the number of cable crossings. The total volume of cable protection is considered the key factor for assessment. Cable protection is defined in the DCO as: "measures for offshore cable crossings and where cable burial is not possible due to ground conditions, to protect cables and fibre optic cables and prevent loss of seabed sediment by use of grout bags, protective aprons, mattresses, flow energy dissipation (frond) devices or rock and gravel dumping;". The cable protection maximum parameters are outlined in Requirement 5 of Schedule 1 of the DCO. Accordingly, the maximum number of cable crossings has been taken into account in defining the maximum volume of cable protection and is therefore a component of Requirement 5(1) and the DMLs. Furthermore, to the extent necessary, any measures to deal with the particular cable crossing will be outlined within the Scour Protection and Cable Protection Plan, which is to be agreed with the MMO and secured through condition 14 (Schedules 9-10) and condition 9 (Schedules 11-12) of the DMLs. The Applicant therefore considers that the DCO should remain as it is currently drafted in this respect.	Natural England disagree with this statement and suggest that Part 3 condition 2 (1) (e) should include how many cable crossings are permitted. This should be limited to the number assessed in the ES.
20.72	Applicant	Comment on whether in Part 3 condition 2 (2) (c) it is appropriate to give disposal as a total volume, having regard to NE's RR's at Appendix 5.	Natural England's comments regarding including a limit on the drill arising disposal volume in the DCO is acknowledged and the dDCO will be updated and submitted at Deadline 2.	Natural England welcome this acknowledgment from the Applicant and will provide further comments. If necessary, following relevant submission at Deadline 2.
20.73	Applicant	Should Part 4 condition 8 (1), whilst listing the maximum scope of the project for both	The dDCO, at Requirement 5, includes the maximum length of array cables and volumes (in	Natural England welcome this acknowledgment from the

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		potential phases, also specify the total maximum array cables, cable protection and cable crossings?	m3) of cable protection. The Applicant would refer the Examining Authority to the response to Q.20.72 in relation to cable crossings.	Applicant and will provide further comments. If necessary, following relevant submission at Deadline 2.
20.74	Applicant	Part 4 condition 8 (2) requires the undertaker to inform the MMO if the project is to be built in one phase or two. Should Natural England also be included in this notification and if not why not?	In relation to the discharge of Conditions in the DMLs, the MMO will be the relevant authority. Certain Conditions provide for consultation with specified bodies on the discharge of that Condition, such as Trinity House, the MCA, and the relevant statutory body. It is considered that the MMO would consult relevant statutory nature conservation bodies where appropriate.	As per our response to ExA Questions submitted at Deadline 2 [REP1-088] Natural England would welcome inclusion in this notification as the decision on how to build out the projects will inform our advice more widely on marine sustainable development projects with the southern north sea.
20.76	Applicant	Comment on the MMO's recommendation [RR-186] that a condition is included to restrict the maximum hammer energy to the worst case scenario (5,000kJ) assessed in the ES: *In the event that driven or part-driven pile foundations are proposed to be used, the hammer energy used to drive or part-drive the pile foundations must not exceed 5,000kJ*"	The Applicant agrees that hammer energy should be referred to within the conditions in the DMLs. The Applicant is reviewing the proposed wording and the Applicant will submit a revised dDCO at Deadline 2 of the Examination timetable.	Natural England welcome this acknowledgment from the applicant and will provide further comment, if necessary, following relevant Deadline 2 submissions.
20.77	Applicant	In Part 4, condition 9(7), does the Applicant agree that Kingfisher should be informed at the beginning of a major stage of the project, such as operations and maintenance or any works which represent a risk to fishermen?	The Applicant considers the wording of condition 9(7) in Schedules 9 and 10 and Condition 4(7) in Schedules 11 and 12 of the Draft DCO to be suitable and appropriate. This follows the standard condition wording agreed for other offshore wind farms to date, as outlined below: 7) The undertaker must inform the Kingfisher Information Service of Seafish by email to kingfisher@seafish.co.uk of details regarding the vessel routes, timings and locations relating to the construction of the authorised scheme or relevant part— (a) at least fourteen days prior to the commencement of offshore activities, for inclusion in the Kingfisher Fortnightly Bulletin and offshore hazard awareness data; and (b) as soon as reasonably practicable and no	No comments

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			later than 24 hours of completion of all offshore activities. Confirmation of notification must be provided to the MMO within five days.	
20.78	MMO	Supply wording in respect of your proposed amendment to Part 4, condition 9(7) of Schedules 9 to 12 to the dDCO	MMO proposes the following wording: The Kingfisher Information Service of Seafish, must be informed of details of the vessel routes, timings and locations relating to the construction of the authorised project or any part thereof by email to kingfisher@seafish.co.uk :- a) at least 2 weeks prior to the commencement of offshore activities, for inclusion in the Kingfisher Fortnightly Bulletin and offshore hazard awareness data, and; b) as soon as reasonably practicable and no later than 24 hours of completion of all offshore activities. Confirmation of notification must be provided to the MMO within 5 days. This has been supplied to the applicant and the MMO expect this to be updated on the draft DCO for deadline 2.	Natural England would support this.
20.79	Applicant	Should Condition 12 be amended as suggested by MMO to ensure that no man-made material is disposed to sea ("*any man-made material must be separated from the dredged material and disposed of on land*"), and if not why not?	The Applicant considers that this is covered by DML Condition 12(5) (Generation DML, Schedule 9-10) and DML Condition 7(5) (Transmission DML, Schedule 11-12) which states that: "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 at this site." This has been agreed with the MMO - see Appendix 1 of the MMO SoCG (document	Natural England support the comments raised by MMO and acknowledge the agreement that has been made in the Applicant's SoCG with MMO.

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			reference Rep 1 –SOCG –11.1).	
20.80	Applicant	The disposal return date in Condition 12(4) of 31 January for a period August to January inclusive is suggested by the MMO to be revised to the 15th of the month following the disposal period. Does the Applicant agree the consequential amendment proposed by MMO: "*The undertaker must inform the MMO of the location and quantities of material disposed of each month under this licence. This information must be submitted to the MMO by 15 February each year for the months August to January inclusive, and by 15 August each year for the months February to July inclusive*." And if not why not?	The Applicant is content to change this wording and this will be reflected within the revised dDCO at Deadline 2 of the Examination timetable.	No comments.
20.81	Applicant	Should Part 4 condition 12 (6) be amended, in light of NE's RR's that the use of similar materials minimises the impact on the environment, to include the additional wording: '*where reasonably practicable any rock material used will be similar to material naturally present in the location'* and if not why not?	DML Part 4 Condition 12(6) requires the undertaker to ensure that any rock material used in the construction of the authorised scheme is from a recognised source, free from contaminants and containing minimal fines. The Applicant considers that this wording provides an appropriate degree of protection to the marine environment, while allowing for the selection of materials that are fit for purpose.	Natural England disagree with the response from the Applicant as stating that the rock material will simply be from a *recognised source, free from contaminants and containing minimal fines* is not the same as stating *rock material used will be similar to material naturally present in the location.* Natural England would therefore retain its request to amend the wording of Part 4 condition 12 (6).
20.82	MMO	Clarify your reference to Condition 13(2) and "the survey" in connection with your suggestion that where the cable route crosses the Haisborough, Hammond and Winterton SAC, the survey should extend outside the Order Limits to ensure any reef known to be present has been unaffected by the works.	The MMO has discussed this point with the applicant. The applicant provided a response to MMO's comment, presented within the appendix of the SoCG (comment OS247) which stated: 'The In Principle Monitoring Plan (document 8.12) refers to the survey including a buffer from the cable installation works. Therefore, the survey would stay within the order limits if the cable route is towards the middle of the corridor	Natural England would support this position.

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			or may extend out of the order limits if the route is towards the edge of the corridor. The In Principle Monitoring Plan provides a framework to agree a buffer with MMO prior to construction, based on the final cable positioning.' The MMO is satisfied that the buffer area can be agreed as part of the pre-construction monitoring plans. The MMO has no further comment at this stage.	
20.83	Applicant	Condition 14 (1) (a) refers to the design plan which outlines the micro-siting requirements. Should Natural England be named as a consultee on this design plan and if not why not?	See the response to Q6.7.	Natural England would retain its request to be named as a formal consultee in regard to the design plan that is referenced in Condition 14(1)(a) of the DMLs contained in Schedules 9 and 10 of the dDCO.
20.84	Applicant	Conditions 14 (1) (b) (iii) and (aa) cover the requirement for pre-construction monitoring to be agreed 4 months prior to the first survey. Assess whether in light of NE's comments [RR-106] a different approach is appropriate and comment on the benefits argued for, of an extended period for submitting monitoring plans prior to the first survey and what, if any, alternative period is appropriate.	The Applicant refers the Examining Authority to the answer to Q6.8, which also applies in this context.	Condition 14 (1) (b) (iii) and (aa) these conditions cover the requirement for pre-construction monitoring to be agreed 4 months prior to the first survey. The standard approach of submitting monitoring plans 4 months prior to the first survey may not be the best approach. Natural England would like to discuss the possibility of the pre-construction monitoring plans and methodology being required 18 months prior to construction. The benefits would be a clearer deadline, the 4 months prior to the first survey leaves the decision on when the first survey should commence to the undertaker and the risk to the undertaker that that decision is wrong. Which could potentially lead to delays in construction programme. Some discussion on monitoring timelines would be useful and this condition

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				should be reworded to capture more appropriate timescales.
20.85	Applicant	Condition 14 (1) (c) and (g) require submission of cable installation plans but not to discuss ground preparation works and potential disposal activities involved. Comment on NE's RR's on this matter and whether: i) the plans should be required to provide detailed information on any disposal works involved, methodology and proposed location of disposals. ii) a condition should be added to ensure a sandwave levelling, seabed preparation and disposal plan is provided as detailed in NE's RR's; and if so comment on the proposed wording: "(*vii) in the event that sandwave levelling, seabed preparation or disposal is required within the Haisborough Hammond and Winterton Special Area of Conservation, the licence activities, or any phase of those activities must not commence until a detailed methodology and updated assessment of the impacts has been submitted to the MMO and the MMO is satisfied that the methodology includes such mitigation and monitoring as is necessary to avoid adversely affecting the integrity of a relevant site."*	In answer to points i and ii, the Applicant considers preparation works such as sandwave levelling and disposal to be a component of the cable installation strategy and therefore included in DCO Schedules 9 and 10 Part 4 Condition 14(1)(g)(ii) "a detailed cable (including fibre optic cables) laying plan for the Order limits, Incorporating a burial risk assessment to ascertain suitable burial depths and cable laying techniques, including cable protection" N.B. this also applies to the Transmission DMLs (Schedules 11 and 12, Part 4 condition 9(1)(g)(ii)).	Natural England welcome the Applicant's agreement that these elements should be included within cable installation strategy. However, note that the applicant has not provided comment on the proposed wording for the new condition. Natural England would welcome comment from the Applicant in this regard.
20.86	Applicant	Condition 14 (g) (ii) requires submission of cable installation methodology. Should it be amended to require the plan to provide the methodology for seabed preparation works such as pre-lay grapnel runs, seabed levelling and disposal activities and if not, why not?	As stated in response to Q20.85, the Applicant considers preparation works such as sandwave levelling and disposal to be a component of the cable installation strategy and therefore included in 14(1)(g)(ii). N.B. this also applies to Schedules 11 and 12, 9(1)(g)(ii).	Natural England welcome the Applicant's agreement that these elements should be included within cable installation strategy. However, note that the applicant has not provided comment on the proposed wording for the new condition. Natural England would

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				welcome comment from the Applicant in this regard.
20.89	Applicant	Condition 14 (1) (l) requires submission of an ornithological monitoring plan, however as the timing of this report is not stipulated, it would, under Condition 15 (2) require to be submitted 4 months prior to construction. Comment on whether a longer period of 18 months as suggested by Natural England is appropriate in light of NE's suggestion that ornithological monitoring plans often require a full year's survey pre construction, and if not what alternative period if any is appropriate.	The Applicant notes NE's comment. 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. In any event, the Applicant will endeavour to submit plans, programmes, protocols, schemes and/or statements to the MMO in good time and in advance of the four month minimum period. It should also be noted that Condition 15(2) (Generation DML) and Condition 10(2) (Transmission DML) allows for the determination period to be extended if agreed between the parties.	Natural England would seek further clarification in this regard. If this point is just referring to an ornithological monitoring plan solely for **post construction monitoring** then 4 months is likely to be acceptable. However, the question refers to a monitoring plan that would cover everything from pre-construction, construction and post construction – which is generally the case for offshore ornithology monitoring plans. If this is the case, as seems likely, then submitting 4 months prior to construction would be too late.
20.90	Applicant	Condition 14 (j) requires submission of an operations and maintenance plan every 3 years. Comment on whether, in light of NE's RR's as to significant concerns related to the designated sites and the presence of annex I habitat along various areas of the export cable, its proposal for consultation and updated assessments is acceptable and if not why not.	The RR comment states: Natural England notes that condition 14 (j) requires the submission of an operations and maintenance plan every 3 years and that based on the in-principle operations and maintenance plan all activities permitted (including cable repair and reburial) would not require a consultation. Given the significant concerns related to the designated sites and the presence of annex I habitat along various areas of the export cable, Natural England does not consider it appropriate for such works to proceed without further consideration and updated assessments. Natural England would like to engage with the applicant and the MMO on potential changes to the Outline Operations and Maintenance Plan and the DML conditions to ensure that important habitats are not unduly impacted during the operations phase of the project.	Natural England welcome the Applicant's comment to revise the Outline Operations and Maintenance Plan (document 8.11) for resubmission during the Examination and are happy to continue to engage with the Applicant and MMO in this regard.

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			The Applicant acknowledges this comment and will revise the Outline Operations and Maintenance Plan (document 8.11) for resubmission during the Examination following further discussion with NE and the MMO.	
20.91	Applicant	Condition 15 (1) requires all archaeological reports to be agreed with the statutory historic body. Could another condition be added requiring all ecological reports be agreed with the statutory nature conservation body?	In relation to the discharge of Conditions in the DMLs, the MMO will be the relevant discharging authority. Certain Conditions provide for consultation with specified bodies on the discharge of that Condition, such as Trinity House, the MCA, and the relevant statutory body. Ecological reports will be submitted to and approved by the MMO, and it is considered that the MMO would consult relevant statutory nature conservation bodies where appropriate.	No comments.
20.92	Applicant	Should all pre-construction monitoring reports be submitted to the MMO six months before commencement of works? (Condition 14(j))	Further to the responses to Q6.8 and Q20.84, the Applicant considers that the four month time frame conditioned within the DMLs is appropriate and proportionate to allow the MMO sufficient time for stakeholder consultation and the provision of comments, whilst ensuring no unnecessary delay to the commencement of development. The four month time period is also contained in a number of other offshore wind farm DCOs.	Natural England support MMO position that all pre-construction monitoring reports be submitted more than 4 months prior to construction as the standard approach of submitting monitoring plans only 4 months prior to the first survey may not be the best approach. Natural England would like to discuss the possibility of the pre-construction monitoring plans and methodology being required 18 months prior to construction. The benefits would be a clearer deadline, the 4 months prior to the first survey leaves the decision on when the first survey should commence to the undertaker and the risk to the undertaker that that decision is wrong. Which could potentially lead to delays in construction programme. Some discussion on monitoring timelines

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				would be useful and this condition should be reworded to capture more appropriate timescales.
20.93	Applicant	Condition 15 (2) requires all pre-construction plans to be submitted 4 months prior to construction. In light of the reasons stated by NE as to the increased size and complexity of projects such as the Project, should this period be extended and if so by what period, and if not why not?	Further to the responses to Q6.8 and Q20.84, the Applicant considers that the four month time frame conditioned within the DMLs is appropriate and proportionate to allow the MMO sufficient time for stakeholder consultation and the provision of comments, whilst ensuring no unnecessary delay to the commencement of development. The four month time period is also contained in a number of other offshore wind farm DCOs.	Natural England support MMO position that all pre-construction monitoring reports be submitted more than 4 months prior to construction as the standard approach of submitting monitoring plans only 4 months prior to the first survey may not be the best approach. Natural England would like to discuss the possibility of the pre-construction monitoring plans and methodology being required 18 months prior to construction. The benefits would be a clearer deadline, the 4 months prior to the first survey leaves the decision on when the first survey should commence to the undertaker and the risk to the undertaker that that decision is wrong. Which could potentially lead to delays in construction programme. Some discussion on monitoring timelines would be useful and this condition should be reworded to capture more appropriate timescales.
20.94	Applicant	Condition 16 requires a post construction survey of the seabed to be submitted to the MCA. This appears to be very similar to the requirements of Condition 20. Is there a need for a separate condition?	Condition 16 (of the Generation DML, Schedule 9-10) refers to a swath bathymetric survey to be carried out in accordance with IHO Order 1a, with the data and survey reports to be shared with the MCA and UKHO; whereas Condition 20 links with the discharge of the construction programme and monitoring plan pursuant to Condition 14(1)(b) and requires approval by the MMO. Condition 20 includes various different requirements and details on the proposed post-	Natural England would defer to MCA in this regard.

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			construction surveys, including methodologies and timings, and a proposed format for providing reports on the results. In the interests of clarity, it is therefore appropriate to separate these obligations into different conditions; the former relates to matters concerning navigation, whereas the latter is a more detailed condition relating to the construction programme and monitoring plan and which falls within the primary jurisdiction of the MMO.	
20.94	Additional response from MCA	Condition 16 requires a post construction survey of the seabed to be submitted to the MCA. This appears to be very similar to the requirements of Condition 20. Is there a need for a separate condition?	The MCA requirements for hydrographic surveys are detailed in section 6 of MGN 543 and in the guidelines for Offshore Developers, including the post construction guidelines. These can be found at the bottom of the following link: https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-onshipping On the understanding that these guidelines are followed, we would have no concerns. If possible, the MCA would also like to be involved in the determination of the 'pre-established periodicity' when this is decided. We would therefore suggest the DCO refers to: .0Pre-Construction requirements: The undertaker must conduct a swath bathymetric survey to IHO Order 1a of the site and its immediate environs extending to 500m outside of the authorised project area. The survey shall include all proposed cable routes. This should fulfil the requirements of MGN 543 and its supporting 'Hydrographic Guidelines for Offshore Developers', which includes the requirement for the full density data and reports to be delivered to the MCA and the UKHO for the update of nautical charts and publications. This must be submitted as soon as possible,	Natural England would defer to MCA in this regard.

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			and no later than [three months] prior to construction. The Report of survey must also be sent to the MMO. Post-construction requirements: The undertaker must conduct a swath bathymetric survey to IHO Order 1a of the installed export cable route and provide the data and survey report(s) to the MCA and UKHO. The MMO should be notified once this has been done, with a copy of the Report of Survey also sent to the MMO, as per above guidelines.	
20.96	Applicant	Condition 19 (3) Please comment on the reasons given by NE for its proposed amendment and the proposed wording: *(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 impact to those assessed in the ES or failures in mitigation all piling activity must cease until an update to the MMMP and further monitoring requirements have been agreed*.	The Applicant is required to submit a construction programme and monitoring plan to the MMO for approval at least four months prior to commencement of any licensed activities (Condition 14(1)(b) of the Generation DMLs, and Condition 9(1)(b) of the Transmission DMLs). In discharging this condition, and before the MMO can approve the construction programme and monitoring plan, the Applicant must submit details (which accord with the offshore in principle monitoring plan (document 8.12)), for approval by the MMO in consultation with relevant statutory bodies, of the proposed monitoring and surveys for the construction of the authorised scheme. It is considered likely that the MMO will consult Natural England at this stage. The timings, methodologies, and details of further actions in the event of unacceptable levels of noise would therefore be included in the plan provided pursuant to Condition 14(1)(b) or Condition 9(1)(b) of the DMLs. The MMO would have control, after consulting with the relevant statutory bodies, as to whether to approve the details and methodology within the said plan. The Applicant therefore does not believe that it is necessary to amend the wording of the dDCO at this stage.	Natural England considers the proposed change to the wording of Condition 19 (3) is required to ensure that in the event that the assessment of the noise monitoring report demonstrates an impact more significant than that assessed in the ES is occurring, operations cease until appropriate increased mitigation and/or monitoring can be agreed and implemented. If operations are allowed to continue without sufficient mitigation, their impact will not have been assessed in the ES and is therefore outwith that which the consent for the project was based on. This poses a major risk of significant impact to the Harbour porpoise feature of the Southern North Sea SCI.

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20.97	Applicant	Part 4, Condition 19(3) is interpreted by MMO (2.22) such that activities can continue in the event that the results of the as-built noise monitoring fail to confirm the effectiveness of current modelling and mitigation. Please comment, including on the suggested amendment: "*If, after expert review, the results received 6 weeks after the completion of the first four piles are deemed to be unacceptable, then the MMO will look to suspend all further piling activities in the event that the developer has not already voluntarily done so*"	The Applicant would refer the Examining Authority to the response to question 20.96 as the same principles apply in this context.	Natural England considers the proposed change to the wording of Condition 19 (3) is required to ensure that in the event that the assessment of the noise monitoring report demonstrates an impact more significant than that assessed in the ES is occurring, operations cease until appropriate increased mitigation and/or monitoring can be agreed and implemented. If operations are allowed to continue without sufficient mitigation, their impact will not have been assessed in the ES and is therefore outwith that which the consent for the project was based on. This poses a major risk of significant impact to the Harbour porpoise feature of the Southern North Sea SCI.
20.98	MMO	Justify your proposed amendment to Part 4, Condition 19(5): "*In the event that driven or part-driven pile foundations are proposed to be used, a marine mammal mitigation protocol (MMMP), including details of soft start procedures with specified duration periods following current best practice as advised by the relevant statutory nature conservation bodies*."	The MMO advised in its Relevant Representation that, as a key mitigation, soft start should be included in condition 19(5). Following further discussion with the applicant, the MMO is satisfied with the wording originally proposed by the applicant, on the basis that soft start procedures with specified duration periods will be included in the In Principle Monitoring plan for consideration as part of the Marine Mammal Mitigation Protocol. This is presented within the appendix of the SoCG (comment OS250).	No comments.
20.99	Applicant	Does the Applicant agree the proposed amendment by MMO to Condition 19(5) and if not why not?	The MMO's suggested wording refers to adding specific reference to using soft start mitigation. Given NE's recent potential concerns with the use of soft start, as referred to in Q4.1, the Applicant suggests the wording should remain as per the dDCO. As stated in response to Q4.1,	No comments.

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			the MMMP provides the framework to agree mitigation measures based on the latest guidance at that time. This has since been agreed with the MMO as shown in Appendix 1 of the SOCG (document reference Rep1 - SOCG - 11.1 App1).	
		Schedules 11 and 12 transmission DML's		
20.100	Applicant	Part 3 condition 2 (2) lists cable protection, however the export cables include 2 pipeline crossings. Should this provision be amended and should the number of pipeline and cable crossings be restricted to the parameters assessed in the ES?	The maximum number of cable and pipeline crossings has been taken into account in defining the maximum volume of cable protection and is therefore a component of the cable protection volumes provided in dDCO Schedule 1 Part 3 Requirement 5(1) and Schedules 9 and 10 Part 4 Condition 3.	Natural England still ascertain the condition be amended to ensure the number of pipeline and cable crossings are restricted to the parameters assessed in the ES.
20.101	Applicant	Part 3 condition 3 describes the limits of the project. Should it also limit the project to a maximum of 6 export cables and maximum length of cable of 400km, as detailed in the ES?	Schedules 11 and 12, Part 3, paragraph 2(3) provides the details of Work no 4A, which includes the maximum of four export cables. Schedules 11 and 12, Part 4, Condition 2 provides the maximum length of export cables (400km).	Natural England welcome confirmation that the project is limited to a maximum of 6 export cables and maximum length of cable of 400km, as detailed in the ES.
20.102	Applicant	If the Change Report is accepted [AS-009] what would be the consequential amendments to the DCO Order Limits?	The Change Report details onshore amendments to a number of cable route accesses, as requested by landowners; minor route amendments, as requested by landowners; increases to the areas within which the National Grid towers will be located (resulting in equivalent increases to the areas subject to permanent compulsory acquisition); and inclusion of permanent new rights for that part of the overhead line that is to be repositioned, as requested by National Grid. The Change Report provides an assessment of the implications of each amendment on other relevant application documents, including relevant updates to the DCO Order limits. It should be noted that none of the proposed amendments have been found to result in any change to the impacts assessed in the ES, or	Natural England provided comment on the change report at Deadline 1 and have no further comments to make in this regard [REP1-088].

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			any relevant DCO application documents as submitted in June 2018. Figures 1 – 9 of the Change Report present the amendments required to the Order limits as a result of each proposed change. The Applicant intends to submit revised drafts of the Onshore Works Plans (document reference 2.04) and corresponding updated dDCO, as well as any other relevant plans (e.g. Access to Works Plan (document reference 2.05)) at Deadline 2. There would be no change to the Order limits offshore. The Applicant would also refer the panel to the response to Q1.1.	
20.103	MCA	The dDML's refer to Emergency Response & Co-operation Plans. Are you proposing an amendment in respect of a SAR checklist to be agreed before construction starts to include the requirement for an approved Emergency Response Co-operation Plans (ERCOP)? If so please clarify what part of the dDCO and/or DML's you consider should be amended and provide your proposed wording.	The MCA would like schedules 9 Condition 15 (5), schedule 10 Condition 15 (5) and schedule 11 condition 10 (5) amended as follows: No part of the authorised project may commence until the MMO has received a SAR checklist containing all the required elements from Annex 5 of MGN 543 "Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response" which have been agreed with the MCA. The agreed checklist must be updated throughout the lifecycle of the project. The checklist must include an agreement to supply the MCA with an Emergency Response Co-operation Plan (ERCoP), maintained to the satisfaction of the MCA, at least three months before construction commences.	No comments.
20.104	Applicant	Please comment on the MCA's suggestion relating to Emergency Response Cooperation Plans (ERCOP)'s [RR-187].	The Applicant notes that the provision of the Emergency Response Cooperation Plans (ERCOP) is currently a standard DML condition contained within other offshore wind farm DCOs and this requirement is included in Condition 15(5) of the DMLs.	No comments.
20.105	MCA	Justify your proposal for linear progression of the construction programme with	The MCA spends a lot of time working with developers to ensure a minimum of two lines of	No comments.

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		reference to any adverse effects of disparate construction sites across the development area, and the need for an agreed construction plan to be in place ahead of any works commencing, explaining how the dDCO/DML's should be amended.	orientation as part of the windfarm layout. Multiple lines of consistent orientation provide alternative options for vessel passage planning, and we know that by far the safest way to navigate through a windfarm is when the turbines are in straight lines, with multiple lines of orientation, which gives a clear line of sight of entry and exit. Vessels may transit a windfarm through choice or they may unexpectedly find themselves in the vicinity of the offshore windfarm in poor conditions or in an evolving emergency situation, and two lines of orientation would make navigation through the windfarm much safer. In addition, all search and rescue patterns are essentially linear in that they are composed of patterns of (normally parallel) straight lines to ensure that a search area is covered to a consistent 'coverage factor'. Therefore, nonlinear OREI layouts may not necessarily provide an effective and 'safe' search-unit environment if SAR helicopters have to operate at low altitude e.g. because straight-line paths cannot be flown without encountering physical obstacles on a desired track. Therefore, this request is to help ensure that during construction, due consideration is given to the safety of navigation and our Search and Rescue obligations. MCA would have concern about any large gaps which could cause difficulty regarding aids to navigation/buoyage; outliers/dangerously protruding turbines or any other construction scenario which could impact vessels and SAR. We would therefore like to see the plans for construction showing how the developer intends to build the site; for example, in a phased approach, so we can consider any potential safety of navigation implications. We suggest that the pre-construction plans and	

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			documentation include the requirement for the Design Plan to detail how the construction/phased construction will take place, which should be in writing, and submitted to the MMO for approval. Such approval may only be granted following consultation by the MCA and TH and any such other advisors or organisations as may be required at the discretion of the MMO. The design plans would then also include those points listed as part of conditions 9 of Schedule 11 and condition 14 of Schedule 9.	
20.106	Applicant	Comment on the MCA's suggestion [RR-187] relating to the construction programme.	The MCA note in their Relevant Representation that they would expect to see some form of linear progression of the construction programme, avoiding disparate construction sites across the development area, and request that the DCO needs to include the requirement for an agreed construction plan to be in place ahead of any works commencing. The Applicant's preference would be for some form of linear progression of the construction programme, however the two-phase programme is considered to be a possible and necessary scenario for construction of the project for the following key reasons: • CfD auctions – There is no guarantee that Norfolk Vanguard will be able to secure CfD support for the full project of up to 1,800MW in one allocation round. At present, CfD bidding rules impose a limit of 1,500MW on the size of projects that can receive CfD support. Further clarity is therefore required in relation to future CfD auction rounds. • Supply chain capability – At 1,800MW, Norfolk Vanguard is substantially larger than any offshore wind farm built to date. There is therefore uncertainty whether the supply chain will be able to deliver such a large project in a short programme. In order to limit programme	No comments.

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			risks, and to minimise costs, it may be necessary to split the construction of the project into two distinct phases. The methodology for the construction programme would be agreed with the MMO before the works commences as secured in Schedule 9 Part 4 Condition 14(1)(b), Schedule 10 Part 4 Condition 14(1)(b), Schedule 11 Part 4 Condition 9(1)(b) and Schedule 12 Part 4 Condition 9(1)(b) of the dDCO.	
20.107	MCA	Clarify what amendment is proposed to the dDCO/DML's to ensure that consented cable protection works do not compromise existing and future safe navigation. Does the Applicant accept the MCA's request to specify a maximum of 5% reduction in surrounding depth referenced to Chart Datum?	MCA standard condition for all cable and pipeline related marine licence applications is that any consented cable/pipe protection works must ensure existing and future safety navigation is not compromised, accepting a maximum of 5% reduction in surrounding depth referenced to chart datum. The 5% is our trigger point for initiating conversations with the developers regarding any compromise in navigation safety, and whether the risk is suitably mitigated in those specific areas when the depth has changed significantly. A Marine Licence under the Marine and Coastal Access Act 2009 will likely be required for any rock dumping/cable protection and MCA would be consulted. MCA would then apply our standard condition as above and therefore this may not need to be addressed in the DCO if I understand correctly.	No comments, however, we note that the Applicant has confirmed in their Deadline 1 response that there is now agreement with MCA on this point.
20.108	Applicant	Comment on the MCA's suggestion relating to the cable protection works.	As stated in the SoCG between the Applicant and the MCA (document reference Rep1 -SOCG -31.1) the dDCO, Schedules 9 and 10, Part 4 Condition 14(1)(a) and Schedules 11 and 12, Part 4 Condition 9(1)(a) requires a design plan to be submitted and approved by the MMO in consultation with the MCA and Trinity House prior to licensed activities commencing. A cable specification, installation and monitoring	Natural England would support MCA in this regard.

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			plan must also be agreed with the MMO prior to construction as per the dDCO Schedules 9 and 10 Part 4 Condition 14(1)(g) and Schedules 11 and 12 Part 4 Condition 9(1)(g). This must include a detailed cable laying plan, including cable protection.	
20.109	Applicant	Schedule 14 Comment on Natural England's RR(Appendix 5) taking account of concerns that the arbitration procedure may compromise its advice and its ability to meet its responsibilities; that it should not be subject to any potential award of costs; and that the confidentiality clause may not be enforced against it.	Please see the Applicant's response to Question 20.110 below which also applies here. In addition to the matters raised in response to Question 20.110 below, it should be noted that Natural England has previously sought to be excluded from the arbitration article in relation to 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 the arbitration article to apply to SNCBs. Paragraph 7.3 of the Secretary of State's decision letter for Triton Knoll Offshore Wind Farm states: "The Panel also asked the Secretary of State to consider whether SNCBs should be removed from the provisions for arbitration covered by Article 12 of the draft Order at Appendix E (headed "Arbitration") [ER 5.11.20]. To maintain consistency with other offshore wind farms approved under the Planning Act 2008 since the close of the Panel's Examination, the Secretary of State has decided that the arbitration provisions should apply to SNCBs and has therefore modified the article in the Order accordingly." In his Report to the Secretary of State, the Examiner appointed to examine the Burbo Bank Extension Offshore Wind Farm Order stated at paragraph 7.45 and 7.46: Article 13 - Arbitration "This draft article provides for the appointment of	Natural England would reiterate the concerns with regard to the arbitration provision in the DCO, arbitration conditions in the DML and the arbitration rules schedule. Natural England does not believe the provision made for arbitration within this DCO is appropriate. As an SNCB appointed by the government through the NERC Act, Natural England cannot be bound by the findings of another organisation or individual such as is proposed within this provision. It is Natural England's responsibility to ensure that the natural environment is conserved, enhanced and managed. Within this role it is Natural England's duty to provide regulatory bodies with advice on plans or proposals with regard to their impact and nature conservation. Natural England is, therefore, unable to agree to a mechanism whereby its advice may be compromised or its ability to meet its responsibilities fettered by a third party. It is also noted that, within this provision, an award of costs may be made against Natural England. While it is acknowledged that the wording used is reasonably

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			an arbitrator if a dispute arises in respect of any provision of the DCO. Early draft DCOs excluded NE from the operation of the provision, pursuant to an opinion provided by NE to the Triton Knoll Offshore Wind Farm Examining Authority that the exercise of its statutory powers should not be subject to arbitration and should only be adjudicated upon by the court. However, the Secretary of State in the Triton Knoll decision decided not to exclude NE from the arbitration provision in that DCO, on the basis that all issues and parties should be equally subject to arbitration on the same basis. I proposed to delete the exclusion of NE from the arbitration provision in my draft DCO. The applicant and NE did not object to this revision which was sustained in the applicant's draft DCO Version 6 [APP-099]. I am content with the current drafting of this article." It is therefore considered appropriate that the arbitration article should apply to Natural England and other SNCBs. In any event, it is considered unlikely that matters between Natural England and the Applicant will result in a dispute to be referred to arbitration given that Natural England's role under the DCO is as a consultee rather than an approval body. The arbitration provisions would not prevent Natural England from providing its advice or from meeting its responsibilities when consulted on matters by the MMO, for example.	standard for arbitration agreements, Natural England considers that it is inappropriate for a Statutory Body to be subject to additional outside costs while performing the function government and legislation requires of it. In relation to the confidentiality clause of the arbitration schedule: Natural England is subject to the requirements of the Code of Practice on Access to Government Information ("Code"), Freedom of Information Act 2000 ("FOIA") and the Environmental Information Regulations 2004 ("EIR"). Therefore Natural England may be obliged to release documents in response to an FOIA or EIR request including any file notes. In respect of any FOIA or EIR request, Natural England is responsible for determining at its absolute discretion whether any information it holds, whether commercially sensitive information or otherwise, is exempt from disclosure in accordance with the provisions of the Code, FOIA or the EIR or is to be disclosed in response to a request for information. Natural England cannot therefore guarantee confidentiality or agree to be bound by such a requirement. **Natural England also note that MMO, MCA and Trinity House also have concerns in relation to**

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				arbitration.
20.110	Applicant	Comment on the RR's from the MMO [RR-186] in respect of the arbitration clause, and on each of the paragraphs 2.1 to 2.7 of the representations.	Model Article 42 of the Infrastructure Planning (Model Provisions) (England and Wales) Order 2009 provides an arbitration provision and the inclusion of such a mechanism in this manner has existed since the creation of the Planning Act 2008. The model article reads as follows: "Any difference under any provision of this Order, unless otherwise provided for, shall be referred to and settled by a single arbitrator to be agreed between the parties or, failing agreement, to be appointed on the application of either party (after giving notice in writing to the other) by the [insert appropriate body]." The principle of arbitration has therefore never previously been in dispute and has been included in numerous development consent orders in this form. However, such arbitration mechanisms based on the model provision do not contain any structure, timings or outcomes so as to provide the detail of how the arbitration process is intended to operate. For Nationally Significant Infrastructure Projects it is considered appropriate to provide a swift and clear process for resolution of disputes. The Applicant has therefore adopted the approach taken by the Hornsea Project Three Offshore Wind Farm project (currently at examination with reference EN010080) to develop the model provision by including more detail on the timeframes and steps associated with the arbitration process in order to ensure clarity and that the provision has practical effect. The Applicant is not seeking to remove the MMO's decision making powers and the Applicant recognises the MMO's important statutory function, but the Applicant is instead seeking to introduce a practical way forward in the (unlikely) event of the parties not reaching	Natural England support concerns raised by MMO with regards to arbitration, see response above. **Natural England note that MCA and Trinity House also have concerns in relation to arbitration.**

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			agreement through the approval process associated with the Order (particularly the conditions within the deemed marine licences). Arbitration is not, and should not, be the first port of call when a difference of opinion is encountered. The arbitration process would only begin in the event of non-determination or unreasonable non-approval of the conditions set out in the deemed marine licences. The draft DCO sets out minimum periods (usually four months) to consider plans and submissions and the MMO would therefore already have been in discussions for some time with the Applicant regarding this. In any event, it is extremely likely that further discussions would continue following the end of the determination period set out in the deemed marine licences. Therefore the MMO would have a significant amount of time to consider the issues that could ultimately be presented at arbitration and to reach a conclusion on their position. The 14 day period to appoint an arbitrator is therefore appropriate and strikes a reasonable balance to enable collation of known information whilst avoiding unnecessary delay. Allowing for a further consultation period would negate the purpose of the arbitration provisions in seeking a conclusion in a reasonable timeframe following a lengthy but ultimately unsuccessful process to discharge a condition under the deemed marine licences. The Applicant understands the importance of the MMO's statutory duty, and the Applicant is not seeking to dis-apply statutory provisions in this regard. The arbitration provisions would apply equally to the MMO as they do to all parties under the DCO; and the appointed arbitrator would have regard to the submissions and standing of the MMO when considering the	

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			matter in question. It is therefore unclear as to how arbitration would compromise the ability of the MMO to meet its responsibilities. It is a well-established principle, with precedence in offshore wind farm DCOs to date, that arbitration should apply equally to all parties. In relation to confidentiality, the Applicant acknowledges that the MMO would still be subject to the requirements of the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 and the Applicant proposes to amend the confidentiality provisions at paragraph 7(2) of Schedule 14 to make it expressly clear that a party can disclose information in accordance with an obligation required by legislation, as follows: "(2) The parties and Arbitrator agree that any matters, materials, documents, awards, expert reports and the like are confidential and must not be disclosed to any third party without prior written consent of the other party, save for any application to the Courts and/or save for compliance with legislative rules, functions or obligations on either party." Equally, costs will follow the principles well-established through the courts and the arbitration process. The MMO would be subject to similar cost awards in the event of judicial review proceedings. It is for the above reasons that the Applicant believes the current Arbitration mechanism would be fit for purpose and provide greater clarity for all parties in the event of a dispute under the DCO and is therefore preferable to the wording contained in the Model Provisions.	
20.111	Applicant	Schedule 15, 2.4. There appears to be a typographical error in the wording “is not thereafter be entitled”. Please clarify.	The wording should read as follows: "…(4) If the discharging authority does not give such notification as specified in sub-paragraph (2) or (3) it is deemed to have sufficient	No comments.

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			information to consider the application and is not thereafter ~~be~~ entitled to request further information without the prior agreement of the undertaker." The Applicant will include the revised drafting within the next version of the dDCO to be submitted at Deadline 2.	
20.112	All Discharging authorities	Schedule 15 sets out the procedure for discharge of Requirements. Please comment on the efficacy of the proposed arrangements, highlighting areas of dispute, if any.	Broadland Council – no comment	No comments.
20.113	Applicant	Schedule 16 The Environmental Permitting Regulations (England and Wales) 2016 are now the relevant regulations which relate to flood risk activity permitting. Should the protective provisions for the benefit of the Environment Agency (Schedule 16) refer to this legislation?	The protective provisions for the benefit of the Environment Agency, contained in Part 7 of Schedule 16 to the draft DCO, do not refer to the Environmental Permitting (England and Wales) Regulations 2010. The Part 7 protective provisions refer to section 23(8) and section 72 (interpretation) of the Land Drainage Act 1991 which are still in force and contain appropriate definitions for 'drainage authority' and 'ordinary watercourse' respectively. Paragraph 4(a), Part 6 of Schedule 16 contains protective provisions for the benefit of Anglian Water Services Limited. Paragraph 4(a) refers to the Environmental Permitting (England and Wales) Regulations 2010 and this will be amended, in the next version of draft DCO to be submitted at deadline 2, to refer to the Environmental Permitting (England and Wales) Regulations 2016 (which are defined in Article 2 of the draft DCO as the 2016 Regulations). Similarly, Article 7(3)(a) refers to the 2010 Regulations and this will also be amended to refer to the 2016 Regulations in the next version of the draft DCO submitted at deadline 2.	No comments.
20.114	Applicant	Schedule 16, Part 2 (National Grid) paragraph 16 prevents the undertaker from	Schedule 16, Part 2 is stated to apply "unless otherwise agreed in writing" between the	No comments.

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		acquiring any land interest or apparatus or overriding any easement and/or other interest of National Grid otherwise than by agreement. However The BoR lists several interests that National Grid (National Grid Electricity Transmission plc) has, among other matters, as lessees or occupiers. Clarify why these entries are included in the BoR as interests susceptible to compulsory acquisition.	Applicant and National Grid. The parties may wish, in due course, to agree an alternative process to the protective provisions. That could include permitting the Applicant qualified consent to compulsorily acquire interests belonging to NGET (subject to NGET's permission). It is accordingly necessary to have NGET's interests scheduled in the Order to permit such flexibility.	
20.115	Cadent Gas	Comment specifically on the protective provisions in Part 3, Schedule 16 of the dDCO as to whether they adequately protect your interests, including apparatus and land interests (gas distribution network) with reference to major accident hazard pipelines and below and above ground apparatus within the Order Limits.	No the Protective Provisions in Part 3 Schedule 16 of the dDCO are not yet in an agreed form and do not therefore adequately provide protection for Cadent Gas Limited's assets within the Order Land including the major accident hazard pipelines and below and above ground apparatus within the Order Limits. The key issues currently in dispute with the promoter are set out in our written representation and relate to the promoters request for a cap on the Indemnity Clause, which has been made, although it is not reflected on the face of the dDCO. There are also minor details remaining to be agreed including timescales for submission of details to plant protection for approval. The issues in dispute are currently in negotiation with the Promoter and we hope to make further progress in the near future. Cadent Gas Limited have reserved their right to attend a hearing should the drafting of the protective provisions not be addressed to their satisfaction. We are happy to provide the ExA with an update of the issues outstanding between the parties, if any, in response to the ExA's second round of questions.	No comments.
20.116	Applicant	Please explain why a definition of 'scour protection' has not been provided within the 'Part 1 Interpretation' section of each of the DMLs?	The Applicant notes this comment and will include a definition of "scour protection" within the next draft of the DCO to be submitted at Deadline 2. The definition will read as follows:	Natural England welcome this acknowledgment from the applicant and will provide further comment, if necessary, following

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			"scour protection means measures to prevent loss of seabed sediment around any marine structure placed in or on the seabed by use of protective aprons, mattresses with or without frond devices, or rock and gravel placement".	the relevant Deadline 2 submissions.
20.117	RSPB	In the relevant DML Conditions in Schedules 10 and 11of the made DCO for East Anglia THREE and Requirement 2(2), there was a specified minimum draught height of 22m above MHWS, but there was also the stipulation of a maximum number of wind turbine generators (WTGs) with a draught height of less than 24m from MHWS. Are you satisfied that this has not been included in the dDCO for Norfolk Vanguard?	This condition was for the purpose of minimising collision risk by raising the height of the turbines, as this reduces the number of birds flying at Potential Collision Height and hence reduces likely collision mortality. We would welcome a similar approach for Norfolk Vanguard, but given the inadequacies of the CRM presented so far, we are not able to calculate reductions in predicted collisions for any given increases in turbine heights. Therefore whilst this would be likely to be beneficial, we are unable at this stage to say with any confidence what effect raising the height of the turbines would have for individual species or impact significance.	Natural England support comments made by RSPB in this regard. Natural England also provided comment on this question as part of our submission at Deadline 1 (Annex A of our Written Representation) [REP1-088].
21.	**Monitoring, mitigation and management plans**			Note from ExA: Please see questions in other sections
22.	**Compulsory acquisition (CA)**			This section is not relevant to Natural England.
23.	**Habitats Regulation Assessment**			
23.1	Applicant	The Information for the HRA report [APP-045] states that approximately 1,200,000m^3 of sediment would be released within the Haisborough, Hammond and Winterton SAC (HHW SAC) due to trenching operations for the offshore export cables. However, the draft DMLs refer to 1,900,000 m3 of material being disposed of within the HHW SAC. Can you please explain why a greater volume of material would be permitted to be disposed of than is anticipated to be released, and confirm whether you have assessed the effects of	Schedules 11 and 12 Part 3, 1(d)(iii) refers to 1,900,000m3 of sediment disposal within the offshore cable corridor excluding the Haisborough, Hammond and Winterton SAC. As this is excluding the SAC, this value is not referred to in the Information to Support HRA report. In addition, Schedules 11 and 12 Part 3, 1(d)(iv) refers to sediment disposal within the Haisborough, Hammond and Winterton SAC of up to 500,000m3 in accordance with Table 7.4 of the Information to Support HRA report. Table 7.4 of the Information to Support HRA	No comments.

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		the volume of material permitted by the draft DMLs.	report, refers to the following: • 1,200,000m3 of potential sediment arising in relation to trenching works in order to provide a conservative assessment of suspended sediment, however as this sediment would not be raised, (as it would for pre-sweeping/dredging) it does not require disposal and is therefore not referred to in the dDCO. • 500,000m3 of sediment disposal within the Haisborough, Hammond and Winterton SAC (in accordance with Schedules 11 and 12 Part 3, 1(d)(iv)).	
23.2	Applicant	Paragraph 662 of the Information for the HRA report [APP-045] states that there would only be one UXO detonated at a time during UXO clearance operations. Can you explain what measures would be in place in regard to concurrent UXO detonations taking place and how such measures would be secured within the dDCO?	As discussed in response to Q6.9, UXO clearance is not licensed within the dDCO, it would be licenced separately once the nature and extent of UXO clearance is known. Conditions associated with the UXO clearance Marine Licence would be determined at that time. This is the approach that has been taken on other offshore wind farms to date.	No comments.
23.4	Applicant	In regard to the Information for the HRA report [APP-045], for example paragraphs 40 and 47, please can you explain how in-combination effects have been assessed at the screening stage and provide clear justifications for the conclusions you have reached.	With respect to paragraph 40 (screening for displacement and barrier effects on lesser black-backed gull and herring gull from Alde Ore Estuary SPA), the assessment considers the likelihood of these impacts occurring at any wind farms (for which there is no evidence) and also the fact that Norfolk Vanguard is at a sufficiently great distance from the SPA that connectivity will at most be very low. Thus, the likelihood of a project alone effect has been ruled out on the basis of both aspects. The risk of an in-combination effect is similarly ruled out on the basis of the absence of evidence for these impacts (displacement and barrier) on these species and the fact that no effect is predicted for the project alone. With respect to paragraph 47 (screening for displacement barrier effects for auks from	As advised in our Section 42 (Preliminary Environmental Information Report) response, Relevant Representations (RR-106] and Written Representation [REP1-088], Natural England require that the variability (uncertainty) in the underlying population estimates (i.e. through consideration of appropriately calculated upper and lower confidence intervals) is considered in the displacement assessments. Whilst the upper and lower confidence limits around the bird abundance estimates are presented in the tables in Annex 1 of Appendix 13.01, these have not been considered in the impact

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			Flamborough and Filey Coast SPA), project alone effects were screened out due to the fact Norfolk Vanguard is beyond foraging range of the SPA and hence breeding birds are not likely to be present, and during the nonbreeding season the proportions of the regional population made up of birds from this SPA are very small. The extremely low proportions from the SPA on Norfolk Vanguard and absence of predicted cumulative effects means that the likelihood of Norfolk Vanguard contributing to an in-combination effect can be ruled out.	assessments for construction or operational displacement within the ES, with only the mean peak seasonal abundances considered. This approach needs to be revisited for all relevant species. Please also note NE's concerns in our answer to Examiners Question 23.40) regarding the approach taken to screening out an LSE for impacts on SPA auks on the basis that there is no significant impact at an EIA scale.
23.5	Applicant	Paragraph 50 of the Information for the HRA [APP-045] screened out a likely significant effect (LSE) of gannet displacement from the Flamborough and Filey Coast SPA. Please justify why you have not used a similar approach for gannet displacement as that which you have applied to auk cumulative displacement, and set out whether a LSE for gannet could be screened out should such a similar approach be undertaken.	The assessment makes use of appropriate ecological information for each species' assessment. In the case of gannet, the predicted displacement impact for Norfolk Vanguard was extremely small and this was considered sufficient justification for ruling out a likely significant effect for the project alone and in-combination.	Natural England disagree with the Applicant's response and recommend that the Applicant uses the same approach as per auks for Gannet cumulative displacement. Once this has been completed a review can be completed of the no LSE conclusion for in-combination displacement from FFC (see point 5.3 of Relevant Representation appendix for further information). Please also note NE's concerns in our answer to Examiners Question 23.40) regarding the approach taken to screening out an LSE for impacts on SPA auks on the basis that there is no significant impact at an EIA scale.
23.6	Applicant	Please respond to NE's comment [RR-106] that it does not agree to no AEOI for the Greater Wash SPA and also its recommendation that the in-combination collision risk should be revisited once uncertainties around the CRM are resolved.	The Red-throated diver displacement note (Appendix 3.1, document reference ExA; WQApp3.1; 10.D1.3) considers the potential impacts on the Greater Wash SPA and provides additional justification for a conclusion of no AEoI on that feature. The little gull assessment, which it is assumed this question refers to, is subject to the same considerations with regard	Due to the size of the documents provided and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review these documents. Natural England will therefore provide comment on this

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			to agreement regarding CRM methods as discussed in answer to Qs 3.3, 3.7 and 3.8 above. Thus, this aspect is subject to ongoing discussions with NE. In addition the Collision Risk Modelling: update and clarification note (Appendix 3.2, document reference ExA; WQApp3.2; 10.D1.3) includes mean collision predictions (i.e. as per Natural England's request) and these outputs are very similar to those presented in the ES and on which the likelihood of a significant effect was ruled out. Therefore, the Applicant does not expect this conclusion to be affected.	submission at Deadline 3.
23.8	Applicant	Please can you clarify whether or not any enabling works for Norfolk Boreas within the marine environment would be included within the dDCO for Norfolk Vanguard, and if so, whether these works have been assessed?	There are no enabling works for the offshore aspect of Norfolk Boreas. As such, no offshore enabling works were assessed and there are no offshore Norfolk Boreas enabling works included within the dDCO.	No comments.
23.9	Applicant	To what extent have you given consideration to proposed developments outside UK territorial waters in undertaking the assessment of in-combination effects on European sites?	**Marine mammal in-combination assessment** The CIA screening for ES Chapter 12 Marine mammals (provided in ES Appendix 12.3), was also used to inform the in-combination assessment for the HRA. As outlined in ES Appendix 12.3 Section 12.3.2.2, an initial list of 66 European offshore wind farms with the potential for construction, operation and decommissioning cumulative impacts or in-combination effects were considered. Where information was available, the potential for in-combination effects from other activities was also considered. European offshore wind farms were taken into account in the HRA (see Table 8.33 of the Information to Support HRA report), the provision for the potential UXO clearance and seismic surveys outside UK waters was also taken into account in the Information to Support HRA report. **Ornithology in-combination assessment**	Natural England would defer to the relevant Government in this regard.

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			Natural England developed the BDMPS approach and has advocated its use in case work by developers and their consultants. The BDMPS approach considers the smallest appropriate biologically defined population scale against which to assess population-level impacts. For most seabirds this scale is a section of UK waters and does not extend into areas outside UK territorial waters. Due to differences in how projects are assessed in different countries it is extremely challenging to combine impact estimates across countries. However, the majority of impacts at Norfolk Vanguard to which the project could contribute to an in-combination effect relate to the nonbreeding season. During this period of the year seabirds from a wide range of European designated sites are mixed together and it is only possible to assign individuals to colonies on the basis of relative population sizes. The resulting reference populations against which impacts are assessed are based on birds within UK waters (e.g. BDMPS populations in Furness 2015). Thus, assessing UK projects against UK seabird populations ensures consistency in approach. An in-combination assessment across a larger spatial scale would not only be difficult because other European countries make assessments differently, so numbers cannot easily be added up, but also would assess in-combination impacts against a larger population size (because the larger spatial scale would include birds in non-UK waters that are not included in the BDMPS approach advocated by Natural England). The larger seabird population resulting from using a larger spatial scale would reduce the assessed in-combination impact, since at the present time the density of	

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			developments is higher in UK waters than in waters of other European countries. The present method is therefore precautionary. An assessment against the biogeographic population would be much more difficult, but also would indicate a smaller impact than associated with a BDMPS population.	
23.11	MMO	Can you provide examples as to how a strategic approach to the scheduling of pile driving can best be delivered?	The MMO recognises that the review of consents has not been concluded for the Southern North Sea cSAC, and that the outcome of this review of consents may influence how any mitigation is defined and secured on projects coming forward. The MMO recognises that at present, there is no mechanism for a regulator to control the timings of activities that generate underwater noise on a strategic level. The MMO considers the inclusion of a Site Integrity plan could be used to submit to the MMO to demonstrate how the in-combination underwater noise impacts of a project will be mitigation to ensure that it will not cause an adverse effect. The MMO believes that that this will require accurate timetables based on up to date construction information from all projects that generate underwater noise. The MMO considers that it may be possible for developers to cooperate in order to present sufficient information in the SIP to demonstrate how the construction schedules, in combination with each other, will not result in adverse effect. Please also see response ExA question 23.22,	Natural England provided a detailed response in this regard (see response to Qu. 23.10 and 23.22 of our responses to Examining Authority's first written questions). However, in our response to the consultation on the RoC draft HRA we expressed our concern that there remains a lack of clarity on how Site Integrity Plan (SIP) conditions will ensure that mitigation will be put in place to prevent exceedance of the SNCB thresholds for disturbance. A mechanism will need to be developed by the regulators to ensure continuing adherence to the SNCB thresholds as multiple SIPs are developed over time, especially when piling can take place over several years, and new projects can come online during this time. Should potential exceedance of the thresholds occur, a process for dealing with this issue needs to be in place – the affected developers / industries will need to work together with the regulator and SNCBs to prevent adverse effect on the SCI. We advise that this mechanism/regulatory responsibility to control noisy

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				subsea activities is identified and committed to now to ensure that in-combination there will be no AEoI, otherwise there is a risk to projects proceeding and the likelihood of significant delays.
23.12	Applicant	Please respond to the comments made by NE and the MMO regarding in- combination impacts on the Southern North Sea cSAC.	Sections 3 and 4 of Appendix 20.3 (document reference ExA; WQApp20.3; 10.D1.3) provide the Applicant's response to Relevant Representation comments regarding in-combination impacts on the Southern North Sea cSAC.	No comments.
23.15	Applicant	Please provide comment on whether you consider that trenchless crossing (Appendix 5.2, paragraph 86) [APP-047], limited construction hours (Information for the HRA report, paragraph 102) [APP-045], mitigation for noise effects from piling and UXO clearance (Table 8.4) [APP-045] and micrositing to avoid permanent habitat loss (Information for the HRA report, paragraph 67) [APP- 045] should be considered mitigation in light of the judgement in the People over Wind, Peter Sweetman v Coillte Teoranta case C-323/17.	In Case 323/17 People over Wind and Peter Sweetman v Coillte Teoranta, the Court of Justice of the European Union ruled that where a developer has screened out the need for Appropriate Assessment of a SAC or SPA on the grounds that a significant effect is unlikely, the proposed mitigation measures must not be a factor in this decision. The Court interpreted mitigation as "measures that are intended to avoid or reduce the harmful effects of the envisaged project on the site concerned". "A full and precise analysis of the measures capable of avoiding or reducing any significant effects on the site concerned must be carried out not at the screening stage but specifically at the stage of the appropriate assessment". (i) Trenchless crossing (Appendix 5.2 paragraph 86) [APP-047]. Paragraph 86 states "the River Wensum is located in the onshore project area. The onshore cable corridor crosses the River Wensum at Elsing. As part of the embedded mitigation for the project, a trenchless technique (e.g. HDD) will be used when crossing the River Wensum. This technique will ensure that there are no direct effects upon any of the qualifying features of the SAC within the site boundary and therefore potential direct effects upon the SAC	No comments.

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			boundary are screened out from any further assessment." The trenchless installation techniques referred to in Requirement 16(17) are not strictly "intended to avoid or reduce the harmful effects of the envisaged project on the site concerned". These techniques must be used for the purposes of passing under specified rivers, becks, a canal, a plantation, County Wildlife Sites, a coastal path, railway lines and A roads. They are inherent features of the onshore transmission works as set out in Requirement 16(17). As stated at paragraph 94 "direct impacts on the River Wensum SAC have been screened out following the selection of method used to cross the feature, namely the use of trenchless cable burial techniques (eg horizontal directional drilling (HDD)). The use of this technique will ensure no direct effects upon any of the qualifying features of the SAC". (ii) Limited construction hours (Information for the HRA Report, paragraph 102) [APP-045] In considering potential effects on Paston Great Barn SAC (a building supporting a maternity roost of barbastelle bats), located 2.9km form the onshore project, paragraph 102 states "potential effects arising from air quality and visual disturbance have been screened out of further assessment as the qualifying features of the Paston Great Barn SAC are not sensitive to potential effects from these sources. Construction noise effects will be restricted to project working hours of 7.00am – 7.00pm Monday to Friday and therefore have also been screened out from further consideration". The specified project working hours are not "intended to avoid or reduce the harmful effects of the envisaged project on the site concerned". They are an inherent feature of the onshore	

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			transmission works as set out in Requirement 26(1). (iii) Mitigation for noise effects from piling and UXO clearance (Table 8.4) [APP-045] Table 8.4 states "lethal effects and permanent auditory injury from piling and the clearance of UXO will be mitigated and therefore there is no potential for LSE". In practice this mitigation has been considered as part of the assessment at 8.2.1 Mitigation. Paragraph 6.17 states "in addition to embedded mitigation, if further mitigation is required and possible (i.e. those measures to prevent or reduce any remaining potentially significant adverse effects) these are discussed in the relevant sections and the post-mitigation residual effect is provided. A summary of all proposed mitigation is provided in section 8.4." Under 8.2.1.1 Embedded mitigation, paragraph 6.20 describes the mitigation to reduce potential effects on marine mammals, comprising the use of a soft start and ramp up protocol. Under 8.2.1.2 Further mitigation, reference is made to the MMMP for piling (8.2.1.2.1), the MMMP for UXO clearance (8.2.1.2.2), and the in principle Site Integrity Plan (8.2.1.2.3). Paragraph 6.58 concludes that "the effective implementation of a UXO MMMP will reduce the risk of permanent auditory injury (PTS) to harbour porpoise during any underwater detonations at Norfolk Vanguard (alone) therefore there would be no potential adverse effect on the integrity of the Southern North Sea cSAC in relation to the conservation objectives for harbour porpoise". Paragraph 678 concludes that "the MMMP for piling will reduce the risk of permanent auditory injury to harbour porpoise as a result of underwater noise during piling at Norfolk	

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			Vanguard (alone) therefore there would be no potential adverse effect on the integrity of the Southern North Sea cSAC in relation to the conservation objectives for harbour porpoise." (iv) Micrositing to avoid permanent habitat loss (Information for the HRA Report paragraph 67) [APP-045] Paragraph 67 states "It was agreed through the EPP that there would be no permanent loss of Annex 1 reef due to the embedded mitigation to microsite where possible to avoid reef and the fact that S. Spinulosa is ephemeral and can be expected to recover from cable installation works". In practice this mitigation has been considered as part of the assessment at 7.3.1 Embedded mitigation. Paragraph 314 states "as discussed above should important seabed features or obstacles (eg Annex 1 reef and UXO) be identified on the proposed cable routes during the pre-construction surveys, micrositing will be undertaken where possible "to minimise potential impacts". Paragraph 410 concludes that "due to the considerable width available for micrositing to avoid core S. Spinulosa reef where identified during pre-construction surveys it is likely that no temporary physical disturbance will occur in the offshore cable corridor. The export cable corridor is approximately 4km wide at the point where S. Spinulosa reef has been recorded to date. A total width of approximately 1.35km is required for Norfolk Vanguard and Norfolk Boreas; therefore 2.65km is likely to be available for micrositing at this location within the cable corridor. As a result based on the likely scenario that micrositing is possible there would be no adverse effect on the integrity of the Haisborough Hammond and Winterton SAC in relation to the conservation objectives for Annex	

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			1 S. Spinulosa reefs due to temporary physical disturbance during construction." Paragraph 428 concludes "therefore given the very small proportion of temporary disturbance and the high recoverability, the conservation objective of maintaining or restoring extent would be sustained. It is therefore reasonable to conclude that there will be no adverse effect on the integrity of the Haisborough Hammond and Winterton SAC in relation to the conservation objectives for Annex 1 S. Spinulosa reefs due to temporary physical disturbance during construction".	
23.16	Applicant	Please confirm the mechanism through which it will be ensured that seabed material would be retained within the HHW SAC.	The Applicant has committed to disposing of seabed material arising from the Haisborough, Hammond and Winterton SAC during cable installation back into the SAC. This is secured through the cable specification, installation and monitoring plan, to be agreed with the MMO, which is required under dDCO Schedules 9 and 10 Part 4 Condition 14(1)(g) and Schedules 11 and 12 Part 4 Condition 9(1)(g). The Haisborough, Hammond and Winterton SAC is not a closed system and it presently has sediment both entering and leaving it around the boundaries. The movement which occurs in and out of the Haisborough SAC at present will continue, irrespective of the proposed dredging or disposal activities as discussed in Information to Support HRA report Appendix 7.1 ABPmer Sandwave Study.	No comments.
23.17	Applicant	Please confirm whether the proposed buffer zone from *Sabellaria* reef, within which disposal of sediment would be restricted, is 100m (as indicated in paragraph 324 of the Information for the HRA report) or 50m (as indicated in paragraphs 432, 435, 470 and Table 7.4 of the Information for the HRA report)?	A 50m buffer from S. spinulosa reef is proposed for disposal of sediment, in accordance with advice provided by Natural England by email on 13th February 2018.	Natural England would like to flag that whilst we agree with the 50m buffer the appropriate buffer for offshore designated sites is normally 500m and therefore further justification for a reduced buffer should be considered to ensure a consistent approach

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				across sites and industry. In addition, if the sediment is to be surface released then this needs to be taken account of and release points identified at specific states of the tide that will ensure the resting place of the bulk of the material is a minimum of 50m from *Sabellaria spinulosa* reef identified in pre-construction surveys (noting *S. spinulosa* is tolerant to a certain amount of smothering, but the volumes being discussed here are large). This needs to be a license condition.
23.18	Applicant	In response to NE's concern about the scale of the buffer zone, please justify your proposed 100m/50m buffer zone, when an appropriate buffer zone for offshore designated sites is usually 500m.	Please see the Applicant's response to Q23.17.	Natural England would like to flag that whilst we agree with the 50m buffer the appropriate buffer for offshore designated sites is normally 500m and therefore further justification for a reduced buffer should be considered to ensure a consistent approach across sites and industry. In addition, if the sediment is to be surface released then this needs to be taken account of and release points identified at specific states of the tide that will ensure the resting place of the bulk of the material is a minimum of 50m from *Sabellaria spinulosa* reef identified in pre-construction surveys (noting *S. spinulosa* is tolerant to a certain amount of smothering, but the volumes being discussed here are large). This needs to be a license condition.
23.19	Applicant	Please set out the mechanism through	The buffer zone will be secured through the	No comments.

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		which the buffer zone will be secured in the dDCO.	Cable Specification, Installation and Monitoring Plan, submitted to the MMO for approval pursuant to condition 14(1)(g) (Generation DML, Schedules 9-10) and condition 9(1)(g) (Transmission DML, Schedules 11-12). In particular, through requirement 9(1)(g)(ii) which includes a detailed cable laying plan incorporating a burial risk assessment to ascertain suitable burial depths and cable laying techniques, including the appropriate cable protection.	
23.20	Applicant	Can you confirm whether or not the measures detailed in paragraph 201 of the Information for the HRA report [APP-045], which you have suggested are necessary to offset in-combination collision mortality, are relied upon to reach your conclusion of no AEOI.	The additional conservation measures outlined in paragraph 201 were not included in the conclusion of no AEoI, but rather represent additional measures which could be undertaken to enhance the status of the population.	Natural England have provided comment in this regard in response to ExA Question 3.3 m in Annex A of our Written Representations [REP1-088].
23.21	Applicant	In response to the concerns raised by NE regarding the potential impact of cable laying operations on red-throated divers of the Greater Wash SPA, are you willing to impose restrictions on the timing of cable laying operations and, if so, please set out how these restrictions could be secured in the dDCO.	The assessment of the potential impact on red-throated divers in the Greater Wash SPA due to cable laying assumed 100% displacement and 5% mortality affecting birds within a 2km radius of up to 2 vessels. The number of individuals at risk was estimated from the density estimates presented in Natural England and JNCC (2016). Cable laying was assumed to occur during the period of peak RTD presence (i.e. mid-winter). This assessment was highly precautionary, since the mortality rate of 5% is probably five times higher than a realistic precautionary rate for displaced red-throated divers (see Appendix 3.1 Red-throated diver displacement note, document reference ExA; WQApp3.1; 10.D1.3). Even on this basis, no adverse effects on the integrity of the SPA were predicted as a result of cable laying. Therefore, there is no requirement for timing restrictions on cable laying.	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review the Red-throated Diver displacement note. Natural England will therefore provide comment on this submission at Deadline 3. However, as noted in our Relevant Representations [RR-106] and Written Representations [REP1-088] Natural England do not agree with the Applicant's use of 5% mortality and advise a worst case of up to 10%. In addition, as noted in our response to Examining Authority's question 3.1, the numbers of RTD present (and

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				therefore impact levels) could be higher, given that the SPA data is based on visual aerial surveys, which appear to detect lower numbers of divers compared with digital aerial surveys. 'Timing of works' restrictions on disturbing activities are a well-established mitigation measure where sensitivities vary seasonally, e.g. wintering waterbirds on estuaries. If cable-laying activities were to avoid the months during which red-throated divers were susceptible to displacement-related mortality, this has significant potential to reduce impacts.
23.22	MMO	The Applicant has proposed a number of mitigation measures within the draft Marine Mammal Mitigation Protocol [APP-037], and the Draft SNS cSAC Site Integrity Plan [APP-041], and it has also proposed that a Marine Pollution Contingency Plan be produced post-consent. The successful delivery of these plans is relied upon for concluding no AEOI, and yet there remains some doubt about the nature and efficacy of some of the proposed measures. Therefore can you please confirm to what extent you are satisfied that the measures referred to in these plans are sufficiently well-defined and deliverable?	The MMO defers to Natural England for conservation advice, however MMO can comment in respect of the proposed conditions and whether it considers that mitigation is adequately defined and secured on the DML. As currently presented, the MMO is not satisfied that the In principle Site Integrity Plan adequately addresses in-combination effects, and that the proposed mitigation of scheduling of piling operations as currently presented in the IPSIP, cannot currently be delivered as there is no mechanism in place for a regulator to control the scheduling of piling operations. The MMO is continuing to discuss with the applicant through the SoCG.	Natural England would support this position.
23.22	The Wildlife Trusts	As above.	**SNS cSAC Site Integrity Plan (SIP)** In its current form the SIP lacks detail on the effectiveness of the proposed mitigation methods. Therefore, TWT does not consider it adequate to ensure no adverse effect on the SNS SCI beyond reasonable scientific doubt. To achieve this, more evidence is required to detail	Natural England would support this position.

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			how effective the proposed mitigation will be. This should include referenced examples of how the implementation of mitigation will reduce underwater noise disturbance impacts within the SNS SCI. Noise modelling should also be undertaken to demonstrate the degree of noise reduction which could be achieved through mitigation. The following text of the European Commission Article 6 Habitats Directive Guidance from 21st November 2018 (page 52) establishes the obligation to detail the effectiveness of mitigation measures. *"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."* We are pleased that the applicant has named TWT on the SIP but we wish to engage with the developer in more detail post-consent than what is proposed. We also wish to be named on the MMMP for piling and UXO clearance. We are in ongoing discussions with the applicant regarding this.	
23.22	WDC	As above.	WDC are pleased to see a commitment to a MMP and SIP. We recognise that these will be designed closer to construction, once all details and plans are known, that mitigation methods to be used will be decided at that time. However, until the details of these documents, and the proposed Marine Pollution Contingency Plan, are finalised they cannot be relied upon for concluding no AEoI.	Natural England would support this position.

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			We are concerned that currently the MMMPs and the SIP only include mitigation methods from the JNCC guidelines, and claims that this will mitigate any auditory or physical injury. WDC strongly disagrees with this conclusion as there is a lack of scientific evidence on the effectiveness of these measures. As yet these embedded mitigation measures are unproven and relying on them in any of the above please will lead to inaccurate and misleading results therefore we cannot agree with the assumption that these mitigation methods will ensure no AEoI on the SNS SCI harbour porpoise population. We recommend that these documents include a commitment to using a proven mitigation methods alongside modelling the effectiveness of proposed mitigation measures, in particular the cumulative impacts, supported with case studies on how these measures reduce noise disturbance on marine mammals. In addition there should be a monitoring programme suitable to ground-truth the effectiveness of these mitigation measures. A number of mitigation methods to reduce noise from piling activities have been proven in demonstration scale trial studies. Studies at full scale offshore wind farms have shown that the used of bubble curtains during pile driving activities can reduce the disturbance area on harbour porpoises from ~15km to ~5km compared to piling with no mitigation, totalling ~90% reduction in harbour porpoise disturbance area.	
23.23	Applicant	Please respond to NE's assertion in its RR [RR-106] that adopting a condition to prevent piling if 20% of the SAC is at risk of disturbance would not be sufficient to be Habitats Regulations compliant.	The Applicant understands that NE is referring to the requirement for a mechanism to be identified and implemented to control the number of piling events to ensure that thresholds are not exceeded. The In Principle Site Integrity Plan (document reference 8.17)	No comments.

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			provides the mechanism, provided that other projects also have comparable conditions, as has been proposed by the Review of Consents (BEIS13, 2018). It has been agreed in the SoCG with NE (document reference Rep1 -SOCG -13.1) that the Site Integrity Plan, in accordance with the In Principle Site Integrity Plan provides an appropriate framework to agree mitigation measures for effects on the Southern North Sea cSAC/SCI with the MMO in consultation with the relevant SNCBs prior to construction.	
23.24	MMO	In regard to the Applicant's proposed MMMP for UXO clearance, please indicate the degree of confidence you have in the efficacy of mitigation measures that are yet to be defined.	UXO clearance is no longer part of the DCO application, and therefore the MMO has no comment to make.	No comments.
23.24	WDC	As above	Our comments for the MMMP for UXO clearance are the same as for the question above. Mainly, whilst we welcome in principle the MMMP for UXO, until the mitigation measures are defined is inaccurate to conclude that mitigation measures will be effective. We recommend that modelling is undertaken to assess the effectiveness of proposed mitigation measures and are supported with case studies on how these measures reduce noise disturbance on marine mammals.	Natural England support this position.
23.26	Applicant	Can you provide reasons to explain and demonstrate why, having regard to the precautionary principle, your PVA approach as described in the ES and HRA is sufficient to support a finding of no AEOI, and how your approach has overcome the issues identified by NE in this regard.	The Population Viability Analysis (PVA) models referred to in the assessment were produced with a view to generating predictions which balance precaution with realism. In most cases these models, which have been used in previous wind farm applications, were developed in consultation with NE and thus were considered robust and fit for purpose. There are two key pieces of Natural England advice which have changed since these model outputs were	Natural England would like to provide further comment in this regard at Deadline 3 to ensure consistency with our response to Hornsea Project Three.

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			previously accepted. The first relates to how the models are run, with simulations either paired (i.e. using identical demographic rates) with one of the pairs subject to additional mortality and the other run in the absence of impact. These are referred to as matched-pairs. Comparison across the pairs provides an estimate of the predicted impact. Previously impact and non-impact simulations were completely independent (i.e. did not share sequences of demographic rates) and these are referred to as non-matched simulations. The other piece of revised advice is how the results are presented, with the preferred option being the ratio of impacted to non-impacted population size and population growth rate now requested (referred to as counterfactuals). Previously alternative impacts such as the probability of decline were provided (although counterfactuals often have also been provided). Extensive analysis undertaken for the kittiwake PVA used in the Hornsea Project THREE assessment has demonstrated that the results obtained from matched-pairs and non-matched simulations are the same in terms of the average predictions obtained (for density independent simulations). This is not a surprising result since with sufficient numbers of iterations (e.g. >=1,000) there is no reason for the two approaches to generate different results, and the suggestion that they would appears to indicate a flaw in the work on which this is based. It is worth noting that density dependent simulations cannot be run as strictly matched-pairs because by their nature, the population size of each of the pair will diverge (i.e. impacted will decline relative to non-impacted) and this means the strength of density dependence will also diverge.	

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			Thus, the PVA results referred to in the Norfolk Vanguard assessment remain reliable despite having been produced before NE adopted the matched-pair advice. The Applicant acknowledges that some of the PVA referred to did not include counterfactual outputs, as they pre-dated that advice. However, the relative magnitude of outputs and context in which they are used is relevant. For example, the gannet PVA was produced on the basis of populations which were around 1/3 smaller than they are currently, and this clearly will have a big effect on the relative scale of predicted effects.	
23.28	Applicant	Please specify the extent to which you are willing to undertake the PVA, taking into account the factors requested by NE.	Notwithstanding the response to Q 23.26, if, following revisions to the impact assessment, any impacts are considered sufficiently large to warrant further investigation using PVA, and such model outputs are not already available (and considered robust), then the Applicant will undertake the additional modelling required.	Natural England welcome the Applicant's commitment to undertake this additional modelling and are happy to continue to engage with the Applicant in this regard.
23.31	Applicant	Can you update the integrity matrices to include specific paragraph references from the Information to Support HRA report [APP-045] which support the conclusions you have reached. The matrices should also explain how the mitigation measures you propose are to be secured.	Updated HRA Integrity matrices are provided in Appendix 23.1 of this submission (document reference ExA; WQApp23.1; 10.D1.3).	Natural England have not yet had the chance to review Appendix 23.1 and will therefore provide comment in this regard for Deadline 3.
23.32	Applicant	Please respond to the comments made in the Regulation 32 consultation response from the French Ministry, and in particular justify why you did not identify the Bancs des Flandres SPA and the Cap Gris-Nez SPA in regard to cumulative impact assessment.	**Offshore ornithology** These French SPAs were not identified in the consultation responses, hence were not previously brought to the Applicant's attention. The impacts of concern identified in the response from the French Ministry with regards ornithology are ones which have been assessed thoroughly in the assessment. The Applicant will provide additional screening responses (and subsequent assessment if necessary) for the two named SPAs.	Natural England notes this position by the French Government. In Natural England's considered opinion, it is not within our remit to comment upon issues and assessments when the relevant designated sites are in France. These should be addressed by the relevant nature conservation body in the country of concern and would therefore defer to the French

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			Bancs des Flandres SPA (175km from Norfolk Vanguard) was designated in January 2010 for 25 species of birds. Most of these species have not been seen within the Norfolk Vanguard site during offshore ornithology surveys. However, the species list includes gannet, kittiwake, fulmar, razorbill, red-throated diver, little gull, Arctic skua, great skua, common tern, Arctic tern, guillemot. Migrations of birds from that SPA are likely to result in very small numbers from those populations passing through Norfolk Vanguard during migration, relative to the size of regional populations. Cap Gris-Nez SPA (210km from Norfolk Vanguard) was designated in January 2005 for 75 species of birds. Most of these species have not been seen within the Norfolk Vanguard site during offshore ornithology surveys. However, for the species that may migrate through the Norfolk Vanguard site, migrations of birds from that SPA are likely to result in very small numbers from those populations passing through Norfolk Vanguard during migration, relative to the size of regional populations. **Marine mammals** The Applicant notes the comments on marine mammals and agrees that French sites were included in the screening process and were screened out on the basis of Norfolk Vanguard having no Likely Significant Effect (as detailed in Appendix 5.1 of the Information to Support HRA Report). Mitigation for marine mammals will be delivered through the Marine Mammal Mitigation Protocol (required under Schedules 9 and 10 Part 4 Condition 14(1)(f) and Schedules 11 and 12 Part 4 Condition 9(1)(f), in accordance with the draft MMMP, document 8.13) and the Southern North Sea cSAC/SCI SIP (required under Schedules 9 and 10 Part 4 Condition	Government in this regard.

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			14(1)(m) and Schedules 11 and 12 Part 4 Condition 9(1)(l) in accordance with the draft Site Integrity Plan, document 8.17). The requirement for monitoring is secured through the Construction Programme and Monitoring Plan (required under Schedules 9 and 10 Part 4 Condition 14(1)(b) and Schedules 11 and 12 Part 4 Condition 9(1)(b)), in accordance with the In Principle Monitoring Plan (document 8.12). **Commercial Fisheries** The Applicant notes Direction Interregionale de la Mer (DIEM) Manche Est – mer du Nor comments in relation to the cumulative assessment and their view that in line with the assessment presented in the EIA, cumulative impacts on the French fleet would be of minor significance. With regards to the potential for some displacement of Dutch fishing vessels to areas within the French 6-12nm limit, the wide operational range and associated fishing opportunities of the Dutch vessels active in areas relevant to the project should be noted.	
23.33	French Ministry	Can you please identify which European sites within your jurisdiction you consider there could be a LSE from the proposed development, and set out your reasoning with full justification.		Natural England notes the position by the French Government. In Natural England's considered opinion, it is not within our remit to comment upon issues and assessments when the relevant designated sites are in France. These should be addressed by the relevant nature conservation body in the country of concern and would therefore defer to the French Government in this regard.
23.34	RSPB	In terms of the seasonal apportioning of impacts for the Alde-Ore Estuary SPA and Ramsar site, what figure do you consider should be applied to lesser black- backed gulls?	We consider that the apportioning of 25% of collision risk at Norfolk Vanguard to the Alde-Ore Estuary SPA is not sufficiently supported by evidence in two key areas: the estimation of the non-SPA lesser black-backed gull population	Natural England broadly agrees with comments raised by RSPB and have provided similar concerns in our responses to Examining Authority's first written

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			and its likely growth rate, and the assumption that urban and inland gulls are likely to forage at sea to the same level as rural coastal birds. Whilst we acknowledge the difficulties arising from the lack of recent census data for urban gull colonies, the approach taken by the Applicant to estimate the urban gull population in Norfolk and Suffolk is speculative and lacking in precaution. A key source of information, the Seabird 2000 census, is missing from the cited colony counts and no evidence is provided for the rate chosen to account for colony growth since the last counts. The Seabird 2000 census carried out in 1999 – 2002 (Mitchell et al., 2004) recorded 1149 apparently occupied nests (AON) in Suffolk roof-nesting colonies, 1605 AON in Norfolk coastal colonies, and 1456 in Suffolk Coastal colonies (excluding the SPA colony at Orfordness). This gives a total of 4210 AON outside the SPA, or 8420 adult birds. We acknowledge that these data do not include roof-nesting birds in Norfolk, and that the counts of roof-nesting birds are thought to be underestimated. More recent work by Coulson and Coulson (2015) suggests that results from the vantage point surveys of roof-nesting birds carried out for Seabird 2000 should be multiplied by 1.33 to correct for under-detection of nests. This would raise the number of adult birds in Norfolk and Suffolk to 9178 when the roof-nesting numbers for Suffolk are corrected in this way. Given that Norfolk is likely to be similar to Suffolk in terms of urban habitats available, it may be appropriate to double the numbers of urban birds in Suffolk to account for the missing Norfolk data. This would give a total non-SPA population of 12,234 adult birds, or 21,093 birds of all ages (assuming adults comprise 58% of the population, Furness, 2015), of which 10,539 are from urban colonies in Norfolk and Suffolk.	questions provided at Deadline 1 (Annex A of Written Representation) [REP1-088].

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			JNCC (2018) discuss the growth rate of lesser black-backed gull colonies since the Seabird 2000 census, and conclude that there is insufficient evidence to allow a trend to be identified. Colonies display differing trends, due to differences in factors affecting their growth rate. Many large coastal colonies have undergone significant declines, including that of the Alde-Ore Estuary SPA at Orfordness, whilst some urban colonies, particularly in the south-east and north-west are known to have increased significantly. Given that JNCC (2018) cannot specify trend figures, and that the non-SPA population for Norfolk and Suffolk includes both urban colonies (likely to have increased) and rural coastal colonies (may have decreased), we therefore do not consider it safe to propose an overall level of population change for the non-SPA population since the Seabird 2000 census. There is also no discussion of the differences in foraging behaviour between urban and inland colonies and rural, coastal colonies. Whilst the evidence available is limited, some studies of lesser black-backed gull diet are available. Coulson and Coulson (2008) found no offshore marine component (i.e. fish or fish offal) in the diet of the lesser black-backed gull colony in Dumfries, in an analysis of regurgitated pellets. Food sources were predominantly agricultural (55% of pellets), from landfill sites (23%) or intertidal habitats (12%). Similarly, at an inland colony in the Netherlands (c.30km from the North Sea), Gyimesi et al. (2016) found no marine remains in an analysis of pellets and boluses, and found only 2 of 710 trips recorded by GPS tags visited the North Sea. Conversely, at two rural island colonies in the south-eastern North Sea, Kubetzki and Garthe (2003) found	

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			that 80% of lesser black-backed gull pellets contained prey from coastal waters. Given this difference, we do not consider it safe to assume that birds from urban colonies will forage at sea to the same extent as those birds from rural coastal colonies, including the Alde-Ore Estuary SPA. There is an argument therefore, to exclude urban populations when considering apportioning to the SPA. Using the Applicant's calculation of 6,700 birds of all ages associated with the SPA, the apportioning to the Alde-Ore SPA would therefore be between 24.1% if urban birds are included (6700/21093 + 6700) and 38.8% when urban birds are excluded (6700/10555 + 6700). Given the discussion above, the lower figure (which is close to the Applicant's proposed 25%) is clearly unrealistic, and a figure likely to be at least 35% would be more appropriate. However, the RSPB further advocate the use of the theoretical approach as laid out in SNH guidance (SNH 2018). This theoretical approach is based on foraging range and three colony-specific weighting factors: colony size, distance of colony from site and the areal extent of the open sea within the foraging range of the relevant species.	
23.35	Applicant	Please provide evidence to justify the approach you have taken in regard to the apportioning of impacts for lesser black-backed gulls at the Alde-Ore Estuary SPA.	Tracking data (Thaxter et al. 2015) indicate very low connectivity between breeding lesser black-backed gulls at Orfordness (Alde-Ore Estuary SPA) and the Norfolk Vanguard site. Connectivity appears to vary across years between zero and very low, presumably depending on variations in food availability in different years. Tracking data show a time budget overlap with the entire East Anglia Round 3 Zone of 3.7% in 2010, 1.1% in 2011 and 0.2% in 2012 (Thaxter et al. 2015 Supplementary material Appendix A). The	Natural England have previously noted (in comments on draft HRA report) that whilst tracking data are useful and demonstrate connectivity of the Vanguard site with breeding birds from the Alde-Ore Estuary, it can only ever tell part of the story as there will be both individual and between year differences. Whilst the Applicant has attempted to address some of the issues

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			Norfolk Vanguard site forms a small part of the entire East Anglia Round 3 Zone. The tracking data indicate that much less than 0.5% of the foraging time of lesser black-backed gulls is spent within the Norfolk Vanguard site plus 2 km buffer. For the population of about 2,000 breeding pairs at Alde-Ore Estuary SPA that would represent considerably fewer than 10 birds (0.5% of the total number of pairs) at any point in time (assuming that under normal circumstances one adult is at the nest site while the other is away on a foraging trip). Given that there were on average about 300 lesser black-backed gulls in the Norfolk Vanguard site plus 2 km buffer during counts in June, July, August (the main months when collisions were predicted), fewer than 10 birds during the chick-rearing period from the Alde-Ore Estuary SPA would represent less than 3.5% of the lesser black-backed gulls present. The low numbers originating from the Alde-Ore Estuary SPA that the tracking data indicate are likely to reach Norfolk Vanguard suggest that less than 3.5% of the lesser black-backed gulls seen at Norfolk Vanguard during the chick-rearing period are likely to originate from the Alde-Ore Estuary SPA breeding population. Tracking data cover the chick-rearing period, so do not necessarily apply at other times during the breeding season. However, lesser black-backed gulls show more marine foraging behaviour during chick-rearing and more terrestrial foraging behaviour earlier in the breeding season, so the overlap with Norfolk Vanguard is likely to be highest during the latter part of the breeding season when birds have chicks to provision, and is probably lower than this during the early breeding season. Thus, estimated rates of connectivity with marine sites derived from tracking of chick-rearing adults will	Natural England / RSPB raised regarding additional town colonies that they hadn't previously been included, the foraging behaviour of town colonies compared to more traditional colonies and control of town colony populations, this doesn't really address the issue of segregation and this issue still requires consideration. As noted in our response to ExA Q23.34 provided in Annex A of our Written Representations [REP1-088], we concluded that the Applicant's apportioning for the non-breeding season periods (i.e. migration and winter) was reasonable / precautionary.

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			be higher than those obtained during other periods of the breeding season. The Applicant has apportioned 25% of breeding season impacts on lesser black-backed gulls to individuals from the Alde-Ore Estuary SPA which, as can be seen, is highly precautionary given the tracking evidence. In reality, the tracking data indicate that considerably less than 25% of impacts are likely to be apportioned to Alde-Ore Estuary SPA and most likely less than 3.5%. Given the low numbers indicated by tracking but the higher numbers observed to be present at Norfolk Vanguard this raises the question of where those birds come from if not Alde-Ore Estuary SPA. Tracking data from birds in the Netherlands strongly indicate that no breeding adults from the populations in the Netherlands visit the Norfolk Vanguard site. However, it is known that there are large numbers of immature lesser black-backed gulls in the populations (Furness 2015 estimated from demographic data that about 40% of the population will be immature birds and 60% will be breeding age adults). While younger immature birds may remain in the wintering area, in spring and summer older immatures move towards breeding areas and may form a significant part of the population at sea in areas such as Norfolk Vanguard. So a substantial proportion of the birds present at Norfolk Vanguard is likely to comprise immature birds which originate from a variety of populations. The birds present may also include breeding adults from non-SPA colonies. The Alde-Ore Estuary SPA population of lesser black-backed gulls has decreased considerably, the most recent published counts being 640 pairs at Orfordness in 2012 and 1,668 pairs at	

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			Havergate in 2016. By comparison, there were 743 pairs at Great Yarmouth in 2012, 467 pairs at Southtown/Gorleston in 2012, probably about 2,000-3,000 pairs at Lowestoft in 2008-2011, and a few hundred pairs at other sites in Norfolk and Suffolk (Piotrowski 2012). This suggests that the Alde-Ore breeding numbers represent less than 50% of the breeding numbers in East Anglia. There are no published data that the Applicant could find on how breeding numbers have changed between 2012 and 2018, but the Applicant contacted Steve Piotrowski who carried out the census of breeding numbers in 2012 and he stated that efforts to deter urban nesting gulls have largely been ineffective and do not seem to have resulted in significant reductions in the population in urban sites overall. Urban nesting lesser black-backed gull numbers in Suffolk increased by over 1000% between 1995 and 2012 (Piotrowski 2012) at a period when numbers breeding in the Alde-Ore Estuary SPA decreased by about 70% so the proportion of lesser black-backed gulls nesting in urban sites may well have continued increasing since the 2012 census; if so, the proportion of lesser black-backed gulls at Norfolk Vanguard that originate from Alde-Ore Estuary SPA may be decreasing further since 2012, but this is uncertain. At a qualitative level, the situation revealed by the 2012 census appears not to have changed much since then. The Applicant understands that a repeat census of breeding gull numbers may be carried out as part of the current national census of breeding seabirds. Tracking data and diet data for urban nesting lesser black-backed gulls suggest that those birds feed to an extent in marine habitat, especially when rearing chicks, and do not suggest that urban nesting gulls are any less	

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			marine than those nesting in rural colonies. Lesser black-backed gulls nesting in urban colonies in East Anglia include marine fish in their breeding season diet as well as earthworms, small mammals and urban food waste (Piotrowski pers. comm.) so clearly forage at sea to some extent, just as rural nesting gulls do. In the migration seasons the Applicant apportioned the impact on the basis of the relative sizes of the BDMPS population (Furness 2015) and the Alde-Ore Estuary SPA population; the latter is about 3.3% of the BDMPS number. Apportioning 3.3% of the impact to Alde-Ore lesser black-backed gulls during migration assumes that the Alde-Ore Estuary SPA birds are randomly mixed among the whole BDMPS population, which seems to be a reasonable assumption given that these birds migrate from the UK to southern Europe/north Africa so are very unlikely to remain segregated by colony of origin during migration. Although the numbers of lesser black-backed gulls present in winter are small, and so the impact in winter is assessed to be small relative to that at other times of year, the Applicant assumes that it is likely that birds from the Alde-Ore Estuary SPA population may make up a somewhat higher proportion of the winter BDMPS population because these birds may tend to winter closer to their breeding colony; so for the winter impact assessment the Applicant estimated a precautionary 10% of the impact attributed to Alde-Ore Estuary SPA birds. That is a precautionary estimate, as the Alde-Ore Estuary SPA population is likely to be nearer to 3.3% of the total population.	
23.36	Applicant	Having regard to Flamborough and Filey Coast SPA can you explain why the very	The assessment applied an evidence-based approach for this aspect. The timing of annual	Natural England welcome that the Applicant has done this, however,

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		low presence of breeding birds means that you consider it appropriate to define the breeding season as the migration free breeding period and how this accords with the precautionary principle? What would the difference in the outcome of the assessment of impacts to gannet be if the breeding season as presented in Furness (2015) was used rather than the migration-free period?	activities of breeding of gannets is fairly well established. A few adults can return to nest sites in UK colonies from as early as January, but most return in March and some not until April (Furness 2015; Furness et al. 2018). Adults mostly depart from UK colonies in late September (although this starts in August and may continue until November; Furness 2015). On the basis of evidence, Furness (2015) defined the UK gannet breeding season as March to September. Kober et al. (2010) in a review by JNCC, defined the gannet breeding season as May to September, and the nonbreeding season as October to April, so there is some difference in interpretation among studies, in part due to the fact that the occupation of nest sites at colonies overlaps with the main migration periods of gannets. Migration periods are well defined, but also somewhat protracted and differing between individual birds (Furness et al. 2018). Gannet spring migration into and through UK waters from their wintering areas off west Africa and southern Europe occurs mainly in December to March. Autumn migration from colonies to the wintering area occurs mainly in September to November (Furness 2015). Therefore, there is overlap between the full breeding season of UK gannets and the main period of migration of gannets (some of which originate from colonies in Norway, Faroes and Iceland) through UK waters. Numerous studies that have tracked foraging breeding adult gannets have shown that the majority of foraging breeding gannets travel less than 100 km from the nest site (Thaxter et al. 2012, Wakefield et al. 2013); longest trips tend to occur from the largest colonies due to greater competition with conspecifics, and gannets from	there are still outstanding issues regarding the CRM and queries regarding the non-breeding season apportionment figures, which need to be resolved before Natural England can agree with the CRM figures for gannet from the FFC SPA from Vanguard alone. Please note, due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review Appendix 3.2. Natural England will therefore provide comment on this submission at Deadline 3, and will provide update if this alters our advice. Natural England would also like to highlight that there is still no assessment of displacement of gannet from the FFC SPA using either the migration free or full breeding seasons or any migration seasons.

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			Flamborough & Filey Coast SPA show foraging trips predominantly within 200 km of the colony (Wakefield et al. 2013). Since Norfolk Vanguard is ca. 200 km from Flamborough & Filey Coast SPA, connectivity between Flamborough & Filey Coast SPA breeding gannets and Norfolk Vanguard appears to be low, and tracking of foraging trips by gannets breeding at Flamborough & Filey Coast SPA has suggested that those birds do not normally forage in the vicinity of Norfolk Vanguard (RSPB annual reports on gannet tracking from Flamborough & Filey Coast SPA). The Applicant fully supports the use of the precautionary principle where there is a lack of evidence to permit a clearly evidence-based approach. However, in the case of the timing of gannet migrations and breeding season, in the case of gannet population sizes and demography, and in the case of foraging behaviour of breeding gannets from their colonies, the Applicant has better evidence than for many other seabirds. For that reason the Applicant considers that an evidence-based approach is appropriate. The evidence indicates that breeding gannets from Flamborough & Filey Coast SPA have low connectivity with Norfolk Vanguard, and that the peak numbers seen at Norfolk Vanguard occur during the autumn migration. Those birds are therefore most likely to be birds from many different colonies with a low representation from Flamborough & Filey Coast SPA. During the breeding season (whether defined as the migration-free or the 'full' breeding season) gannet numbers at Norfolk Vanguard are low, and that is consistent with low connectivity with Flamborough & Filey Coast SPA breeding gannet population. Furness (2015) estimated	

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			that about 55% of the UK gannet population comprises breeding adults and about 45% is immature birds. It is known that immature birds move towards colonies later than established adults and that many of the younger immatures do not reach breeding colonies, but range widely at sea often in areas not used greatly by breeding adults (Wernham et al. 2002, Furness 2015). It is, therefore, highly likely, based on the evidence, that gannets seen at Norfolk Vanguard in summer are mostly birds that are migrating through the area (including immature birds not yet attached to particular colonies), rather than breeding adults from Flamborough & Filey Coast SPA. For that reason, the Applicant has taken this evidence-based approach. However, the Applicant agrees that it is useful to consider the precautionary approach of assuming greater connectivity to reassure stakeholders that this does not greatly alter the conclusions. If the full breeding season (March to September) is applied in place of the migration-free breeding season (April to August) the number of gannet annual collisions (total = 110) which are apportioned to the Flamborough and Filey Coast SPA population changes from 23 (April to August, as assessed in the HRA) to: Breeding season: 30 x 100% = 30 Autumn: 51 x 4.2% = 2 Spring: 30 x 5.6% = 2 Total = 34. The addition of 11 individuals to the project total would increase the background mortality by 0.36% and this would not alter the HRA conclusion that collisions at the project alone would not result in an AEoI. If the gannet breeding season defined by JNCC	

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			was used (May to September; Kober et al. 2010) the estimated collision mortality for Flamborough & Filey Coast SPA gannets would be slightly lower than in our original estimate, because Kober et al. (2010) defined more of the year as nonbreeding season.	
23.37	RSPB	What value do you suggest should be apportioned to kittiwake breeding season apportioning in relation to the Flamborough and Filey Coast SPA?	The RSPB advocate the use of the theoretical approach as laid out in SNH guidance (SNH 2018) amended, as per the guidance, to take into account recent tracking data from Flamborough and Filey Coast SPA. This theoretical approach is based on foraging range and three colony-specific weighting factors: colony size, distance of colony from site and the areal extent of the open sea within the foraging range of the relevant species. Tracking of kittiwake from the Flamborough and Filey Coast SPA has been carried out from 2010 to 2015 and 2017-2018. The tags used between 2010 and 2015 were GPS tags that required recapturing of the birds and typically were only able to collect data for a period of a few days, around the time of late incubation and early hatching when the birds are likely to remain closest to the nest. The tags used in 2017-2018 were very lightweight tags that allowed for remote downloading of data so there was no need to recapture the birds. A different attachment method was also used which meant that the tags remained on for longer, between 20 and 29 days. This means that kittiwakes were tracked for a longer part of the breeding season including when adults were provisioning large chicks (that can be left for longer than small chicks). The tracking data for 2017 are presented in Wischnewski et al. (2018) and has been made available to the Applicant. The foraging ranges recorded during 2017 were greater than those previous recorded, with a	No comments.

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			maximum foraging range of 324km1, and this is most likely to be a function of the longer tracking period. The tracking in 2017 also showed a high degree of overlap with Norfolk Vanguard. Data from 2018 is currently being analysed. As such we recommend that the applicant, in discussion with NE and RSPB, revise and recalculate the apportioning value for kittiwake using the amended SNH method which takes into account these recent tracking data. This value is likely to be higher than the current arbitrary suggested value. Marine Scotland have been developing a tool that uses the information from Wakefield et al., (2017) to apportion birds to colonies. This is currently under internal review at Marine Scotland and is likely to be available soon. Once available it is likely to provide the best method for apportioning, for some species, including kittiwake.	
23.38	Applicant	Can you set out what the differences would be in the outcome of the assessment of collision risk to gannet and kittiwake of the Flamborough and Filey Coast SPA if the nocturnal activity rates as advised by NE and RSPB are utilised?	For gannet, application of the higher nocturnal activity rate of 25% would increase the Flamborough and Filey Coast SPA total collisions by 17% (from 34 above, to 40) and application of the 0% nocturnal rate would reduce the total collisions by 17% (from 34 to 28). For kittiwake, application of the higher nocturnal activity rate of 50% would increase the Flamborough and Filey Coast SPA total collisions by 42% (from 12, to 17) and application of the 25% nocturnal rate would increase the total collisions by 8% (from 12 to 13). Neither of these changes would materially affect the conclusions of no AEoI for the SPA populations.	Please note, due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review Appendix 3.2. Natural England will therefore provide comment on this submission at Deadline 3, and will provide update if this alters our advice.
23.39	Applicant	Please respond to the comments NE has	Note it is assumed that this question is with	Please note, due to the size of the

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		made in its RR [RR-106] in regard to the in-combination displacement of auks utilising a range of mortality rates. If you conclude that there would be a LSE can you update the Greater Wash SPA integrity matrix to include this figure?	respect to the Flamborough and Filey Coast SPA, not the Greater Wash SPA, since it refers to species (auks) which are features of the former SPA but not the latter. The methods for estimating auk displacement are subject to ongoing discussions with Natural England (Operational Auk Displacement: update and clarification note, Appendix 3.3). Following this, a determination of the requirement to update the screening assessment will be made and further assessment provided as necessary.	document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review Appendix 3.3. Natural England will therefore provide comment on this submission at Deadline 3, and will provide update if this alters our advice.
23.42	Applicant	Please confirm whether or not you concur with NE's views in relation to common scoter, and if so, please update the Greater Wash integrity matrix to include this feature.	A figure presenting the distributions of common scoter in relation to the export cable route will be provided and the integrity matrix for the Greater Wash SPA will be updated to reflect the comments NE make in their RR with respect to potential disturbance to common scoter by cable laying vessels along the export cable route. If this results in a determination that a likely significant effect for this feature cannot be ruled out, additional assessment will be provided.	Natural England have not seen this information yet and so cannot provide comment at this time.
23.44	Applicant	Please clarify what Biologically Defined Minimum Population Scales (BDMPS) figure has been used in the non-breeding apportionment of gannets to the Flamborough and Filey Coast SPA.	The gannet BDMPS populations used to apportion impacts occurring in the nonbreeding season to the Flamborough and Filey Coast SPA population were those presented for the UK North Sea and Channel in Furness (2015): during autumn migration 456,298 and during spring migration 248,365.	The Applicant has used apportionment figures for gannet at FFC SPA in autumn of 4.2% and 5.6% in spring. Whether the colony figure in the BDMPS tables used is the adult figure or that for all ages depends on any Population Viability Analysis (PVA) model and outputs to be used – for gannet, the PVA being used by the Applicant was configured to be adults-only. Using this approach, we do not get the same apportionment figures as the Applicant: - Autumn migration: number of FFC SPA adult gannets in North Sea and Channel BDMPS =

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				22,122 and the total number of birds of all ages in the BDMPS = 456,299. So the proportion of FFC SPA adult birds = (22,122/456,299) x 100 = 4.8%. - Spring migration: number of FFC SPA adult gannets in North Sea and Channel BDMPS = 15,485 and the total number of birds of all ages in the BDMPS = 248,385. So the proportion of FFC SPA adult birds = (15,485/248,385) x 100 = 6.2%. These figures are consistent with our advice on this matter for Hornsea Project Three. Therefore, our calculated apportionment figures of 4.8% for autumn and 6.2% for spring are slightly higher than those used by the Applicant of 4.2% for autumn and 5.6% for spring. If the Applicant wishes to use their preferred values, Natural England seeks clarification regarding how they have been calculated.
23.45	Applicant	In relation to the in-combination assessment with the Hornsea 3 and Thanet Offshore Wind Farm projects, please set out how you intend to monitor the progress of these examinations and update your in-combination assessment as and when relevant information from these other examinations becomes available?	The Applicant has and will continue to monitor the examinations of Thanet Extension and Hornsea Project THREE by reviewing examination submission documents 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 in-combination assessment following any significant updates to these projects during examination. The Applicant also expects that Natural England would identify potential required	No comments.

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			updates through their direct involvement in the examination of each project.	
23.46	Applicant	Please provide a detailed consideration of the specific features of the HHW SAC that could be impacted, both alone or in-combination with other relevant plans or projects, as a result of the various types of cable protection.	The designated features of the Haisborough, Hammond and Winterton SAC include Annex I Sandbanks which are slightly covered by sea water all the time and Annex 1 Reef. Section 7.4 of the Information to Support Habitats Regulations Assessment (document reference 5.3) provides the assessment of impacts associated with cable installation, including cable protection, both alone and in-combination with other relevant plans or projects. The worst case total area of cable protection installed within the SAC could be 0.05km2, 0.003% of the total SAC area. Potential impacts considered in the Information to Support HRA report in relation to cable protection include the following: • Annex I Sandbanks o Permanent habitat loss from Norfolk Vanguard alone (section 7.4.1.1.2 of the Information to Support HRA report); o Introduction of new substrate from Norfolk Vanguard alone (section 7.4.1.1.2); o In-combination permanent habitat loss (section 7.4.1.2.2); o In-combination introduction of new substrate (section 7.4.1.2.3); • Annex I Reef o Introduction of new substrate from Norfolk Vanguard alone (section 7.4.2.1.2); o In-combination introduction of new substrate from Norfolk Vanguard alone (section 7.4.2.2.2). NB, it was agreed through the ETG that there would be no permanent loss of Annex I Reef due to the fact that S. spinulosa is ephemeral and can be expected to recover from cable	Natural England hasn't agreed that establishment of *Sabellaria Spinulosa* on artificial substrate is Annex I reef as designated and therefore we believe that cable protection would result in permanent habitat loss

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			installation works.	
23.47	MMO	In light of the information contained in the Change Report [AS-009], and in particular the amended proposal for up to 36 piles in total for the two offshore electrical platforms and an increase in the diameter of the pin piles from 3m to 5m, please confirm whether you concur with the findings contained in the ES and the Change Report.	The MMO agrees with the conclusions within the change report for benthic ecology, shellfisheries and marine water and sediment quality. For marine coastal processes the MMO can advise the findings in the ES and the Change Report are reasonable from a marine process perspective, accepting that the impact assessment has been made by expert judgment rather than directly applying site-specific data. The change report states that "the number of foundations to be piled at any one time will not change. The increase in the number of offshore electrical platform piles therefore has no influence on the impact range of underwater noise". This is dependent on whether the 24-hour exposure will increase, i.e. whether there is an increase in the number of piles to be installed per 24 hours. The MMO notes from the ES that offshore working hours during construction are anticipated to be 24/7 and the number of piles anticipated to be installed in a 24-hour period was not stated. The MMO recommend the developer should clarify this and whether there is any change from what was estimated in the original application in relation to underwater noise and fisheries. The MMO defers to the advice of the SNCBs in regards to the implications for HRA. Further information can be found in document: EN010079- 002201 Change Request and Errata Comments Deadline 1_MMO _final.	Matches Natural England position.
23.47	WDC	As above	WDC has not had the opportunity to review the Change Report, so is unable to comment on the proposed changes.	No comments.
23.47	TWT	As above	TWT agrees that the findings of the Change Report do not result in any changes to the results in the Information to Support the HRA	Matches Natural England position.

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			report for the Southern North Sea SCI and that mitigation is still required to ensure no Adverse Effect on Integrity (AEOI) of the site.	
23.48	Applicant	Confirm the extent to which you consider the HRA report is legally compliant in light of the judgment in People over Wind, Peter Sweetman v Coillte Teoranta Case C-323/17.	The Information to Support HRA Report (document 5.3) is considered to be legally compliant for the reasons set out in the response to question 23.15.	Natural England broadly agrees with the Applicant. However, as noted in our response to Qu 23.48 [REP1-088] the current mechanism in place for in-combination impacts on Southern North Sea SCI is currently not compliant. This can only be secured through outcome of Review of Consents (RoC) and a mechanism to ensure that management thresholds for the SAC are not exceeded. Natural England are unable to comment further on this until the RoC has been undertaken.
23.49	Applicant	Appendix 5.2 of the HRA Report screened out likely significant effects at Broadland SPA and Ramsar site on the basis of low numbers of wintering birds but, NE (Appendix 4 #12) [RR-106] suggests that the low numbers were due to the cropping regime at the time of the survey. Please comment on the feasibility of conducting further surveys to optimise the accuracy of numbers of wintering birds by the time the examination closes. What would 'suitable mitigation measures' comprise and how would they be secured? If no additional measures were to be implemented, can NE confirm whether it agrees with the Applicant's conclusion of no LSE at Broadland SPA and Ramsar site? If the answer to (iii) is no, the ExA is mindful of the need to consider the Sweetman judgement which stipulates that mitigation	It was agreed with NE during the Evidence Plan Process (Norfolk Vanguard - Onshore Wintering Bird Surveys Survey Methodology Approach Update Response March 2016) that one year of surveys was appropriate, and as such the Applicant does not intend to conduct further surveys for wintering birds. As part of this agreement NE recommended considering reviewing local cropping patterns to provide evidence to indicate what the likely area of available habitat will be during construction. The potential for local cropping patterns to influence the findings of the surveys was taken into account, however it was considered that although some fields were recently ploughed, the majority of crops in place over winter within the wintering bird survey area (winter crop, fallow (grass)) would provide suitable foraging habitat for pink-footed geese, and as such the survey results recorded over winter in 2016/2017 provided a robust estimate of the use	Natural England have provided a full response to this question at Deadline 1 [REP1-088]. Natural England confirm that during the Evidence Plan process (Norfolk Vanguard - Onshore Wintering Bird Surveys Survey Methodology Approach Update Response March 2016) one year of surveys was agreed. However, (iii) Natural England considers that further work on non-seabird migration modelling and hence CRM needs to be undertaken, particularly regarding Broadland and Breydon SPAs. We would also again suggest the CRM is undertaken again using the Vanguard turbine specifications

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		should not be taken into account at the screening stage. As such, does NE suggest that there would be a LSE on the Broadland SPA and Ramsar site? If this is the case, for which features and which potential impacts? Is NE content that there would be no adverse effect on integrity?	of these habitats by qualifying features of the Broadland SPA and Ramsar site. Mitigation measures have been proposed to account for changes in cropping patterns and for wintering birds to use different habitats for foraging and resting on an interannual basis and are set out in Paragraph 224 and 225 of the OLEMS (document reference 8.7) and secured through DCO Requirement 24. This includes a commitment to not undertake winter works in any one area in consecutive years. The area of arable land located within 5km of the Broadland SPA and Ramsar site and within the onshore project area is approximately 20ha, which represents a negligible amount of the available arable land within 5km of the SPA (see Paragraph 196 of Chapter 23 Onshore Ornithology document reference 6.1.23 for further information), and therefore the use of the mitigation measures set on in the OLEMS (document reference 8.7) are considered appropriate.	and site locational information. There may also be a need to consider cumulative CRM impacts on non-seabird migrants as Vanguard East is located immediately north of East Anglia 3 and so birds migrating north and south may encounter both sites. Also if Vanguard is built across both Vanguard East and Vanguard West then birds migrating east-west as could encounter both sites. Therefore, we advise that once the figures are agreed and the summed figures accurately presented that the assessment and conclusion of the LSE screening is reviewed by the Applicant. iv) Natural England requires further information from the applicant in order to determine LSE or AEoI, including further work on non-seabird migration modelling and CRM.
23.51	Applicant	NE (Appendix 1 #4.3) [RR-106] points out there are qualifying species in the 'shadow' of the Vanguard sites – particularly Broadland and Breydon SPA and potentially North Norfolk Coast SPA. With reference to the collision assessment for migrant non-seabirds referred to in paragraphs 393 and 357 of ES Chapter 13 (Offshore Ornithology): Please comment on the extent to which migration modelling and CRM for Bewick's swan and avocet is required and whether the CRM for species modelled at the East Anglia THREE offshore windfarm project should be updated using Norfolk Vanguard	The assessment of non-seabird collision risk has not been updated at this stage so the Applicant is not in a position to respond to this question at present. This aspect will be addressed for subsequent submissions. However, the Applicant anticipates that as a minimum such an assessment would need to consider the inclusion of the same species assessed for the nearby East Anglia ONE and East Anglia THREE wind farms, with the addition of those species identified by NE in their RR (Bewick's swan and avocet). The first stage of this will be to screen species for both project alone and cumulative collision risks, and it is anticipated that this will determine the need for further	Natural England will be happy to provide further comment once the Applicant has completed this update.

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		turbine specifications and site location information?	assessment both for the project alone and cumulatively.	
23.52	Applicant	The Applicant is requested to revisit its in-combination assessment for the River Wensum SAC, Norfolk Valley Fens SAC and The Broads SAC and provide greater justification for a finding of no in combination effects, with reference to NE's Relevant Representations (4.5.11) suggesting that an 'in combination' assessment with Hornsea 3 OWF should also be undertaken as this cable route passes about 360m to east of Booton Common and construction periods may overlap.	Norfolk Valley Fens SAC and The Broads SAC A clarification note was provided to NE in response to NE's RR in relation to the need for further information regarding the effects upon the water supply mechanism to the Norfolk Valley Fens SAC and the Broads SAC. The clarification note is provided in Appendix 2 of the SoCG with Natural England (document reference Rep1 - SOCG - 13.1) and provides further information in relation to the water supply mechanism for Booton Common Site of Special Scientific Interest (SSSI) (part of Norfolk Valley Fens SAC, located 0.6km from the onshore cable route and Broad Fen, Dilham component SSSI (part of The Broads SAC, located 3.6km from the onshore cable route)). In summary, these sites, whilst predominantly surface water fed, are also partly groundwater fed – from the underlying chalk aquifer (based on the Environment Agency's WETMECs data). There is no direct pathway between the construction works and the underlying chalk aquifer that these sites are dependent upon, and the Applicant has determined that detailed groundwater assessment is not necessary and that the conclusions of no AEoI in the Information to Support Habitats Regulations Assessment (document reference 5.3) for these two sites are appropriate. River Wensum SAC The Applicant avoids direct impacts to the River Wensum SAC through a commitment to cross this site using trenchless crossing techniques. Potential impacts relate to sediment management associated with construction related exposed soils outside of the footprint of	Natural England acknowledges receipt of this clarification note, however, in our response to the Applicant in this regard Natural England highlighted that further information is still required and therefore Natural England do not consider this issue to be resolved. Full details of this letter are provided in Annex D of Natural England's Written Representation [REP1-088] The applicant has agreed (22.01.19) to consult EA ground water modelling data for the area and use to inform am in-combination assessment of trenchless or HDD on water dependant designated sites, Natural England would be happy to provide further comment once this work has been done.

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			the SAC. Sediment management measures to mitigate potential water quality impacts during construction are presented within the Information to Support HRA Report (document reference 5.3) at paragraph 1166. Following the implementation of these measures no AEoI has been identified for the River Wensum SAC. These measures will be included in an updated OCoCP and secured through Requirement 20. The Applicant has also committed to develop a detailed scheme and programme for each watercourse crossing, diversion and reinstatement, which will include site specific details regarding sediment management and pollution prevention measures. This scheme will be submitted to and, approved by the relevant planning authority in consultation with Natural England. This commitment is secured through Requirement 25 (Watercourse Crossings) of the draft DCO. With these commitments in place there will be sufficient control measures to safeguard designated sites in relation to sediment control, pollution prevention and reinstatement of all work areas at watercourse crossings. In light of the conclusion of the Information to Support Habitats Regulations Assessment (Document Reference 5.3) that no potential adverse effect on the integrity on the River Wensum SAC, Norfolk Valley Fens SAC and The Broads SAC outlined above, the Applicant does not consider that an in-combination assessment with Hornsea Project 3 is required as no pathway to give rise to potential effects for Norfolk Vanguard alone has been identified.	
23.54	Applicant	Explain the apparent discrepancy between the LSE identified in the screening matrix [AS-006] for Norfolk Valley Fens SAC for narrow-mouthed whorl snail (Disturbance	Effects on narrow-mouthed whorl snail of the Norfolk Valley Fens SAC from disturbance due to groundwater / hydrology changes and impacts from changing air quality (within 5km) are not	No comments.

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		due to groundwater / hydrology changes within 5km and Impacts from changing air quality within 5km), and the omission of this feature from the integrity matrix.	screened in for further assessment within the Habitats Regulations Assessment Onshore Screening (document reference 5.3.5.2). Table 5.1 of that document states that only effects on the qualifying features of Alkaline fens, Northern Atlantic wet heaths with *Erica tetralix* and Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* only are screened in. As such, effects on narrow-mouthed whorl snail of the Norfolk Valley Fens SAC is not considered within the Information to Support Habitats Regulations Assessment (document reference: 5.3) and is not included within the Integrity Matrices (Section 2.3 of The Applicant's Response to Section 51 Advice from The Planning Inspectorate (Document Reference PB4476-008-001)).	
23.55	Applicant	Construction hours are secured through Requirement 26 of the draft DCO and detailed in para 38 of the outline Code of Construction Practice (CoCP). Exceptions apply for 'essential and non-intrusive activities' which include concrete pouring, drilling and pulling cables, trenchless installation techniques and works at the landfall. Paston Great Barn SAC is 2.9km from the onshore project area and the Information for the HRA report (para 101) [APP-045] confirms that the colony uses six areas within the onshore project area as foraging routes. Explain whether the activities exempted from the construction hours would be likely to impact upon Barbastelle bats from the Paston Great Barn SAC.	Details of the potential effects of lighting outside of the secured construction hours upon commuting and foraging bats of the Paston Great Barn SAC is provided in Section 9.3.2.1.1 and Section 9.3.5.3 of Information to Support Habitats Regulations Assessment (document reference 5.3). This includes consideration of the potential effects in relation to the use of trenchless crossing techniques at the following locations: • Dilham Canal and land east of Dilham Canal • Witton Hall Plantation along Old Hall Road Mitigation is provided in relation to potential short-term impacts arising as a result of temporary construction lighting at these locations. In summary, this includes ensuring that the BCT's Artificial lighting and wildlife guidance (2014) is adhered to when designing lighting during temporary works at trenchless crossing locations. This BCT guidance includes provisions for the use of directional lighting only, which is angled away from sensitive ecological	Natural England note the commitment by the Applicant to use directional lighting i.e. angled downwards and provision of a cowl for the light to minimise light spill.

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			features. These measures are captured within the OLEMS (document reference 8.7) and secured through Requirement 24 of the dDCO. No potential adverse effect on the integrity of the Paston Great Barn SAC in relation to the conservation objectives for the site has been identified.	
23.57	Applicant	Please revisit the possibility of HDD method for Blackwater Drain in light of NE's comments.	Please refer to the Applicant's response to question 11.13 with respect to the careful consideration associated with the selective use of trenchless installation methods. The two HDD locations close to Blackwater Drain tributary crossings noted within the NE comments (Figure 9.6 of Document 5.03 Norfolk Vanguard Information to Support HRA) refer to a single HDD crossing with individual compounds depicted at each end of the crossing, for entry and exit of the HDD. This trenchless crossing is of the proposed Hornsea Project Three cables which may be required for technical requirements. NE suggest that HDD could also be undertaken for the watercourses that feed into Blackwater Drain rather than the trenched crossings which are proposed. Impacts at watercourse crossings are predominantly related to the introduction of temporary culverts to allow construction access either side of the watercourse. Whether the crossing technique is trenched or trenchless, a temporary culvert will be required for access either side of the Blackwater Drain. However, neither crossing method (whether trenched or trenchless) is considered to result in a significant impact when assessed individually. Impacts resulting from the use of temporary culverts would be reversible once the structures have been removed and the area reinstated. The natural hydrology would recover immediately	As agreed 22.01.2019 Natural England awaits further information from the developer regarding EA groundwater modelling data in the area to inform HDD/ trenchless options.

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			upon structure removal, and geomorphology and associated physical habitats are also expected to recover rapidly. The use of these techniques is therefore not considered to result in significant adverse effects. In light of this, and the response provided to Q 11.13 regarding impacts associated with HDD, it is not considered that HDD would provide a more suitable option in this scenario. The design of all watercourse crossings will be submitted to and approved by the relevant planning authority in consultation with Natural England, prior to the commencement of each stage of the onshore transmission works. This is secured through Requirement 25 of the dDCO.	
23.59	Applicant	Please review the outline CoCP [APP-025] and comment on whether this should be updated with regard to sediment control and reinstatement of work areas to safeguard designated sites, and if so how.	The approach to sediment management and water quality has been identified and described in Section 11.1 of the OCoCP (document reference 8.1). Requirement 20 of the dDCO sets out that no stage of the onshore transmission works may commence until for that stage a final CoCP has been submitted to and approved by the relevant local planning authority. This would provide site specific details for sediment management, based on the principles agreed in the OCoCP and informed by the detailed design and appointment of the Principal Contractor. In addition to the CoCP, the Applicant will develop a scheme and programme for each watercourse crossing, diversion and reinstatement which will include site specific details of the sediment management measures including their use and removal. This scheme will be submitted to, and approved by, the relevant planning authority in consultation with Natural England. This is secured through Requirement 25 of the dDCO. With these commitments in place there will be	As highlighted in the Statement of Common Ground with Natural England (document reference Rep1 - SOCG - 13.1), Natural England does not agree that the current approach to sediment management and water quality has been sufficiently addressed. Natural England welcome a programme for each watercourse crossing, diversion and reinstatement which will include site specific details of the sediment management measures including their use and removal. As mitigation for any impacts we would expect this to be presented at this stage.

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			sufficient control measures to safeguard designated sites in relation to sediment control, pollution prevention and reinstatement of all work areas at watercourse crossings. Notwithstanding the point above, the Applicant notes that the OCoCP does not include all of the mitigation measures set out in Section 9.3.5.1 of the Information to Support Habitats Regulations Assessment (document reference: 5.3), which include measures in relation to topsoil management and sediment management measures. The OCoCP will be updated to reflect this and an updated version will be submitted at a future deadline during the examination process. Further details regarding the Applicant's position in relation to the information required in relation to sediment control and reinstatement of work areas is provided within the Statement of Common Ground with Natural England (document reference Rep1 - SOCG - 13.1).	
23.60	Applicant	NE suggests (para 4.5.7) [RR-106] a requirement for a mitigation plan to be developed and agreed with NE prior to the removal of hedgerows, which should be in place for 7 years or until the hedgerow has satisfactorily recovered. Do you agree to this suggestion and if not why not?	Hedgerow mitigation measures are captured out in the OLEMS (document reference 8.7) and refer to a period of recovery of up to 7 years. Requirement 24 of the dDCO requires that no stage of the onshore transmission works may proceed until an Ecological Management Plan (which accords with the OLEMS) is submitted and approved by the relevant planning authority in consultation with NE. In addition, Requirement 18 of the draft DCO requires that a Landscape Management Scheme for each stage of the works is produced (in accordance with the OLEMS), submitted and approved by the relevant planning authority. This would include details of soil restoration and ground preparation, species choice, stock size, spacing, protection and a program of weed control and aftercare to cover a period of 5	Given the importance of linear hedgerows to bat species we confirm that the EMP should include provision to monitor hedgerows, for 7 years or until they have reached the same or better quality than before they were removed.

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			years. Whilst hedgerows may take up to 7 years to fully replace the hedgerow that was lost, the latter part of this period will simply be the hedgerow thickening as it continues to fill the gap. It will be apparent within the first 5 years of aftercare whether a replacement hedgerow has adequately established. As such, the Applicant believes that the Ecological Management Plan described in Requirement 24 and the Landscape Management Scheme described in Requirement 18 includes sufficient measures to meet the hedgerow requirements requested in Natural England's relevant representation.	
23.63	Applicant	Paragraph 1162 of the Information for the HRA report [APP-045] states that a pre-construction botanical survey of the northern floodplain habitat of the River Wensum would be conducted. This is not included within the Outline Landscape and Ecological Management Strategy [APP-031]. Confirm how the pre-construction surveys would be secured in the dDCO and/or what changes to the OLEMS should be made.	This pre-construction survey is captured in paragraph 196 of the OLEMS (document reference: 8.7).	No comments.
24.	**Onshore Ecology**			
24.1	Applicant	NE has raised a number of concerns in Appendix 4 of [RR-106] relating to terrestrial ecology. Please respond, with particular regard to the comments made in relation to (i) SSSIs where NPS EN-1 states that development consent should not normally be granted where development is likely to have an adverse effect on a SSSI; (ii) Protected species; and (ii) Habitats.	The Applicant has noted the concerns raised in Natural England's Relevant Representation and have provided a detailed response to their concerns within the Statement of Common Ground with Natural England (document reference: Rep1 - SOCG - 13.1). A summary of the key points (in relations to SSSIs, protected species and habitats) is provided below. SSSIs	Natural England and the Applicant discussed potential effects on water dependent designated sites in a teleconference (22 Jan 2019) during which it was agreed that the Applicant would try and access the EA groundwater modelling for the area to inform an assessment of alone and in-combination effects on water dependent designated

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			Clarification regarding the potential for the construction works to affect groundwater supply to the SSSIs identified by Natural England (Dereham Rush Meadow SSSI, Holly Farm Meadow SSSI, Whitwell Common SSSI and Booton Common SSSI) is presented within Appendix 2 of the Statement of Common Ground with Natural England (Document reference: Rep1 - SOCG - 13.1). In summary, the SSSIs mentioned above whilst predominantly fed by surface water are partially fed by groundwater from the chalk aquifer. The depth of the chalk aquifer in the vicinity of the onshore project area confirms that interactions with the chalk aquifer will not occur and therefore there is no direct pathway between the construction works and the underlying chalk aquifer, and a detailed groundwater assessment is not deemed necessary. Regarding the potential for the construction works to affect surface water flows at these SSSIs, the Applicant has committed to develop a scheme and programme for each watercourse crossing, diversion and reinstatement which will include site specific details of the sediment management measures and pollution prevention. This scheme will be submitted to and approved by the relevant planning authority in consultation with Natural England. This is secured through Requirement 25 of the dDCO (Document Reference 3.1). With these commitments in place there will be sufficient control measures to safeguard designated sites in relation to sediment control, pollution prevention and reinstatement of all work areas at watercourse crossings. Felbrigg Wood SSSI was identified as a designated site with the potential to be subject to air quality impacts due to its proximity to the	sites. Natural England welcomes the commitment to develop a scheme and programme for each watercourse crossing, diversion and reinstatement which will include site specific details of the sediment management measures and pollution prevention. With regards to air quality at Felbrigg Wood SSSI, the site is already above its CL, and as there are predicted air quality effects above the 1% CL threshold we advise that a condition is applied that the OLEMS should include mitigation to reduce changes in air quality at the site e.g. using efficient vehicles, reducing number of vehicles/time on the road, timing of construction to support biodiversity, possible use of barriers or screening etc. Paston Great Barn SAC Bats. The development has the potential to effect the conservation objective: Maintain the presence, structure and quality of any linear landscape features which function as flight lines. Flight lines should remain unlit, functioning as dark corridors (Conservation Objectives, supplementary advice 2019).

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			nearest road network (A148 between King's Lynn and Cromer). A full assessment of the air quality impacts has been undertaken within Chapter 26 Air Quality, and the impact of the project upon sensitive habitats of Felbrigg Woods SSSI has been assessed as to be an impact of negligible significance. Protected species Clarification of the approach to assessment of the impacts on bats of the Paston Great Barn SAC (and the Old Hills barbastelle maternity colony) are provided in Appendix 3 of the Statement of Common Ground with Natural England (Document reference: Rep1 - SOCG - 13.1). In summary, all hedgerows within 5km of Paston Great Barn SAC and the Old Hills barbastelle maternity colony that will be temporarily removed during construction were identified (130m in total). Detailed bat and hedgerow mitigation measures (for all hedgerows, not just those identified as important for barbastelle) are provided within Chapter 22 Onshore Ecology and captured within the OLEMS (document reference 8.7) and secured through Requirement 24 of the draft DCO (Ecological Management Plan), which will require consultation with Natural England prior to discharge. No potential adverse effect on the integrity of the Paston Great Barn SAC in relation to the conservation objectives for the site has been identified. Habitats Natural England's comments on habitats for nesting birds is addressed in the Applicant's response to Q24.18. Natural England's concerns regarding sediment management and pollutant release during watercourse crossings is addressed earlier in this response when discussing Natural England's comments on	Natural England and the Applicant discussed bats in a call on 22 Jan 2019. The Applicant will provide a map showing all available Barbastelle habitat and the effect of loss of connectivity to the 11 ha of woodland. Further clarification to be provided on the worst case scenario with regards reinstatement of hedgerows over easements.

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			potential impacts to SSSIs. The mitigation outlined in relation to SSSIs will apply to all watercourse crossings.	
24.2	Applicant	Please address the comments raised about discrepancies between dDCO parameters presented in the ES referred to in NE Appendix 5 [RR-106] and the MMO RR [RR-186].	Appendix 6.1 provides an explanation of the relationship between design parameters of the draft DCO and ES.	Due to the size of the document and the limited time between upload of documents to PINS website and Deadline 2 Natural England have not had the opportunity to review this document. Natural England will therefore provide comment on this submission at Deadline 3.
24.4	Applicant	Confirm that the final Project Environmental Management Plan is to be based on the Outline Project Environmental Management Plan (OPEM) provided at Document 8.14 [APP-038] and detail how you propose to deal with uncertainty as to whether the assessment in the final plan would result in effects of greater significance than have been assessed in the OPEM.	As stated in section 1.2 of the Outline Project Environmental Management Plan (PEMP), the document provides the framework for the final PEMP (required under DCO Schedules 9 and 10 Part 4 condition 14(1)(d) and Schedules 11 and 12 Part 4 condition 9(1)(d)), including the controls that are proposed to manage the environmental risks associated with the construction and operation of the offshore components of Norfolk Vanguard. In accordance with the dDCO, the PEMP must be approved in writing by the MMO and therefore any works that would lead to effects that are greater than those assessed in the ES would not be permitted.	No comments.
24.5	Applicant	Confirm, in respect of Table 34.15 Potential impacts identified for onshore ecology [APP-358], whether you consider that adverse impacts could be mitigated further or provide a robust justification as to why this is not possible.	Table 34.15 provides a summary of impacts and mitigation that are presented more fully in each relevant topic chapter. The impact assessment presented in Chapter 22 Onshore Ecology (document reference: 6.1.22) has considered all appropriate mitigation to reduce, as far as possible, all impacts to a non-significant level and these are captured in the OLEMS (document reference 8.7) and secured through Requirement 24. In the two instances where a residual significant	The Applicant and Natural England had a teleconference on 22 Jan.2019 to discuss adverse impacts on bats. During this teleconference the Applicant has agreed to provide a map of all barbastelle bat habitat in the vicinity of Paston Great Barn. Natural England will therefore provide further comment in this regard following provision of this

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			impact remains following mitigation (temporary loss of hedgerow and impacts to bats (related the temporary loss of hedgerow), no other viable mitigation options are available to reduce the impact level further. For both of these impacts, with mitigation in place, the magnitude of effect has been reduced to low. However, since the receptors are considered to be of high importance, a residual significant impact remains. Solutions have been adopted to minimise the impact upon hedgerows as far as possible: • during site selection for the onshore cable route, efforts were made to minimise the number of hedgerow crossings made; • the onshore cable route working width at hedgerows has been reduced from 45m to 20m to minimise the amount of hedgerow which needs to be removed; • where hedgerow gaps are required beyond the two-year duct installation phase (i.e. for the duration of the subsequent two-year cable pull phase), the number of gaps required will be minimised as far as possible and will be no wider than 6m; • during detailed design, the project will seek to avoid mature trees within hedgerows through the micro-siting of individual cables, in order to retain as many mature trees as possible, and • all hedgerows will be replanted following guidance within the Norfolk hedgerow BAP and will include appropriate species for north-east Norfolk (NBP, 2009), including ground flora planting designed to encourage insect biomass (BCT, 2012). Future hedgerow management will include allowing standard trees to develop to improve quality of the hedgerow as a foraging resource. Hedges will be double-planted with 2m	information.

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			grassland strips on both sides so there is always a leeward side to forage. This will ensure that the quality of the hedgerow resource is improved in the long term. Despite this, there is a short term loss of 20m sections of hedgerows at 165 locations, which is assessed as a moderate adverse impact, until the replanted hedgerows can reach maturity. It should be noted that this is a temporary impact which would reduce to negligible once the hedgerows have matured (up to seven years after construction).	
24.6	Applicant	Provide an update on discussions with NE regarding monitoring measures to be relied upon and what corrective action it is envisaged would be taken in the event of an outcome during monitoring that is worse than anticipated.	The SOCG with Natural England shows that it is agreed that the In Principle Monitoring Plan (document 8.12), provides an appropriate framework to agree monitoring with the MMO in consultation with Natural England. Condition 14(1)(b) of the Generation DMLs (Schedule 9-10), and Condition 9(1)(b) of the Transmission DMLs (Schedule 11-12)), require a construction programme and monitoring plan to be submitted to and approved in writing by the MMO. In discharging this condition, and before the MMO can approve the construction programme and monitoring plan, the Applicant must submit details (which accord with the offshore in principle monitoring plan, document reference 8.12), for approval by the MMO in consultation with relevant statutory bodies, of the proposed monitoring for the construction of the authorised scheme. The timings, methodologies, and details of further actions in the event of an unacceptable outcome of the monitoring would therefore be included in the final plan provided for approval by the MMO, pursuant to Condition 14(1)(b) or Condition 9(1)(b) of the DMLs.	No comments.
24.7	Applicant	Table 23.3 in ES Chapter 23, Onshore	The Natural England comment in Table 23.3	No comments.

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		Ornithology, [APP-347] refers to further sites identified by Natural England that should be considered, to include Cawston and Marsham Heaths, Foxley Wood, Honeypot Wood and Beetley and Hoe Meadows SSSIs designated as representative of rare habitats. You confirm in the table that these sites have been considered in sections 23.7 and 23.8 of the ES [APP-347], but this does not appear to be the case. Please clarify and explain how effects to these sites have been or will be considered and specify the information contained within the ES in this regard.	was made in relation to the Scoping Report provided in 2016, in which a large search area (scoping area) for the onshore project area was provided. These four SSSIs were located within this scoping area. Following route identification and refinement, these sites are no longer located within the onshore project area, and are located 1.5km or more from the onshore project area. Given the distance of these sites from the onshore project area, potential effects upon these sites have not been considered further.	
24.8	Applicant	Table 23.13 in ES Chapter 23 [APP-347] is divided into two parts and contains inconsistencies. Certain habitat types are duplicated in the first part of the table, and repeated in the second part of the table but with different hectare values. The second part of the table contains an additional column not present in the first. Explain these apparent discrepancies, confirming what are the appropriate values for each habitat type and explaining to what extent this may affect the findings in the ES?	The upper part of Table 23.13 has been included in error – this upper part is the habitat table which was included in Chapter 23 of the Norfolk Vanguard PEIR, which was subsequently updated following amendments to the onshore project area between PEIR and submission of the application. The habitat footprints provided in the lower part of Table 23.13 are the correct values and have been used to inform the subsequent assessment. These are the same as the habitat footprints provided in Table 22.11 of Chapter 22 Onshore Ecology (document reference: 6.1.22).	No comments.
24.10	Applicant	Natural England's RR [RR-106] Appendix 4, point 13 states that no detailed assessment of noise on bird features appears to have been carried out, and advises 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 provided to demonstrate that there will be no additional noise experienced from construction at the designated site boundary. Please comment on this advice and confirm whether, and if so how these issues will be	To account for potential noise disturbance upon notified features of SSSIs, a buffer of 300m from designated sites (where birds are qualifying features) was identified, within which potential noise impacts were considered. This buffer was agreed with Natural England in January 2017 (Onshore Wintering Bird Surveys Survey Methodology Approach Update). Using this criterion, the Applicant undertook further route refinement seeking to avoid sites, where possible, using the agreed noise buffer. With the exception of the River Wensum all other SSSIs have been avoided by at least 300m. Based on	Natural England is clarifying our position on this and will provide further update, if necessary, at Deadline 3.

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		addressed.	the agreed methodology there was therefore no requirement to assess potential noise disturbance effects. On this basis the assessment of impacts for construction, operation and decommissioning presented are consistent with the agreed assessment methodologies. The assessment of the effects of the project upon the notified features of the River Wensum SSSI considered those notified features which were recorded during the Breeding Bird Surveys (Appendix 23.4 of Chapter 24 Onshore Ornithology). No notified species were recorded roosting during the 2017 breeding bird surveys, and as such no potential impacts upon the notified features of the River Wensum SSSI were identified.	
24.11	Applicant	The Overarching National Policy Statement for Energy aims to secure a halting, and if possible a reversal, of decline in priority habitats and species. Confirm that whilst priority habitats are presented in ES Chapter 23, no such bird species have been identified.	The following 'priority species' (i.e. those listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006) have been recorded during the Onshore Wintering Bird Surveys (document reference: 6.2.23.2), Breeding Bird Surveys (document reference: 6.2.23.4) and the Extended Phase 1 Habitat Survey (document reference: 6.2.22.1) undertaken for the project: • Bullfinch • Common Scoter • Dark-bellied Brent Goose • Dunnock • House Sparrow • Lapwing • Linnet • Marsh tit • Reed bunting • Skylark	No comments.

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			• Song thrush • Starling These species have been fully considered in the impact assessment presented in Section 23.7.6 and 23.7.7 of Chapter 23 Onshore Ornithology. With mitigation in place residual impacts to all bird species are no greater than minor adverse during construction and negligible during operation.	
24.12	Applicant	ES Chapter 6: EIA Methodology [APP-330] states that a Rochdale Envelope approach has been applied, and the parameters of the Proposed Development provided represent the worst-case scenario. Having regard to the design parameters and assumptions used to inform the worst case assessment, explain how and to what extent the dDCO constrains the Proposed Development to ensure that effects greater that those assessed will not occur?	The Explanatory Memorandum sets out the approach of the draft DCO and DMLs to parameters on • Phasing of offshore works (4.5) • Phasing of onshore works (4.10) • Offshore flexibility (4.11 – 4.15) • Onshore flexibility (4.16 – 4.17) • Policy support for flexibility (4.18 – 4.19) • Parameters in the Order (4.20 – 4.21). A list of Order parameters is set out in Schedule 3 of the Explanatory Memorandum with DCO references and references to the offshore project components (offshore structures, offshore cables, foundations, scour protection, licenced marine activities), and onshore project parameters, to which they relate. These parameters together constrain the proposed development to ensure that effects greater than those assessed will not occur.	No comments.
24.13	Applicant	Study areas not surveyed would be subject to surveys post-consent, as noted in the Outline Landscape Ecological Management Strategy OLEMS [APP-031]. Justify the robustness of your approach to address gaps in survey information, importantly those that relate to notable	The worst case scenario was established based on the following approach: • For areas where survey data had been obtained, the baseline survey and desk-based data gathered for the onshore project area was used; • For unsurveyed areas, following CIEEM's Guidelines for Ecological Impact Assessment in	No comments.

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		species, also explaining, in the absence of such information, how the worst case scenario used for the assessment has been established and the extent to which it is appropriately robust.	the UK and Ireland (2018) a precautionary approach was used. For these areas, it was assumed that the relevant ecological receptor was present. The impact assessment was conducted based on this assumption and mitigation was proposed based on this assumption. In this way, the assessment has taken account of the worst case scenario for the ecological receptors which could be present within the onshore project area (and species-specific buffer zones surrounding it). This approach ensures that as far possible the impacts assessed are based on a detailed knowledge of the existing ecological baseline, but in those areas where data is incomplete, by using a precautionary approach the maximum potential impacts and maximum potentially required mitigation is captured. Additional desk-based data sources were also used to inform the baseline for the unsurveyed areas, such as the use of the Norfolk Living Map and Norfolk Barbastelle Study Group's radio-tracking data (as detailed in Chapter 22 Onshore Ecology). Whilst these data sources do not replace survey data they ensure that an overview of the ecological baseline within the unsurveyed areas can be understood.	
24.14	Applicant	Explain how you propose to undertake future surveys of land not previously accessed, detailing methods applicable to land that is deemed inaccessible due to physical constraints, not subject to landowners' consent, or not previously surveyed for any other reason. Please explain how this will be secured in the dDCO.	Post-consent, survey access rights will have been secured for all landowners within the onshore project area as part of voluntary agreements or through powers authorised under the DCO (see Article 16). This will then provide survey access rights to 100% of the Order limits. There are no plans to undertake pre-construction surveys outside of the Order limits. Some small areas of the onshore project area will remain inaccessible due to physical barriers to entry. Based on the areas where access has been granted to date, physical restrictions to	No comments.

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			access represent less than 1% of the onshore survey area. This is inevitable to some degree for all ecological surveys. Following CIEEM's Guidelines for Ecological Impact Assessment in the UK and Ireland (2018) in these instances a precautionary approach will continue to be used, and unless likely absence of a receptor can be determined, it will be assumed to be present and mitigation undertaken accordingly. Pre-construction surveys will be undertaken at the first available opportunity post-consent. The scope of the pre-construction surveys is captured within the OLEMS (document reference: 8.7) and secured through Requirement 24.	
24.16	Applicant	Explain, having regard to (i) Natural England's comments at [APP-106] Appendix 4, point 15 and (ii) the Environment Agency's [RR-117] comments at paragraph 5.1 regarding sand martin: The extent to which impacts to sand martin, particularly in relation to noise and vibration, have been assessed, and specify where this information is presented in the ES.	Potential effects on sand martin have been considered in Section 23.7.6.3 of Chapter 23 Onshore Ornithology (document reference: 6.1.23). Information presented within Chapter 23 draws from the noise and vibration modelling presented within Chapter 25 Noise and Vibration. Noise effects –the nearest receptor (LFR4H) is located along the coastal path at Happisburgh and in proximity to the landfall works (refer to Figure 25.2 in ES Chapter 25 Noise and Vibration). Background noise was monitored at this location and recorded between 39 to 42dB (Appendix 25.1 of ES Chapter 25). Worst case construction noise levels were modelled for this location and the noise attributable to the landfall works along the coastal path at LFR4H was between 35dB and 45dB (Appendix 25.2 of ES Chapter 25)., i.e. a potential noise increase of 3dB along the coastal path. As the sand martins nest in the cliff face there would be further noise reduction as the cliff itself would screen noise effects. As such, any noise increase at the cliff face, associated with the landfall works, would	Natural England would like to highlight that mitigation within the OLEMS should include method statements on reducing light, vibration and noise impacts on sand martins nesting in the cliff face.

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			be negligible. Vibration effects - The landfall area is underlain by sandy clay and sand to a depth of approximately 18m below ground level (Section 19.6.1.1 of Chapter 19 Ground Conditions and Contamination). Drilling through this relatively loose material would generate limited vibration effects as the material is a poor propagator of vibration. Vibration is best propagated through hard surfaces and the looser the material the more any potential vibration effect becomes dampened. As such there is no propagation pathway for vibration effects between the works (either 130m away or up to 20m below) and known sand martin nesting sites, and no impact is anticipated. Lighting effects - The potential for effects arising from the use of 24hr lighting at the landfall compound has been identified, which has been classified as a minor adverse impact (low magnitude effect upon a medium importance receptor) within Chapter 23 Onshore Ornithology. As a non-significant impact, no specific mitigation has been proposed, however the design of all construction lighting will require approval prior to the commencement of any stage of the onshore transmission works through the development of an Artificial Light Emissions Management Plan that will form part of the final CoCP for each stage of the works, which is secured through Requirement 20. In addition, Requirement 24 of the draft DCO requires that no stage of the onshore transmission works may proceed until an Ecological Management Plan (which accords with the OLEMS) is submitted and approved by the relevant planning authority in consultation with Natural England. The OLEMS sets out that any artificial lighting must adhere to:	

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			• BCT's Artificial lighting and wildlife guidance (2014) when designing lighting during temporary works.	
24.17	Applicant	Confirm whether it will be possible to avoid construction during the sand martin breeding season, as requested by Natural England. If not, then specify what additional mitigation measures you propose in regard to sand martins.	As set out in the response to Q24.16, no impact pathway has been identified between vibration effects and the sand martins nesting at Happisburgh cliffs. On this basis it is not proposed that works should specifically avoid the sand martin breeding season and no further mitigation measures are proposed.	If HDD works are undertaken during breeding season we recommend an ECoW should monitor the cliff face for vibration effects on nests, 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.
24.18	Applicant	Confirm, having regard to Natural England's comments at [RR-106] Appendix 4, point 16, that nesting birds will be added to the protected species in paragraph 230 of the OLEMS such that works would stop immediately if nesting birds are found during construction. Does the OLEMS/ Requirement 24 make adequate provision for a survey for nesting birds (and other species) prior to construction by a qualified ecologist to be carried out? If not, then how will the presence or absence of nesting birds and other species be established?	Paragraph 230 of the OLEMS sets out the procedure if any protected species are unexpectedly found, i.e. that works will cease immediately. It does not provide a list of protected species where this applies, as all nesting birds are protected. Therefore, the Applicant does not propose to update the OLEMS on this element. Pre-construction surveys of protected species are set out in the relevant section of the OLEMS and secured through Requirement 24. Where vegetation removal is discussed within the OLEMS, the measures set out are that this should be undertaken outside of the breeding bird season where possible. However, the Applicant acknowledges that the OLEMS does not explicitly state that if vegetation clearance is undertaken during the breeding bird season then pre-construction checks for nesting birds will be undertaken. The OLEMS will be updated to make explicit reference to pre-construction checks for nesting birds in instances where vegetation removal is required within the bird breeding season. An updated version of the OLEMS incorporating this detail will be issued during the Examination	Natural England look forward to receiving the updated OLEMS regarding nesting birds and pre construction checks and will provide further comment on this update as necessary.

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			process at a later date.	
24.19	Applicant	With regard to the monitoring envisaged as noted in Section 23.7.3 of the ES to be agreed with relevant stakeholders and included within the Code of Construction Practice and Ecological Management Plan prior to construction works commencing, provide further information as to the monitoring envisaged, how this is to be secured and how it will influence the Proposed Development in terms of corrective actions as a result of monitoring data. For example, is there to be a pre-construction survey undertaken by a qualified ecologist, and is an ecological clerk of works proposed?	The potential need for monitoring has been identified for water voles and great crested newts. This is detailed within section 12 of the OLEMS (document reference: 8.7) and secured through Requirement 24. Monitoring would only be required should great crested newts or water voles need to be translocated (great crested newts) or displaced (water voles). The extent of monitoring will be confirmed once pre-construction surveys are completed. Pre-construction surveys are proposed for all protected species and these are set out in the respective sections of the OLEMS. The findings from the surveys will inform the final approach to mitigation and monitoring within the Ecological Management Plan secured through Requirement 24. The OLEMS also confirms that an Ecological Clerk of Works will be appointed (section 12) and sets out that their responsibilities, including implementation of the agreed ecological mitigation measures on site during construction, and specific post-construction monitoring commitments for water voles and great crested newts. Details of the post-construction monitoring will be agreed with Natural England post-consent through the Ecological Management Plan, secured through Requirement 24.	No comments.