East Anglia ONE North and East Anglia TWO Offshore Windfarms

Applicants' Responses to Examining Authority's Written Questions 3

Volume 4 – 3.2 Biodiversity, Ecology and Natural Environment

Applicants: East Anglia ONE North Limited and East Anglia TWO Limited
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Applicable to East Anglia ONE North and East Anglia TWO

Revision Summary				
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001	07/06/2021	Paolo Pizzolla	Lesly Jamieson / Ian Mackay	Rich Morris

Description of Revisions			
Rev	**Page**	**Section**	**Description**
001	n/a	n/a	Final for Submission

Glossary of Acronyms

APP	Application Document
AS	Additional Submission
BEIS	Business Energy and Industrial Strategy
DCO	Development Consent Order
EC	European Commission
EMP	Ecological Management Plan
FFC	Flamborough and Filey Coast
HDD	Horizontal directional drilling
HRA	Habitats Regulations Assessment
MGN	Marine Guidance Note
MMO	Marine Management Organisation
NBL	Norfolk Boreas Limited
NE	Natural England
NPPF	National Planning Policy Framework
OLEMS	Outline Landscape and Ecological Management Strategy
OTE	Outer Thames Estuary
PD	Procedural Decision
RSPB	Royal Society for the Protection of birds
RTD	Red-Throated Diver
SPA	Special protection Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom

Glossary of Terminology

Applicant	East Anglia TWO Limited.
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one offshore construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia TWO windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
East Anglia Zone	The broader area defined for Round 3 applications within which the East Anglia TWO windfarm site is located together with East Anglia One, East Anglia THREE, East Anglia ONE North, Norfolk Boreas and Norfolk Vanguard.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Habitats Directive	European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017
HRA	Habitat Regulations Assessment is a recognised step by step process which helps determine likely significant effect and (where appropriate) assesses any adverse effects on the integrity of Natura 2000 sites protected under the Birds or Habitats Directives
Likely Significant Effect	Checking for the likelihood of significant effects on Natura sites is a part of HRA. Unless a significant effect can be ruled out, it is considered 'likely' and requires appraisal.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.[1]

[1] Please note that, post Brexit, for the purpose of the Habitats Regulations references to "Natura 2000" are to be construed as references to the national site network.

ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
3.2 Biodiversity, Ecology and Natural Environment (including Habitats Regulations Assessment (HRA))			
Offshore Ornithology			
3.2.1	Natural England and the Applicants	**Red-throated diver (RTD) displacement** With regard to RTD displacement, on page 36 of [REP10-017], the Applicants state that "… *the in-combination assessment is already overprecautionary*…". a) To the Applicants: Drawing together the evidence from your previous submissions, please provide a summary of your reasoning to justify this statement. The Applicants' argument in relation to the potential displacement effects on RTD is predicated upon its contention that the SPA population is at worst, not declining and at best, may be increasing. b) How confident are you that this statement is robust, given improvements in survey techniques? c) Should future surveys using digital surveying techniques indicate that the SPA population was declining then how would this be accounted for in the mitigation and the compensation measures that you are proposing?	a) In the red-throated diver in-combination assessment the Applicants consider that the main source of over-precaution in the approach advised by Natural England is the large distance over which Natural England consider birds are likely to be displaced, and the application of this distance to all the windfarms in the in-combination assessment. To include '*a range in relation to the extent of the buffer and the gradient across it*' (Natural England REP9-067) which equates to applying an even greater displacement distance than 11.5km, is, on the basis of the Applicant's modelling, unwarranted and therefore overly precautionary. The Applicants' modelling (most recent version: deadline 11 document reference ExA.AS-29.D11.V5), undertaken by an expert in the field of spatial modelling, applied robust statistical methods to the most relevant data for consideration of the current applications, collected over almost 20 years in the Outer Thames region. This work estimated that a maximum displacement distance of approximately 7.5km was appropriate for assessment. The Applicants' have provided detailed and robust responses to Natural England's comments on the modelling however Natural England still consider that the results from the

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		d) Does Natural England have any comments on (b) and (c)?	monitoring of one windfarm (London Array, rather than the whole SPA) to be more appropriate. This is despite the fact that the study was conducted over a shorter span of years (2010-2016 rather than 2002-2018), over a much smaller area, and is focussed on a region of the SPA where the red-throated diver distribution before any windfarms were constructed corresponds remarkably closely to that attributed to windfarm displacement (see the figures on page 7 of REP9-016). For these reasons, the apparent avoidance distance derived from the London Array monitoring (11.5km), advocated by Natural England, is highly questionable as the basis for assessment. For this distance to be extended further, as suggested by Natural England is therefore adding on precaution to an already precautionary (and the evidence indicates, unreliable) displacement distance. With respect to the appropriate baseline for assessment, since Kentish Flats and Gunfleet Sands I and II were already operational before the SPA was designated, and the current designated population size of red-throated divers was derived following construction of the London Array windfarm. Therefore, whatever effect those windfarms have on the distribution and population size is already present and the predicted impacts of these windfarms should not be included in the in-combination assessment. However, Natural England disagree and consider the effects of

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			these windfarms should be included in the in-combination assessment in the same manner as would be expected if they completely post-date the SPA. This inevitably introduces a degree of double counting of any effects. Because the Applicant's modelling was able to explicitly account for the staggered introduction of the windfarms into the SPA in the counterfactual distributions generated by the spatial models this aspect was controlled for. **Displacement mortality** Although Natural England's primary focus is on the potential for redistribution of red-throated divers within the SPA, the Applicant has made the case (REP6-020) that the SPA's primary role is to maintain the size of the designated populations, of which red-throated diver is one. Natural England advises that the mortality rate for red-throated divers displaced by windfarms may be up to 10% (i.e. up to 10% of birds subject to displacement may die as a direct consequence). However, a detailed review of evidence (Vattenfall 2019[2]) found no research that supported such a high mortality rate and recommended that a rate of 1% was in fact suitably

[2] Vattenfall (2019) Norfolk Vanguard Offshore Wind Farm The Applicant Responses to First Written Questions Appendix 3.1 - Red-throated diver displacement (https://infrastructure.planninginspectorate.gov.uk/wpcontent/ipc/uploads/projects/EN010079/EN010079-002249-Womble%20Bond%20Dickinson%20on%20Behalf%20of%20Norfolk%20Vanguard%2 0-%20Appendices%20to%20written%20Questions-%20Email%204.pdf)

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			precautionary. Natural England has agreed that the contributions of the Projects to in-combination mortality impacts are likely to be very small and are unlikely to result in any population consequences even using their precautionary 10% mortality rate (i.e. no AEoI on the populations of qualifying species, alone and in-combination; REP9-067) it follows that a more appropriate interpretation of potential mortality consequences (i.e. displacement mortality of 1%) would reduce the level of concern on mortality even further. b) The estimated red-throated diver population of the SPA was around 6,000 in 2006 prior to windfarm construction, around 14,000 in 2013 following construction of Kentish Flats, Gunfleet Sands and London Array and around 18,000 in 2018. There are two potential causes for this increase: the population has grown (e.g. by a factor of three) or survey methods have improved (e.g. such that two out of every three birds went unobserved in the early, non-digital aerial surveys conducted prior to 2006). While the reality is likely to be some combination of both of these, what seems more certain is that the population has not decreased over this period (which Natural England agree, REP9-067), since this would require that the early surveys missed even more than two out of every three birds. Thus, at the very least the population must have remained stable, and in all likelihood, it has increased to some extent. This population

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			stability/increase has occurred while windfarms have been constructed within the SPA. Yet, at the same time Natural England advise that up to 47% of the SPA is subject to some degree of displacement effect on red-throated divers due to these windfarms. Using Natural England's approach it can be assumed that the effective area of displacement is 23.5% of the SPA. If 10% of the displaced birds die as a result, this would be a loss of 2.35% of the SPA population every winter. The population prior to all the windfarms being constructed would need to have been around 24,000 in 2006 in order to have declined to 18,000 by 2018 at this mortality rate, nearly 4 times larger than was estimated in 2006. While some species are known to be more difficult to accurately record during visual surveys (e.g. common scoter which aggregate in large flocks that are very challenging to estimate the size of) this does not apply to red-throated divers. Personal communication with an ornithologist involved in the early surveys of the Outer Thames region (P. Cranswick) has confirmed that this species was generally encountered as individuals or small groups, the birds were easy to spot as they contrasted with the sea surface, and they are relatively large in size. This corresponds with the experience of one of the Applicants' consultants who undertook much of the data analysis for these early visual aerial surveys: the data for red-throated diver conformed closely to the

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			requirements of the analysis methods used (Distance Analysis) and generated reliable estimates with good levels of precision. Thus, while digital survey methods almost certainly provide improvements in accuracy, the magnitude of this is very unlikely to be a factor of three. Furthermore, if visual aerial surveys did systematically underestimate seabird abundance when compared with digital methods, this would suggest that the move from visual aerial surveys to digital imagery would have been accompanied by a general increase in apparent at-sea abundance of most seabirds. While the magnitude of this effect would vary between species (e.g. depending on their size and colouration etc.) there would still be an overall general positive trend in numbers, all else being equal. The Applicants are unaware of any such suggestion that at-sea seabird population estimates have been revised upwards to such an extent over the last 10 to 15 years due to methodological changes. If a general effect of this manner and scale had occurred, it seems highly implausible that it would have gone unreported. One study which did compare digital and visual survey estimates found that the density of divers was 15% lower with visual surveys than digital (Zydeli et al. 2019[3]). This would suggest that the early SPA

[3] Zydelis, R., Dorsch, M., Heinanen, S., Nehls, G. & Weiss, F. (2019) Comparison of digital video surveys with visual aerial surveys for bird monitoring at sea. Journal of Ornithology, https://doi.org/10.1007/s10336-018-1622-4

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			estimate of 6,000 may have been estimated to be around 7,000 if digital methods had been used. Thus, it is considered that these factors taken together provide a strong indication that the existing windfarms in the SPA have not had an impact of the scale suggested by Natural England, and for this reason the Applicants consider Natural England's advice to be over precautionary. Taking all these factors together, the Applicant is confident that the population has not declined since 2006 (which Natural England agree, REP9-067), and is also very confident that the population has in fact increased, by at least a factor of two in the last decade. c) If future monitoring indicated a decline in the red-throated diver population then the first steps would be to attempt to determine the cause. For example, if this cause was attributable to factors occurring in the breeding grounds (Fenno-Scandinavia) then actions taken in the wintering grounds would likely be of limited benefit at best. Natural England's position on the effect of windfarms on red-throated divers in the SPA relates to the distribution of the birds, not the population size. The hypothesised decline in the red-throated diver population posed in this question, if it was attributable to the current windfarms, would therefore require

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					compensation that reduced other sources of mortality. Since this is not the effect that Natural England has concerns about and is not predicted to occur, the discussions with Natural England about compensation to date have not been focussed on this aspect. Hence, any measures suggested by the Applicant which could reduce mortality (e.g. potentially through reduced by-catch) have been deemed inappropriate for compensating for Natural England's predicted effect and have not been pursued by the Applicants.
3.2.2	The Applicants			**RTD displacement: East Anglia TWO in-combination effects** Notwithstanding your comments on page 36 of [REP10-017], for the sake of completeness please could the Applicants please provide the modelling outputs with the worst-case (i.e. Natural England's mortality assumptions) East Anglia TWO contribution towards RTD displacement included in the in-combination assessment.	This information is already within ***section 5.2*** of ***Displacement of red-throated divers in the Outer Thames Estuary*** (REP8-033). The document has been updated at Deadline 11 (document reference: ExA.AS-29.D11.V5) to add the effect of East Anglia TWO to the total presented in ***section 5.3.***
3.2.3	Natural England			**Legal submissions: RTD displacement – 'effective habitat loss'** In [REP10-017], the Applicants contend that recorded densities of red throated diver (RTD) vary within the Outer Thames Estuary (OTE) SPA and that to treat all parts of the SPA as being of equal importance for the	

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				species is not appropriate. They state that, "*the areas of the SPA within the potential zone of influence of the windfarms have consistently recorded lower densities of birds and this is a material factor in considering the magnitude of potential impac*t". Does Natural England accept this line of reasoning? If not, please explain your reasons.	
3.2.4	Natural England			**Legal submissions: RTD displacement – 'effective habitat loss'** In REP9-064, Natural England accepts that exclusion effects can be seen as a continuum of severity and states that "*the Bagmoor Wind case appears to have been a severe case"*. The Applicants [REP10-017] submit that in the Bagmoor Wind case, there was a concluded ecological consequence (i.e. that the territory was likely to be abandoned resulting in a potential increase in disturbance), whereas for EA1N and EA2, the displacement of RTD would have effects that are too small to detect. a) How does Natural England respond to this position? b) In light of what we understand to be the magnitude of displacement effects on RTD of the OTE SPA in the case of the EA1N and EA2	

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				projects, where does Natural England consider that the projects sit	
3.2.5	Royal Society for the Protection of Birds (RSPB)			**Cumulative and in-combination collision risk: Hornsea Project Three contribution** In [REP8-171], the RSPB states that it does not agree with the Applicants that the in-combination annual kittiwake collisions apportioned to the FFC SPA should exclude the estimated collisions at Hornsea Project Three because the adverse effect arising from Hornsea Project Three will not be avoided and because it considers the effectiveness of the Hornsea Project Three compensatory measures to be "*highly uncertain*". Conversely, Natural England [REP8-166, answer to R17QB.12] agrees with the Applicants' approach, stating that the SoS decision is clear that the impacts from Hornsea Project Three will be fully compensated for. a) Does the RSPB maintain the view expressed in [REP8-171]? If so, please could you elaborate on the reasons for your position? b) Specifically, whilst noting your position that the collision risk impacts from Hornsea Project Three will not be avoided, if the H3 collision risk impact on kittiwake is fully compensated for, please explain why you consider it to be appropriate to	

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				include that impact in the incombination and cumulative assessments?	
3.2.6	The Applicants and Natural England			**Cumulative and in-combination collision risk: Flamborough and Filey Coast SPA** Paragraph 5 of the letter dated 28 April 2021 from Gareth Leigh of BEIS to Norfolk Boreas Limited (NBL) requests that NBL in collaboration with Natural England provides updated in-combination assessments for collision and/or displacement effects at Flamborough and Filey Coast SPA, with and without Hornsea Project Four Offshore Wind Farm, using Natural England's advised assessment parameters and the latest project parameters and baseline ornithology survey data for Hornsea Project Three Offshore Wind Farm. That information is requested by 28 May 2021. Since the in-combination totals used for EA1N and EA2 are derived from figures agreed at D8 of the Norfolk Vanguard examination, what do the Applicants and Natural England consider to be the implications (if any) of those updated in-combination assessments for the EA1N and EA2 examinations?	For clarity the East Anglia ONE North and East Anglia TWO in-combination estimates were derived from the Norfolk Boreas Deadline 8 submission not the Norfolk Vanguard Deadline 8 submission. In light of the request from BEIS to Norfolk Boreas, the ***Ornithology Cumulative and In-Combination Collision Update*** (REP8-035) has been updated at Deadline 11 (document reference: ExA.AS-3.D11.V1) to account for the revised totals now available from Hornsea Project Three. Updates have also been provided for the collision estimates for the Dudgeon Extension and Sheringham Extension project taken from their Preliminary Environmental Information Report (dated 29th April 2021). It is understood that Natural England has advised Norfolk Boreas to include Dudgeon Extension and Sheringham Extension revised in-combination tables, therefore the assessments are expected to be aligned. Finally, the document has also been updated to account for the Non-Material Change for East Anglia THREE (which has now been granted) and comments raised by NE in their ***Appendix A16b - Comments on Cumulative and In-combination Collision Risk*** (REP9-066).

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3.2.7	The Applicants			**HRA Derogation Case: Alternatives Assessment** The ExA is not satisfied that the indicative array area layout plans submitted as Figure 1 in [REP6-044] and [REP8-088] provide an adequate response to ExQ2.2.5 [PD-030] and questioning at ISH14. This has particular importance for the consideration of EA1N effects, where Natural England has argued that increasing the buffer between the array area and the OTE SPA boundary should be considered as a suitable project-level alternative solution. In the absence of an agreed position with Natural England and other IPs, the ExA seeks the presentation of the following material to inform its consideration of the project's HRA derogation case. a) Please update [REP8-088] to include an indicative layout plan that shows the minimum inter-turbine spacing requirements specified within the offshore parameters of the dDCO (1200m x 800m) and which shows the siting of structures in the eastern part of the array area. On that plan, please indicate the distance between the closest of the WTGs and the boundary of the OTE SPA. b) If you wish to retain the plan currently presented in [REP8-088] (in addition to, and not instead of, the plan requested under part (a) of this question), then please justify the spacing	a) The Applicant has prepared a new indicative layout plan, as requested by the ExA, based on the minimum inter-turbine spacing requirements specified within the offshore parameters of the draft DCO (1200m x 800m) and which shows the siting of structures in the eastern part of the array area. Based on this 'minimum spacing' layout plan, the distance between the wind turbines at the western end of the layout and the OTE SPA is 10.1 Km. This new 'minimum spacing' layout plan has been appended to this document under ***Appendix 1***. The Applicant has not included the 'minimum spacing' layout plan in the updated ***EA1N Habitats Regulations Assessment Derogation Case*** submitted at Deadline 11 (document reference ExA.AS-27.D11.V4) as this 'minimum spacing' layout plan would not be deliverable in practice and no weight should be given to it for the reasons stated in the response to 'b' below. b) The 'nominal spacing' layout plan has been retained in the ***EA1N Habitats Regulations Assessment Derogation Case*** submitted at Deadline 11 (document reference ExA.AS-27.D11.V4). As stated in section 6.5.3.1 of ***Chapter 6 - Project Description*** [APP-054]; *"in the absence of detailed geophysical and geotechnical information, minimum separation distances are provided based on the likely requirements of wind turbine suppliers.*

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				distances presented and explain why you consider that a spacing arrangement more akin to the minimum spacing requirements could not realistically, in practice, be provided. c) Please also update the layout plan to ensure the key shows which is the purple solid line and which is the purple dashed line for the respective EA3 export cables. Please supplement the supporting text to explain why it is necessary to allow for both a preliminary and alternate export cable for EA3 and clarify why four structures are depicted within one of the cable exclusion zones. d) In section A.1.2.2 of [REP8-088] you refer to the Ulysses 2 cable and the EA3 export cables crossing the EA1N site and indicate that an exclusion zone of 500m on either side of each cable is required. However, in Figure 1 of the same document you indicate a cable exclusion zone of 750m. Please explain why these two greyed out zones in Figure 1 are 750m rather than 1,000m wide, or alternatively, amend the plan at Figure 1 to reserve cable exclusion zones that are 1,000m in width.	*The nominal separation distances are anticipated to be greater"* Identification of minimum spacing arrangements serves two key purposes, which are discussed below. *i) Impact assessment and safety of navigation* In addition to informing the impact assessment for receptors that may be affected by the layout plan, such as physical processes, the principal reason for the inclusion of minimum spacing arrangements within the DCO is to inform the shipping and navigation impact assessment and to ensure that sufficient space is maintained to allow for safe navigation through the windfarm. Marine Guidance Note (MGN) 654[4,5] states that: *Turbine layouts of every offshore renewable energy project with floating and/or surface piercing devices and structures must be designed to allow safe transit through OREIs by SAR helicopters operating at low altitude in bad weather, and those vessels (including rescue craft) that decide to, or must, transit through them.* In this respect, the minimum spacing arrangements presented in ***Chapter 6 – Project Description*** [APP-054] are not meant to reflect the minimum spacing applied

[4] See section 6.2 of MGN 654 (M+F), Safety of Navigation: Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response. Available at https://www.gov.uk/government/publications/mgn-654-mf-offshore-renewable-energy-installations-orei-safety-response
[5] Note that MGN 654 replaces MGN 543, where turbine layout requirements were covered in section 3.

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					across the entire layout plan, but rather minimum separation distances to ensure that the requirements of MGN654 are met where, for example, pre-construction surveys identify new constraints (ground conditions, reefs, archaeology etc) that may require some infrastructure to deviate from the spacing adopted more generally. *ii) Mechanical turbine loading and wake effects* There are also wind turbine suitability requirements which limit the minimum spacing between turbines. These requirements stem from the need to ensure that the mechanical turbine loading experienced by the turbines on specific site conditions are within the limits of the turbine design envelopes. Turbines located too close to one another, particularly in the prevailing wind direction are more affected by turbulence from the wakes of upstream turbines (though this does not apply to the spacing between turbines and other infrastructure such as the offshore substation). Turbine suppliers therefore typically recommend a minimum nominal spacing of 5 rotor diameters in the non-prevailing wind directions and 8 rotor diameters in the prevailing wind directions (though note that whilst this is the recommended minimum nominal spacing, individual turbines can be closer to each other upon confirmatory analysis for the conditions of the individual positions in the array). The rotor diameter assessed for the Project ranges between a minimum of 220m to a maximum of 250m. A

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					turbine row separation distance of 1200m would equate to between 4.8 to 5.5 rotor diameters, which would not comply with the suitability limits for such rotor diameters in the prevailing wind direction. The reason for the Projects' minimum spacing arrangements given their apparent unsuitability, is explained further below. But first, to illustrate the more nominal row spacings adopted by developers, the Defra 'magic' geographic information portal[6] was used to calculate approximate row spacings at a number of constructed UK windfarms[7]. Using online resources for each project's wind turbine rotor diameter, row spacing was then calculated as a function of rotor diameter (i.e. approximate distance between wind turbine rows divided by rotor diameter equals row spacing as a function of rotor diameters). This illustrative exercise shows that windfarm turbine rows are generally spaced between 7 and 10 rotor diameters apart. **Table 1: Wind turbine row spacing as a function of rotor diameters at a number of constructed UK windfarms** Windfarm | Approximate distance between wind | Rotor diameter (m) | Row spacing as a function of rotor diameters

[6] https://magic.defra.gov.uk/
[7] When measuring the distance between wind turbine rows, it was noted that at many constructed UK windfarms, row spacing is not always consistent. Therefore, the measurements presented in Table 1 are approximate and based on the most common spacing noted to underpin this illustrative exercise.

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	turbine rows (m)		
London Array	1000	120	8.3
Sheringham shoal	890	107	8.3
Dudgeon	1000	154	6.5
Lincs	970	120	8
Westermost rough	1100	154	7.1
Rhyll Flats	1030	107	9.6
North Hoyle	840	80	10.6
Kentish Flats	690	90	7.6
Thanet	730	90	8.1
West of Duddon	870	120	7.2
Ormonde	1030	126	8.17
Walney	1100	107	10.3
East Anglia ONE	2060	154	13.4
Rampion	790	112	7.1
Gunfleet Sands	800	107	7.5
Hornsea 1	1,290	154	8.4

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Hornsea 2	1,990	167	11.9
Greater Gabbard	1,010	107	9.4
Galloper	1,120	154	7.2

The Projects' minimum spacing arrangements are based on the original wind turbine envelope which included a 7MW wind turbine with a rotor diameter of 154m as deployed on East Anglia ONE. Therefore, the minimum inter-row spacing of 1200m is based on 150m x 8 = 1200m, which is noted in the title of the 'minimum spacing' plan presented in ***Appendix 1***.

The original wind turbine envelope considered 7MW to 19MW wind turbines with a rotor diameter of 150m to 250m and a maximum number of wind turbines of up to 115. Due to initial stakeholder feedback through the evidence plan process and a reassessment of the likely commercial availability, the 7MW wind turbine was removed from the wind turbine envelope (indeed, it is now no longer commercially available). The evidence plan process method statements appended to the East Anglia ONE North Scoping Report[8] document this. For example, see section

[8] East Anglia ONE North Scoping Report (November 2017). Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010077/EN010077-000030-EA1N%20-%20Scoping%20Report.pdf

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					1.2.3 'Preliminary Project Parameters' of Appendix 2.1 of the scoping report where it states: "*7MW wind turbines have been discounted. The smallest wind turbine will be 12MW".* Following this decision, the minimum spacing arrangements for the Project (and indeed for East Anglia TWO) were not revised because they did not affect the worst case scenarios. Based on the final rotor diameter envelope (220m to 250m), the Project could not be deployed at the minimum spacing arrangements across the entire Project due to the impact it would have on mechanical turbine loads and wind yield. Indicative realistic minimum spacing between rows would be 1760m (8 x 220m) to 2000m (8 x 250m). The 'nominal spacing' layout plan (see Figure 1 of the ***EA1N Habitats Regulations Assessment Derogation Case*** updated at deadline 11 [document reference ExA.AS-27.D11.V4]) presents between row spacing of 2060m. This equates to between 8.2 and 9.4 rotor diameters for the Project's rotor diameter envelope and is based on the between row spacing of East Anglia ONE as it will be necessary to align wind turbine rows with East Anglia ONE to meet the requirements of MGN654. In terms of mechanical turbine load and energy yield, the 'nominal spacing' layout plan is based on at least exceeding the 'realistic minimum spacing' in order to account for other constraints (known and

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					unknown) within the windfarm site which may influence the layout and spacing arrangements. As explained in the ***Offshore Commitments*** document [REP3-073] and ***EA1N Habitats Regulations Assessment Derogation Case*** (updated at deadline 11 [document reference ExA.AS-27.D11.V4]) there are a number of known and unknown constraints within the windfarm area that require spatial flexibility to be maintained. This is particularly critical for the Project given that the windfarm site is relatively small with a high target capacity density of 3.9MW per km^2. In the context of investigating what size of buffer could be accommodated between the Project and OTE SPA, the Applicant investigated the potential to reduce wind turbine spacing arrangements and reported that: *The results of the analyses have determined that whilst a 2km buffer is likely to have a commercial impact on the project and would reduce spatial flexibility, the impact is considered tolerable. A commitment to a buffer of greater than 2km however, would reduce the remaining spatial flexibility and jeopardise the Project's ability to meet the target capacity in addition to impacts on commercial viability, principally through loss of viable wind turbine locations.* The 'nominal spacing' layout plan utilises the entire windfarm area. Given the likelihood of unknown constraints (resulting from ground conditions, archaeology and reefs), spatial flexibility must be maintained. Subject to the pre-

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					construction site investigation, the final spacing of wind turbines is likely to lie between the 'nominal spacing' and the indicative 'realistic minimum spacing'. Indeed, it may even be necessary to locate some infrastructure at the 'minimum spacing' to mitigate the impact of further site constraints on target capacity (subject to confirmatory analysis for the conditions at the individual positions in the array). Finally, as noted above and explained in section A1.2.2 of the ***EA1N Habitats Regulations Assessment Derogation Case*** (updated at deadline 11 [document reference ExA.AS-27.D11.V4]), due to the 1km separation distance between the southern boundary of the windfarm site and East Anglia ONE, it will be necessary to align wind turbines rows with East Anglia ONE to meet the requirements of MGN654 unless the separation distance between the two projects can be significantly increased, which for the reasons stated above and position presented in the ***Offshore Commitments*** document [REP3-073] and ***EA1N Habitats Regulations Assessment Derogation Case*** (updated at deadline 11 [document reference ExA.AS-27.D11.V4]) is not feasible without impacting target capacity and commercial viability. The separation distance between wind turbine rows on East Anglia ONE is 2060m. On the basis of the points made above, and in response to the ExA's question, a spacing arrangement more akin to the

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					minimum spacing requirements could not, in practice, be deployed across the Project. c) The nominal layout plan originally presented in ***EA1N Habitats Regulations Assessment Derogation Case*** (updated at deadline 11 [document reference ExA.AS-27.D11.V4]) has been updated so that the legend clearly identifies the preliminary and alternate export cable routes for East Anglia THREE. The supporting text in the document has also been updated to explain the need for preliminary and alternate cable routes for East Anglia THREE in the absence of detailed site investigation data for that project. Regarding the four structures within the EA3 alternate export cable buffer, the ***EA1N Habitats Regulations Assessment Derogation Case*** has been updated deadline 11 to explain that as only one export cable route of the two options will be used for East Anglia THREE, it would bias the indicative layout plan to avoid placement of infrastructure in both export cable exclusion zones, therefore, the buffer zone for the 'alternate' option was ignored. d) The cable exclusion zones on the layout plan included in the ***EA1N Habitats Regulations Assessment Derogation Case*** (updated at deadline 11 [document reference ExA.AS-27.D11.V4]) were incorrectly labelled as '750m' and should have stated '750m either side of the export cable'. The label has been updated to '1500m'. Thus, the exclusion zones on the layout plan are 1,500m in width. As

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					stated in section A.1.2.2, best practice requires implementation of cable exclusion zones of a minimum of 500m either side of a cable. In practice however, cable asset owners are likely to require a greater exclusion zone to allow for activities such as deployment of anchor spreads. For this reason, a cable exclusion zone with a width of 1,500m has been used rather than 1,000m.
3.2.8	The Applicants, Natural England, RSPB			**Without prejudice compensation measures [REP8-089]: level of detail in relation to implementation** Natural England expresses a view [REP9-065] that greater detail about the design and implementation of compensatory measures is needed to provide the SoS with the necessary confidence that those measures can be secured. This is a position echoed strongly by the RSPB [REP10-054, REP9-071]. The Applicants maintain the position [REP10-017, REP10- 018, REP9-016] that compensation measures are appropriately secured and provide adequate levels of compensation, whilst providing necessary flexibility to allow for refinements in detail in the post-consent period. The ExAs note that publicly available correspondence from the Secretary of State in relation to the decision stage for the Norfolk Boreas application requests additional environmental information with regard to possible HRA compensatory measures. This includes, for example, "confirmation of the selected site(s) for	a) The Applicants maintain the position, as set out in REP10-017 and REP10-018 that sufficient detail about the delivery of the without prejudice compensation measures has been submitted into this examination to enable the Secretary of State to discharge its duties as Competent Authority without the need for further consultation in the decision stage. Notwithstanding the above, the Applicants have updated appendix 1 (kittiwake) and appendix 5 (lesser black-backed gulls) of the ***Offshore Ornithology Without Prejudice Compensation Measures*** document at Deadline 11 (ExA.AS-28.D11.V3) to address the potential for strategic delivery of compensation measures, where necessary, with Norfolk Boreas Ltd. This builds on recent engagement between the Applicants, Norfolk Boreas Ltd, Natural England and Defra.

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				compensation strategies and details of how the site(s) will be acquired/leased', as well as 'an implementation timetable for when the compensation measures will be delivered and achieve their objectives in relation to the first operation of the wind farm". a) In light of these requests, do the Applicants maintain their position that sufficient detail about the delivery of its without prejudice compensation measures has been submitted into this examination to enable the Secretary of State to discharge its duties as Competent Authority without the need for further consultation in the decision stage? b) Does Natural England or RSPB have any observations to make on this question? If you consider that additional detail on the implementation of compensation measures is necessary, please set out the main areas in which you consider detail to currently be lacking.	
3.2.9	Natural England			**Without prejudice compensation measures [REP8-089]: kittiwake feature of the Flamborough and Filey Coast (FFC) SPA** Specifically, in relation to the proposed compensation measure for the kittiwake feature of the FFC SPA, Natural England states that [REP9- 065], "*greater detail regarding the design and implementation of the artificial*	

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				nest sites are needed". Please can Natural England elaborate on this by being more specific about what further information the Applicants could provide that might assuage your concerns. Please explain why this information is required prior to decision as opposed to as a possible submission of detail for approval post consent.	
3.2.10	The Applicants			**Without prejudice compensation measures [REP8-089]: information about selected locations** Natural England [REP10-053] advises that article 3(a) of Schedule 18 Parts 1-4 and 6 of the draft DCO [AS-110] should be amended to require that the information to be submitted includes justification for the selected location in terms of its ecological appropriateness. Please could the Applicants respond to this advice?	The Applicants do not consider any amendments are required to Schedule 18 to address this point as any location selected for compensation measures will need to be justified as an integral part of the implementation plan (as is evident from the ***Offshore Ornithology Without Prejudice Compensation Measures*** document (updated and submitted at Deadline 11 (document reference ExA.AS-28.D11.V3)) on which the implementation plans must be based). Furthermore, the implementation plan(s) require to be approved by the Secretary of State in consultation with the relevant statutory nature conservation body (among others) and therefore this provides the opportunity for comment on location(s) and information can be added during iterations of the plan(s) Notwithstanding the Applicants' view that no amendment to Schedule 18 is necessary, , the Applicants will update the ***draft DCO*** [REP8-003] at Deadline 12 to address Natural England's comment.

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3.2.11	Natural England, the Applicants			**Without prejudice compensation measures [REP8-089]: timing of implementation** Natural England has repeatedly expressed a view [REP9-069, REP8- 163] that compensatory measures must be fully functioning and effectively compensating prior to construction/operation. The Applicants accept [REP9-016, REP10-017] that for some species subject to collision risk, there would be a time lag between the compensation measures being put in place and those measures resulting in additional birds within an SPA population, but have maintained that the resulting 'mortality debt' would be extremely small and could be recouped within one or two years of the measures becoming operational. The Applicants make the case that an approach akin to that within the made DCO for Hornsea Project Three, in which a lead-in period of four full breeding seasons is specified, would not be proportionate or justified in this case due to the much smaller numbers of birds that would need to be compensated for. a) To Natural England - do you accept the Applicants' reasoning on pages 49-50 of [REP10-017] that for displacement effects, in all cases the compensation measures would have immediate effect (i.e. removing predation mortality or preventing displacement effect at source) and therefore that any 'time lag'	The Applicants maintain their position, as set out in REP9-016 and REP10-017, that an approach akin to that within the made DCO for Hornsea Project Three would not be proportionate or justified due to the much smaller numbers of birds that would need to be compensated for. Under a scenario where the Applicant had to incorporate a requirement for a compensation lead-in period for collision risk species of four years prior to commencement of operation of the wind turbines, the applicant would have two options; construct the projects in parallel with the compensation lead-in period so that it is achieved prior to commencement of operation or delay the delivery programme. The key concern with the first option relates to the uncertainty such an approach would create with regard to the construction programme and generation of first power. Whilst it is possible that construction of the projects could be undertaken in parallel with the compensation lead-in period, there is a risk that any delays in implementation of the compensation could result in a need to adjust the delivery programme, stop works or delay commencement of wind turbine operation. Under either option this will have serious repercussions with regards to manufacturing windows already secured with suppliers and impacts on synergies achieved across the East Anglia Hub, which is designed to reduce the cost of

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				concerns should be confined to potential collision effects? If not, please explain your reasons. b) To Natural England - do you accept the Applicants' reasoning on pages 49-50 of [REP10-017] that any 'mortality debt' associated with collision effects would be tolerable in this case? If not, please explain your reasons. c) To Natural England – do you accept the Applicants' reasoning on page 68-69 of [REP9-016] that the smaller number of predicted mortalities arising from this project, relative to the predicted mortalities from Hornsea Project Three, justifies the absence of any requirement in Schedule 18 to wait for compensation to become effective before the wind farm may begin operation? If not, please explain your reasons. d) To the Applicants – if an approach was to be taken within Schedule 18 that required all of the proposed compensation measures to be effectively compensating prior to the potential adverse effects arising (in the manner seen, for example, in the Hornsea Project Three DCO), what (if any) would be the implications for the delivery programme, cost and financial viability of the project as a whole?	energy. Furthermore, this uncertainty and risk to the delivery programme is likely to also extend to the grid connection agreement and Contract for Difference (CfD) milestones, most notably the milestone associated with generation of first power. To mitigate for this risk, it would be necessary to incorporate a level of flexibility into the delivery programme, which is likely to add significant additional complexity, cost and risk. Furthermore, whilst this risk would likely be greatest for the first project taken forward, due to the integrated approach to delivery of the East Anglia Hub, this risk could also extend to the second project and East Anglia THREE. Given the urgent need for deployment of the Projects in order to ensure delivery of the Sector Deal and the UK government's 2030 ambitions, a delay to delivery in the circumstances is unnecessary, disproportionate and prejudicial.

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3.2.12	The Applicants, RSPB and Natural England			**Without prejudice compensation measures [REP8-089]: duration of compensation measures** The RSPB has highlighted [REP10-054] provisions in Schedule 14, Part 1, article 7 of the made Hornsea Project Three DCO, which require that artificial nest structures for kittiwake must be maintained beyond the lifetime of the authorised development if they are colonised, with routine and adaptive management measures continuing whilst the structures are in place. Schedule 18, Part 1, article 7 of the dDCO for this project does not include comparable provisions. a) Whilst noting the Applicants' comments on pages 10 and 11 of [REP9-020], including that the EC Guidance does not explicitly require compensation measures to be provided in perpetuity, please could the Applicants set out the justification for taking a different approach in this case to that deemed to be necessary in the recently made DCO for Hornsea Project Three? b) Please could the Applicants set out the justification for departing from Defra advice to Competent Authorities that they "should make sure the compensatory measures…will remain in place all the time they're needed, which in most cases will be indefinitely"?	a) Section 5.4.3 in appendix 1 of the ***Offshore Ornithology Without Prejudice Compensation Measures*** updated at Deadline 11 (document reference ExA.AS-3.D11.V1) originally stated that: *"The structure would remain in place, and maintained as fit for purpose until the windfarm has been decommissioned or a determination is made by the SoS on duration, following consultation with the relevant statutory nature conservation body, that compensation is no longer required. The artificial nest structure must not be decommissioned without written approval of the Secretary of State."* The intention in the above statement was that the compensation measure would remain in place until the later of windfarm decommissioning or a determination by the Secretary of State on duration. To make this clear, the statement in the ***Offshore Ornithology Without Prejudice Compensation Measures*** submitted at Deadline 11 has been updated to include *'the later of'*. With regard to Schedule 18 of the draft DCO [REP8-002], paragraph 3 of Part 1 secures submission of a Kittiwake Implementation and Monitoring Plan to the Secretary of State for approval which must accord with the kittiwake compensation plan and its statement on duration of

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			c) To the Applicants, RSPB and Natural England - The RSPB has raised this matter in relation to kittiwake, however arguably the principle has wider applicability, not least in this case to artificial nesting sites for gannet. Should an approach be taken in Schedule 18 Part 1 which requires the compensatory measures to remain in place beyond the decommissioning of the wind farm where those measures have been colonised, which of the other Parts of Schedule 18 (i.e. which other compensation measures), if any, might require similar amendment? d) Further to the question in part (c), what does Natural England consider would happen to these sites in terms of their management and status if they were to be maintained after the wind farm has been decommissioned? e) Could the Applicants please explain any implications of the above approach for the Offshore Ornithology Compensation Measures Funding Statement [REP8-081]?	the compensation measure, whilst paragraph 7 secures that the artificial nest structure must not be decommissioned without written approval of the Secretary of State. The Applicant would therefore contend that it has taken a very similar approach to the Hornsea Project Three DCO and through the kittiwake implementation plan and the provisions in the DCO, has secured the duration of the compensation measure as being the later of windfarm decommissioning and a determination by the Secretary of State that the compensation measure is no longer required. b) The Applicants contend that they have not departed from the Defra advice to Competent Authorities for the reasons set out in the response to 'a' above. c) The other relevant parts of Schedule 18 in this regard are Part 2 (gannet) and Part 5 (lesser black-backed gull). The implementation plans for both species as set out in appendix 2 and appendix 5 of the ***Offshore Ornithology Without Prejudice Compensation Measures*** submitted at Deadline 11 (document reference ExA.AS-3.D11.V1) respectively include the same commitment to duration as for the kittiwake compensation measure. As described in the response to 'a', the

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				document has been updated to include *'the later of'*. The Applicants contend that no further amendments are required to Schedule 18 as paragraphs 3 and 7 in Parts 2 and 5 secure the duration of compensation as discussed in the response to 'a' above. d) No response e) The cost estimates provided in the ***Offshore Ornithology Compensation Measures Funding Statement*** [REP8-081] assume a period of 30 years (as stated in paragraph 23 of the document) which was used as a basis upon which to calculate the cost estimates. Given that the costs to maintain each compensation measure are relatively low in comparison to the wider total costs, it is the Applicants' position that maintaining the compensation measures beyond 30 years has no material bearing on the commitment made in the funding statement. Furthermore, It should also be noted that the Applicants have proposed a mechanism within each part of Schedule 18 to the draft DCO, which provides: *"The undertaker must not commence the authorised development unless it has first—* *(a) provided a reasonable estimate of the cost of delivery of the compensation measures; and*

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					(b) put in place either— *(i) a guarantee in respect of the reasonable estimate of costs associated with the delivery of the compensation measures; or* *(ii) an alternative form of security for that purpose,* *that has been approved by the Secretary of State."*
3.2.13	The Applicants			**Offshore Ornithology Compensation Measures Funding Statement [REP8-081]** A separate Offshore Ornithology Compensation Measures Funding Statement [REP8-081] has been submitted for each project. a) Please could the Applicants confirm that the cost estimates for each project would remain as quoted, even if only one of the projects was to be constructed? b) Would the proposed compensation measures still be deliverable if only one of the projects was to be constructed?	a) The Applicants can confirm that the cost estimates for each project would remain as quoted, even if only one of the projects was to be constructed. b) The Applicants can confirm that the proposed compensation measures would still be deliverable if only one of the projects was constructed.
3.2.14	The Applicants			**Without prejudice compensation measures [REP8-089]: quantification of effect** The appendices for [REP8-089] (noting these are unique to each project) follow a standard format, dealing with	a) Overall displacement and mortality figures were included at the project alone level for the East Anglia ONE North project. These figures had originally not been included for East Anglia TWO at the project alone or in-combination level or for East Anglia ONE North at the in-combination

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				each species in turn. Under the heading of 'quantification of effect', appendices 1-5 attempt to quantify the effect of the project, alone and then in-combination, upon the feature of the European site. For appendix 6 (red-throated diver) however, there is no clear quantification of the potential effect, either of the project alone or in-combination. a) Please could the Applicants explain the reasons for this? b) If it is possible to include this information within appendix 6, then please could the Applicants do so in the updated document.	level because the key consideration for red-throated diver is in relation to the extent of displacement / redistribution of individuals within the Outer Thames Estuary SPA. Indeed, Natural England has accepted that there is very unlikely to be a detectable effect on the SPA population from the Projects (REP4-087) and that there would be no AEoI at the project alone level for East Anglia TWO. However, overall displacement and mortality figures have now been included in the updated document submitted at Deadline 11 (document reference ExA.AS-28.D11.V3) – see response to b) below. b) The Applicants have updated the ***Offshore Ornithology In-Principle Compensation Measures*** document at Deadline 11 (document reference ExA.AS-28.D11.V3) to include overall displacement and associated mortality figures at the project alone and in-combination level for the East Anglia TWO project and at the in-combination level for the East Anglia ONE North project. Project alone displacement and associated mortality figures were already provided for the East Anglia One North project under the 'quantification of effect' heading in REP8-090.
3.2.15	Natural England, RSPB			**Without prejudice compensation measures [REP8-089]: quantification of effects** In a number of appendices to [REP8-089], the Applicants advance the argument that, "*(t)he Project's impacts are small compared with those for most other windfarms, and*	

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				would also be more than offset by the difference between the total collisions based on consented windfarm designs compared with as-built designs". How do Natural England and the RSPB respond to this statement?	
3.2.16	Natural England, RSPB			**Compensatory measures for the guillemot and razorbill features of the FFC SPA** In response to Natural England's advice [REP9-065] that because the FFC SPA is classified for the albionis sub-species of guillemot, compensation should be ideally directed towards this sub-species, the Applicants make the case [REP10-017, page 14] that the *albionis* and *aalge* sub-species are probably not biologically valid classifications or genuinely separate populations, and therefore that compensation at colonies within the range of aalge would still improve the conservation status of colonies in the *albionis* area. Do Natural England and RSPB accept the evidence and logic progressed by the Applicants in this regard? If not, please explain and evidence your position.	
3.2.17	The Applicants			**Without prejudice compensation measures [REP8-089]: relevant Guidance** It is noted that the updated HRA Derogation Case [REP8-089] takes into account the Defra/NE (2021) Guidance 'HRAs: protecting a European site'. However,	The ***Offshore Ornithology In-Principle Compensation Measures*** document has been updated at Deadline 11 (document reference ExA.AS-28.D11.V3) to include reference to the updated guidance.

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				the updated HRA compensation measures document [REP8-089] appears not to do so. Whilst acknowledging that the 2021 Guidance broadly follows the practice established by predecessor guidance, for completeness please update the compensation measures document to have regard to it, as requested in ISH14 action point 2 [EV-126a].	
3.2.18	The Applicants			**Without prejudice compensation measures [REP8-089]: updates** Some parts of [REP8-089] appear to have been overtaken by subsequent events or agreements. For example, section 10.3.1 of the East Anglia TWO document indicates that Natural England is not able to advise that an AEoI on RTD of the OTE SPA for the project alone can be ruled out, whereas in [REP8-110] and [REP8-166] Natural England appear to accept that it can be. Please could the Applicants review the content of [REP8-089] for both projects and ensure that the documents present the latest available information and status of agreement.	The ***Offshore Ornithology In-Principle Compensation Measures*** document has been updated at Deadline 11 (document reference ExA.AS-28.D11.V3) to ensure that the document presents the latest available information and status of agreement.
3.2.19	The Applicants			**Compensatory measures: prey availability measures** In [REP10-051], Natural England sets out the reasons why it contends that "*to deliver the most ecologically robust outcome, prey availability measures are the most*	The Applicants do not contest that prey availability measures would deliver ecological benefit. It is simply that, for the reasons set out in ***Offshore Ornithology Without Prejudice Compensation Mechanisms - Annex 1 - Prey***

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				appropriate compensatory mechanism to attempt to progress". How do the Applicants respond to this advice?	***Availability Compensation Mechanisms*** (REP6-046) there are no practical or legal means for non-Government bodies to deliver this type of measure.
3.2.20	Natural England			**Compensatory measures: prey availability measures** In [REP10-051], Natural England states that "developing a strategic approach to increasing prey availability will be more judicious". a) Do you consider that there would be a realistic prospect of such a strategic approach being developed within the period necessary for the commencement of the EA1N and EA2 projects? b) How in practical terms do you envisage that an individual developer (or pair of developers) could drive this strategic approach forward with the range of government, conservation, renewables and fisheries stakeholders that would need to be involved?	
Marine Mammals					
3.2.21	Marine Management Organisation			**In-combination effects on the Southern North Sea (SNS) SAC** Natural England's position has remained throughout examination that it cannot exclude adverse effect on integrity of the SNS SAC incombination until a	

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				mechanism is in place to manage multiple SIPs. This is a matter that Natural England acknowledges is a wider, regulatory issue rather than a project-specific one. Nonetheless, the ExAs will need to form recommendations on this matter for the projects before us. In [REP9-060], the Marine Management Organisation (MMO) states that it "a*cknowledges these comments and believes that the SNS SAC SIP is the appropriate document to manage the in-combination noise impacts, along with the SNS Regulators Working Group"*. a) Could the MMO please submit the terms of reference for the SNS Regulators Working Group and confirm whether the control of incombination underwater noise impacts on features of the SAC is within the scope of the Group's responsibilities. b) Please could the MMO elaborate on how this management of incombination noise impacts will work in a practical sense - is it limited to the management of the SNS activity tracker or are there other functions of the Working Group in coordinating the noisy activities of multiple projects?	
3.2.22	Natural England			**In-Principle Site Integrity Plan (SIP) for the Southern North Sea (SNS) SAC** Natural England's response to outstanding ISH7 action point 9 [REP8- 165] directs the reader to [REP8-161].	

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				However, a direct response to action point 9 appears not be included in [REP8-161]. Please could Natural England respond to these points: a) Do you agree that the IP SIP provides an appropriate framework to agree mitigation measures and that the scope of the measures within the IP SIP are appropriate? b) Are you satisfied that through the IP SIP, the Applicants will use the most appropriate measures for the Project based on best knowledge, evidence and proven available technology at the time of construction? c) Do you have confidence that the mitigation measures contained in the IP SIP are deliverable?	
3.2.23	Natural England			**In-Principle Site Integrity Plan (SIP) for the Southern North Sea (SNS) SAC** The updated In-Principle SIP [REP8-031] is clear that the document will need to be reviewed once any final management measures for the Southern North Sea SAC are defined or further advice is provided. On the basis of the best available information, could Natural England please indicate when any final management measures for the SNS SAC can be expected, and whether there is any potential for the	

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				management measures to be made available within the timescales of these examinations?	
3.2.24	Marine Management Organisation			**Marine mammals: underwater noise modelling update [REP8- 040]** It is apparent from submissions that there are ongoing discussions between the Applicants and the MMO in relation to underwater noise modelling and specifically [REP8-040]. Please could the MMO respond to [REP8-040] and set out any outstanding concerns in full by Deadline 11.	
Benthic Ecology					
3.2.25	Natural England, Marine Management Organisation			**Benthic ecology: Security for reef buffer** Noting the Applicants response to ExQ2.2.15 [REP6-061], does NE and the MMO consider that the MMO has adequate control through the approval process as currently documented to ensure that significant impacts on Sabellaria reef are avoided?	
3.2.26	Natural England, Marine Management Organisation			**Benthic ecology: Cable installation in mixed sediments** Noting the Applicants response to ExQ2.2.17 [REP6-061] and taking specific note that the additional measured used at Boreas related to cable installation with a SAC whereas that is not proposed here, does NE and the	

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			MMO consider that any additional measures or controls around cable installations in mixed sediments are required?	
Fish Ecology				
3.2.27	The Applicants, Marine Management Organisation and any Interested Party concerned with fish ecology and fisheries		**Herring Spawning** The MMO made comments at D9 [REP9-060] raising ongoing concerns about DMLs conditions 29 (Schs 13) and 25 (Schs 14) in relation to herring spawning. The Applicants' D10 Submission [D10-014] identified this as an ongoing unresolved matter. The MMO continues to seek a seasonal piling and UXO detonation restriction during the herring spawning period, (but subject to confirmation/ variation in writing between the MMO and the undertaker(s)). The Applicants seek to maintain their position at D9 [REP9-021] that current drafting referring to a period of 'approximately 14 days' is precise and enforceable and so meets the five tests for a planning condition set out in the NPPF at paragraph 55. The MMO maintains its view that they are not and has advanced alternative wording that the Applicants have not adopted. The ExAs remind both parties of the importance of, where possible, reaching an agreed position before the end of the Examinations and the undesirability of further consultation being required on this point during the decision-making period by the SoS, as occurred in the Thanet Extension Offshore Wind Farm decision-making	The Applicants maintain their position as set out in the ***Applicants' Comments on Marine Management Organisation's Deadline 8 Submissions*** [REP9-021] and the ***Applicants' Comments on Marine Management Organisation's Deadline 9 Submissions*** [REP10-014]. The Applicants and the MMO are continuing to engage on this matter and during a meeting on 26th May 2021 both parties agreed to explore the possibility of substituting 'approximately 14 days' with 'up to [a specified period]'. At ISH17 on the 28th May 2021, the MMO advised that it has sought advice from its scientific advisors, Cefas, on the appropriateness of this wording however, as of 7th June 2021, the MMO has not yet received a response from Cefas and the Applicants understand that the MMO will update the ExA on its position at Deadline 12 (28th June 2021). The Applicants will continue to liaise with the MMO in the interim with the aim of agreeing an appropriate amendment to the conditions for inclusion in the updated draft DCO at Deadline 12.

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				process on the same point – in correspondence from BEIS to the parties in that Examination dated 21 November 2019 at paragraph 10 – fish spawning). The ExAs refer the parties to the drafting consulted on by the SoS in that case to assist discussions. By D11 the parties are requested to have agreed drafting on this point or to put in final alternative drafts, followed by final comments from the MMO at D12 and a closing position from the Applicants at D13, enabling the matter to be adjudicated by the ExAs. The dDCO Commentaries also refer at page 18 (Fish Spawning Conditions (Schs 13 Conditions 29 and Schs 14 Conditions 25))	
Terrestrial Ecology					
3.2.28	Natural England, ESC			**Ammonia emissions on Leiston-Aldeburgh SSSI and Sandlings SPA** In the representation from SEAS [REP5-109] and at ISH 14 the issue of the impact of emissions, in particular ammonia, on Leiston-Aldeburgh SSSI and Sandlings SPA was raised by Mr Redmore. The Applicants responded to this in [REP6-032]. Having regard to these submissions, please comment on whether this matter has been properly assessed by the Applicants and what you consider the impacts on the habitats and species of the aforementioned SSSI and SPA would be as a result of	

ExA. Question Ref.	Question addressed to			ExA. Question	Applicants' Response
				vehicular and machinery emissions associated with the Proposed Developments.	
3.2.29	The Applicants			**Badger setts and construction timetable** Should any main badger setts need to be removed, please confirm that there would be sufficient time within the overall construction timetable for the mitigation measures set out in the Badger Mitigation Statement [REP6-050] to be undertaken and to take proper effect before their closure.	***Table 2*** and ***Table 3*** of the ***Draft Badger Method Statement*** (REP6-050) provide timings for the implementation of badger mitigation. Should the DCO be made in January 2022, it is anticipated that a pre-construction walkover survey (to assess the status and current use of previously identified setts and identify any new setts excavated) and bait marking surveys of the affected badger setts will be undertaken over approximately three weeks between February and late April as this period corresponds with peaks in badger territorial marking activity. The findings of these surveys would be used to inform the siting of an artificial sett if required. Three months is deemed to be a suitable length of time to agree a location with relevant consultees (including landowners) and obtain all necessary approvals. It is envisaged that an artificial sett could then be created during May 2022, which would take approximately two to three weeks to complete. One-way gates would then be installed on the badger setts identified for closure (in accordance with a badger licence) during July 2022. In line with guidance, these must be in place for a minimum of 21 consecutive days meaning the identified setts could be closed in August 2022. An earliest construction start date of mid-2023 was assessed in ***Chapter 22 Onshore Ecology*** (APP-070). Noting that the latest date for excluding badgers from setts

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					in any given year is 31st November (i.e. installation of the one-way gates), the Applicants consider that the three additional months within the programme of badger mitigation ensure there is sufficient flexibility to ensure that setts are closed in 2022 ahead of the commencement of construction during 2023.
3.2.30	Natural England			**Removal of Badger Setts** The Applicants have confirmed in [REP9-016] that as detailed design information is not currently available then the worst-case scenario is that the known active badger sett along the cable corridor will require removal. Given that you have stated that without further information this would be of major concern, what further information would you be seeking from the Applicants on this matter and in your view is the matter resolvable during the Examinations?	
3.2.31	The Applicants			**Lowland mixed deciduous woodland mitigation** Natural England states in [REP10-052] that lowland mixed deciduous woodland is declining and that every effort should be made to avoid its loss. The OLEMS state that the planting of trees over the cable corridor will not be possible. Please provide further details on how impacts to this woodland and fragmentation thereof will be mitigated in terms of avoiding loss and providing enhancements to this habitat.	The Applicants will continue to engage with Natural England and the Councils to agree the landscape planting proposals within the woodland to both the east and the west of Aldeburgh Road and will provide details of the landscape design treatment at this location within the final Landscape Management Plan and Ecological Management Plan. The ***Outline Landscape and Ecological Management Strategy*** (OLEMS) (document reference 8.7) presents the current approach to landscaping and reinstatement within the area around the Hundred River. Notwithstanding the

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					constraints associated with planting directly over and within the immediate vicinity of the onshore cables (as set out within ***section 3.5.10*** of the ***OLEMS***), the remaining area within the onshore cable corridor would be replanted according to an agreed specification and design. This will aim to be lowland mixed deciduous woodland planting to maintain / provide linkages between areas of planting within the immediate and wider landscape (e.g. through planting corridors of native vegetation that connect areas of grassland to areas of low-lying scrub and ultimately to the wider hedgerow / woodland networks). This will in turn connect habitats at a landscape scale, but also will provide commuting / foraging habitat for species such as birds and bats. The reinstatement of woodland in this area will be dependent upon the micrositing of the onshore cables and the final landscaping proposals will be agreed with the relevant planning authority.
3.2.32	The Applicants			**Hairy Dragonfly** In [REP10-052] Natural England recommends that a survey for hairy dragonfly can now take place at the end of May/beginning of June to better understand the potential presence of hairy dragonfly and potential use of the meadow adjacent to the Hundred River.	Hairy dragonfly requires clean and still water with large amounts of emergent vegetation, including common club rush, fen sedge and true bulrush. It also requires open sunny areas with dense vegetation for protection and is susceptible to poor water conditions. Preferred habitat is ditches within grazing marsh.

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				a) Will any further surveys be undertaken and submitted into the Examinations? b) If so, please indicate at which deadline additional survey results will be available. c) If not, then please explain your reasoning, responding to comments from Natural England.	No records of hairy dragonfly were returned for the Hundred River crossing location during the ecological desk study that was undertaken for the Applications. All the ecological surveys undertaken by the Applicants (those in 2018, 2019, February 2021 and May 2021(a May 2021 survey report has been submitted at Deadline 11, document reference ExA.AS-21.D11.V1) referred to species-specific guidance when assessing habitats for their suitability to support legally protected and notable species. No evidence of suitable hairy dragonfly habitat has been found to date. It is industry practice to undertake species-specific surveys only where suitable habitat has been identified. Additionally, according to the British Dragonfly Society[9], in order to ascertain the maximum abundance of species it is necessary to undertake up to three survey visits during the months from May to September. As such, the Applicants do not intend to undertake a hairy dragonfly survey during the Examinations, but would note that the Outline Landscape and Ecological Management Strategy (document reference 8.7) includes the commitment to undertake pre-construction surveys (within the optimal survey window and for specific species if identified as being required) of the proposed Hundred River crossing location

[9] British Dragonfly Society (2021). Dragonfly Survey Guidance. Available at: https://british-dragonflies.org.uk/wp-content/uploads/2019/03/Survey-guidance.pdf [Accessed 06/21]

ExA. Question Ref.	Question addressed to			ExA. Question	Applicants' Response
					(as well as across the Order limits). Should the findings of these surveys differ from those recorded to date they will be used to inform the necessary mitigation measures. They will also inform the final Ecological Management Plan (secured under Requirement 21 of the ***draft DCO*** (document reference 3.1)) and the final Watercourse Crossing Method Statement.
3.2.33	The Applicants			**Noise and ecological issues at landfall** Please respond to Natural England's query in [REP7-074] regarding what would happen if there was a conflict between reducing noise and increasing ecological issues in the placement of the equipment at landfall. How is this accounted for in the dDCO?	The Applicants note that there are no above ground works proposed within the Leiston – Aldeburgh Site of Special Scientific Interest (SSSI) at the landfall, as Work No. 6 comprises the underground component of Horizontal Directional Drill (HDD) works. No part of Work No. 8, in which the HDD compound will be located, overlaps with the SSSI. ***Figure 22.4*** of the ES (APP-277) shows that the majority of Work No. 8 currently comprises arable fields which are regularly worked for crop production (i.e. ploughed, sowed / drilled, reaped / harvested etc.). Two target notes from the ***Extended Phase 1 Habitat Survey*** (APP-503) that fall within Work No. 8 (TN69a and TN103a) recorded two separate species poor hedgerows: one with trees running alongside a farm track and another alongside a footpath. No evidence of legally protected or notable species has been found during the surveys undertaken to date. ***Chapter 22 Onshore Ecology*** (APP-070) identifies no direct ecological impacts at the landfall arising from construction of the Projects, but does note the potential for

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					indirect impacts (disturbance) to bird species associated with the Sandlings Special Protected Area (SPA) over the medium term. Mitigation for all bird species is provided through the Breeding Bird Protection Plan, an outline of which is set out within the ***OLEMS*** (document reference 8.7). The Applicants would note their response in the ***Applicants' Comments on Natural England's Deadline 7 Submissions*** submitted at Deadline 8 (REP8-049), which reads "*If this potential issue were to arise then the Applicants would seek to consult with all relevant parties to agree the most appropriate course of action at the time".* The Applicants would include Natural England in such consultation and will have regard to ecological receptors within the process of identifying suitable locations for plant. In terms of how this is secured, Requirement 13(1) of the ***draft DCO*** (document reference 3.1) stipulates that a final Landfall Construction Method Statement and Monitoring Plan must be submitted to and approved by the relevant planning authority in consultation with the statutory nature conservation body (i.e. Natural England),who will be given the opportunity to review and comment on the provisions within the plan, including those in relation to ecological receptors and potential disturbance from plant. Furthermore, Requirement 21 of the ***draft DCO*** (document reference 3.1) specifies that no stage of the onshore works

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					can commence until the Ecological Management Plan (EMP) has been submitted to and approved by the relevant planning authority in consultation with the relevant statutory nature conservation body. This includes the final Breeding Bird Protection Plan. ***Section 1.2.1*** of the ***Outline Code of Construction Practice*** (Outline CoCP) (document reference 8.1) also secures consultation with Natural England (as the statutory nature conservation body) during the preparation of the Construction Phase Noise and Vibration Management Plan with respect to Work Nos. 7 to 14 (including Work No. 8).
3.2.34	Natural England			**Nightingale mitigation** In your D5 [REP5-084] and D8 [REP8-162] submissions you stated that the nightingale mitigation measures within the SPA crossing Method Statement were fundamental to preventing an AEoI of the Sandlings SPA and should be secured by way of Requirement. Could you please justify this position given that nightingale is a named component of the SSSI but not a qualifying feature of the Sandlings SPA? The dDCO Commentaries also refer at page 15 (Missing Requirement – Ecosystem Services for Sandlings SPA)	

Appendix 1 – Figure 1

FOR INFORMATION ONLY

N

10.1KM

450000 455000 460000 465000 470000 475000

5810000 5805000 5800000 5795000

- Locations (67 x WTG, 5 x Platform, 1 x Met Mast) Total 73
- Third Party Cables (Active)
- EA3 Preliminary Export Cable
- EA3 Alternate Export Cable
- EA1N Buildable Area (-125 m buffer)
- EA1N DCO Boundary
- Cable Exclusion Zone (1500m)
- Archaeology 100 m Buffer
- Outer Thames Estuary Special Protection Area (SPA)

Bathymetry (Gardline, 2017) [m]

- 0-50
- 50-55
- >55

SCOTTISHPOWER RENEWABLES

Rev	Date	By	Comment
0	02/06/2021	RB	For Information

Prepared: RB
Checked: JB
Approved: IC

1:75,000 Scale @ A3

Kilometers 0 1 2 3 4

East Anglia One North

Indicative layout for 67 wind turbines and associated infrastructure (1200 m x 800 m) - Layout assumes a maximum WTG Rotor Diameter of 150m

Drg No	EA1N-GEN-GIS-DRG-IBR-000557
Rev	1
Date	02/06/2021
Figure	2

Datum: WGS 1984
Projection: UTM Zone 31N

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