East Anglia ONE North and East Anglia TWO Offshore Windfarms

Applicants' Responses to Examining Authority's Written Questions 2

Volume 4 – 2.2 Biodiversity Ecology and Natural Environment

Applicants: East Anglia ONE North Limited and East Anglia TWO Limited
Document Reference: ExA.WQ-2.D6.V1_04
SPR Reference: EA1N_EA2-DWF-ENV-REP-IBR-001239_04 Rev 01

Date: 24th February 2021
Revision: Version 01
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Applicable to East Anglia ONE North and East Anglia TWO

Revision Summary				
Rev	**Date**	**Prepared by**	**Checked by**	**Approved by**
001	24/02/2021	Paolo Pizzolla	Lesley Jamieson / Ian Mackay	Rich Morris

Description of Revisions			
Rev	**Page**	**Section**	**Description**
001	n/a	n/a	Final for Deadline 6

Glossary of Acronyms

AEoI	Adverse Effects on Integrity
DML	Deemed Marine Licence
DCO	Development Consent Order
EIA	Environmental Impact Assessment
IP	Interested Parties
LAT	Lowest Astronomical Tide
MMO	Marine Management Organisation
MHWS	Mean High Water Spring
NE	Natural England
SAC	Special Area of Conservation
SPA	Special Protection Area
UXO	Unexploded Ordnance
WTG	Wind Turbine Generator

Glossary of Terminology

Applicants	East Anglia TWO Limited / East Anglia ONE North Limited
Cable sealing end compound	A compound which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Cable sealing end (with circuit breaker) compound	A compound (which includes a circuit breaker) which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Construction consolidation sites	Compounds associated with the onshore works which may include elements such as hard standings, lay down and storage areas for construction materials and equipment, areas for vehicular parking, welfare facilities, wheel washing facilities, workshop facilities and temporary fencing or other means of enclosure.
Construction operation and maintenance platform	A fixed offshore structure required for construction, operation, and maintenance personnel and activities.
The Councils	East Suffolk Council and Suffolk County Council
Development area	The area comprising the onshore development area and the offshore development area (described as the 'order limits' within the Development Consent Order).
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one 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 project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one 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.
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.
Generation Deemed Marine Licence (DML)	The deemed marine licence in respect of the generation assets set out within Schedule 13 of the draft DCO.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
HDD temporary working area	Temporary compounds which will contain laydown, storage and work areas for HDD drilling works.

Inter-array cables	Offshore cables which link the wind turbines to each other and the offshore electrical platforms, these cables will include fibre optic cables.
Jointing bay	Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers within the onshore cable route housing electrical earthing links.
Meteorological mast	An offshore structure which contains metrological instruments used for wind data acquisition.
Mitigation areas	Areas captured within the onshore development area specifically for mitigating expected or anticipated impacts.
Marking buoys	Buoys to delineate spatial features / restrictions within the offshore development area.
Monitoring buoys	Buoys to monitor *in situ* condition within the windfarm, for example wave and metocean conditions.
National electricity grid	The high voltage electricity transmission network in England and Wales owned and maintained by National Grid Electricity Transmission
National Grid infrastructure	A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia TWO / East Anglia ONE North project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines (including cable sealing end compounds and cable sealing end (with circuit breaker) compound) to transport electricity from the National Grid substation to the national electricity grid.
National Grid overhead line realignment works area	The proposed area for National Grid overhead line realignment works.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia TWO / East Anglia ONE North project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO / East Anglia ONE North project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
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.
Offshore cable corridor	This is the area which will contain the offshore export cables between offshore electrical platforms and landfall.
Offshore development area	The East Anglia TWO / East Anglia ONE North windfarm site and offshore cable corridor (up to Mean High Water Springs).

Offshore electrical infrastructure	The transmission assets required to export generated electricity to shore. This includes inter-array cables from the wind turbines to the offshore electrical platforms, offshore electrical platforms, platform link cables and export cables from the offshore electrical platforms to the landfall.
Offshore electrical platform	A fixed structure located within the windfarm area, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore export cables	The cables which would bring electricity from the offshore electrical platforms to the landfall. These cables will include fibre optic cables.
Offshore infrastructure	All of the offshore infrastructure including wind turbines, platforms, and cables.
Offshore platform	A collective term for the construction, operation and maintenance platform and the offshore electrical platforms.
Onshore cable corridor	The corridor within which the onshore cable route will be located.
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables.
Onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia TWO / East Anglia ONE North project from landfall to the connection to the national electricity grid.
Onshore preparation works	Activities to be undertaken prior to formal commencement of onshore construction such as pre–planting of landscaping works, archaeological investigations, environmental and engineering surveys, diversion and laying of services, and highway alterations.
Onshore substation	The East Anglia TWO / East Anglia ONE North substation and all of the electrical equipment within the onshore substation and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia TWO / East Anglia ONE North project.
Platform link cable	Electrical cable which links one or more offshore platforms. These cables will include fibre optic cables.
Safety zones	A marine area declared for the purposes of safety around a renewable energy installation or works / construction area under the Energy Act 2004.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations as a result of the flow of water.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.
Transmission DML	The deemed marine licence in respect of the transmission assets set out within Schedule 14 of the draft DCO.

ExA. Question Ref.	Question addressed to			ExA. Question	Applicants' Response
2.2 Biodiversity, Ecology and Natural Environment (including Habitats Regulations Assessment (HRA))					
2.2.1	Applicant			**The Applicant's Habitats Regulations Derogation Case [REP3-053]: scope** Please set out the reasoning for not including within [REP3-053] other European sites and qualifying features for which there remains disagreement with NE [REP5-088] and RSPB [REP4-097] that there would be No Adverse Effect on Integrity. Specific reference should be made to guillemot and razorbill of the Flamborough and Filey Coast (FFC) SPA, harbour porpoise of the Southern North Sea (SNS) SAC and Sandlings SPA. For East Anglia TWO, this should also set out the reasoning for excluding potential in-combination effects on red-throated diver of the Outer Thames Estuary (OTE) SPA.	In REP3-053 the Applicants only included those European sites and qualifying features which had been the focus of on-going discussion with Interested Parties (IPs) and for which it was clear that there would remain disagreement. The position of Natural England (NE) **on auks (razorbill and guillemot)** (prior to submission of REP3-053) was stated in REP3-116: *FFC SPA in-combination auk displacement: we were able to conclude that an AEoI on the guillemot and razorbill features of the FFC SPA could be ruled out from displacement in-combination with other plans and projects* ***if Hornsea 3 and Hornsea 4 are excluded*** *from the in-combination totals. However, we were not in a position to advise that an AEoI could be ruled out for the guillemot and razorbill features of the FFC SPA for displacement in-combination with other plans and projects when the Hornsea 3 and Hornsea 4 projects are included in the in-combination totals. This was due to our significant concerns regarding the incomplete baseline surveys for the Hornsea 3 project, the associated level of uncertainty with regards to the potential impacts of that project and the inevitable uncertainty associated with the figures for Hornsea 4 from the PEIR and are subject to change* As NE have confirmed that this position remains unchanged (REP5-088), and given that Hornsea Project Three has now

ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
			been granted consent, the Applicants have added razorbill and guillemot to the species for which without-prejudice compensation measures are proposed (see ***Offshore Ornithology Without Prejudice Compensation Measures*** submitted at Deadline 6 ExA.AS-8.D6.V2) compensation measures D6). The Applicants' Habitats Regulations Derogation Case (REP3-053) will be updated to reflect this change. On a precautionary basis, the Applicants have added **red-throated diver** to the without-prejudice compensation measures proposed for East Anglia TWO (ExA.AS-8.D6.V2). This reflects NE's position in REP4-087 *Whilst East Anglia Two will have less of an impact on red-throated diver in the Outer Thames Estuary SPA than East Anglia One North; we disagree that there will be no displacement from East Anglia Two. We advise that the questions raised around the modelling approach are addressed before effects from East Anglia Two can be ruled out.* With regard to harbour porpoise of the Southern North Sea Special Area of Conservation (SAC) and nightjar and woodlark of the Sandlings SPA, the Applicants consider that a conclusion on no Adverse Effects on Integrity (AEoI) will be confirmed by NE. Outstanding matters on these sites should be resolved through agreement over mitigation measures (e.g. the wording of the ***Outline Special Protection Area (SPA) Crossing Method Statement*** (an updated version has

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			been submitted at Deadline 6, document reference ExA.AS-3.D6.V2) and agreement of the condition controlling piling and Unexploded Ordnance (UXO) detonations to be included in the Deemed Marine Licence (DMLs)). The condition controlling piling and UXO detonations will be included in the updated draft Development Consent Order (DCO) to be submitted at Deadline 7.
2.2.3	Applicant	**The Applicant's Habitats Regulations Derogation Case [REP3-053]: alternative project designs** In Table 4.8 of [REP3-053] you contend that larger turbines "*are not considered viable for the Project in terms of their commercial availability and sufficient supplier capacity within the construction timeframe*". Please provide evidence to support this statement.	Offshore turbine technology is rapidly evolving with bigger turbines often disrupting the market. However, there is a natural time frame for turbine design development, type certification and adapting the manufacturing capacity in readiness for serial production. This is typically a period of circa 4 years. ScottishPower works closely with the main turbine manufacturers to understand their technology development plans and inform consenting envelopes. Currently, the largest advertised WTG in the market spans 236m rotor diameter, has a tip height of 263m above Lowest Astronomical Tide (LAT) and is expected to be ready for serial production in 2024. A further step in technology evolution can be expected in the timeframe of East Anglia ONE North and East Anglia TWO which could realistically reach the Wind Turbine Generator (WTG) size envelope of maximum WTG tip height of 282m being applied for. With the current available information, the envelope is expected to future proof the project for the envisaged development timescale.

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					Additionally, interfacing elements such as the turbine foundations and installation vessels must evolve at the same pace to be able to support and install the larger turbines. ScottishPower works closely with supply chain which is rapidly adapting to suit the large generation turbine requirements.
2.2.4	Applicant			**The Applicant's Habitats Regulations Derogation Case [REP3-053]: alternative project designs** In Table 4.8 of [REP3-053] which sets out the assessment of alternative project designs, you state that in regard to increasing the distance to the OTE SPA you have considered the application of buffers of greater than 2 km. In updating your derogation case at Deadline 6, please provide further justification and evidence to explain the nature and spatial extent of the "*existing and known future constraints"* you refer to in Table 4.8, and explain how in practice such constraints would restrict the WTG siting options within the overall Project envelope for EA1N. Where the case builds on evidence in previously submitted documents (such as the ES or [REP3-073]) or oral submissions made at hearings, please set that evidence out in full for the derogation case and elaborate upon it. Please include a plan or plans illustrating all of the known and future constraints to support the case made, for example in relation to water depths and the location of exclusion areas for other consented cables and infrastructure.	The ***HRA Derogation Case*** (ExA.AS-7.D6.V2) submitted at Deadline 6 has been updated to include further evidence of existing and known future constraints and includes the points that were provided in the 'Offshore Commitments' [REP3-073]. The update also includes a plan that illustrates the indicative layout for 67 wind turbines, the associated infrastructure and water depths.

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2.2.5	Applicant			**The Applicant's Habitats Regulations Derogation Case [REP3-053]: illustrative array layout** In updating your derogation case at Deadline 6, please provide the following further justification and evidence: a) Please provide an indicative plan or plans, at an appropriate scale, to illustrate how 67 wind turbine generators (WTGs) plus supporting infrastructure could fit within the offshore order limits for EA1N whilst also taking into account the minimum spacing requirements between each WTG and the known and future constraints. b) Please explain (providing illustrative plans where possible) what alternative project designs in terms of turbine size, layout and location within the order limits have been considered in your assessment. c) Having regard to the comments received by NE at Deadline 5 about providing a 10 km buffer to the boundary of the OTE SPA [REP5-082], please explain why a buffer of greater than 2km (and up to 10km) is not achievable, providing evidence of both technical and commercial feasibility considerations. d) What degree of flexibility have you factored in within your offshore order limits reduction to allow for as yet unknown constraints within the site that may only be identified following, for example, further site	a) The ***HRA Derogation Case*** submitted at Deadline 6 (ExA.AS-7.D6.V2) has been updated to illustrate how 67 WTGs plus supporting infrastructure could fit within the offshore order limits for East Anglia ONE North whilst also taking into account the minimum spacing requirements between each WTG and the known and future constraints. b) The ***HRA Derogation Case*** submitted at Deadline 6 (ExA.AS-7.D6.V2) has been updated to respond to this point. Please note, for the avoidance of doubt, that layout is not a factor in the ornithological assessment; therefore, this was not relevant when considering assessment of alternatives: • Displacement is based upon the windfarm site boundary and buffers thereof (when considering project alone or in-combination effects) it is simply the windfarm area (and associated buffer areas) that are considered, not the location of infrastructure within it. The assessment assumes that wind turbines could potentially be located right up to the boundary. • Collision risk estimates are derived from consideration of the densities of each species within the site (derived from survey data collected within the boundary only), other species specific parameters (e.g. flight height) and the turbine parameters (e.g. rotor diameter, draught height etc). These estimates are determined per wind turbine and multiplied to the number of turbines, the collision risk estimates do not consider

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				investigations? What is the justification for this approach?	spatial variations in the densities of birds across a site or the actual location of the wind turbines. In terms of turbine size, the Applications considered two sizes of wind turbine considered to represent the range of likely turbine which would be deployed; a nominal 250m turbine and 300m turbine which translated in 75 (or 67) and 60 (or 53) individual turbines. ***Table 12.31*** of ***Chapter 12 Offshore Ornithology*** (APP-060) illustrates, for the species assessed for collision risk, the difference between these scenarios in EIA terms (i.e. not apportioned to SPA populations). Although in most cases, the larger number of smaller turbines represented the worst case, this difference was in each case less than one individual bird (in EIA terms, which would then be greatly reduced when apportioned for HRA). Therefore, layout and turbine size are not considered to be viable alternatives. Draught height was considered and is discussed in Appendix 1 of HRA Derogation Case (ExA.AS-7.D6.V2). c) The HRA Derogation Case submitted at Deadline 6 has been updated to explain why a buffer of greater than 2km (and up to 10km) is not achievable and provides an explanation of both technical and commercial feasibility considerations. d)The HRA Derogation Case submitted at Deadline 6 has been updated to address the point of how unknown constraints were considered.

ExA. Question Ref.	Question addressed to			ExA. Question	Applicants' Response
2.2.6	Applicant		2	**The Applicant's Habitats Regulations Derogation Case [REP3-053]: illustrative array layout** In updating your derogation case at Deadline 6, please provide the following further justification and evidence: a) Please provide an indicative plan or plans, at an appropriate scale, to illustrate how 75 wind turbine generators (WTGs) plus supporting infrastructure could fit within the offshore order limits for EA2 whilst also taking into account the minimum spacing requirements between each WTG and existing and known future constraints within the site. b) Please explain (providing illustrative plans where possible) what alternative project designs in terms of turbine size, layout and location within the order limits have been considered in your assessment.	a) The HRA Derogation Case submitted at Deadline 6 (ExA.AS-7.D6.V2) has been updated to illustrate how 75 WTGs plus supporting infrastructure could fit within the offshore order limits for EA2 whilst also taking into account the minimum spacing requirements between each WTG and the known and future constraints. b) Please note, for the avoidance of doubt, that layout ***is not*** a factor in the ornithological assessment; therefore, this was not relevant when considering assessment of alternatives. See above (2.2.5) for discussion of wind turbine parameters
2.2.7	Applicant			**The Applicant's Habitats Regulations Derogation Case [REP3-053]: Increase in minimum turbine draught height** In Table 4.8 of [REP3-053] you state that: "*increasing air-draught beyond the commitment made to 24m above MHWS would have further implications on technical aspects (tower weight and foundation requirements) and commercial implications*." In [REP3-073] and at ISH1 you provide an indication of the windfarm sites' water depths and a general view of the	The Applicants have assessed the technical and commercial implications of increasing the draught above 22m Mean Highwater Spring (MHWS). The following has been concluded: • Draught between 22m MHWS to 30m MHWS are deemed technically feasible with increasing commercial impact on the project. • Draught over 30m MHWS is considered technically unfeasible with current Installation Vessels and WTG technology considered.

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				layout constraints which could affect the feasibility of a further increased turbine draught height. Please provide evidence to fully justify the technical and commercial reasons why you are unable to commit to a minimum draught height of greater than 24m above MHWS for either project.	It has been concluded that draughts greater than 24mMHWS will add significant cost and restrict flexibility in foundation options. The following factors have been assessed to reach the above conclusion: • Annual energy production: larger draughts results in higher hub height, reaching higher wind speed and an increase in production. This is deemed marginal. • Foundation feasibility and cost: the large water depth of the East Anglia ONE North and East Anglia TWO sites challenges the limits of extra-large monopile feasibility. Draught and consequently, hub height are design driver for these structures. ScottishPower Renewables has worked with specialist foundation designers to understand the limits of feasibility of the concept. Given the stage of the project and uncertainties in geotechnical characteristics of the site and WTG technology, it has been concluded that draughts greater than 24m MHWS add significant risk to the technical feasibility of the concept for the site. As stated in the ***offshore commitments*** (REP3-073) documents, 98% of East Anglia ONE North lies in water depths of 40 – 57m below LAT and 85% of East Anglia TWO in water depths of 40 - 67m below LAT. Moreover, water depth sets a limit at which the technical requirements of types of foundations become commercially unviable at this location. This limit is approximately 50m below LAT which is conservative in the absence of detailed site investigation data on the underlying geology and more likely to lie at approximately 48m below LAT. Simply put, at the cut off 48m below LAT, an air-draught of 24m already sets the foundation at 72m in length. As a result, greater draughts would require

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					water depths to be limited with the consequent loss of buildable area. Alternative, different foundation types would be required adding significant complexity, cost and reduced supply chain flexibility to the projects. • Transport and Installation: there is limited number of turbine installation vessels in the current fleet that could reach up to 30m above MHWS draught and consequent hub height.
2.2.8	Applicant and NE, RSPB			**The Applicant's Habitats Regulations Derogation Case [REP3-053]: Imperative Reasons of Overriding Public Interest (IROPI)** a) Please expand on the information in Section 5.2.2 of [REP-053] regarding the significance of the contribution each project is anticipated to make to the claimed public interests, providing a clear reasoning of what the project contribution would be. b) The information in Section 5.2.4 regarding overriding reasons sets out the Applicant's position on the effects upon designated sites. Please comment on whether the overriding reasons case could be affected by amended predictions of the effects of the proposals and a conclusion of AEOI for any of these designated sites.	a) In terms of the 2030 target of 40GW for deployment of offshore wind, the contribution of each project is stated in ***section 3.2.4*** paragraph 59 (REP3-053): *The Project [East Anglia TWO], at 900MW **represents 5.8%** of the current gap between operational, in -construction and other consented projects and the 40GW target* *The Project [East Anglia ONE North], at 800MW **represents 5%** of the current gap between operational, in -construction and other consented projects and the 40GW target.* These project-alone figures are derived from the totals presented in ***Table 3.3.*** The Projects will provide, at almost 11% of the capacity required to meet targets, a significant contribution to the urgent objectives of combatting anthropogenic climate change by meeting 2030 targets, delivering low cost energy and ensuring security of supply. In terms of the other benefits listed in section 5.2.2 (REP3-053), it is not possible to allocate a percentage of the

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			Government's projections (in the Energy White Paper '*Powering our Net Zero Future'*) of job creation of 60,000 jobs in offshore wind to the Projects as with the GW target above. However, employment opportunities (both direct and through the supply chain) were estimated in ***Chapter 30 Tourism, Recreation and Socio-Economics*** (APP-078). It is worth noting that the estimates provided in that assessment predate the Offshore Wind Sector Deal and the target within that to reach 60% UK content in offshore wind projects. b) The Applicants consider that any minor changes to the assessments or the conclusions on AEOI would not change the rationale presented in ***section 5.2.4***. Any changes to the project alone case will have a marginal effect on the collision-risk based or displacement in-combination conclusions which are driving all considerations of AEOI. It remains the case that climate change is likely to be the strongest influence on seabird populations in coming years, with anticipated deterioration in conditions for breeding and survival for most species of seabirds. The Projects would provide a benefit in the long term to individual bird species across their range through its objective to decarbonize the economy to help the UK combat global climate change.
2.2.9	Applicant	**The Applicant's Compensatory Measures [REP3-054]**	The Applicants' response to the comments made by NE in [REP5-082] can be found in section 6 of the Applicants' Comments on Natural England's Deadline 5 Submissions (document reference ExA.AS-16.D6.V1).

ExA. Question Ref.	Question addressed to	ExA. Question	Applicants' Response
		Please respond to the comments made by NE in [REP5-082] with regard to the compensatory measures you have proposed on a without prejudice basis in [REP3-054]. a) In addition, please clarify how the compensatory measures that are proposed in [REP3-054] for kittiwake, gannet, lesser black-backed gull and red-throated diver (RTD) (the latter being for EA1N only) are to be secured in the dDCO and how the drafting would allow for scenarios in which the Secretary of State concludes there would or would not be a potential AEoI. b) If such compensatory measures were to be undertaken outside of the current order limits for either of the EA1N or EA2 projects then please explain the process by which this would be legally secured, and explain how the long-term monitoring of any compensatory measures would be secured, funded, carried out and assessed. c) How would alternative measures be provided for, should the proposed compensatory measures for any species prove not to be effective?	a) The Applicants have submitted an ***Offshore Ornithology Without Prejudice Compensation Measures*** document (document reference ExA.AS-8.D6.V1) at Deadline 6. This document includes a series of compartmentalised plans for the delivery of compensation for each potentially affected species should the Secretary of State reach a decision that this is necessary. It is proposed that the document would be certified by the Secretary of State for the purposes of the Development Consent Order. The Applicants also propose that, similar to the Hornsea Three Development Consent Order, a new Schedule be inserted into the Development Consent Orders. This schedule would be separated into different parts, with each part securing the submission and approval of a species specific compensation and monitoring plan (which plan will be in accordance with the relevant part of the In-principle Compensation Measures document as certified). The Applicants' position remains that there will be no adverse effect on the integrity of any European Site as a result of the Projects alone or in combination. And so the Applicants would submit that this Schedule should be removed wholesale from the Development Consent Orders as made. However, if the Secretary of State takes a different view, the proposed structure of the schedule would allow the compensation measures for one species to be changed or removed without affecting the operation of compensation for other species.

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			The Applicants propose to suggest drafting for the DCO Article incorporating the Schedule and the Schedule itself at Deadline 7. b) Again similar to the approach within the Hornsea Three Development Consent Order, the Applicants are proposing a staged approach to approval and delivery of compensation measures, with corresponding controls on the timing of implementation of elements of the Projects that the Secretary of State has concluded may have an Adverse Effect on Integrity. As explained in the ***Offshore Ornithology In-principle Compensation Measures*** document submitted at Deadline 6, where relevant and necessary to deliver the compensation: town and country planning permission will be sought; land will be acquired by agreement, which failing utilising the Electricity Act compulsory purchase process; and the effectiveness of compensation against the stated objectives will be monitored with adaptive management instigated where appropriate. This will all be in accordance with the species specific compensation and monitoring plan approved under the schedule at the appropriate time. These measures will be funded in like manner to the remainder of the Projects (as set out in the Funding Statement [REP1-009] c) As noted above, the species specific compensation and monitoring plans will secure appropriate monitoring and where necessary adaptive management. The ***Offshore Ornithology***

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					Without Prejudice Compensation Measures document submitted at Deadline 6 provides further details on this.
2.2.11	Applicant			**The Applicant's Compensatory Measures [REP3-054]: RTD of the Outer Thames Estuary SPA** In its D5 submission [REP5-082], NE has referred to the removal of existing wind turbines from within the OTE SPA as representing the only other compensatory measure for RTD, apart from management of vessel traffic, with a high degree of certainty in reducing anthropogenic influences. Please comment on the feasibility and implications of removing already-installed turbines in order to provide headroom for EA1N.	The projects suggested for removal have been in operation from 2005 (Kentish Flats) to 2015 (Kentish Flats Extension) therefore dependent upon the project chosen, removal would require compensating the operator for at least 10 years of operational revenue (assuming a nominal 25-year operation life). This will run into 10s to 100s of millions of lost revenues, not to mention that as far as the operators are concerned (as evidenced by their consents and the recent Review of Consents) there are no issues with their projects. More fundamentally though, there is already a considerable challenge faced in delivering the 40GW of offshore wind by 2030 removal of any of these increases the gap to be bridged and which would be detrimental to the pursuit of the Government's target. For information, Gunfleet Sand I, II & III have a combined capacity of 172MW, Kentish Flats and Kentish Flats Extension have a capacity of 140MW and London Array has a capacity of 630MW.
2.2.12	Applicant and NE			**The Applicant's Offshore Commitments [REP3-073]: Ecological consequences** [REP3-073] discusses the reduction in disturbance anticipated from the 2km buffer. What are the ecological	***Section 3 Ecological consequences of displacement*** of the ***Displacement of red throated divers in the Outer Thames Estuary SPA – Update*** (REP5-025) discusses the ecological consequences of diver displacement. The section of the report

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				consequences of the 2km buffer or larger buffer in terms of the conservation objectives of the Outer Thames SPA?	provides a review of the latest literature available and concludes *"The available evidence suggests that the most likely result of displacement is that there will be little or no impact on adult survival, and that any impact would probably be undetectable at the population level."* NE acknowledge that there is likely to be limited ecological consequence stating (REP4-087); Para 26 – *We acknowledge that the likely consequences (lethal or otherwise) of displacement that results from the concentration of more birds into a smaller area of sea distant from all windfarms is not known and may indeed be small* Para 37 - *Natural England acknowledges that the abundance objective is likely to be maintained.* The buffer was provided on a precautionary basis because there was scope to reduce to windfarm site boundary to accommodate this and therefore move the area of the largest magnitude of displacement effect (i.e. the windfarm site itself) away from the SPA. In terms of the conservation objectives, the ecological consequence of the 2km (or indeed any larger buffer) would be: 1) *Maintain the size of the non-breeding population at a level which is at or above 18,079 individuals*. As discussed above and acknowledged by NE there are

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					unlikely to be any population level effects from the displacement. 2) *Maintain the extent, distribution and availability of suitable habitat*. The modelling shows that the effective area of the SPA which would be subject to displacement from East Anglia ONE North is up to 0.5%, increasing the buffer would simply reduce this already small area of effect.
2.2.13	Applicant and NE			**Offshore Ornithology Cumulative and In-Combination Collision Risk** Please comment on when the mitigation and additional baseline data for Hornsea Project 3 is likely to be made available. **To Applicants only** – Should this data be submitted before the close of the EA1N and EA2 Examinations, then please clarify how long it would take you to update and submit amended collision risk and displacement figures for your cumulative/in-combination assessments?	The Applicants have no knowledge of the timescales for the provision of information by Ørsted, either in relation to the non-kittiwake collision risk estimates from Hornsea Project Three or as to the likely timing of the DCO application for Hornsea Project Four. The Applicants note that in any case, whilst the provision of these numbers would provide 'certainty' to NE of the exact values for the in-combination totals, NE's position on the conclusion of AEOI would not change. Provision of these numbers is therefore academic. 2 – 3 weeks would be required to update the relevant figures and cascade these values through the relevant documentation and undertake the required quality and consistency checks. It is not considered that any additional modelling would be required.
2.2.15	Applicant / NE			**Benthic ecology: Security for reef buffer** In NE's D5 submission [REP5-085] it states that it is concerned that the Applicant's request to retain the ability to discuss reef buffer requirements on a case by case basis during the	The Applicants acknowledge NE's position however consider that the Marine Management Organisation (MMO) would

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				preconstruction period, is not condition-able and therefore the mitigation remains unsecure, even if explained within a listed DCO/dML plan. How would NE/the Applicants suggest this could be secured?	have the necessary control through the approval process to ensure significant impacts on *Sabellaria* reef are avoided. The Applicants have updated the text within the outline *Sabellaria* Reef Management Plan submitted at Deadline 6 to clarify the intention of paragraph 12 to the following: *However, the Applicant notes that in some cases it may be necessary to impinge on these buffers, where for example the proximity of several reefs makes micrositing with a minimum 50m buffer (or 60m for UXO clearance) impractical. Therefore, exceptions to the full buffer may be required in some circumstances. These would be agreed in advance with the MMO.*
2.2.16	Applicant			**Benthic ecology: Reef survey timing and commencement** Please comment on NE's contention that unless both the UXO clearance and commencement of the OWF installation occurs within 12-18 months of the survey being undertaken a second Annex I reef survey and report will be required prior to construction commencing. How would this be secured?	The Applicant notes the advice of Natural England regarding the 12 - 18 month time frame between undertaking the pre-construction Sabellaria reef survey and commencement of UXO clearance and commencement of construction, which has been standing advice for a number of years now. The In-principle Monitoring Plan submitted at Deadline 6 (8.12) has been updated to secure both the time frame for Sabellaria reef surveys and the need for a 'top-up' survey should the pre-construction surveys need to commence outside the 12 - 18 month period.
2.2.17	Applicant			**Benthic ecology: Cable installation in mixed sediments**	a) No, geotechnical surveys have not yet been undertaken as they are conducted in the pre-construction phase of an offshore windfarm project.

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				NE's D5 submission [REP5-085] states that as submitted into examination for Hornsea Project 3, Norfolk Vanguard and Norfolk Boreas areas of mixed sediment have proven to be more challenging for cable installation. Case example is cable installation within the Wash and North Norfolk Coast SAC where cables have been sub-optimally buried in areas of mixed sediment and post installation requests have been submitted for cable protection. In order to commit with any certainty that cable protection can be avoided in areas of potential reef Norfolk Boreas utilised available geotechnical investigations to undertake a cable burial assessment which was submitted into examination to provide the necessary evidence to support the proposals. Therefore, NE advises in [REP5-085] that something similar for these projects is submitted into the examination for EA1N and EA2 to demonstrate that cables can be buried to the optimum depth in areas of 'unavoidable' reef or assures that that sub-optimally buried cables would not require external protection i.e. <1m a) Have the applicants already undertaken such geotechnical investigations? b) If not, then are such investigations to be undertaken and submitted before the close of these examinations? c) If (b) is the case, then please explain the process by which the extent of cable protection that is required is to be assessed and how potential impacts on Sabellaria reef	b) Geotechnical surveys are not proposed to be undertaken before the close of the examination as such surveys are conducted in the pre-construction phase of an offshore windfarm project c) The Applicants note that the example of Norfolk Boreas to which NE refers, relates to cable installation within a Special Area of Conservation (SAC). The Projects' offshore development areas are not within or in close proximity to any site designated for Sabellaria reef. The request from NE is not proportionate to the Projects and their locations. The Applicants would also note that within the outline *Sabellaria* Reef Management Plan (REP4-040) submitted at Deadline 4, the Applicants have recognised that the use of cable protection is to be avoided where it is necessary to route a cable through *Sabellaria* reef. Geotechnical investigations will be undertaken pre-construction as is standard practice to inform the cable routeing design. Detailed geotechnical information will therefore be available to inform the decision making process which ultimately must be approved by the MMO through the design plan secured under Condition 17(1)(a) of the Generation DML and Condition 13(1)(a) of the Transmission DML.

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		resulting from cable protection can be adequately mitigated.	