



THE PLANNING ACT 2008
THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE)
RULES 2010

HORNSEA PROJECT THREE OFFSHORE WIND FARM

Planning Inspectorate Reference: EN010080

**Annex A: Schedule of Natural England's responses to Examining
Authority's first round of written questions.**

7 November 2018

The table below presents Natural England’s responses to the first round of the Examining Authority’s Written Questions. We have omitted the questions that were not directed at Natural England from this document.

2. Ecology – Offshore			
Ref	Question to	Questions	Natural England’s comments
Q1.2.2	Natural England (NE)	<p>Paragraph 4.4.5 of NE’s representation [RR-097] states that the consideration of each phase in isolation failed to consider cumulative impacts over time.</p> <p>Please explain why the approach outlined in paragraph 12.7.1.14 of the ES [APP-072] and paragraph 11.7.2.6 of the ES [APP-083] is not adequate.</p>	<p>Natural England remains of the view that the implications of a phased build scenario over a number of years has not been fully considered and it is also unclear whether any particular impact is considered to be temporary or long term.</p> <p>Whilst Natural England recognises inter-related effects have been considered in 12.7.1.14, this document is a tabulated summary of the information from other chapters. It is not a sufficient assessment on its own and is not appropriately considered/cross referenced in the chapters assessing individual impacts to allow an informed judgement to be made on the adequacy of the assessment of inter related effects (N.B. The interrelated effects chapter only covers EIA matters relating to the wider marine environment, and does not apply to in-combination impacts on designated sites).</p> <p>Additionally, as NE and JNCC fundamentally disagree with the assessments in many of the individual chapters. We do not believe that the project led and receptor led effects have been appropriately assessed. One of the main concerns is in relation to the recoverability of receptors during different phases of the project. Especially for long/temporary impacts which could be persistent over the lifetime of the project.</p> <p>For example, a receptor impacted in the construction phase may be considered to be likely to recover within 5 years, and therefore a judgment of the level of overall impact made on that basis. As the potential O&M works are considered in isolation, there is an underlying assumption that these are new impacts on a recovered/un-impacted receptor, and again the judgement of significant is made on the basis</p>

			<p>that the receptor will recover within 5 years. This does not take account of the possible scenario whereby a receptor impacted at construction phase is impacted again in the O&M phase before full recovery has occurred, meaning overall recovery is now up to 10 years and therefore potentially of much greater significance.</p> <p>Equally there has not been consideration of the potential scenario of a phased build over numerous years which could substantially change the conclusions around the recoverability of features over the lifetime of the project.</p> <p>Natural England has not been able to find reference to 11.7.2.6 paragraph within the ES, but are happy to provide further comment if required.</p>
Q1.2.3	NE	<p>Paragraph 4.2.4 of NE's representation [RR-097] states that it is unclear whether the best available evidence was used to determine impact and refers to unspecified offshore wind farm projects where actual construction impacts have been significantly greater than those predicted.</p> <p>Please direct us to the evidence that shows that the actual impacts from historic projects have been greater than the modelled impacts and explain how these examples relate to the assessments for Hornsea Project Three and the requirements in the draft Development Consent Order (dDCO)[APP-027].</p>	<p>Please see Natural England's Cable paper included in the correspondence. Please also see Natural England's other Benthic Annexes which highlight how the lessons learnt from previous projects identify uncertainties within the HOW03 application and the introduces scientific doubt in the Applicant's conclusions.</p>
Benthic			
Q1.2.6	NE, Marine Management Organisation (MMO)	<p>Table 2.38 of the ES [APP-062] states that the introduction of hard substrates associated with foundations, scour protection and cable protection would only lead to a</p>	<p>Natural England agrees that in terms of the wider EIA context (i.e. outside of designated sites) the impacts may be considered minor adverse on epifaunal and infaunal communities. However, we believe that there would be a likely significant effect within designated sites,</p>

		<p>minor adverse impact.</p> <p>Do you agree that there are unlikely to be significant changes in the composition of epifaunal and infaunal communities as a result of the introduction of hard substrates?</p>	<p>which may hinder the conservation objectives for the site and therefore there is a risk of an adverse effect on integrity of the designated sites.</p> <p>Natural England received further information from the applicant on the subject of scour protection and rock placement on 10th October 2018. Please see Annex D2 for detailed comments on this additional information, however, it should be noted that overall our advice remains unchanged.</p>
Q1.2.8	NE, MMO	<p>Table 2.38 of the ES [APP-062] states that the risk of spreading invasive and non-native species is minor adverse to negligible.</p> <p>Do you agree with this assessment of the risk to benthic communities from invasive and non-native species?</p>	<p>Natural England believes that if the relevant best practice operational management measures are implemented to ensure that the risk of spreading INNS is minimised as much as possible the risk will only be minor adverse to negligible.</p> <p>It would be appropriate for the Applicant to provide a best practice management plan for INNS</p>
Q1.2.13	NE, MMO, EIFCA	<p>Representations from NE [RR-097], the MMO [RR-085] and the EIFCA [RR-070] suggest that there is a need for additional survey data to be collected for the nearshore cable corridor re-route.</p> <p>Please explain why historical data are insufficient and state what, in your view, would be required to provide an adequate baseline.</p>	<p>Natural England has been provided with a clarification note from the Applicant on 9th October 2018 which provided additional drop down video data for the Wash and North Norfolk Coast SAC. We have provided further advice on what would be considered an adequate baseline report and our views on the acceptability of the further survey data in benthic Annexes D1 and D7.</p>
Q1.2.15	NE	<p>Paragraph 5.4.13 of NE's representation [RR-097] states that there are outstanding questions regarding how the survey data have been analysed and interpreted. Errors have been noted in the results and the significance of potential impacts on biotopes and VER.</p> <p>Please identify the nature of these errors and the implications that you think this has for the</p>	<p><u>Lack of confidence in survey evidence</u></p> <p>This has been a focus of the discussions during the evidence plan process, but we continue to have concerns over the appropriateness of the analyses, and note in particular:</p> <ul style="list-style-type: none"> splitting data by sediment type for analyses creates clusters that are unlikely to prove meaningful ecologically. We understand that doing this will lower the size of the dataset for analysis, but we would expect the contractors to investigate more appropriate ways of dealing with scale. If the analysis must be split,

		findings of the ES.	<p>investigating split by geographical area than sediment type would be more appropriate.</p> <ul style="list-style-type: none"> • use of ‘shoe horning’ to ensure samples match a biotope. Rather than supplying the ‘closest’ biotope to the grouping, it would be preferable to just describe characterising species of the group • appropriate use of infauna and epifauna in datasets dependent on sampleability rather than strict definitions of infauna vs epifauna, e.g. some epifauna (e.g. brittlestars) are much better sampled by grab, as opposed to epifauna such as seapens. • We consider that the methods used for faunistic analysis by the applicant are such that there is little opportunity that true ecological patterns and relationships could emerge. As such, we have low confidence in the biotoping results as well as any conclusions as to characterisation or monitoring resulting from them. <p><u>Implications for the findings of the ES</u></p> <p>It would only be possible to fully identify the implications for the results of the ES with reanalysis of the benthic survey evidence, including peer-review by NMBAQC/SNCBs. We understand that, for timing reasons, it is now not likely to be possible to undertake reanalysis before examination and so we advise that the examining body considers that the results include a degree of uncertainty, and thus includes a further layer of precaution when considering benthic survey results.</p>
Q1.2.17	Applicant, NE	<p>Table 2.18 of the ES [APP-062] states that cables would be micro-sited through areas of ‘lower quality’ <i>Sabellaria</i> reef. Paragraph 2.7.1.19 of the ES [APP-062] acknowledges that this is a widespread benthic feature with potential for occurrence in the array and cable corridor areas.</p> <p>How effective is this mitigation measure likely to be given the widespread distribution</p>	<p><i>Sabellaria spinulosa</i> is an Annex I reef habitat under the habitats directive and our advice to the Applicant during the evidence plan process was the same as to all industries; namely that Annex I reef, of all quality, is avoided, within designated sites and that under the NERC Act 2006 <i>Sabellaria spinulosa</i> reef is also a habitat of conservation importance and therefore should be avoided where possible even outside of designated sites. The main area of concern in relation to impacts on Annex I <i>Sabellaria spinulosa</i> reef relates to North Norfolk Sand Banks and Saturn Reef SAC.</p>

		of this habitat?	<p><u>Reef layer evidence</u></p> <p>JNCC's spatial products for Annex I reef is currently being updated. Version 7 (the current published version) of the Annex I reef layer was provided to the applicant during their PEIR consultation, and we provided updated layer images to the applicant in early 2018. JNCC were expecting to be release version 8 before the Hornsea examination, but publication is now expected to be December 2018. This data set will be required to understand how effective the mitigation measure to avoid reef (not just low quality) will be.</p> <p><u>Micrositing as mitigation</u></p> <p>It is Natural England's view that with the current cable corridor routing, primary mitigation (i.e. avoiding Annex I reefs within SACs and/or biogenic or geogenic reefs outside SACs within the Hornsea Three offshore cable corridor) will not always be possible, particularly around Saturn Reef where evidence for Annex I reef shows presence across the cable corridor. We do not consider the applicant's consideration of routing through 'lower quality' reef to be acceptable in terms of restoration of conservation objectives as the 'lower quality' reef mentioned by the applicant is still contained within area to be managed as reef, with the protection provided by Annex I status.</p> <p>We welcome the applicant's desire to avoid areas of higher quality reef and/or restrict cable installation to the periphery of reef features, and we consider that both of these mitigations may decrease impact on individual reefs. However, we do not consider that they will lower risk related to leaving the overall reef feature in unfavourable condition, particularly as we are unsure as to whether the applicant can microsite around the reef feature in this area. Please see Annex D4 or further details.</p>
Q1.2.19	NE	Paragraph 5.4.4 of NE's representation [RR-097] states that the 'core reef approach' that was used to assess impacts on the North Norfolk Sandbanks and Saturn Reef Special Area of Conservation (SAC) did not follow	<p>Natural England has provided comments on the core reef approach in section 2.4 of Annex D4 and within Annex D5 of our Written Representation.</p> <p>Please also refer to paper by Roberts et al., 2014.</p>

		<p>published guidance.</p> <p>Please explain how the adopted approach differs from the published guidance.</p> <p>How is any difference in approach likely to have affected the findings of the ES?</p>	
Q1.2.20	Applicant, NE, MMO	<p>Paragraph 2.7.1.19 of the ES [APP-062] states that <i>Sabellaria</i> reefs are 'likely to be ephemeral'.</p> <p>What peer reviewed literature supports this assumption?</p> <p>Is it possible that the observed changes in distribution are attributable to regular loss of reefs from bottom trawling?</p> <p>Given the observed ephemerality, would pre-construction surveys be effective in mitigating potential impacts?</p> <p>Please could NE and the MMO comment on whether they agree that the reefs are likely to be ephemeral and whether it is reasonable to consider them as having medium recoverability.</p>	<p><u>Ephemerality</u></p> <p>In UK waters, the extent of <i>S. spinulosa</i> reefs is highly variable and subject to physical and biological pressures such as those created by storms and predation. <i>Sabellaria</i> reefs are naturally ephemeral (capable of forming, decaying and disappearing from an area over just a few years) and shift in spatial distribution (occasionally forming cohesive expanses of reef up to several hectares, but often demonstrating a high degree of patchiness). Due to the cyclical nature of reef formation and decay, it is important to conserve the feature's overall extent within a site, and that this approach includes conserving both established reef and areas of potential reef. Assessments should focus on reef extent occurring at that specific point in time, therefore a repeat survey may be required at the point of assessment.</p> <ul style="list-style-type: none"> • Hendrick, V. J. (2007). An appraisal of <i>Sabellaria spinulosa</i> reefs in relation to their management and conservation. PhD thesis, School of Marine Science and Technology, University of Newcastle Upon Tyne [online]. Available at: http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.485604 • Hendrick, V. J., Foster-Smith, R. L. and Davies, A. J. (2011). Biogenic Reefs and the Marine Aggregate Industry. Marine ALSF Science Monograph Series (3). MEPF 10/P149. • Benson, A., Foster-Smith, B., Gubbay, S. and Hendrick, V. (2013). Background document on <i>Sabellaria spinulosa</i> reefs. Biodiversity Series [online]. Available at: http://www.ospar.org/documents/dbase/publications/p00614/p00614_sabellaria.pdf • Roberts, G., Edwards, N., Neachtain, A., Richardson, H. and

			<p>Watt, C. (2016). Core reef approach to Sabellaria spinulosa reef management. In: The Wash and North Norfolk Coast SAC and The Wash approaches. Natural England Report No. 065.</p> <p>Trawling</p> <p>There is some evidence to demonstrate that loss of <i>Sabellaria spinulosa</i> reefs has been associated with the long-term effects of various fishing practices, predominantly that of towed demersal gear (Jones et al, 2000; Holt et al. 1998). Trawls can break apart <i>S. spinulosa</i> tubes, resulting in direct mortality of the worms and a reduction of the structure and complexity of the habitat, which may then no longer support epifauna (UK Biodiversity Action Plan, 2000).</p> <p>However, the scale of any potential impact is likely to be relative to the footprint of the activity, and trawling is only one impact occurring within NNSR.</p> <p>As such, while we agree that trawling can cause damage to <i>Sabellaria sp.</i>, we do not believe that the observed changes in distribution are attributable to regular loss of reefs from bottom trawling, but is more a function of innate ephemerality of the <i>Sabellaria</i> associated with living in areas of variable hydrodynamics and sediment movement.</p> <p>Mitigation</p> <p>We welcome the applicant's desire to undertake pre-construction surveys, but surveys in themselves are not considered mitigation. The surveys should inform avoidance of <i>Sabellaria spinulosa</i> reef which if undertaken within the appropriate timeframes (12-18month prior to construction) and project flexibility allowing for sufficient additional cable length for micro routing (which given that cables are procured years before cable installation may not be possible); we consider that this mitigation may decrease impact on individual reefs. However, we do not consider that it is likely to lower risk related to leaving the overall reef feature in unfavourable condition and therefore will still hinder the conservation objective of restore for this feature.</p> <p>Recoverability</p>
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			We agree that individual reefs are likely to be ephemeral, though there may be areas where overall reef presence remains consistent (area to be managed as reef). We agree that it is reasonable to consider reefs as having medium recoverability, however this does not necessarily imply that the overall reef feature can be considered to be recovering. Feature recovery is associated with decrease / removal of pressure within the site.
Q1.2.29	NE	<p>Paragraph 5.1.2.8 of the Marine Conservation Zone Assessment [APP-104] outlines the potential impacts on the Cromer Shoals Chalk Bed Marine Conservation Zone.</p> <p>Why do you think that this, together with other parts of the ES, does not adequately consider the worst case scenario associated with horizontal direct drilling operations?</p>	Please refer to Natural England's Annex D6 for detailed comments on the MCZ Assessment.
Q1.2.30	NE	<p>NE's representation [RR-097] states that the features of the Markham's Triangle proposed Marine Conservation Zone (pMCZ) should be assessed separately rather than by using one feature as a proxy. However, the applicant has provided a Marine Conservation Zone Assessment [APP-104] which includes an assessment of individual features of the pMCZ.</p> <p>If you do not consider this assessment to be adequate, please explain why.</p> <p>How, in your view, should the assessment have been carried out?</p> <p>How would the outcome of the assessment be altered if the features were assessed individually rather than by using one feature</p>	<p><u>Separate feature assessment</u></p> <p>We believe that levels of impact on the site discussed in the MCZ Assessment to be extremely unclear. For example:</p> <ul style="list-style-type: none"> • 5,872,589 m² is noted as the overall amount of disturbance in the site • 5,872,589 m² is also noted as the amount of disturbance to coarse sediments within the site <p>Impact values (such as the 5,872,589 m² of disturbance to coarse sediments) are prefaced with '<i>this represents the maximum adverse scenario for each broadscale habitat feature individually and therefore construction would not lead to a sum of the areas/proportions below being affected by temporary habitat loss</i>'. This again provides confusion about how total impact values are calculated through the assessment. As such it remains challenging to understand where impacts will occur and in what amounts.</p>

		as a proxy?	We suggest that this issue is related more to the presentation of the analyses than fundamental flaws in the figures. We suggest that the applicant provides a clear table in which they present the likely impact (km ²) per feature, if possible split into long-term impact and temporary impact. This would allow us to more clearly understand the MCZ Assessment chapter, and to reconsider our uncertainty over its assessment.
Q1.2.31	NE	<p>Paragraph 5.4.8 of NE's representation [RR-097] states that the Relevant Authority will need to carry out a full Marine Conservation Zone assessment.</p> <p>Please supply the conservation objectives, operational advice and a sensitivity analysis for the Markham's Triangle pMCZ.</p> <p>If this information is not available, please advise on what information should be used to inform a Marine Conservation Zone assessment for Markham's Triangle pMCZ.</p> <p>Are you in agreement with the Applicant's approach of using the conservation objectives for the Cromer Shoals Chalk Beds Marine Conservation Zone?</p>	<p><u>Available evidence</u></p> <p>Defra Consultation factsheet for Markham's Triangle (2018): https://consult.defra.gov.uk/marine/consultation-on-the-third-tranche-of-marine-conser/supporting_documents/Markhams%20Triangle%20factsheet.pdf</p> <p>Site assessment for Markham's Triangle (2017): http://jncc.defra.gov.uk/pdf/JNCC_T3PreConsultationAdviceOnPossibleOffshoreMCZs_v3.0.pdf</p> <p>Post survey site report (2011-12): http://randd.defra.gov.uk/Document.aspx?Document=12836_MarkhamsTrianglerMCZSummarySiteReport_v6.pdf</p> <p>(habitat data available https://data.gov.uk/dataset/42f967ae-082b-4d72-9a9d-55efe6558bf6/broadscale-habitat-eunis-level-3-for-markham-s-triangle-recommended-marine-conservation-zone-rmcz)</p> <p>We note that the conservation objective for the site's features is currently draft, and could be subject to subsequent changes. The form and content of MCZ assessments is regulator specific, however we consider the following to be of value:</p> <p>MB0102 - Report No 22: Task 3. Development of a Sensitivity Matrix (pressures-MCZ/MPA features): http://sciencesearch.defra.gov.uk/Document.aspx?Document=MB0102_9721_TRP.pdf</p> <p>JNCC's Pressures-Activities Database: http://jncc.defra.gov.uk/page-</p>

			<p>7136</p> <p>Natural England agrees that the Applicant has referenced the correct Conservation Objectives for the site. However, we have concerns in relation to the assessment undertaken that can be found at Annex X in relation to Cromer Shoal Assessment.</p>
Q1.2.32	NE, MMO, TWT	<p>Paragraph 2.12.2.3 of the ES [APP-062] identifies a number of impacts that have been scoped out of the cumulative impact assessment.</p> <p>Do you agree with the decision not to assess certain impacts on benthic ecology receptors within this assessment or within the HRA in-combination assessment for the North Norfolk Sandbanks and Saturn Reef Special Area of Conservation?</p> <p>If not, why not?</p>	<p>As stated in Natural England’s Relevant Representations and the response to the PEIR Consultation, we do not consider that seabed disturbance impacts related to maintenance activities should be scoped out of cumulative assessment. It is currently not clear what levels of cable protection will be added into the site during maintenance operations, though we note it may be up to 25% of initial cable length.</p> <p>We do agree that the following (2.12.2.3) can be scoped out:</p> <p>Construction phase:</p> <ul style="list-style-type: none"> • Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology. <p>Operation and maintenance phase:</p> <ul style="list-style-type: none"> • Increased risk of introduction or spread of invasive and non-native species (INNS) due to presence of subsea infrastructure and vessel movements (e.g. ballast water) may affect benthic ecology and biodiversity; • Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology. <p>Please also see Natural England’s comments on the HRA for the nearshore area which included further detail on our concerns for the Wash and North Norfolk Coast SAC – Annex D5.</p>
Ornithology			
Q1.2.38	NE, Royal Society for	Representations from NE [RR-097], RSPB [RR-113] and the MMO [RR-085] consider	Natural England advises that a <u>minimum</u> of two years of survey data are collected to inform the Environmental Statement. This is because there

	<p>the Protection of Birds (RSPB), MMO</p>	<p>that an appropriate site specific baseline has not been established.</p> <p>Why do you consider that two years of survey data is essential to provide an appropriate baseline?</p> <p>Given the potential for the variability in the number and distribution seabirds, what increased confidence would be provided by an additional 8 months of data?</p>	<p>can be considerable variability in the numbers of birds that will be present in an offshore area between years and therefore characterising the use of a project area by a species requires multiple years of data in order to sample that variability. If the variability in numbers between years is high, or the purpose of the surveys is to undertake a statistical analysis of changes in bird numbers, then potentially more than two years of data would be needed.</p> <p>By not capturing any of the inter-annual variability between December and March there is a significant risk that the abundance of individuals is under or over-estimated and consequently there is a higher level of scientific uncertainty around any of the conclusions reached.</p> <p>If data from a second year were collected for December- March, this would mean there are two complete years of baseline survey data for each month. This would allow an abundance estimate to be derived for these months that incorporates a degree of the inter-annual variability in bird numbers, and so will be a more accurate reflection of the actual numbers of birds using the project area.</p> <p>Natural England consider that this would increase the accuracy of the population estimates and reduce the potential bias that arises by having not sampled the inter-annual variability.</p> <p>As an example, the density of kittiwake in the project area in April of year 1 of the DAS surveys was 2.73 birds/km² compared to 0.22 birds/km² in year 2 (see Table 1.24 of Applicant's ES Annex 5.4). If only one year of DAS data could be used for April the predicted collisions would be around 12 times higher in year 1 compared to year 2. Likewise Table 1.15 in the Applicant's ES Annex 5.4 shows an example of the inter-annual variability in abundance for gannet – for example in August 2016 the abundance of gannet is estimated at 159 birds compared to 1738 birds in August of 2017. By having data from two years for August means that this inter-annual variability can be factored into the subsequent impact assessment so that it is a more accurate representation of the numbers of birds using the project area and is less likely to under or over-estimate the impacts.</p> <p>Full details of Natural England's position on the baseline data can be</p>
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			found in Section 2 of Annex C of our Written Representations.
Q1.2.42	NE	<p>Paragraph 5.2.2 of NE's representation [RR-097] states that the hierarchical data selection method for integrating densities/numbers of species derived from digital aerial and boat-based survey data is flawed.</p> <p>Please explain in more detail why you consider the method to be flawed.</p> <p>What, in your view, are the implications for the findings of the ES and HRA?</p>	<p>Please note that Natural England does not agree that the historical boat-based data can be used to inform the impact assessment for Hornsea Three as presented by the Applicant. This includes integration of either the Hornsea Three boat survey data or the wider Hornsea Zone boat survey data with the DAS data collected in 2016/17. Further details of Natural England's position can be found in Section 2 of Annex C of our Written Representations</p> <p>With reference to the questions posed in Q1.2.42, Natural England has provided detailed comments regarding the Applicant's hierarchical data selection method in paragraphs 2.11-2.18 of Annex C of our Written Representations and also in detailed advice that we provided to the Applicant in December 2017 as part of the Evidence Plan Process.</p> <p>In summary we consider the approach to be flawed for a number of reasons. One of the criteria for deciding whether or not to integrate historical boat survey data with the 2016/17 digital aerial survey data is the extent of overlap between the confidence intervals between population estimates derived from the different surveys which we do not consider to be an appropriate method because we do not consider it appropriate to combine data collected from different survey platforms with no evidence of compatibility of data collected (or estimates and confidence intervals derived from these data) across these different platforms.</p> <p>A second criterion used in the hierarchical data selection method is the extent of survey coverage available from the historical boat-based surveys, which in the case of the dataset of historical boat data that overlap with Hornsea Three, Natural England do not consider sufficient to support generation of population estimates and confidence intervals.</p> <p>Natural England also do not agree with the Applicant's hierarchical method which results in just one year of digital aerial data being deemed sufficient in months where the confidence intervals around the monthly estimate overlap with the confidence intervals in the boat data for the equivalent month by 50% or more. Just because the confidence intervals</p>

			<p>overlap does not mean the two estimates are not statistically different from one another and the point of needing more than one year of data is to ensure that the natural variability is captured in the mean and confidence intervals of the sample.</p> <p>The result of application of the hierarchical data selection method is that 1) it combines variable amounts of data from differing years (spanning years 2010 to 2017) within individual species' assessments; 2) it includes data collected over variable spatial scales within individual species' assessments; 3) it uses density and abundance estimates based on inadequate survey coverage and sample size. Natural England do not consider this to be methodologically appropriate.</p> <p>The implications for the findings of the ES and the HRA are that the Applicant's approach introduces an unacceptable level of uncertainty to the assessments of impacts on species, with the potential that predicted impacts are significantly under or over-estimated. Consequently Natural England would not be able to agree with the conclusions of the ES or conclude no adverse effect on site integrity beyond reasonable scientific doubt.</p>
Q1.2.51	NE	<p>Paragraph 5.2.6 of NE's representation [RR-097] states that a considerably higher confidence and emphasis should be placed on the use of colony data to inform colony specific breeding seasons.</p> <p>Please explain why more confidence should be placed on colony specific data rather than 'at sea' abundance data to define the length of the breeding season.</p> <p>Please provide a summary of the key findings and associated caveats of any peer reviewed evidence that supports your view.</p> <p>How would the use of colony data most likely alter the findings of the ES and the HRA?</p>	<p>NE advise that when undertaking an assessment in relation to a specific colony (e.g. for HRA) it is important where possible, to use colony specific breeding seasons for the assessment. It should be noted that while establishing seasonal definitions is the first stage in progressing to apportioning birds at the project site to individual colonies, it should be independent from the determination of a suitable apportioning rate. (see section 7, in particular 7.9-7.15 in Annex C of our Written Representations for more detail on this).</p> <p>Of the evidence sources available to establish colony specific breeding seasons, NE place higher confidence in observations made at the colony, as opposed to at sea observations. Colony specific observations (e.g. colony attendance, egg laying, chick fledging, colony desertion dates) give a clear indication of when birds are present at the colony and the assumption that birds observed are part of the colony in question is a reasonable one. Indeed, Busch and Garthe (2018) in their paper on the need to consider annual cycles within cumulative</p>

			<p>assessments, use kittiwake as an example and recommend the use of a 'colony attendance' season (in place of a 'breeding season') and base this on colony specific data.</p> <p>The alternative option of interpreting at-sea data gathered as part of the baseline characterisation surveys of the wind farm site (e.g. abundance peaks) is challenging and introduces considerably uncertainty. In the case of Hornsea Three and FFC pSPA, for the species where connectivity in the breeding season has been established at FFC pSPA (kittiwake, gannet and puffin) a peak in bird numbers can variously be interpreted as birds on passage passing through the project site to colonies further afield, breeding birds from FFC pSPA using the project site in higher numbers during a period in the breeding season when central place foraging constraints are relaxed and/or when both birds of a pair can forage (e.g. Robertson et al 2014), immature birds returning to the colony they intend to recruit into (e.g. Votier et al 2010), or failed/non-breeders associated with FFC pSPA. In reality the birds observed at Hornsea Three are likely to be a combination of all these categories, and it is important to note that the last three categories (breeding birds, immatures, non-breeders) are all components of the FFC pSPA population to some extent. Natural England accept that during the FFC pSPA breeding season, a proportion of the birds present at the project site will be 'non-FFC' birds, this should be addressed in the approach to apportioning and not in the definition of Annex C of our Written Representations.</p> <p>In terms of defining the length of the breeding season at a colony, using observations from the colony in question is more defensible and provides greater certainty than attempting to interpret at-sea data. At-sea data (e.g. abundance peaks, flight direction, fish carrying behaviour) combined with other evidence sources (e.g. tracking data, ringing recoveries) can however help build a picture of how birds are using the project site throughout the breeding season.</p> <p>NE have referred to a number of evidence sources to determine the appropriate breeding length definitions for FFC pSPA (summarised in Table 7.1 in Annex C of our Written Representations). It should be noted that data on colony attendance and breeding observations are</p>
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			<p>found predominantly in the grey literature (in monitoring reports and observer records) and are not commonly peer-reviewed. In the case of Flamborough and Filey Coast pSPA it is closely managed and monitored by the RSPB. The RSPB reserve managers are well versed in standard monitoring practices and are best placed to advise on breeding colony attendance periods for this colony (these are included as <i>pers comms</i> and by reference to monitoring reports (e.g Aitken et al 2017, Babcock et al 2016) in the table).</p> <p>The use of colony observations to define the length of the breeding season for kittiwake, gannet and puffin results in breeding seasons at FFC pSPA that are closely aligned to the breeding seasons described in Furness (2015) for the UK. The interpretation provided by the applicant of at-sea data to define the breeding seasons for these species results in reduced breeding seasons (see Table 7.1 in Annex C of our Written Representations).</p> <p>The use of colony data therefore results in a longer breeding season for these species. In the breeding season collision and displacement effects are apportioned at a higher rate to FFC pSPA than in the non-breeding season, therefore a longer breeding season will result in a greater impact to FFC pSPA. To use gannet as an example, NE advise that a breeding season of March–Sept is defined for FFC pSPA while the applicant has selected April – August (see below). The apportioning rates defined by the applicant for gannet are: 40.4% in breeding season, 4.8% in post breeding and 6.2% pre-breeding (NB NE have yet to reach agreement on the appropriate apportioning rate in the breeding season, this example is for illustration only). This would mean that in March (when breeding gannets are in attendance at FFC pSPA) only 6.2% of birds observed at the project site are considered likely to be part of the nearest breeding colony. Likewise in September (when gannets are still breeding at FFC pSPA) only 4.8% of birds recorded at the project site would be apportioned to FFC pSPA.</p> <p>In terms of collision mortality this would mean that in March an extra 34.2% (40.4-6.2) of collisions would be apportioned to FFC pSPA and likewise in September an extra 35.6% (40.4-4.8) of collisions would be</p>
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			<p>apportioned.</p> <p>In the case of displacement, the magnitude of the effect is calculated based on a seasonal 'mean of peak' calculation. A longer breeding season (March – Sept) results in these months being included in the calculation, and may result in a higher mean of peak in the breeding season (this is dependent on whether the peak count is in March or Sept). The use of the applicant's shorter proposed breeding seasons will either have no effect or lead to an under-estimate in the breeding season.</p> <p>Overall, the use of colony data would significantly increase Natural England's confidence in the methodology, but concerns would remain in relation to the underlying data.</p>
Q1.2.52	Applicant, NE	<p>The RSPB [RR-113] considers that herring gull should not have been scoped out of the impact assessment.</p> <p>Please can the Applicant comment on this point.</p> <p>Does NE think that herring gull should have been identified as a Valued Ornithological Receptor?</p> <p>If not, why not?</p>	<p>Natural England considers that Herring gull should be included as a Valued Ornithological Receptor (VOR). Natural England has previously requested that the Applicant includes Herring gull as VOR in their assessments and included comments about the approach to identifying VORs in Annex C of our Written Representations (Section 10.)</p>
Q1.2.53	NE, RSPB	<p>Paragraph 5.9.2.12 of the ES [APP-065] states that displacement effects along the cable corridor were assessed using seasonal mean population data derived from Lawson and others (2015).</p> <p>Do you agree that this survey data should be used to calculate displacement from the export cable corridor?</p>	<p>On the basis that Natural England understand that the densities of birds used to inform the displacement assessment have been derived from the under-lying density estimate data for the ECR for all 1x1km squares that cover the ECR and 2km buffer from the individual surveys, rather than extracted from the overall mean density surface modelled data presented in Lawson et al 2016 as shown in Figure 7.4 of the RIAA, then Natural England consider this to be acceptable in the context of displacement effects in the cable corridor.</p>
Q1.2.54	NE	<p>Paragraph 5.2.5 of NE's representation [RR-097] states that there is a need to account</p>	<p>The use of displacement matrices, presenting a range of displacement and mortality rates, allows consideration of the uncertainty in these</p>

		<p>for uncertainty associated with natural variability and the underlying data sources.</p> <p>Please explain how you would expect to see the information on uncertainty and the variability of input parameters, such as bird densities, incorporated into the assessment of displacement effects?</p>	<p>rates.</p> <p>Displacement effects require the calculation of seasonal mean of peaks – the peak abundance is selected from the monthly population estimates within a season (per year), this approach seeks to account for peak usage of the site within a season while accounting for inter-annually variability.</p> <p>In the case of Hornsea Three, there are four missing months, which will lead to some seasons having a number of missing months (this will vary depending on the season/species). As such, the calculation of mean of peaks will not capture the intra or inter-annual variability in bird numbers at Hornsea Three and therefore there will be additional uncertainty associated with these estimates that cannot be quantified. Consequently there will only be limited confidence in the outputs and any conclusions drawn from them.</p> <p>While it is not possible to fully address this additional uncertainty, Natural England advises that it would be precautionary to place greater weight on using the upper confidence intervals of the density estimates for these months, in order to try and reduce the likelihood that impacts are underestimated.</p> <p>Natural England advise that displacement matrices of the upper and lower confidence intervals (following a mean of peak process as for the mean population estimates) should be presented.</p>
Q1.2.56	NE	<p>Paragraph 5.9.3.4 of the ES [APP-065] refers to the use of mean estimate/maximum likelihood methods to estimate collision risk.</p> <p>Please explain in more detail why you consider that these methods do not account sufficiently for variability and uncertainty within the collision risk modelling (CRM)?</p>	<p>It is well documented that the use of the mean estimate/maximum likelihood values to estimate collision risk does not account sufficiently for variability and uncertainty within the CRM process (e.g. Band (2012), Masden (2015), McGregor et al. (2018)).</p> <p>As acknowledged by the Applicant in paragraph 5.9.3.4 of the ES there are varying levels of uncertainty/variability around many of the input parameters used in the collision risk model as well as uncertainty that is intrinsic to the model itself.</p> <p>However, Natural England do not agree with the Applicant's statement that "<i>the collision risk estimate calculated using the mean</i></p>

			<p><i>estimate/maximum likelihood scenario for all parameters is therefore the estimate that best describes the likely magnitude of collision risk...".</i></p> <p>In the case of the various input parameters like bird density or flight speed, the mean or central value of the parameter generated from a sample is not a measure of the most likely value of that parameter, and due to uncertainty in the estimates that arise from imperfect knowledge of the parameter and measurement/sampling errors – the mean estimate may also not be an accurate value. Therefore there is no basis for selecting this single value to use in the collision risk model.</p> <p>The mean value for a parameter does not reflect the natural, ecological variability in the distribution of the parameter (e.g. flight heights) or the probability that a sample mean (e.g. of bird density calculated from a transect sample at a project site) is representative of the real population mean for that parameter. For example, confidence intervals calculated around a sample mean only indicate the probability that the confidence interval actually contains the real population mean – so they do not represent values that encompass the extremes of a parameter value – or even the variability in a particular parameter value. They reflect information about the likely size of mean parameter values.</p> <p>There is also a lack of knowledge about the values of some parameters and/or a lack of data to calculate the parameter values (e.g. flight behaviour in different weather conditions or time of day) which mean it may be mis-leading to rely on a mean parameter value.</p> <p>Additionally, collision risk predictions are known to be more sensitive to variation in some input parameters compared to others and the mean value for a particular parameter may not reflect the effect that variability in that parameter might have on the resultant collision calculation.</p> <p>For this reason Band (2012) recommended that collision model outputs “<i>should convey the uncertainty in the collision risk estimate, by indicating, in addition to a ‘best estimate’, a range of confidence around that estimate</i>”. Band (2012) goes on to suggest that “<i>worst case</i>” assumptions should not be applied at each stage of the CRM process but that the aim should be to present a range of figures such that there</p>
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			<p>is 95% likelihood that the collision risk falls within the specified range.</p> <p>Recently the Band (2012) model has been developed to allow variability and uncertainty in input parameters to be explicitly incorporated into the collision risk modelling process, providing a more robust and transparent method of accounting for uncertainty in the estimation of seabird collision rates (McGregor et al 2018). This is done by specifying mean (or some other central tendency measure) parameter values and either standard deviations around these values or confidence intervals. The resultant collision risk predictions are reported as predicted mean collisions with an associated standard deviation and confidence intervals.</p>
Q1.2.59	NE	<p>Paragraph 5.2.3 of NE's representation [RR-097] questions the way in which nocturnal activity factors (NAF) have been applied to some species in the CRM.</p> <p>Please explain why you consider that the parameterisation of NAFs is wrong.</p> <p>How do you say it should be improved?</p> <p>Can you refer to any appropriate peer reviewed literature to support your view?</p>	<p>The Applicant has used nocturnal activity factors (NAF) of 3 for lesser black-backed gull and great black-backed gull, 2 for kittiwake and 1 for gannet in the CRM (see Table 1.3 of Annex 5.3 of the Applicant's ES).</p> <p>Band (2012) advises that NAFs derived from Garthe and Hüppop (2004) and King et al (2009) are used in the absence of actual night-time survey data or other empirical evidence of nocturnal activity levels for a species within the Band Model. These sources give lesser black-backed gull, great black backed gull and kittiwake NAFs of 3, and gannet a NAF of 2.</p> <p>Recent offshore windfarm submissions and papers (e.g. MacArthur Green 2015, MacArthur Green 2018 and Furness et al. 2018) have looked at data from tagging studies (in particular relating to gannet and kittiwake) to investigate whether empirical data on nocturnal activity levels relative to daytime activity levels can be derived from the tag data and therefore whether empirical NAFs can be produced for use in CRM.</p> <p>The Applicant refers to MacArthur Green (2015) as the basis for changing the NAF for gannet from 2 to 1, and for kittiwake from 3 to 2 in the ES documents. A NAF of 1 equates to zero nocturnal activity compared to daytime and a NAF of 2 to 25% nocturnal activity relative to daytime.</p> <p>However MacArthur Green (2015), MacArthur Green (2018) and</p>

			<p>Furness et al (2018) make different recommendations regarding the nocturnal activity of gannet – one concludes that nocturnal activity is higher in the non-breeding season compared to the breeding season, whereas the other papers conclude that nocturnal activity is higher in the breeding season. The three papers suggest different levels of nocturnal activity are used – but they also do not suggest that levels of nocturnal activity are zero – which is what a NAF of 1 relates to in the CRM.</p> <p>Natural England also queries the way the information from the tagging studies has been used in relation to definitions of daytime, night-time and twilight periods and the way these are incorporated in the Band Model, and the lack of consideration of variability and uncertainty in activity levels across the studies, across sites and different times of day and night.</p> <p>Natural England also do not agree with the Applicant that the proportional night-time activity levels calculated from the tagging studies can be applied to the monthly day-time activity levels from the Hornsea Three survey data.</p> <p>MacArthur Green (2015) was commissioned by the East Anglia Three offshore windfarm developer and MacArthur Green (2018) was commissioned by the Norfolk Vanguard OWF developer therefore are not in the peer-reviewed literature. Furness et al (2018) – which is not cited in the Applicant's ES is a peer reviewed paper, but was only published in July 2018. To Natural England's knowledge these analyses have not been peer reviewed.</p> <p>Natural England has provided details of the approach that we advise in relation to use of NAFs within the CRM assessment in paragraphs 3.9-3.13 of Annex C of our Written Representations. We agree that levels of nocturnal activity for kittiwake and gannet are likely to be lower than 50% and 25% of daytime activity levels respectively, but we do not consider that the values derived from the analysis of the tagging studies referenced above can be applied to the site specific Hornsea Three survey data on day-time activity levels.</p>
Q1.2.61	NE, RSPB	Appendix B of the ES [APP-109] outlines the	Natural England considers that the migratory front approach that the

		<p>approach to CRM that was applied to migratory seabirds.</p> <p>Notwithstanding your concerns about the baseline data and model parameterisation, do you agree with the underlying approach that was used for the CRM for migratory seabirds?</p> <p>If not, why not?</p>	<p>Applicant has used for CRM for migratory seabirds is an appropriate method for these species.</p>
Q1.2.64	NE, RSPB	<p>Appendix C of the ES [APP-109] outlines the approach to CRM that was applied to migratory water birds.</p> <p>Notwithstanding your concerns about the baseline data and model parameterisation, do you agree with the underlying approach that was used for the CRM for migratory water birds?</p> <p>If not, why not?</p>	<p>Natural England considers that the migratory front approach that the Applicant has used for CRM for migratory waterbirds is an appropriate method for these species.</p>
Q1.2.65	NE, RSPB	<p>Paragraphs 5.11.2.84, 5.11.2.205 and 5.11.2.221 of the ES [APP-065] identify the potential impacts associated with habitat loss, barrier effects and lighting.</p> <p>Notwithstanding your concerns about the baseline data, do you agree with the underlying approach that has been used to assess these impacts and the resulting conclusions?</p> <p>If not, why not?</p>	<p><u>Habitat loss</u></p> <p>Natural England is not clear what the Applicant's approach to the assessment of indirect effects on seabirds from changes in habitat or distribution of prey are. For example paragraph 5.11.2.84 of the ES [APP-065] refers to the Benthic Ecology and Fish and Shellfish Ecology chapters as the source of detailed assessments of the effects of indirect impacts on seabird prey resource and habitats, however these chapters only consider impacts in relation to the habitats or fish populations themselves and not on the seabird species that may depend on them. Whilst the overall conclusions regarding supporting habitats and prey species in their own right are highly relevant to understanding the impacts on seabirds, there are additional factors that may need to be considered before drawing overall conclusions. Natural England acknowledges that this is a complex area and difficult to quantify, but we believe that the ES would benefit from further qualitative analysis,</p>

			<p>relating the conclusions drawn in the Benthic and Shellfish Ecology chapters back to Seabird ecology.</p> <p><u>Barrier effects</u></p> <p>The Applicant has assessed barrier effects in a qualitative way on seabird species where Hornsea Three is within foraging range of a colony and also for species for which Hornsea Three may be a barrier to migration. Due to a lack of evidence on barrier effects on seabird species, Natural England agrees that only a qualitative assessment can be undertaken.</p> <p><u>Lighting</u></p> <p>Evidence relating to the impacts of lighting in the offshore environment is limited, therefore it is not possible to say with any certainty that the lighting associated with offshore turbines and ancillary structures would have a negligible or minor adverse effect on receptor populations.</p> <p>The Applicant suggests that most of the species likely to be present in large numbers are not generally active at night, but does not consider the possibility that the presence of offshore lighting at night could promote increased activity of these species. The Applicant has not provided information about the nature of the offshore lighting or potential mitigation that could be incorporated into the design. For example, the Applicant states that “<i>Lighting of wind turbines will meet minimum requirements, namely as set out in the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendation O- 117 on ‘The Marking of Offshore Wind Farms’ for navigation lighting and by the Civil Aviation Authority in the Air Navigation Orders (CAP 393 and guidance in CAP 764). In keeping with the minimum legal requirements, this will minimise the risks of migrating birds becoming attracted to, or disorientated by turbines at night or in poor weather.</i>”</p> <p>However, these minimum legal requirements have not been developed with reference to migrating birds, so it cannot be concluded that these measures will ‘minimise the risk’.</p> <p>As the level of risk associated with lighting is largely unknown, Natural</p>
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			England advise that the Applicant considers the OSPAR <i>Guidelines to reduce the impact of offshore installations lighting on birds in the OSPAR maritime area</i> (OSPAR Agreement 2015-08) (source: OIC 15/15/1, Annex 5) and develops a suitable protocol aimed at minimising potential impacts as far as possible.
Q1.2.66	NE, RSPB	<p>Paragraph 5.13.3.29 of the ES [APP-065] outlines the difficulties of evaluating the cumulative effects on the non-breeding component of the North Sea razorbill population.</p> <p>Do you agree that the complexities of the razorbill population structure preclude attempts to compare predicted displacement effects?</p> <p>If you do not agree, how might such an assessment be undertaken?</p>	<p>Natural England acknowledge that there are complexities in conducting a cumulative assessment for any species. However razorbill are not more challenging than other seabird species.</p> <p>For razorbill, Natural England recommend using a North Sea UK waters population scale to define the projects and population scale at which impacts should be assessed. Further information is provided in our response to Q1.2.82.</p>
Q1.2.67	NE, RSPB	<p>Paragraph 5.9.2.9 of the ES [APP-065] highlights guidance that recommends the use of a 4km buffer for divers and sea ducks. Paragraph 5.9.2.10 goes on to state that the displacement analysis for the cable corridor only included a 2km buffer.</p> <p>Do you agree with the choice of buffer zone for the cable corridor given the presence of common scoter and red-throated diver?</p>	<p>SNCB guidance (MIG-Birds, 2017) recommends the use of a 4 km buffer for divers and sea duck when estimating displacement caused by the presence of turbines (i.e. an offshore wind farm). Natural England accept the use of a 2km buffer for divers and sea duck (including common scoter and red throated diver) when estimating displacement caused by cable laying. The displacement driver in this context is assumed to be disturbance due to vessel presence, and based on current evidence, a 2 km buffer is sufficient to estimate displacement effects from shipping disturbance.</p>
Q1.2.69	Applicant, NE, RSPB	<p>Paragraph 1.3.3.2 of the ES [APP-108] outlines how predicted displacement mortality was evaluated when it exceeds a 1% background threshold. Paragraph 5.9.4.1 of the ES [APP-065] sets out the impact assessment criteria.</p>	<p>Natural England consider that comparing predicted mortality against background mortality is a useful tool, and advises that predicted mortalities that exceed 1% of baseline mortality for a population require further investigation as to the likelihood of significant impact.</p> <p>However, NE highlight that we have a number of concerns regarding the applicants approach to assessing displacement (see section 4 of Annex</p>

		<p>Please can the Applicant explain how these two approaches relate to one another in the determination of the significance of effects in section 5.9.4 of the ES [APP-065].</p> <p>Please can the Applicant explain how the levels of background mortality have been derived and outline any peer-reviewed, empirical evidence that supports the approach.</p> <p>Do NE and RSPB agree with the comparison of predicted mortality against background mortality as a means of determining the significance of any negative effects on bird populations?</p> <p>If NE and/or RSPB do not agree, how might such an assessment be undertaken?</p> <p>Are NE and RSPB satisfied with the way in which the predicted seasonal mortality has been presented in section 1.4 of the ES [APP-108]?</p>	<p>C in our Written Representations). SNCB advice is to conduct assessments at appropriate seasonal population scales and to sum seasonal assessments across the year. The applicant has presented comparisons on a seasonal basis alone (meaning the population scale, and hence background mortality alters between seasons). Additionally, as stated previously, NE does not agree with the definition of the seasons for gannet, puffin and kittiwake (kittiwake is not assessed for displacement, so in this case only puffin and gannet apply)</p> <p>Annual assessments should refer to the largest population scale used within the seasonal assessments.</p> <p>Notwithstanding our concerns regarding a) baseline data and b) seasonal definitions, we require that seasonal impacts are summed and presented at an annual level (at an appropriate population scale) and that uncertainty around the estimates are presented as secondary tables (upper and lower confidence intervals).</p> <p>We further note that Natural England does not agree with the selection of differing mortality rates for displacement in different seasons.</p>
Q1.2.70	NE, RSPB	<p>Table 5.9 of the ES [APP-065] summarises the assessment criteria for displacement effects and mortality rates for the array area.</p> <p>Do you agree with the displacement and mortality rates and if not, what values would you recommend?</p>	<p>In regards Table 5.9 of the ES [APP-065], we agree with the range of displacement rates identified under the column titled 'Displacement rate based on guidance interpreting Wade et al. (2016) sensitivity scores (%)' aside from Fulmar where we recommend a range of 30-70%. We do not however recommend the selection of a single 'evidence based' rate (the evidence base is equivocal) and instead recommend a matrix approach encompassing a suitable range of displacement rates (as per SNCB guidance, MIG-Birds 2017). In regards mortality rates we do not agree with the application of mortality rates for different seasons and again advise a range of mortality rates (e.g. 1-10%) are presented.</p>
Q1.2.72	NE	<p>Paragraph 5.2.4 of Natural England's representation [RR-097] highlights a concern</p>	<p>NE have two key concerns over the calculation of seasonal mean of peaks. The second of which impacts assessments for all species subject</p>

		<p>over the mean seasonal peaks that were used to calculate displacement mortality for gannet and puffin.</p> <p>Please explain why you consider that the values that have been used are inadequate.</p> <p>What effect do you think this is likely to have had on the impact assessment and the HRA?</p>	<p>to a displacement assessment (puffin, gannet, guillemot, razorbill, and fulmar)</p> <ol style="list-style-type: none"> 1. Definition of seasons. Displacement assessment requires the calculation of mean seasonal peaks (i.e. peak abundance in one year and peak abundance in the following is averaged to produce a mean peak abundance). NE do not agree with the breeding seasons presented for gannet and puffin, and recommend longer breeding seasons (which would therefore include more data points). This may lead to a higher mean peak in the breeding season, or may make no difference to the calculation, depending on when the peak month falls. Conversely, the non-breeding mean of peaks may be either reduced or remain the same. The applicant's seasonal definitions therefore may lead to an underestimate in the breeding season and an over-estimate in the non-breeding seasons. 2. As detailed in answer 1.2.38 above (and in section 2 of Annex C of our Written Representations) the baseline data set is incomplete (with only 20 months of data). This will result in population estimates for December, January, February and March being presented for a single survey year alone. Displacement effects require the calculation of seasonal mean of peaks – the peak abundance is selected from the monthly population estimates within a season (per year). In the case of Hornsea Three, there are four missing months, which will lead to some seasons having a number of missing months (this will vary depending on the season/species). As such, the calculation of mean of peaks will not fully capture the inter-annual variability in bird numbers at Hornsea Three and therefore there will be additional uncertainty associated with these estimates that cannot be quantified. In order to ensure that impacts are not underestimated as a result of this, Natural England advise that greater weight is placed on using the upper confidence intervals of the abundances in the calculation of appropriate displacement effects (see section 4.4 in Annex C of our Written Representations).
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Q1.2.75	Applicant, NE, RSPB	<p>Paragraph 5.7.2.95 of the ES [APP-065] states that the maximum foraging distance for kittiwake was determined from published evidence in Thaxter and others (2012).</p> <p>Could the Applicant explain how these estimates have been derived and to what extent they have been validated by satellite tracking data for the Valued Ornithological Receptors that may be affected by the project?</p> <p>Are NE and RSPB satisfied that the estimated maximum foraging distances are robust?</p>	<p>Natural England do not consider that the maximum foraging distance for kittiwake in Thaxter et al. (2012) is a robust estimate to use for the Flamborough and Filey Coast (FFC) SPA colony. Colony specific tracking data are available from this colony and indicate that maximum foraging distances are significantly greater than those presented in Thaxter et al (2012) (and noting that no data from FFC pSPA is included in the Thaxter et al (2012) estimate for kittiwake).</p>
Q1.2.82	NE	<p>Paragraph 5.2.7 of NE's representation [RR-097] states that the CEA should be applied across the whole annual cycle for each species at an appropriate scale.</p> <p>Please explain how you would expect to see such an assessment undertaken?</p>	<p>In order to undertake a CEA for a particular species it is necessary to define an appropriate population scale over which to assess predicted impacts. This geographic scale defines the "population" of individual birds that will be impacted as well as the identity of the plans and projects which have the potential to impact on these individuals.</p> <p>For the key species the Applicant needs to assess for CEA, Natural England consider that this spatial scale is broadly defined as the North Sea UK waters (but should be based on the relevant BDMPS scales defined in Furness (2015) for each species (which for some species, for example, includes English Channel waters)). This geographical scale will then encompass impacts from current North Sea UK projects from Beatrice to Thanet and Rampion in the English Channel as well as planned projects that fall within the UK North Sea scale.</p> <p>Natural England expects that for a CEA, impacts on all birds present across this spatial scale are considered, and impacts from all plans and projects within this North Sea BDMPS spatial scale are included across the whole annual cycle.</p> <p>At different times of the year, the North Sea BDMPS scale will include different numbers of birds and the origins of these birds will vary across</p>

			<p>seasons.</p> <p>During the breeding season a North Sea UK waters population scale broadly encompasses (depending on the species) birds breeding in colonies from Hermaness in Shetland, southwards down the North Sea east coast of the UK. Individuals present in the North Sea BDMPS scale during the breeding season months (and therefore potentially impacted by projects within this scale) will predominantly be birds deriving from these colonies. During the non-breeding season months a proportion of these breeding birds will have moved to waters outside the North Sea BDMPS, but individuals from colonies outside the BDMPS scale will also have moved into the region e.g. from colonies in Russia, Iceland, Norway, Faeroes as well as UK colonies that lie outside of the North Sea BDMPS scale, e.g. on western coasts. The number of birds present in the North Sea BDMPS scale for the non-breeding seasons can be derived from Furness (2015).</p> <p>The total number of birds that are predicted to be impacted by all plans and projects within the BDMPS spatial scale (e.g. UK North Sea) across the whole annual cycle should be summed and the significance of the impact assessed by reference to the population size of birds associated with the BDMPS scale. As the number of birds within the BDMPS scale will vary with season, Natural England advises that the annual impact should be assessed against the largest population size present across any season.</p> <p>Additionally predicted impacts for each season can be compared against the total BDMPS population size for that particular season as a means of identifying if impacts on specific sub-populations could be significant.</p>
Marine Mammals			
Q1.2.87	NE	Paragraph 5.5.1 Paragraph of NE's representation [RR-097] refers to a lack of 'at source' mitigation of piling noise. Paragraph 4.11.1.39 of the ES [APP-064] refers to the Joint Nature Conservation Committee piling	The JNCC piling mitigation protocol was published in 2010 and while it still contains useful mitigation, it is out of date considering the scale of proposed new developments and the size of potential auditory injury and disturbance zones. The protocol only considers injury zones and only details the use of marine mammal observers (MMOs), passive acoustic monitoring (PAM) and soft starts as mitigation (i.e. no detail on 'at

		mitigation protocol. Why do you consider that this would not ensure adequate mitigation?	source' mitigation). There is a range of other alternatives which are being used in other European countries to reduce the underwater noise impact of piling (injury and disturbance). It is Natural England's view these should be detailed within the ES. However, Natural England does note the applicant's commitment to mitigation (including reduction at source technology) as part of the conditions in relation to the harbour porpoise Southern North Sea SCI. NE welcomes this condition, but further discussion will be required on mitigation options in a suitable timescale to be implemented if required.
HRA			
Q1.2.93	NE	Please provide up-to-date conservation objectives, site improvement plans and supplementary advice for all offshore European sites which you consider are likely to experience significant effects as a result of the proposal.	Please refer to Section 5 of the Written Representations for all the up to date information on the European Sites and their Conservation Objectives.
Q1.2.96	NE	Section 2 of NE's representation [RR-097] lists the European site features for which outstanding concerns remain. The features listed for Flamborough Head and Bempton Cliffs SPA include several which are listed as part on an overall assemblage. However, the conservation objectives for this site only refer to one qualifying feature which is a breeding population of black-legged kittiwake. Please explain this apparent discrepancy. A number of qualifying features are noted for which likely significant effects have been excluded: <ul style="list-style-type: none"> • Flamborough and Filey Coast 	In reference to the Flamborough Head And Bempton Cliffs SPA, the inclusion of assemblage features is an error. The only qualifying feature should be the breeding population of black-legged kittiwake. Thank you for highlighting this discrepancy and for providing Natural England the opportunity to clarify. Natural England has previously raised concerns around the approach to LSE screening within this application. The structure of the HRA screening within this application means that features are effectively screened out if they are deemed to be no LSE alone, and therefore are not considered in-combination. Natural England considers that the Likely Significant Effect (LSE) should be applied as a 'coarse filter' identifying potential effect pathways that warrant further consideration through appropriate assessment. A feature should not be screened out unless it can be clearly demonstrated that there is no impact alone and/or in combination.

		<p>proposed SPA (pSPA) - fulmar, puffin, herring gull, cormorant and shag as part of the overall assemblage;</p> <ul style="list-style-type: none"> • Greater Wash SPA - common tern and little tern; and • North Norfolk Coast SPA - sandwich tern, common tern and little tern. <p>Please explain why you consider that these features would be subject to likely significant effects.</p> <p>Please confirm that there are no other European sites or features that should be included in the HRA other than those listed under Section 2.</p>	<p>Natural England also notes that some features have been screened out of further assessment based on the numbers of birds identified within the Hornsea Three site specific surveys. As this baseline information is incomplete, Natural England would not consider it possible to rule out LSE in some cases. Particularly for features such as Herring gull that are more likely to occupy the site in the winter period.</p> <p>Natural England is not in a position to undertake our own screening exercise, but based on our concerns around this approach, we are unable to confirm that Table 2 [RR-097] provides a complete list of features and European sites that require consideration within the HRA.</p> <p>Natural England considers that there are potential effect pathways that require further consideration through Appropriate Assessment for the following SPA features specifically listed in the ExA question 1.2.96:</p> <ul style="list-style-type: none"> • Flamborough and Filey Coast SPA <ul style="list-style-type: none"> - fulmar, puffin and Herring gull as part of the overall assemblage; <p>For fulmar, the Hornsea Three project is within foraging range of FFC pSPA and there is a therefore a potential impact pathway e.g. from displacement of birds from the project area. Whilst fulmar may be considered as having low sensitivity to disturbance, it is Natural England's view that it is premature to rule out an LSE on fulmar from displacement effects, given i) the potential impact pathway; ii) unresolved issues with the adequacy of the baseline survey data which means the importance of the array site for this species cannot be adequately quantified and iii) that there has been no consideration by the Applicant of in-combination impacts from multiple offshore windfarms within the distributional range of the fulmar feature of FFC pSPA.</p> <p>For puffin there is potential connectivity between Hornsea Three and FFC pSPA in both the breeding and non-breeding seasons as acknowledged by the Applicant in Annex 3 of their RIAA, and therefore potential impact pathways e.g. from displacement of birds from the project area. It is therefore Natural England's view that an LSE on puffin from FFC pSPA cannot be excluded given i) the potential impact</p>
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			<p>pathway; ii) unresolved issues with the adequacy of the baseline survey data which means the importance of the array site for this species cannot be adequately quantified and iii) that there has been no consideration by the Applicant of in-combination impacts from multiple offshore windfarms within the distributional range of the puffin at FFC pSPA.</p> <p>For Herring gull there is potential connectivity and an impact pathway (collision risk) between Hornsea Three and FFC pSPA in the non-breeding season as some birds present in the project area will be from FFC pSPA (Furness 2015). It is therefore Natural England's view that an LSE on Herring gull from FFC pSPA cannot be excluded given i) the potential impact pathway; ii) unresolved issues with the adequacy of the baseline survey data which means the importance of the array site for this species cannot be adequately quantified and iii) that there has been no consideration by the Applicant of in-combination impacts from multiple offshore windfarms within the distributional range of Herring gull at FFC pSPA.</p> <p>Natural England do not consider there to be an impact pathway between the shag or cormorant population of FFC pSPA and Hornsea Three and therefore they would not be subject to likely significant effects from the project. (These features were included in Table 2 due to our overarching concerns regarding the screening processes).</p> <ul style="list-style-type: none"> • Greater Wash SPA – common tern, little tern • North Norfolk Coast SPA – Sandwich tern, common tern, little tern <p>For the tern features of the Greater Wash SPA and North Norfolk Coast SPA (Sandwich tern, common tern and little tern are all qualifying species at both SPAs) the offshore cable corridor maximum design scenario overlaps with the boundaries of the SPAs where these species are features. Further, based on the location of the cable corridor there is the potential for overlap in key areas of usage within the SPAs by these species. Potential impact pathways on these SPA features include displacement and disturbance impacts, as well as indirect effects on</p>
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			prey availability associated with construction/laying of the cable. Natural England therefore considers that it is not possible to conclude no LSE for Sandwich tern, common tern and little tern features of North Norfolk Coast SPA and the Sandwich tern, common tern and little tern features of the Greater Wash SPA.
Q1.2.98	NE	<p>Paragraph 5.4.7 of NE's representation [RR-097] refers to sub-features associated with the Wash and North Norfolk Coast Special Area of Conservation (SAC).</p> <p>Please list the sub-features of the sandbank feature.</p> <p>In your view, how should the assessment of site integrity take account of these sub-features?</p>	<p>Please see Section 5 of the Written Representations that provides a link to Natural England's designated Sites system, where it lists all of the Annex I features of the site and then if you click on those it lists all of the sub-features of the site – which in particular include coarse and mixed sediments as sub features to both Large shallow inlets and bays and Annex I habitats slightly covered by sea water all of the time.</p> <p>Under Natural England's advice on operations for cabling (including protection) within the conservation advice package both of these sub-features are demand to be sensitive to the many of the pressures resulting from cable activities. This will need to be considered further when considering the conservation objectives for the site and supplementary advice on conservation objectives which states 'Maintain the existing distribution of sediment composition across the feature.'</p>
Q1.2.99	NE	<p>Paragraph 5.4.7 of NE's representation [RR-097] states that other offshore wind farms that have routed their cables through The Wash and North Norfolk Coast SAC have had to undertake remedial works which may have caused further damage to the SAC.</p> <p>Please provide further details of the nature of the remedial works, the extent of the damage and the effect that you consider this has had on the integrity and conservation status of the SAC.</p>	Natural England has provided further detailed comments on cable installation challenges in the present Written Representations (Annexes D1, D2 and D5).
Q1.2.101	NE, MMO	Paragraph 5.6.2.35 of the Report to Inform Appropriate Assessment [APP-051] states that the North Norfolk Sandbanks and Saturn	We refer the examining authority to the site Supplementary Advice on Conservation Objectives (http://jncc.defra.gov.uk/pdf/NNSSR_SACO_v1_0.pdf) for consideration

		<p>Reef SAC sandbanks are dynamic and mobile and are therefore considered to have moderate levels of recoverability.</p> <p>Do you agree with this assessment of the recoverability of the SAC sandbank feature?</p> <p>Please refer to any peer reviewed evidence that may be available in support of your response.</p>	<p>of recovery and its peer reviewed evidence base.</p> <p>We note that levels of small-scale sandwave recovery are being seen associated with cabling activities at Race Bank (provided in the clarification note for sandwave levelling). However, we remain unsure of the full extent and distribution of likely recovery. We are also unsure how this would relate to recovery from Hornsea Three cabling operations.</p> <p>We also note that overall feature recovery rates and amounts remain uncertain, and should be assessed on a site-wide basis. Please see Annex D3 in relation to the Sandwave levelling clarification note received from the Applicant on 9th October 2018.</p>
Q1.2.102	NE	<p>Paragraph 5.4.1 of the NE's representation [RR-097] states that the sandbank and reef features of the North Norfolk Sandbanks and Saturn Reef SAC are in an unfavourable condition.</p> <p>Do you consider that any other features of offshore European sites that are relevant to this application are currently in an unfavourable condition?</p>	<p>There are only two Annex I features of North Norfolk Sandbanks and Saturn Reef SAC namely 'Sandbanks slightly covered by seawater all of the time' and Annex I <i>Sabellaria spinulosa</i> reef.</p> <p><u>For you information and to provide context</u></p> <p>The Third Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2007 to December 2012 contains national level information on sandbanks covered by seawater all the time. This conclude that for Specific structures and functions (incl. typical species), condition is inadequate (declining) because 10.9% of the resource is considered to be in unfavourable condition based on SAC data, SSSI/ASSI data and vulnerability assessments for this habitat in UK offshore waters. Available site condition data indicate that more of the habitat in unfavourable condition is declining than recovering (for SACs and SSSI/ASSIs = 8847 ha declining and 0 ha recovering.</p> <p>The Third Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2007 to December 2012 contains national level information on reefs. This conclude that for Specific structures and functions (incl. typical species), condition is inadequate (declining) because 16.1% of the resource (2.4.1) is considered to be in unfavourable condition based on SAC data, SSSI/ASSI data and a vulnerability assessment in UK offshore waters. Available site condition data indicate that more of the habitat in unfavourable condition is declining than recovering (for SACs and</p>

			SSSI/ASSIs = 95803 ha declining and 35010 ha recovering). NNSSR reefs and sandbanks are expected to contribute to national-level recovery of feature.
Q1.2.108	NE	TWT [RR-047] considers that fishing activity should be included in the in-combination assessment rather than in the ES baseline. What is your view on this point?	When assessing the effects of a plan or project it is a requirement of the Habitats Directive that consideration is given to whether those effects are likely to be significant either individually or in combination with other plans or projects. In seeking to avoid deterioration and to properly assess the likely effects of a plan or project it is appropriate to take account of the prevailing factors acting on the site to the extent that they are capable of influencing the conservation objectives for the site. Where there is ongoing fishing activity on the site, it is appropriate to consider the effects of the plan or project that is the subject of the assessment in the context of those prevailing conditions, of which fishing impact may be one.
Q1.2.109	NE	Paragraph 5.5.9 of NE's representation [RR-097] identifies the potential importance of considering the in-combination effects of other cable and pipeline installations in terms of UXO detonations within the Southern North Sea cSAC. Please explain how this effect could be meaningfully addressed given the significant uncertainties associated with the specific locations of UXO?	Natural England suggests that the HRA could review recent cable/pipeline applications where work has been undertaken to remove UXOs to get an idea of the average number being found and/or detonated. This would allow a general assessment to be added into the HRA based on the projects that could overlap with the Hornsea Three development.
Q1.2.113	NE	Paragraph 5.5.3 of NE's representation [RR-097] states that, in addition to a Marine Mammal Mitigation Protocol, there should be a Site Integrity Plan to mitigate the impact of the proposal on harbour porpoise. Please explain what you would expect to see covered by such a plan and what additional benefits it would offer?	Natural England would refer to the example of the outline site integrity plan (SIP) submitted in support of East Anglia Three OWF Application. The outline plan was able to give more detailed information on the potential mitigation that could be used, ruled out mitigation that was not applicable and thus reduced the area of uncertainty. This is not possible or appropriate to do within a licence condition. The outline SIP also addressed the need for additional consents such as EPS licences and Marine Licences for UXO detonations.

			<p>In addition, the outline plan gave a timetable for the development of the final plan, it included when and where it would consult Natural England and non-statutory stakeholders, to give a clear indication of what could be expected and assurances that advice would be sought in an appropriate and timely fashion. The East Anglia Three outline SIP also included timeframes for provision of updated information and assessments to allow for consideration of further HRA within a timely fashion i.e. twelve months prior to construction an updated plan would be submitted, nine months prior to construction an updated noise assessment and confirmation of project design and installation techniques, final plan to be submitted four months prior to construction. This gives an appropriate timeframe for consideration of the updated information, significantly reduces the risks of delay of authorisation and gives clear time for concerns to be raised and addressed.</p> <p>We would like to note that since submitting our Relevant Representations, the Applicant has issued an in-principle Southern North Sea SCI SIP. Natural England has not provided any comments on the draft SIP, as it is our view that agreement on the HRA conclusions needs to be achieved in the first instance, as those are carried over into the SIP.</p>
Q1.2.114	NE, MMO, TWT, Whale and Dolphin Conservation	<p>Conditions 11(4) and 11(5) of the Generation Assets DML and 12(4) and 12(5) of the Transmission Assets DML [APP-027] seek to mitigate potential effects on marine mammals from piling operations.</p> <p>To what extent do you consider that this would be an effective approach?</p>	<p>Natural England would refer to its comments above and in our Relevant Representation paragraph 5.5.3. Natural England considers that a site integrity plan and conditions provides a better approach to ensure appropriate mitigation. The conditions may provide the bare minimum assurance needed that impacts will be mitigated.</p> <p>However, the timeframe for the submission within four months of construction does not, in Natural England's opinion, provide sufficient time for appropriate consideration of the updated information or to conduct a review of these impacts and a potential HRA, or appropriate time for consultation on an HRA. It also does not ensure that appropriate information will be included within the final report submission to allow a sufficiently detailed HRA to be conducted.</p>
Q1.2.115	Applicant	Paragraph 5.2.10 of the NE's representation	Please refer to section 7.16 - 7.17 of Annex C in our Written

		<p>[RR-097] states that data relating to monthly age classes for breeding birds and the proportions of unaged birds were not provided.</p> <p>Please comment on NE's concerns and provide any additional data that may assist.</p>	<p>Representations.</p>
Q1.2.117	Applicant, NE	<p>Paragraph 5.2.8 of NE's representation [RR-097] states that the use of population viability assessment from Hornsea Project Two was not suitable to determine the impacts on the Flamborough and Filey Coast pSPA.</p> <p>Please could NE provide further detail on this point and indicate how it considers that the long-term effects on bird populations associated with the pSPA should be assessed?</p> <p>Why is the population viability analysis for kittiwake and gannet for 25 years when the project would have a 35 year operational phase?</p> <p>Would the Applicant's approach lead to an underestimate of impact?</p>	<p>Natural England has provided detailed comments on the Applicant's population viability assessment in Annex C of our Written Representations (Section 6).</p> <p>In summary Natural England does not consider the Hornsea Two PVA models to be suitable for the assessment of impacts on FFC pSPA arising from Hornsea Three because:</p> <ol style="list-style-type: none"> 1. The Hornsea Two PVA models were projected over 25 years whereas Hornsea Three has an operational lifetime of 35 years; 2. The metrics of population impact and confidence intervals were not generated by a matched runs approach in the stochastic versions of the model; 3. The model outputs are based on adding the windfarm mortality as adult currency only, whereas for Hornsea Three there are some species where potential impacts are predicted for immature age classes only; 4. The counterfactual of growth rate metric has been measured using median growth rate over the population trajectory period (from year 5 to 25) but should be measured using the growth rate in the final year of the projection; 5. It is not possible to derive (and the Applicant has not provided) information on the model outputs across the range of predicted impacts that Natural England thinks should be considered for Hornsea Three (including in-combination impacts with other plans and projects). <p>Natural England considers that the longterm effects on bird populations</p>

			<p>associated with Flamborough and Filey Coast pSPA should be assessed using the counterfactual of final population size and counterfactual of growth rate derived from PVA models that are structured in the way outlined in Annex C of our Written Representations (Section 6). Natural England recommends interpreting the metrics from population modelling against a framework of considerations including the Conservation Objectives for that site/population, focal and wider population status, threats and pressures acting on the population and policies which may change the wider population status.</p> <p>The Applicant's approach whereby PVA models are run over 25 rather than 35 years would lead to an underestimate of impact, given that if the windfarm has an operational period of 35 years, then potential impacts occurring in the last ten year of operation are not being accounted for in the models. Natural England note that the Applicant has tried to account for this by extrapolating the impacts predicted after 25 years to 35 years. It is less clear what effect this will have on the predicted impact and whether it would be an underestimate, as the result would depend on details such as whether the model is a density independent or density dependent one. The solution to this would be for the Applicant to present models and outputs that have been run over 35 years and are therefore applicable to Hornsea Three.</p>
Q1.2.118	Applicant, NE	<p>The European Court of Justice has made a recent ruling which may have implications for the assessment of the integrity of European sites (case C-164/17 - <i>Reference for a preliminary ruling from Supreme Court (Ireland) made on 3 April 2017 — Edel Grace, Peter Sweetman v An Bord Pleanala</i>).</p> <p>Please could the Applicant and NE comment on any implications they think this judgement has for the appropriate assessment of this application in relation to offshore European sites.</p>	<p>Natural England is currently reviewing this recent ruling and considering its implications. We are not able to provide further comment at this time, but will provide our view on this matter as soon as we are able.</p>

4. Ecology – Onshore			
Ref	Question to	Questions	Natural England's comments
Q1.4.5	Natural England (NE)	<p>Paragraphs 5.6.1 and 5.6.2 of NE's representation [RR-097] state that there is insufficient information on groundwater flows to determine the hydrological impact of a nearby crossing point [HDD 53] on Booton Common Site of Special Scientific Interest and Norfolk Valley Fens Special Area of Conservation.</p> <p>Why do you consider that section 4.7 of the ES [APP-127] is not sufficient in this regard?</p> <p>What further information do you think is required to determine whether there would be a hydrological impact on any of the interest features?</p>	<p>It is Natural England's view that the Outline Code of Construction Practice (CoCP) is too general and does not provide specific information in relation to individual protected sites. Clear signposting to other parts of the ES should have been provided as it is currently difficult to determine if all the potential impacts have been identified. The information currently focuses on the flood risk and not ecological impacts of flooding and runoff, which has been overlooked in our view.</p> <p>The assessment focuses on 'typical' rain events and we do not have certainty that the proposed systems will be fit for purpose on the ground, under conditions of heavy/'non-average' rainfall events, that have been occurring more and more frequently in the past years. The ES should have accounted for such events and acknowledged the likelihood of their occurrence. Natural England would like to see <i>commitment to address</i> our concerns and to deliver appropriate mitigation if required.</p> <p>We advise that further information is obtained from the Environment Agency and used in a detailed appraisal of groundwater effects, e.g. WetMex data showing the water supply mechanism for all the component sites and/or Environment Agency's groundwater modelling. If the updated appraisal shows that the installation of the cable route would affect the groundwater supply to these sites, then a detailed assessment should be undertaken and mitigation measures implemented to minimise any identified effects.</p>
Q1.4.16	NE	Paragraph 4.3.2.1 of the Outline Ecological Management Plan [APP-180] states that if a district-wide licensing approach for great crested newts is available to the project	Strategic licensing utilises species distribution models, supported by surveys carried out by Natural England to determine great crested newt (GCN) presence in the landscape, and as such pre-commencement surveys are not required. The modelling will create risk zones in the

		<p>then this might reduce the requirement for pre-commencement surveys and specific mitigation measures such as exclusion fencing.</p> <p>What are your views on this statement?</p> <p>What is the likelihood that such a license would be granted in this instance?</p>	<p>strategy area which predict the likelihood of impacting GCN populations.</p> <p>On-site mitigation is also not a requirement, as conservation effort is focused on increased habitat improvements at a landscape scale, which are funded by the developer paid tariff. The tariff is calculated based on the predicted impacts of the development to ponds and the risk zone which the site sits in.</p> <p>At present, survey data and modelling has not begun in Norfolk and the strategy here is not expected to be rolled out until 2020, at which point tariff costs could be estimated. The traditional licensing approach will still be in operation at this point and includes use of the New Licensing Policies, which may also potentially facilitate reduced survey and mitigation in return for increased compensation. The different approaches should be carefully considered based on costs and timings.</p> <p>In Natural England's Relevant Representation point 5.6.10 we make reference to submission of a draft licence application to the Natural England licencing team such that a Letter of No Impediment (LONI) could be provided at this stage if the proposed mitigation measures are agreeable. However we are yet to receive this from the applicant and therefore cannot fully comment on the likelihood of a licence being granted at this time.</p>
HRA			
Q1.4.21	NE	<p>Paragraph 5.6.1 of NE's representation [RR-097] states that there is insufficient information to determine groundwater impacts on the Norfolk Valley Fens SAC either alone or in combination with the Norfolk Vanguard cable corridor route.</p> <p>What additional information do you think is necessary for you to comment on the alone and in combination effects of the proposed cable corridor on the SAC?</p> <p>What mitigation measures do you think</p>	<p>We advise that further information is obtained from the Environment Agency and used in a detailed appraisal of groundwater effects, e.g. WetMex data showing the water supply mechanism for all the component sites and/or Environment Agency's groundwater modelling. If the updated appraisal shows that the installation of the cable route would affect the groundwater supply to these sites, then a detailed assessment should be undertaken and mitigation measures implemented to minimise any identified effects.</p> <p>An 'in-combination' assessment with Norfolk Vanguard should also be undertaken as this cable route passes about 600 m to the north of Booton Common and construction periods may overlap.</p>

		might be appropriate?	Until further assessment is provided Natural England is unable to advise on any potential site specific mitigation measures,
Q1.4.22	NE	Please provide up-to-date conservation objectives, site improvement plans and supplementary advice for all onshore European sites that you consider likely to experience significant effects as a result of the proposal.	Please see Section 5 of the WR which provides a link to the conservation advice packages for European protected sites. Please note that both the River Wensum SAC and the Norfolk Valley Fens SAC conservation advice packages are currently being updated. The Examining Authority should refer to the published Conservation Advice in the meantime, as referred to in Section 5 of the WR.
Q1.4.24	Applicant, NE	The European Court of Justice has made a recent ruling which may have implications for the assessment of the integrity of European sites (case C-164/17 - <i>Reference for a preliminary ruling from Supreme Court (Ireland) made on 3 April 2017 — Edel Grace, Peter Sweetman v An Bord Pleanala</i>). A previous question seeks views on any implications this judgement may have for appropriate assessment in relation to offshore European sites. Do you have any further or different comments in relation to onshore European sites?	Natural England is currently reviewing this recent ruling and considering its implications. We are not able to provide further comment at this time, but will provide our view on this matter as soon as we are able.

13. Content of the DCO			
Ref	Question to	Questions	Natural England's comments
General			
Q1.13.1	Marine Management Organisation	The Applicant's additional submission [AS-003] sets out the relationship between the design parameters in the dDCO [APP-027]	Natural England has reviewed the additional document submitted and our detailed comments are provided in Annex B of our WR.

	(MMO), Natural England (NE)	and those in the ES. Does this submission address your concerns regarding the relationship between the areas and volumes of material set out in the ES and those referred to in the dDCO?	
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15. General			
Ref	Question to:	Questions	Natural England's comments
Q1.15.8	NE, EA, RSPB, Norfolk Wildlife Trust, Broadland District Council, North Norfolk District Council, South Norfolk Council	Please comment on the Outline Code of Construction Practice [APP-179] and comment on any potential amendments that may, in your view, be required in order the secure appropriate environmental outcomes and regulatory compliance.	It is Natural England's understanding that the Code of Construction Practice would list a number of legal obligations under the DCO. We therefore advise that as much detail is included as possible. Natural England would like to be consulted on the final proposals of the CoCP post-consent. We suggest that any opportunity to enhance the local environment should be used by the Applicant. We refer the Applicant to the National Character Area profiles that coincide with the proposed cable route and associated works for the information on the characteristic features of the area, which should be preserved.
Q1.15.11	NE, EA, RSPB, NWT	Please comment on the Outline Ecological Management Plan [APP-180] and comment on any potential amendments may, in your view, be required in order to secure appropriate environmental outcomes and regulatory compliance.	Natural England agrees in principle with the Outline EMP, but this should remain a live document and updated regularly . We note that currently it makes a number of references to the CoCP, which is relatively vague.

Q1.15.12	NE, BDC, NNDC, SNC	Please comment on the Outline Landscape Management Plan [APP-181] and comment on any potential amendments that may, in your view, be required in order to secure appropriate mitigation of landscape and visual impacts.	Natural England's remit in relation to landscape issues only extends to the Areas of Outstanding Natural Beauty (AONBs). We therefore have no comments to make on the Outline Landscape Management Plan.
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