



THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL PROCEDURE RULES)
2010

Hornsea Offshore Wind Farm (Zone 4) - Project Two

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

15th July 2015

Question to:	Question:	Natural England's Answer at Deadline I:
EOO	Ecology offshore – ornithology	
EOO1	Applicant, Natural England (NE) and RSPB Further to ongoing discussions post-acceptance, and NE Relevant Representations [RR-021], please provide an update on SoCG for offshore ornithological issues?	Please refer to the SoCG for Offshore Ornithology between the Applicant and Natural England for an update on offshore ornithological issues.
EOO2	Applicant, NE and RSPB Please report on progress made in resolving the baseline data issues raised primarily in the Section 42 Response and Relevant Representations [RR-021] by Natural England and the RSPB [RR-028] in relation to the applicant's ornithological assessment for the Hornsea Project 2 alone, in particular issues about: (a) Methods used to derive population estimates, with inter alia an explanation of the reasons for the differences between the species counts data for Hornsea Project 1 and Hornsea Project 2. (b) Treatment of incomplete and missing survey data (eg for month of December) and contributions of more	An update on the progress made in resolving baseline data issues can be found in the SoCG between the applicant and Natural England. An update on progress on these particular points can be found in Natural England's WR. a) Paragraphs 6.5.13 – 6.5.25 of Natural England's WR: The Applicant has provided Natural England with updated tables showing the numbers of birds recorded both on the water and in flight in the baseline surveys that were subsequently used to produce population estimates. Natural England understands that final versions of these data tables will be submitted by the Applicant at Deadline I and Natural England will review the final versions of these for Deadline II. These data have been provided to demonstrate that the relationship between the raw data and the population estimates derived from them do reflect the appropriate Distance correction for birds on the water and the extrapolation from sample area to Project area for both birds on the water and birds in the air.

Question to:	Question:	Question:	Natural England's Answer at Deadline I:
		<p>recent surveys, subsequent to those completed in 2013, including aerial surveys.</p> <p>(c) Clarification of treatment of unidentified species and their apportioning to various species categories;</p> <p>(d) The accuracy of boat based observations of Percentage of birds at Collision Height (PCH) collected at fine scale resolution, approaches to account for uncertainty in flight height data, plus the over-use of site-specific data rather than more generic data sources (e.g. Cook 2012).</p> <p>(e) Data on relevant Biologically Defined Minimum Population Scales (BDMPS) used to assess impacts in EIA.</p> <p>(f) The assumptions used to apportion birds to SPAs in different seasons, for kittiwakes, gannets and auks.</p>	<p>The Applicant has indicated that they are not able to provide a fully worked example of how the raw counts have been converted to population estimates for the whole Project area, but consider that provision of the correct values of the raw data at the correct scale used to generate the population estimates will be sufficient to infer the data is appropriate.</p> <p>Regarding the differences between the population estimates and confidence limits generated for Hornsea Project 1 compared to Hornsea Project 2, the Applicant has not provided evidence to explain the differences between the population estimates. Natural England consider that given the variability and uncertainty around the calculated populations estimates, it is important that upper and lower 95% confidence limits around the population estimates of birds are considered when evaluating the potential impacts on receptor species.</p> <p>b) Paragraphs 6.5.26 – 6.5.29 of Natural England's WR: Following discussions with Natural England, the Applicant has proposed several methods for addressing the issue of the missing and incomplete baseline survey coverage and will present the results of applying these methods, including population estimates derived using these methods for the months of low or no survey coverage, at Deadline I. Natural</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline I:
			<p>England will review these submissions and update the draft SoCG between the two parties for Deadline II.</p> <p>c) Paragraphs 6.5.30 – 6.5.32 of Natural England's WR: The Applicant has provided clarification that unidentified individuals were randomly assigned to species using information on the proportional occurrence of each species in the survey area prior to the generation of population estimates for species using Distance. The Applicant has also provided tables that now include these "unidentified" individuals apportioned to the count data used in the analyses. Natural England is content that the method used to assign unidentified species to species level is appropriate and the figures derived are suitable for use within the impact assessment and this is captured in section 3.2.2 of our Statement of Common Ground.</p> <p>d) Paragraphs 6.5.34 – 6.5.37 of Natural England's WR: The validity of using the Hornsea site specific flight height data to assess collision risk remains an area of disagreement between Natural England and the Applicant. Due to the considerable uncertainty regarding the site specific flight height data, Natural England will base its assessment of potential impacts on the outputs of Band Model Option 2 which uses the generic information on flight heights and provides information on confidence limits around these. The</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline I:
			<p>Applicant has presented collision outputs derived from Band Model Option 2, although these do not form the basis of the Applicant's assessment of impacts from potential collisions.</p> <p>e) Paragraph 6.5.85 of Natural England's WR: This issue is still under discussion between the two parties and an update will be provided at Deadline II</p> <p>f) Paragraphs 6.5.38 – 6.5.58 of Natural England's WR: This issue is still under discussion between the two parties. The Applicant has indicated that that they will submit updated apportioning assessments for kittiwake, gannet and auks at Deadline II.</p>
EOO4	Applicant, NE and RSPB	<p>What progress has been made in resolving the methodological issues raised primarily in the Section 42 Response and Relevant Representations [RR-021] by Natural England /JNCC and the RSPB [RR-028] in relation to the applicant's ornithological assessment for the Hornsea 2 project alone, including issues in relation to:</p> <p>(a) further allowance for <i>uncertainty</i> around the outputs of the CRM, in particular in relation to density of birds in the project</p>	<p>a) This is still a matter of ongoing discussion between the Applicant and Natural England. Please see paragraphs 6.5.59 – 6.5.67 in Natural England's WR for an update on Natural England's position.</p> <p>Following discussions subsequent to submission of our Relevant Representations [RR-021], Natural England understands that the Applicant will submit an updated collision risk assessment at Deadline I.</p> <p>In this submission, the Applicant has agreed to present CRM outputs for all 4 species as requested by Natural</p>

Question to:	Question:	Natural England's Answer at Deadline 1:
	<p>area, flight height of those birds, and uncertainty in PCH figures derived from boat based surveys;</p> <p>(b) <i>Collision Risk Modelling (CRM)</i> methodology:</p> <p>(i) how much weight do the interested parties give to the published findings in the Marine Scotland Report (Dec 2014) on appropriate Avoidance Rates (ARs) for various Band model Options for various species;</p> <p>(ii) further update on this AR work, and responses to it—especially in relation to use of the Band Extended Model;</p> <p>(iii) the NE position on the applicant's CRM approach for migratory species; and</p> <p>(iv) the need for use of a Population Viability Analysis (PVA) in addition to the Population Biological Removal (PBR) approach?</p> <p><i>With regard to the above--please provide the</i></p>	<p>England that use:</p> <p>a. The best estimate and upper and lower CLs around the densities for birds in flight for outputs from the Basic Band Model Options 1 and 2 (as well as for the Extended Band Model Options 3 and "4");</p> <p>b. The maximum likelihood, upper and lower CLs for the generic flight height data for Basic Band Model Option 2 (as well as Extended Band Model Option 3);</p> <p>c. The avoidance rates and SDs as recommended by the SNCBs (JNCC et al 2014);</p> <p>Together, these outputs will allow consideration of the uncertainty around the species densities at the Project site, avoidance rates and the generic flight height data to be considered in relation to predicted project impacts from collision mortality.</p> <p>The accuracy of the site based PCH values and the validity of converting flight height data to one metre resolution values for use in the Extended Band Model (as an Option 4 variant) remain areas of disagreement between Natural England and the Applicant.</p> <p>Natural England advised that collision risk outputs based on the site specific flight height data needed to include consideration of the variability in the data, including the uncertainty resulting from measurement errors. Without any consideration of this uncertainty in the site specific</p>

Question to:	Question:	Natural England's Answer at Deadline 1:
	<p><i>ExA with copies of recent papers on ARs produced by Smart Wind and Forewind (2013) and by SNCB (2014)</i></p>	<p>flight height data, Natural England will focus its assessment of collision impacts on outputs generated from Band Model options that use the generic flight height data (Basic Band Model Option 2 for gannet and kittiwake and Basic Band Model Option 2 alongside Extended Band Option 3 for great black-backed gull and lesser black-backed gull).</p> <p>b)</p> <p>i) Natural England's position regarding the published findings in the Marine Scotland Report (Dec 2014) on appropriate Avoidance Rates (ARs) for various Band model Options for various species:</p> <p>Following peer review and publication of the Marine Scotland Science Avoidance Rate Review (Cook et al 2014), the SNCBs (JNCC, NE, NRW, SNH, NIEA) published a summary of our recommendations on best practise impact assessment of collision risk for birds with offshore wind turbines taking account of the evidence presented in the AR Report.</p> <p>The SNCBs published a position statement which includes a change in our advice on avoidance rates for use with collision risk modelling based on evidence presented in the report.</p> <p>In summary the SNCBs position adopts the ARs</p>

Question to:	Question:	Natural England's Answer at Deadline 1:
		<p>recommended for use with the Basic Band Model by Cook et al (2014) for gannet, lesser black-backed gull, herring gull and great black-backed gull. For kittiwake, the SNCBs did not agree that the lowest "all gull" 99.2% AR was appropriate to use as this was based predominantly on data for common gull and black-headed gulls. Instead the SNCBs advise that the "all gulls" AR of 98.9% should be applied to kittiwake.</p> <p>For the Extended Band Model, Cook et al (2014) make no recommendations regarding appropriate ARs to use for gannet or kittiwake and the SNCB advice follows this in stating that it is not appropriate to use the Extended Band model in predicting collision figures for these species at the present time.</p> <p>For lesser black-backed gull, herring gull and great black-backed gull the SNCBs accept the ARs calculated by Cook et al (2014) for use with Option 3 of the Extended Band Model. However, the SNCBs have concerns regarding the sensitivity of the Extended Band model to flight height distribution data and the extent to which uncertainty in the flight height information affects the estimates of collision risk. Therefore the SNCBs have recommended that when Option 3 outputs are presented for lesser black-backed gull, herring gull or black-backed gull, outputs from Basic Model Options 1 and 2</p>

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		<p>should be presented alongside the Extended Band Model Option 3 outputs along with a range of collision mortality estimates derived from the upper and lower confidence limits of the generic flight height data as well as +/- 2SD around the applicable ARs.</p> <p>Natural England further note that there are currently no agreed ARs that can be used with an "Option 4" of the Extended Band Model.</p> <p>ii) The SNCB (2014) recommendations described above represent the current position regarding the AR work and the use of the Extended Band Model. The Applicant has agreed to present collision risk outputs for the relevant species using the Basic Band Model Options and ARs recommended in the SNCB (2014) paper and requested by Natural England in our Relevant Representations [RR-021]. Please also see paragraphs 6.5.61 - 6.5.65 in our WR and Figure 1 of the SoCG.</p> <p>iii) For an update regarding Natural England's position on the applicant's CRM approach for migratory species please paragraphs: 6.5.88 – 6.5.91 in our WR.</p> <p>Natural England considers that the Migropath model, or the alternative SOSS MAT model (presented in Wright et al.</p>

Question to:	Question:	Natural England's Answer at Deadline 1:
		<p>2012), are in general suitable tools for providing baseline information on which to base a collision risk assessment for wildfowl and waders. For the 10 wildfowl and wader species considered by the Applicant, Natural England has considered the CRM outputs for a 98% avoidance rate and the predicted annual mortalities from collision risk (spring and autumn combined). For all 10 species the collision risk mortality accounts for no more than 0.11% of baseline mortality of the national wintering populations and, these mortality levels for wildfowl and wader species can be considered of negligible significance at an EIA scale.</p> <p>However, for the five seabird species (Arctic skua, great skua, Arctic tern, common tern and little gull) it remains unclear to Natural England whether the CRM is based on Migropath outputs of numbers of birds predicted to pass through the development site, as these species are not included in the updated APEM migration collision risk modelling report in Appendix D2 of the Ornithology Technical Report Part 2. Clarification is still required from the Applicant on this point and this is still under discussion as highlighted in the SoCG (Table 4.1). Further clarity is also requested on the population scales (and sizes) and baseline mortality rates that have been used to assess impacts against. Natural England does not anticipate that the level of mortality in this assessment will</p>

Question to:	Question:	Natural England's Answer at Deadline I:
		<p>reach levels approaching significance. However, Natural England advises that the results of these analyses are an important element of the assessment of impacts for this, and other, projects and need to be presented in a clear and transparent way.</p> <p>iv) the need for use of a Population Viability Analysis (PVA) in addition to the Population Biological Removal (PBR) approach (please see Natural England's WR paragraph 6.5.77 – 6.5.81):</p> <p>Natural England has previously considered PBR outputs for assessing population impacts on the feature populations of protected sites in cases where up to date, colony specific PVA models have not been available, as PBR offers a simpler modelling approach that requires the input of less population data in order to assess potential population impacts.</p> <p>However, the use of PBR on its own as the means of assessing population impacts on the seabird populations of SPAs from predicted windfarm mortality presents a number of issues. In particular using PBR to set thresholds of "sustainable" mortality is problematic for several reasons.</p> <p>Firstly there is a lack of empirical support for the method, with thresholds of sustainable mortality predicted for populations</p>

Question to:	Question:	Natural England's Answer at Deadline 1:
		<p>not always being a good predictor of a species' population trajectory. This may particularly be the case where additional sources of anthropogenic mortality, for example drowning in fishing nets, have not been considered.</p> <p>Secondly, PBR is not used in a way that allows quantification of the impact of the additional mortality on population size. This means that PBR generally cannot be used to assess whether the population-level effects of an anthropogenic impact mean that a conservation objective to maintain or restore populations of protected sites are being met. This is because PBR considers only whether a threshold of mortality is exceeded, rather than the biological impact of any additional mortality at a population level. If the aim of method is to test whether or not the conservation objectives of a site will be met, any approach used must typically be capable of assessing whether the resultant additional mortality will mean a population can be maintained at its current level or allow a population to be restored to a higher level. PBR is not useful for quantifying the impact of additional mortality on population size. Recovery factors (f values) can be used as a means of factoring in the probability of reaching a particular population level in a particular timeframe and also of accounting for uncertainty in the data, but these are not based on empirical</p>

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		<p>evidence.</p> <p>Thirdly, assumptions about the existence and form of density dependence are implicit in PBR. While there is evidence for density dependent processes operating on seabird populations (e.g. see Horswill and Robinson, 2015), PBR does not offer the same scope as PVA modelling to explore the effect of including or not including density dependence in the models or varying the magnitude and form of density dependence. Where there is uncertainty about the operation of density dependence, density independent PVA models can be used which often represent a more precautionary approach.</p> <p>On this basis, Natural England advises that wherever possible the population level impacts of predicted mortality from developments should be assessed using PVA models as these allow the effects of factors such as density dependence and varying demographic parameters to be explicitly investigated in terms of their effect on the population trajectory. PVA models also allow relative comparisons of population level effects with and without the additional mortality to be considered in a way that is not possible with PBR.</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline I:
EOO5	Applicant, NE and RSPB	<p>What progress has been made in resolving the methodological issues raised primarily in the Section 42 Response and Relevant Representations [RR-021] by NE and the RSPB [RR-028] in relation to the applicant's ornithological assessment for the Hornsea project 2 alone, including issues in relation to:</p> <ul style="list-style-type: none"> a) The calculation of <i>displacement rates</i> <ul style="list-style-type: none"> i) the use of a comparative analysis of levels of sustainable mortality generated by tools such as (PVA); and ii) the summing of the annual predicted mortality of the colony, or wider population scale used to assess the population level impact. b) The range of species selected for the impact assessment—collision risk and displacement; and 	<p>Methodological issues in relation to displacement rates are still a matter of on-going discussion between Natural England and the Applicant (see SoCG, Table 4.1).</p> <ul style="list-style-type: none"> a) Natural England is currently not able to draw any conclusions regarding the significance of predicted impacts from the displacement of birds from the Project area and buffers until issues relating to the underlying survey data have been fully resolved and the figures agreed with the Applicant. <ul style="list-style-type: none"> i) Natural England is having discussions with the Applicant regarding updating the Population Viability Analysis for the FFC pSPA populations of the key species subject to displacement, and Natural England understands that the Applicant will submit an updated PVA analysis at Deadline II. Natural England has not seen any outputs from these models for species subject to displacement impacts but has advised that the number of deaths predicted to arise across a likely range of displacement levels (e.g. 30-70% for auks)

Question to:	Question:	Natural England's Answer at Deadline 1:
	c) The approach to the assessment of significance.	<p>and associated mortality (e.g. 1-10%) should be taken through to the assessment of population impacts (e.g. through Population Viability Analysis modelling) rather than a single figure so that a comparative analysis of the impact of possible mortality levels can be made. The same request applies to the use of other population tools such as PBR that the Applicant may use for population scales where suitable PVA models are not available.</p> <p>ii) The summing of seasonal displacement impacts to generate an annual mortality is an area of disagreement between Natural England and the Applicant (see Table 3.3 of the SoCG and paragraphs 6.5.73 – 6.5.74 of our Written Representations).</p> <p>b) Natural England agrees with the range of species selected by the Applicant for the impact assessment. To summarise, Natural England considers that there to be Habitats Regulations Assessment (HRA) concerns in relation to five seabird species which are potentially at risk of collision or displacement related mortality from the constructed, operational offshore windfarm. All five species are qualifying features of the Flamborough and Filey Coast potential Special Protection Area (SPA),</p>

Question to:	Question:	Natural England's Answer at Deadline 1:
		<p>which is partly underpinned by the Flamborough Head SSSI, and so activities at the Hornsea Project 2 site may impact on the bird interests of these protected sites.</p> <p>These species are:</p> <ul style="list-style-type: none"> a. Northern gannet <i>Morus bassanus</i> (gannet) b. Black- legged kittiwake <i>Rissa tridactyla</i> (kittiwake) c. Common guillemot <i>Uria aalge</i> (guillemot) d. Razorbill <i>Alca torda</i> e. Atlantic Puffin <i>Fratercula arctica</i> (puffin) (as a component of the seabird assemblage feature of Flamborough and Filey Coast pSPA) <p>Additionally, Natural England considers there are EIA concerns in relation to seven seabird species which are potentially at risk of collision or displacement related mortality from the constructed, operational offshore windfarm:</p> <ul style="list-style-type: none"> a. Gannet

Question to:	Question:	Question:	Natural England's Answer at Deadline I:
			<ul style="list-style-type: none"> b. Kittiwake c. Lesser black-backed gull d. Great black-backed gull e. Guillemot f. Razorbill g. Puffin <p>c) Due to a number of the issues raised in our Relevant Representations [RR-021] relating to the baseline datasets used to underpin the analysis of population impacts, Natural England has not seen or been able to agree on the level or significance of population impacts on the species and sites listed above. Additionally Natural England and the Applicant have not resolved methodological issues regarding the approach to the assessment of significance, as this is dependent on Natural England reviewing the updated PVA analyses that the Applicant plans to submit at Deadline II.</p>
EOO6	Primarily for the applicant, but also NE and RSPB	What progress has been made in resolving the impact assessment issues raised primarily in the Section 42 Response and Relevant Representations [RR-021] by NE in relation to	Due to a number of the issues raised in our Relevant Representations [RR-021] relating to the baseline datasets used to underpin the analysis of population impacts, Natural

Question to:	Question:	Question:	Natural England's Answer at Deadline I:
		<p>the applicant's ornithological assessment for the Hornsea project 2 alone, in particular concerns about:</p> <ul style="list-style-type: none"> (a) The spatial scope of the assessment. (b) The Special protection area (SPA) and Special areas of conservation (SAC) sites which need consideration in relation to Likely Significant Effects on offshore ecology. (c) Evidence the applicant has relied on in reaching conclusion that disturbance will not exceed a 1km buffer around the source of disturbance. (d) Evidence used to select displacement and mortality rates. (e) Various levels of impact assessment classed by the applicant for operational impacts (displacement and collision risk). 	<p>England has not seen or been able to agree on the level or significance of population impacts on the species and sites listed above. Additionally Natural England and the Applicant have not resolved methodological issues regarding the approach to the assessment of significance, as this is dependent on Natural England reviewing the updated PVA analyses that the Applicant plans to submit at Deadline II.</p>
EOO7	Applicant and NE	Overall, following from the points above in EOO5 and EOO6, what progress has been made to date with NE in agreeing Hornsea Project 2 alone collision and displacement	Since our Relevant Representations were submitted, Natural England has been working with the Applicant to clarify and resolve issues relating to the assessment of project impacts

Question to:	Question:	Natural England's Answer at Deadline I:
	<p>impacts, as appropriate, for the relevant bird species, including:</p> <ul style="list-style-type: none"> (a) Northern gannet; (b) Common guillemot; (c) Razorbill; (d) Atlantic puffin; (e) Black-legged kittiwake; (f) Lesser black-backed gull; and (g) Great black-backed gull? 	<p>for offshore ornithology.</p> <p>Due to a number of the issues raised in our Relevant Representations relating to the baseline datasets used to underpin the analysis of population impacts, as well as assumptions regarding apportioning impacts to populations, Natural England has not had the opportunity to review or been able to agree on the level or significance of population impacts from Hornsea Project 2 on the species and sites listed in the previous column. We anticipate issues related to the baseline datasets to be fully resolved and agreed with the Applicant by Deadline II. Additionally, issues relating to the apportioning of impacts to relevant populations have been discussed with the Applicant, and Natural England understands that the Applicant will submit updated apportioning analyses for kittiwake, gannet, guillemot, razorbill and puffin at Deadline II.</p> <p>The collision risk modelling methodology (and therefore impacts from collision mortality) is an area of disagreement between the Applicant and Natural England (see SoCG sections 3.4 and Table 4.1). Following discussions subsequent to submission of our Relevant Representations [RR-021], Natural England understands that the Applicant will submit an updated collision risk assessment at Deadline I in</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
			<p>which the Applicant has agreed to present CRM outputs for gannet, kittiwake, lesser black-backed gull and great black-backed gull following the methodology and parameters requested by Natural England (as outlined in paragraph 6.5.61 of our Written Representations).</p> <p>Natural England has not had any discussions with the Applicant since submission of our Relevant Representations [RR-021] regarding the specific displacement and mortality levels for the assessment of population impacts, since the number of birds predicted to be displaced will be dependent on agreeing details of the appropriate baseline data and apportioning methodology to use.</p>
EOO8	Applicant, NE and RSPB	<p>What progress been made in resolving the impact assessment issues raised primarily in the Relevant Representations [RR-021] by NE in relation to the applicant's ornithological assessment for Hornsea Project 2 cumulative and in-combination impacts, in particular:</p> <p>(a) Is there now an agreed approach for the <i>re-tiering</i> of Offshore Wind farms (OWFs) used for cumulative and in</p>	<p>Please Natural England's Written Representation paragraphs 6.5.86 – 6.5.87:</p> <p>a) As indicated in our Relevant Representation [RR-021], by using only 2 tiers the Applicant does not have as much scope to consider the effects of including projects with differing levels of uncertainty around their assessment figures compared to if a larger number of tiers are defined. However, Natural England and the Applicant have agreed that this is not an issue of material concern and there is no requirement for</p>

Question to:	Question:	Natural England's Answer at Deadline I:
	<p>combination effects assessment?</p> <p>(b) Is there now an agreed approach on the projects to be included in each tier, including the capacity of those projects?</p> <p>(c) With regard to cumulative displacement impacts, has further work been undertaken on the standardisation and use of a 2km buffer size, and if so, with what implications for assessed impacts?</p> <p>(d) Can the discrepancies between the figures for the various North Sea plans and projects calculated as part of the Dogger Bank Teesside and the Hornsea Project 2 application, as identified by NE, be explained?</p> <p>(e) What methods have been used to generate population estimates and displacement figures for projects where either no information, or information for the development footprint without a 2km buffer, was available in the relevant ESs?</p>	<p>additional work to be completed with regard to using further tiers in the cumulative assessment.</p> <p>b) This issue is still under discussion between the two parties and an update will be provided at Deadline II;</p> <p>c) The Applicant has confirmed that the data used within the cumulative assessment of displacement for gannet, guillemot, razorbill and puffin has been standardised to a Project Site + 2km buffer scale for all projects and species. This being the case there are no implications of this in terms of the figures presented and Natural England assumes that the data presented in for example Tables 5.97, 5.98, 5.101 and 5.106 of the Ornithology Environmental Statement report have therefore been corrected based on project area + 2km buffer and that the statement in paragraph 5.7.225 of the ES chapter: "<i>Tier 1 projects for which comparable data for guillemot were available are summarised in Table 5.98. Many projects only present data for the site and a 1 km buffer, whereas Hornsea Project One, Project Two, and Inch Cape present 2 km buffer data</i>" does not indicate that the correction has not been made in Table 5.98 for sites where a 2km buffer was not used.</p> <p>d) This issue is still under discussion between the two parties and an update will be provided at Deadline II;</p> <p>e) This issue is still under discussion between the two parties and an update will be provided at Deadline II;</p> <p>f) This issue is still under discussion between the two</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline I:
		<p>(f) What progress has been made in undertaking further assessment, as recommended by NE, at a North Sea scale across the whole year, for each relevant species?</p> <p>(g) What progress has been made in agreeing</p> <p style="padding-left: 40px;">(i) cumulative impacts at a population scale (displacement and collision) for all relevant species; and</p> <p style="padding-left: 40px;">(ii) in-combination impacts on the Flamborough Head and Filey Coast (FFC) pSPA, for all relevant species?</p>	<p>parties and an update will be provided at Deadline II;</p> <p>g) This issue is still under discussion between the two parties and an update will be provided at Deadline II</p>
EOO1 2	Applicant, NE, Marine Management Organisation (MMO) and local authorities (LAs)	<p>Para 2.6.71 of NPS EN-3 supports ecological monitoring to mitigate where appropriate any adverse ecological impacts of the project under consideration, and to enable further useful information to be provided for future projects.</p> <p>a) Can the applicant please clarify</p>	<p>Natural England has not yet engaged in detailed discussions with the Applicant regarding offshore ornithological monitoring.</p> <p>Please see paragraphs 6.6.43 – 6.6.44 in Natural England's WR.</p> <p>As described in our written representation (6.5.82 – 6.5.87)</p>

Question to:		Question:	Natural England's Answer at Deadline 1:
		<p>the nature of the intended offshore ornithological monitoring programme for the full life cycle of the Hornsea Project 2?</p> <p>b) How will monitoring of the Hornsea Project 1 be built into the development of the Hornsea Project 2?</p> <p>c) Are the MMO and NE content with the proposed approach to monitoring for Hornsea Project 2?</p> <p>d) Do the conditions in the DML provide sufficient certainty about the delivery of mitigation and monitoring measures (as specified in the ES)?</p>	<p>Natural England has been working with the Applicant to resolve issues relating to the assessment of project impacts on classified birds of interest associated with Flamborough Head and Bempton Cliffs SPA/Flamborough and Filey Coast pSPA. Depending on the outcome of these impact assessments Natural England may advise that a condition for colony-specific monitoring of specific sensitive species, such as those listed in paragraph 6.5.4 of Natural England's WRs would be needed.</p> <p>Natural England also considers that a condition committing to a strategic bird monitoring programme should be included within the DCO. The strategic bird monitoring programme will be required by several consented offshore windfarms to validate assumptions used in the collision risk modelling and displacement assessments as well as the potential consequences of collision and displacement at a population level.</p>
EOMM	Ecology offshore – marine mammals		
EOMM 1	NE	ES 7.2.4, Para 4.2.3 [APP-033], indicates that the extent of site-specific field surveys were agreed with NE and the JNCC in February 2011 following the submission of the Hornsea Project 1 Scoping Report in November 2010. Is NE	Natural England is content that the survey areas were agreed with the applicant and is in line with best practice and those undertaken for other Round 3 offshore wind farms projects at that time. It is recognised that survey design and technology used to undertake the surveys is evolving as we learn more

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		content that the study area adopted is appropriate for the present project?	about the marine environment further offshore. However, we consider the survey data to be fit for purpose for this project.
EOMM 2	NE	Do NE agree with the survey methodology for marine mammals employed by the applicant?	When the surveys were agreed in 2011 the surveys followed standard best practice. It was not considered necessary to do standalone Marine Mammal surveys. As the standard survey methodology would be the same for both birds and Marine Mammals. It is also unlikely that undertaking further standalone surveys (now) would significantly change the advice provided by the SCNBs.
EOMM 3	NE	The ES acknowledges that the cable route corridor has not been covered by the site-specific marine mammal surveys, having been characterised by desk study data alone, gathered over a 15-year period, up to 2010. Do NE consider this data used to establish baseline conditions is acceptable?	Natural England considers the impact risk on Marine Mammals from cable installation to be low, especially as there is minimal subsea noise above that of baseline activities and that the cable installation is not a static operation. Mitigation measures can be adopted to remove the main risk posed by ducted propellers through the use of guards. Therefore specific surveys along the cable route are not required.
EOMM 4	Applicant and NE	Concern was expressed at the scoping stage regarding the recording of mammals in tandem with undertaking seabird surveys (ES 7.2.4, Table 4.5, comment from Lincolnshire Wildlife Trust/Yorkshire Wildlife Trust) [APP-033], and resultant bias/error is noted in paras 4.5.97-8. As a result of concerns from local	When the surveys were agreed in 2011 the surveys followed standard best practice. It was not considered necessary to do standalone Marine Mammal surveys. As the standard survey methodology would be the same for both birds and Marine Mammals. It is also unlikely that undertaking further standalone surveys (now) would significantly change the advice provided by the SCNBs.

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		<p>fishing operations about interference, the towed hydrophone survey to detect cetaceans was limited by latitude and does not cover the whole extent of the proposed project boundary. Please explain how these limitations have affected the assessment and conclusions drawn.</p>	<p>With regards to the reduction in spatial area of the towed hydrophone survey, Natural England have no concerns about the assessment and the conclusions drawn, given the other information and references used to inform the assessment. The applicant undertook a literature review using best available evidence – p4-17 of ES mammal chapter provides details and references. In addition, three years of monthly visual surveys covered the Hornsea Subzone 2 (plus 4km buffer) and overall Zone (plus 10km buffer) provides sufficient data to inform the assessment.</p>
EOMM 5	Applicant and NE	<p>The ES refers to Disturbance Effects on Harbour Porpoise in the North Sea (DEPONS) (paras. 4.6.56-4.6.63) [APP-033] in respect of sound impacts. Regarding the latter model, preliminary results are said to indicate that pile driving at up to 31 offshore wind farms in the south central North Sea over a six-year period would not lead to long-term population-level effects on harbour porpoises and that subsea noise disturbance from pile-driving, possibly leading to displacement, is most likely to be a short-term occurrence, though no firm conclusions can be drawn at this stage. The model is still at development stage. Can</p>	<p>Harbour porpoises have been found to respond to underwater noise generated by piling of wind farm foundations at large distances. While they have also been found to return once construction activity ceases, the significance of piling noise disturbance to the survival and reproduction of harbour porpoises is not understood. The result is considerable uncertainty for the industry and governments alike in the planning of offshore wind farms. Recognising that improved knowledge on the impacts of piling noise will be critical to be able to expand offshore wind power in balance with a long-term viable North Sea harbour porpoise population, a group of five offshore wind developers led by Vattenfall joined forces to initiate and fund the international research program DEPONS.</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		<p>any further information be provided as to the anticipated progress on this research over the timescale of the project and how this might be expected to inform assessment?</p>	<p>The project will lead to fundamental new insights into harbour porpoise responses to underwater piling noise, as well as their small and large-scale general movement patterns (partly informed by empirical data collection). This information will be fed into a model, which will provide an evidence based framework for the assessment of wind farm underwater noise impacts. There are five sub projects within the DEPONS programme which will provide data to feed into the model. More information on these individual sub projects can be found at the following link: http://depons.au.dk/currently/subprojects-sp-timeline/</p> <p>Empirical data collection is still ongoing, but it is anticipated at the present time that the model will be operational by January/February 2016. Natural England have concerns about the conclusions drawn by the interim DEPONS report - but were informed at a DEPONS meeting (May 2015) that the results presented were only to show that the model worked - site specific information and data will be fed into the model to provide an updated assessment.</p>
EOMM 7	Statutory Nature Conservation Bodies (SNCBs)	The primary source of underwater noise that may impact on marine mammals during construction is pile driving during foundation installation. ES para 4.6.66 states that there	Yes. The noise from pile driving is an impulsive noise, which is much louder (with the potential to cause death/injury) than that produced from other activities such as cable laying.

Question to:	Question:	Question:	Natural England's Answer at Deadline I:
		was agreement with the JNCC that only modelling for piling noise was required for Hornsea Project 1 (rather than other activities such as cable installation) and this assumption has been carried forward for the present project. Can the SNCBs confirm that this approach is acceptable?	
EOMM 8	SNCBs	ES Table 4.17 [APP-033] sets out the 'worst case' spatial and temporal scope of predicted impacts. Do NE consider the assessment to be a realistic worst-case scenario?	Natural England is satisfied that the assessment has considered realistic worst-case scenarios in the assessment.
EOMM 12	Applicant	The maximum adverse scenario assumed in ES 7.2.4, Table 4.17 [APP-033], for maximum pile energy per strike varies according to the type of foundation proposed. Clause 10(2)(b) of Part 2 of the Deemed Marine Licences requires a construction method statement to be submitted before commencement of construction. Is it the intention that maximum pile energy per strike would be secured in this statement, or by other means?	Please refer to the SoCG (Section 7.2.26 and Appendix 4 Row 4.14) between the Applicant and Natural England for an update on this issue. Natural England is satisfied with inclusion of maximum hammer energy within the MMMP and Construction Method Statement. Please note this answer also corresponds to question DC27.
EOMM 16	Applicant	NE comment in its relevant representation [RR-021] (paras. 5.2.2.2/3) on the value of SCANS data for context in assessing cumulative effects on harbour porpoise. Can	An update on this issue can be found in Natural England's WR (paragraphs 6.6.8 – 6.6.9)

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
EOMM 18	NE and applicant	<p>the applicant please comment on the use of such data?</p> <p>NE in its relevant representation [RR-021] (paras. 5.2.1.1-5.2.1.4) refers to the development of the interim Population Consequences of Disturbance (PCoD) model developed to forecast the potential disturbance, and collision effects, on marine mammal populations from the construction and operation of offshore marine energy devices. An extension to the original interim model has been commissioned to predict the population consequences of disturbance to harbour porpoises. It is said this project was due to complete by April 2015 and should enable an assessment of whether multiple pile driving operations in the English part of the North Sea are likely to have a population-level effect on the harbour porpoise population in the wider North Sea.</p> <p>(a) Can NE provide an update as to whether the PCoD is complete and whether the outputs indicate</p>	<p>Further work is required before Natural England can use the results of PCoD to better assess the cumulative impacts of pile driving in the region and therefore tis work is not yet complete. Please refer to Natural England's WR (paragraphs 6.6.3 and 6.6.4) for a full response to this question.</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		<p>that a population-level effect is expected?</p> <p>(b) Could the applicant please produce a note clarifying how its own assessment compares with this work (on the assumption that the PCoD extension project has now been completed)?</p>	
EOMM 20	Applicant, NE	<p>A Marine Mammal Mitigation Protocol (MMMP), which is required by Condition 10(2)(c) of the DMLs, is anticipated to provide a description of mitigation and justification for the techniques chosen. Can details be provided as to the anticipated timescale and engagement process regarding the production and agreement of a MMMP?</p>	<p>This has not currently been discussed with the Applicant or the MMO. However this is certainly something which can be discussed and agreed.</p>
EOMM 21	Applicant, NE	<p>It is suggested that the MMMP will include monitoring, the form of which is to be agreed with the SNCBs, to test the predictions of assessment (ES 7.2.4, para. 4.6.314) [APP-033].</p> <p>a) What specific monitoring is proposed?</p> <p>b) Who will be responsible for</p>	<p>a) Natural England has not engaged in any detailed discussions with the Applicant on specific monitoring. Natural England notes that the MMMP will be submitted for approval by the MMO, in consultation with SNCBs, at least 4 months prior to commencement of turbine construction activities. This will set out the circumstances in which marine mammal monitoring will be required and the specific monitoring to be carried out, as secured under</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		<p>the monitoring?</p> <p>c) What are the methods by which it would be delivered?</p> <p>d) How would results be used?</p>	<p>Condition 10(2)(e) of the DMLs.</p> <p>b) The Applicant will be responsible for any monitoring, however methodology and conditions will need to be agreed with the MMO and SNCBs</p> <p>c) Methods by which monitoring will be delivered will be agreed post-consent using latest guidance at the time and will require approval from the MMO and SNCBs.</p> <p>d) Results would be used to ensure that the impacts are no greater than those assessed in the Environmental Statement and/or whether any adaptive management is necessary.</p>
EOMM 22	NE	<p>NE in its relevant representation ([RR-021] (para. 4.2.2) indicates that the JNCC has undertaken an analysis of data for harbour porpoises in UK waters with the aim of identifying possible sites for SAC designation, with formal consultation to be launched this summer. Should this be the case, the impacts on the proposed designated features of these sites will become a material consideration in relation to Habitats</p>	<p>Since the submission of relevant representations, JNCC and the country agencies have issued formal draft advice to all four UK governments on draft SACs (dSACs) for harbour porpoise. This advice is now being considered by the four UK governments. It is anticipated that a formal consultation for these dSAC may commence within the examination period for the Hornsea 2 development, subject to clearance.</p> <p>Please refer to Natural England's WR (paragraph 6.6.2) for a</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		Regulations Assessment for the project. Can further information be provided as to what stage consultation may have progressed and future timescales in the possible designation process?	full response to this question.
EOMM 23	Applicant, NE	It is suggested that the MMMP will include monitoring, the form of which is to be agreed with SNCBs, to test the predictions of assessment (ES 7.2.4 [APP-033], para. 4.6.314). What specific monitoring is proposed, who would be responsible and what are the methods by which it would be delivered, and how would results be used?	Please see response to question EOMM21
EOMM 25	Applicant, NE	Having regard to Habitat Regulation Assessment, TWT in their relevant representation [RR- 29] consider more explicit mitigation should be specified in the outline Code of Construction Practice (CoCP) in order to ensure disturbance to the grey seal feature of the Humber Estuary SAC is minimised. Without mitigation more explicitly in place, TWT do not agree that the test for Likely Significant Effect (LSE) and, subsequently, site integrity, has been adequately considered.	<p>As construction works in the intertidal will be limited to April and September (as secured in Conditions 20(3) and 20(4) of deemed Marine Licences A2 and B2 contained within the projects draft DCO), this will avoid the main pupping season (October-December). In addition the area used by the breeding grey population of the Humber estuary SAC is located within an active bombing range; therefore some acclimation to loud noises should be expected.</p> <p>As detailed in the SoCG between the Applicant and Natural England (see paragraph 7.2.3), the Applicant has agreed to adopt best-practice measures and codes of conduct when in</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		Can the applicant and NE please comment?	<p>close proximity to seal haul-out sites.</p> <p>Based on the above Natural England advice is that there is no likely significant effect, alone and in-combination.</p>
EL	Ecology—onshore and inter-tidal		
EL2	Applicant and EA	<p>In [RR-012], the EA also raises concerns about the apparent datedness of some of the information used in the assessment, and the implications for the project, and in particular for the inter-tidal cable protection. Can the applicant please respond on the potential implications for the inter-tidal impacts of/on the project of:</p> <ul style="list-style-type: none"> a) Tidal movements arising from climate change. b) Recent beach profile data for Horseshoe Point, post Dec 2013. c) Coastal and sea bed erosion in the near shore area. 	<p>Although this question is not directed at Natural England, we have provided some commentary in our WR regarding some of these points. In particular:</p> <ul style="list-style-type: none"> b) Please see paragraphs 6.6.25 – 6.6.26 in Natural England's WR c) Please see paragraphs 6.6.23 – 6.6.24 in Natural England's WR e) Please see paragraphs 6.6.21 – 6.6.22 in Natural England's WR

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		<p>d) Potential changes in the Lincolnshire beach nourishment programme.</p> <p>e) Drift rates–worst case scenarios.</p> <p>f) The potential for increased storminess and surges arising from climate change.</p>	
EL4	NE	Is NE content with the predominant use of baseline data gathered for Hornsea Project 1, for the assessment of the Hornsea Project 2 onshore and intertidal ecological impacts?	<p>Natural England is broadly content with the use of survey data for both projects as long as pre construction surveys are undertaken to demonstrate that there has been no change. SMartwind has undertaken additional surveys after the tidal surge in December 2013 to demonstrate that there has been no significant change in key habitats utilised by birds. However, Natural England has had some reservations in relation to the use of the one year of intertidal birds surveys for both projects, which we have discussed at length with applicant. This poses a low risk to the environment based on the requirement for pre-construction surveys and associated mitigation of any impacts identified and we consider that no further action is needed at this time.</p>
EL7	Applicant, EA and NE	<p>With particular reference to para. 5.3.18 of EN-1, would the applicant please summarise:</p> <p>(a) How best practice will be specified and ensured during both construction and operation</p>	<p>Natural England notes that prior to construction beginning a number of pre-construction surveys, plans and activities will be undertaken to ensure that risks to species and habitats are avoided and/or minimised, which will be secured through the DCO, DMLs, In Principle Monitoring Plan and SoCG.</p> <p>At this stage Natural England do not have any comments to</p>

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		<p>to minimise risks to habitats and species?</p> <p>(b) Which habitats are to be the subject of specific restoration programmes after completion of construction works?</p> <p>(c) Which habitats have been identified as the subject of specific enhancement measures?</p> <p>d) What if any new habitats are to be created?</p>	<p>make on habitat creation or enhancement. However, should pre-construction surveys identify the presence of terrestrial European Protected Species; the applicant may need to consider mitigation, which may include habitat creation. If necessary, these matters will be agreed post-consent and will require the approval from the MMO and local planning authorities, in consultation with Natural England.</p>
EL15	Applicant, NE and MMO	Is the applicant planning to use trailer suction hopper dredgers (TSHD) for cable laying, affecting the Humber Estuary SAC? If so, what effects might this have on the destabilization and redistribution of sediments on the features of the Humber Estuary SAC?	The Applicant has clarified that a TSHD will not be used in the Humber Estuary SAC. Please refer to Natural England's WR (paragraph 6.6.28) for a full response to this question.
LH	Landscape and Heritage		
LH7	NE, East Lindsey District Council	Can the various stakeholders referenced in Table 5.4 of ES-Chapter 5 Landscape and Visual Resources [APP-046] confirm whether or	Natural England does not have any outstanding concerns about the methodology for the assessment as we are satisfied that it is in accordance with the latest edition of the Guidelines

Question to:	Question:	Natural England's Answer at Deadline 1:
	(ELDC), North Lincolnshire Council (NLC), North East Lincolnshire Council (NELC), West Lindsey District Council (WLDC), and Ray Wilson – East Halton Resident	not they have outstanding concerns with regard to the assessment's methodology and the proposals to address the issues raised and if so further outline those concerns and what should be done about them? for Landscape and Visual Impact Assessment.
CL	Construction – intertidal and onshore	
CL2	Applicant	No cable protection measures are proposed to be used in the inter-tidal area. What are the relative merits of this approach, given the climate change and marine processes issues raised in question EL2? Natural England advises that no cable protection is used in the intertidal area. Any hard structure on the intertidal area is likely to restrict longshore sediment transport and possibly increase the risk of erosion and loss of habitat elsewhere. In addition, changes to coastal processes could have an impact on the Humber Estuary SAC/SPA. Natural England notes the requirement for the Applicant to

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
			gain approval of the Cable Specification and Installation Plan (as secured under Part 2, Condition 10(2)(f) of the DCO). The Plan will consider burial depths at the landfall using relevant new information to ensure that the cable is buried to the optimum depth to take account of sea level rise and coastal erosion.
CL9	NE, MMO and LAs	<p>a) Do NE, MMO and the local authorities consider that they have sufficient information on the principles and parameters to be used in drafting the Code of Construction Practice (CoCP) to be confident that the submitted plan will be capable of approval?</p> <p>b) Do NE, MMO and the local authorities consider that they have or will have sufficient information and assurances about monitoring to be confident that the submitted CoCP will be monitored adequately?</p> <p>c) Do NE, MMO and the local authorities consider that they have or will have sufficient information to be</p>	Natural England is in discussion with the Applicant to ensure that areas of specific areas of interest e.g. the 'landfall' will be thoroughly considered in the Code of Construction Practice (CoCP) prior to construction based on the results of pre-construction surveys and requirement to do so secured as part of the DCO. Please refer to Natural England's WR (paragraphs 6.6.29 – 6.6.31) for further detail.

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		confident about the enforcement of the CoCP?	
CL10	NE, MMO and LAs	a) How will the flood defences, sand dunes and salt marsh be monitored and protected to avoid damage during construction? b) How is this to be secured through the ecological, construction practice or other plans or draft DCO Requirements?	Natural England is satisfied that the pre-construction plans, surveys and documentation, which will be secured through the DCO, DMLs, In Principle Monitoring Plan and SoCG will ensure adequate monitoring will be carried out.
FNA	Fishing, Navigation and Aviation		
FNA4	MMO, MCA, NE	Do you agree with the plans and projects which have been included in the cumulative assessment of fishing?	Natural England would like to refer the Examining Authority to the advice of the MMO and the fish specialists at CEFAS.
DC	Draft DCO		
DC13	Applicant	NE feels that there is a need within the DCO for sandwave clearance to take place no closer than 50km from the shore because the effects have not been assessed within the ES. Do you agree with this?	The construction method statement will include details of cable protection and seabed preparation (including sandwave clearance). Please refer to the SoCG (paragraph 4.2.13 and Appendix 2 - row 2.5) between the Applicant and Natural England for an update on this issue.
DC14	Applicant	NE also feels that there is a need within the	Please refer to the SoCG (Appendix 5, row 5.5) between the

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		DCO to specify the maximum number of vehicle movements into the intertidal area, as 15 per day during cable installation, to ensure the impacts of the works do not exceed the maximum assessed level of disturbance in the Humber Estuary SPA. Do you agree with this?	Applicant and Natural England for an update on this issue.
DC15	Applicant, MMO and NE	In Requirement 2 how are the figures for maximum area and volumes of cable protection arrived at?	<p>The Environmental Statement (Chapter 3 – Project Description) submitted by the Applicant provides details on maximum levels of area and volume of cable protection required. Natural England understands that the calculations of these figures were based on geophysical and geotechnical data.</p> <p>Natural England notes that a Scour Protection Management and Cable Armouring Plan providing details of the need, type, sources, quantity, location and installation methods for scour protection and cable armouring to be within the scope of the environmental impact assessment recorded in the Environmental Statement, as secured under Condition 10(2)(d), will be produced in advance of pre-construction activities.</p>
DC19	Applicant	NE consider that a new Requirement should be included in the DCO covering a method statement for the landfall aspects of the cabling works, including method of	Please refer to Natural England's WR (paragraphs 6.6.29 – 6.6.31) for a full response to this question.

Question to:	Question:	Question:	Natural England's Answer at Deadline 1:
		installation and access at the landfall. This to be submitted to the LPA and agreed in consultation with NE and the MMO. Do you agree with this?	
DC20	Applicant	NE requires an 'In Principle Monitoring Plan' to be included in the DCO as a Requirement. Do you agree with this?	Please refer to Natural England's WR (paragraph 6.6.42) for a full response to this question.