CONTENTS

1 ITEM 1 OF SCHEDULE 5 (NO. 6): DETERMINING WHETHER THERE IS A JUSTIFICATION FOR SCREENING IN DISTANT SEABIRD SITES AND ADDITIONAL TERN COLONIES ASSOCIATED WITH THE OUTER THAMES ESTUARY SPA

1.1 Summary of the issue

1.1.1 The Environment Agency identifies two issues under item 1 of their Schedule 5 (no. 6) as follows:

- Item 1a: Assess whether there is any justification for concluding that Likely Significant Effects (LSE) cannot be excluded for distant breeding seabird Special Protection Areas (SPAs), on the basis of potential connectivity with the Zone of Influence (ZOI) for the Sizewell C project (subsequently termed the Project).

- Item 1b: Assess whether there is overlap between the predicted foraging ranges of common tern and little tern from SPA breeding colonies for which the Outer Thames Estuary SPA provides supporting habitat and for which no connectivity with the Project ZOI was concluded in the shadow HRA undertaken as part of the Project's DCO submission. The SPAs in question are considered to be: (i) Foulness (for which both common tern and little tern are qualifying features), (ii) Breydon Water (for which common tern is a qualifying feature) and (iii) Thanet Coast and Sandwich Bay (for which little tern is a qualifying feature).

1.1.2 Consideration of these issues is set out below.

1.2 Distant seabird SPAs

a) Breeding season connectivity and the potential for LSE

i. Relevance of the mean maximum foraging range plus 1 standard deviation

1.2.10 In Schedule 5 (no. 6), the Environment Agency indicate that for assessments for offshore wind farms (OWFs), NE use the mean maximum foraging range plus 1 standard deviation (SD) of seabird species (as determined in Woodward *et al.* 2019) to identify those SPAs that should be screened in for assessment on the basis of potential connectivity in the breeding season.

1.2.11 It is important to note that until recently NE (and the other UK Statutory Nature Conservation Bodies (SNCBs)) have relied upon the mean maximum foraging range (i.e. without the addition of the SD value) for this purpose, as evident in recent and impending DCO submissions for OWF

projects[1]. The addition of the SD value often increases the distance for potential connectivity very considerably (e.g. more than doubling it for some species – Woodward *et al.* 2019).

1.2.12 Furthermore, the NE advice on using mean maximum foraging range plus 1 SD is specifically stated to be in relation to OWF projects, which differ from other marine developments in some important respects. Notably, the in-combination impacts from effects of OWFs that are predicted to lead to additional mortality of adult birds (either directly (collisions) or indirectly (displacement and barrier effects)) are predicted to be at levels close to (or potentially above) those which would lead to adverse effects on some SPA breeding seabird populations. With the continued expansion of the OWF sector, it is now considered important to document even unlikely and small potential additions to this in-combination mortality and this includes considering the potential for mortality at OWFs that are well beyond the expected foraging range of the relevant populations.

ii. SPA seabird populations within breeding season foraging range

1.2.13 For the purposes of undertaking the shadow HRA for the Project's DCO submission, breeding seabird connectivity was determined on the basis of the species' mean maximum foraging ranges, following Thaxter *et al.* (2012). On this basis, LSE was concluded for all SPA breeding seabird populations considered to have connectivity with the Project.

1.2.14 As noted above, NE advice (in relation to OWF developments) is reported to have changed so that connectivity should now be based upon the mean maximum foraging range plus 1 SD, whilst the seabird foraging range estimates presented in Thaxter *et al.* (2012) have been superseded by the updated review and analyses of Woodward *et al.* (2019).

1.2.15 Consequently, the populations of breeding gannet, kittiwake, puffin and fulmar (the latter two being named components of the seabird assemblage feature) from the Flamborough and Filey Coast SPA *could* be considered to have the potential for connectivity with the Project. This is on the basis that the distance between this SPA and the Project site[2] is approximately 255km, whilst the mean maximum foraging ranges (+1 SD) of these species are:

- Fulmar – 542 (+658) km
- Gannet – 315 (+194) km
- Kittiwake – 156 (+144) km
- Puffin – 137 (+128) km

[1] e.g. see Test (planninginspectorate.gov.uk); Chapter 13 Offshore Ornithology.pdf (dudgeonoffshorewind.co.uk)
[2] Taken as the closest distance 'by sea', with the Project site defined by the Order Limits.

1.2.16 The other main breeding seabird colony SPAs on the English east coast which are north of the Flamborough and Filey Coast SPA are Coquet Island SPA and the Farne Islands SPA. At distances of 419km (Coquet Island) and 451km (Farne Islands) from the Project site, both of these SPAs are beyond the mean maximum breeding season foraging range plus 1 SD of all of their seabird qualifying features, other than fulmar (as a named component of the Coquet Island SPA seabird assemblage feature). It is also the case that fulmar populations from some of the Scottish east coast SPAs are (theoretically) within foraging range of the Project site but (as outlined below) the issues concerning potential connectivity for distant seabird SPAs are adequately dealt with by limiting consideration to those in England.

iii. Potential for connectivity

1.2.17 The above considerations could be taken to lead to a conclusion of potential connectivity of both the Flamborough and Filey Coast SPA and Coquet Island SPA with the Project site. However, a number of other factors and evidence sources need to be considered to assess the veracity of any such conclusion.

1.2.18 First, for all of the SPA qualifying features involved (except, arguably, fulmar from the Flamborough and Filey Coast SPA), the Project site is at the further extremes of the breeding season foraging range. Seabirds are central place foragers during the breeding season, due to the need to return to the colony to undertake incubation duties and to feed young. Consequently, the potential foraging area is constrained by the costs (in terms of energy budgets and time) of commuting between foraging sites and the colony, whilst the need to minimise these costs means that birds should forage as close to the colony as possible, all else being equal (Cairns 1987, 1992). This predicted pattern of foraging behaviour is supported by the evidence from a wide range of species (e.g. Wakefield *et al.* 2013, Wakefield *et al.* 2017, Cleasby *et al.* 2018), as well as being incorporated into industry guidance on the apportioning of impacts from offshore wind farms amongst SPA breeding seabird populations[3].

1.2.19 In relation to the species identified above, tracking of kittiwakes from the Flamborough and Filey Coast SPA demonstrates that most activity occurs close to the colony (relative to the mean maximum foraging range plus 1 SD), with the majority of the area encompassed by the 50% utilisation distribution being within 150km of the SPA (Wakefield *et al.* 2017). Associated with this, there is no evidence of tracked birds using waters close to the Project site from several years of tracking studies (Cleasby *et al.* 2018, Wischnewski *et al.* 2018). Similarly, for gannet from the Flamborough and Filey Coast SPA, neither the modelled 50% nor 75% utilisation distributions approach the vicinity of the Project site (Wakefield *et al.* 2013). This is also true for the individual tracks of gannets from three years of study, involving almost 20,000 locations from 42 tracked birds (with

[3] Interim Guidance on apportioning impacts from marine renewable developments to breeding seabird populations in SPAs | NatureScot

the closest locations being approximately 40 – 50km off the Norfolk Coast – Langston *et al.* 2013). There are no tracking data available for fulmar or puffin from the above SPA populations.

1.2.20 Additionally, it is important to give consideration to the issues of scale. If it is assumed that the foraging range of seabirds breeding at the SPAs on the east coast of England can be represented by a semi-circle with radius equal to the mean maximum foraging range plus 1 SD, this gives potential foraging ranges of 2,261,947km^2, 406,964km^2, 141,372km^2 and 110,309km^2 for fulmar, gannet, kittiwake and puffin, respectively. The thermal plume for the 2^o uplift for SZC and SZB operating together encompasses the largest area of marine habitat over which effects of discharges are predicted to manifest. For the April to August period, the 98th percentile for this plume is predicted to extend over an area of 51.3 km^2, representing 0.002%, 0.013%, 0.036% and 0.047% of the potential foraging ranges of fulmar, gannet, kittiwake and puffin, respectively (as defined by the mean maximum foraging range plus 1 SD).

1.2.21 Given the above, it is clear that; (i) the waters around the Project site are at the further extremes of the foraging ranges of these distant SPA populations (meaning that the likelihood of breeding birds from these populations commuting over such long distances during the breeding season is negligible); and (ii) the areas of marine habitat potentially affected by the Project are trivial relative to the potential foraging ranges used by these populations (so that the likelihood of breeding birds from these population encountering these areas of habitat is, again, negligible). Consequently, it is considered reasonable to conclude, on a precautionary basis, that connectivity between seabird populations from distant SPAs and the Project site is highly unlikely during the breeding season and can effectively be excluded.

1.2.22 In addition to the lack of any effective connectivity, there is also no pathway for effect. This is because usage of these areas by individuals from these distant SPAs will be at a negligible level and, if it does occur, will be an extremely rare occurrence involving a trivial proportion of the birds from the population.

b) Non-breeding seasons

1.2.23 In contrast to breeding seabird populations, access to offshore waters for wintering or passage seabirds is not constrained by colony location. Thus, during these periods, individuals from SPA breeding seabird populations could access the waters around the Project site, so that there is the potential for connectivity. However, the relatively small area of marine habitat within which potential effects from the Sizewell C Project could arise is (again) negligible relative to the large areas of sea over which these populations are distributed during the non-breeding periods (see Furness 2015). Thus, as for the breeding season, it is reasonable to conclude on a precautionary basis that connectivity during the non-breeding periods can

effectively be excluded and, for the same reasons as outlined above in relation to the breeding season, there is likewise no pathway for effect.

1.3 Overlap with foraging ranges of additional little tern and common tern SPA colonies

1.3.9 As detailed above (section 1.1), the Schedule 5 (no. 6) identifies three SPAs for breeding terns which are associated with the Outer Thames Estuary SPA and for which confirmation is requested on whether there is any overlap between the predicted foraging ranges of the tern populations and the different thermal and chemical plumes associated with the Project.

1.3.10 The relevant SPAs, their **closest** distance to the Project site (as defined by the Order Limits) and the breeding tern qualifying features are as follows:

- Foulness SPA: **73km** from the Project site, includes both breeding common tern and breeding little tern as qualifying features.
- Breydon Water SPA: **40km** from the Project site, includes breeding common tern as a qualifying feature.
- Thanet Coast and Sandwich Bay SPA: **More than 90km** from the Project site, includes breeding little tern as a qualifying feature.

1.3.11 The mean maximum breeding season foraging range (+ 1SD) for common tern is **17.6 (+9.1)**, whilst for little tern the mean maximum foraging range is **5.0km**, with no estimate of an associated SD value being available (Woodward *et al.* 2019). Therefore, from a comparison of these predicted (potential) foraging ranges with the distances of the three additional breeding tern SPAs it is self-evident that there is no potential connectivity with the Project site itself.

1.3.12 Of the different thermal and chemical discharges relevant to little tern and common tern, it is the thermal plume for the 2° uplift which extends over the greatest area (and approaches closest to each of the above three SPAs). For SZC and SZB operating together, this plume is predicted to extend approximately 9km both to the north and to the south of the Project site for the period May to August (i.e. the period of relevance to both little tern and common tern). Therefore, there is no potential for overlap between the plumes associated with the thermal and chemical discharges from SZC (including when considered together with SZB) and the predicted (potential) foraging ranges of any of the breeding tern populations from the above three SPAs (noting that this has been confirmed by measuring the actual closest distances from the plume to each of these SPAs).

1.3.13 The Schedule 5 (no. 6) also requests that SZC Co. provides the locations (as National Grid References) of the actual colonies for the breeding tern populations at the above three SPAs. SZC Co. does not have this

information available and (given the above) does not consider that it is required for the purposes of the assessment.

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