

## REPORT

# **Boston Alternative Energy Facility – Preliminary Environmental Information Report**

### Appendix 17.1 Habitats Regulations Assessment

Client: Alternative Use Boston Projects Ltd

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## **A17 Habitats Regulations Assessment**

### **A17.1 Introduction**

A17.1.1 European Union (EU) obligations in respect of habitats and species are imposed through Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive), which requires Member States to designate important wildlife sites throughout the European Community as Special Areas of Conservation (SAC) and to give protection to habitats and species listed in the Directive as being threatened or of Community interest (Sites of Community Interest, or SCI).

A17.1.2 The EU imposes obligations in respect of birds through Directive 2009/147/EC on the conservation of wild birds (Birds Directive). The Birds Directive provides a framework for the conservation and management of wild birds in Europe. Of particular relevance is the requirement to identify and designate Special Protection Areas (SPA) for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance. Together with SACs and SCIs, SPAs and sites that are in the process of designation as SACs and SPAs (proposed SACs (pSACs), candidate SACs (cSACs) and potential SPAs (pSPAs)) form a network of protected areas known as Natura 2000 sites or, 'European sites'.

A17.1.3 Regulation 61 of the Habitats Regulations defines the procedure for the assessment of the implications of plans or projects on European sites. Under this Regulation, if a proposed scheme is unconnected with site management (for nature conservation purposes) and is likely to significantly affect the designated site, the competent authority must undertake an 'appropriate assessment' (Regulation 61(1)).

A17.1.4 In addition to sites designated under European conservation legislation, UK Government policy (ODPM Circular 06/2005) states that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them. As such, as a matter of

Government policy, the Habitats Regulations Assessment (HRA) process also applies to Ramsar sites.

A17.1.5 This appendix provides the information to support an HRA for the Facility. Specifically, it sets out the following:

- An overview of the HRA process;
- The European sites considered relevant to the HRA;
- The qualifying features and conservation objectives of the relevant European sites;
- Identification of pathways and impacts considered in this HRA (based on the preliminary impact assessment and consultation with Natural England and Marine Management Organisation (MMO));
- Screening of potential impacts; and
- Appropriate assessment for impacts screened in to the assessment.

## **A17.2 The HRA Process**

A17.2.1 The HRA process helps meet the requirements of Article 6(3) of the Habitats Directive which states that any plan or project, that is not directly connected with or necessary to the management of a European site, but would be *likely to have a significant effect* (LSE) on such a site, either on its own or in-combination with other plans or projects, will be subject to an *appropriate assessment* of its implications for the European site in view of its conservation objectives.

A17.2.2 According to the Waddenzee judgement (Judgement of 7.9.2004 – Case C-127/02), an appropriate assessment will be required if a likely significant effect cannot be excluded on the basis of objective information. The Sweetman Opinion (Opinion of Advocate General 22.10.2012 – Case C-258/11) states that the question is simply whether the plan or project concerned is capable of having an effect.

A17.2.3 The HRA process (in its entirety) follows a four-staged approach, as detailed in the Planning Inspectorate's Advice Note 10 (Planning Inspectorate 2017) (also see **Plate A17.1**):



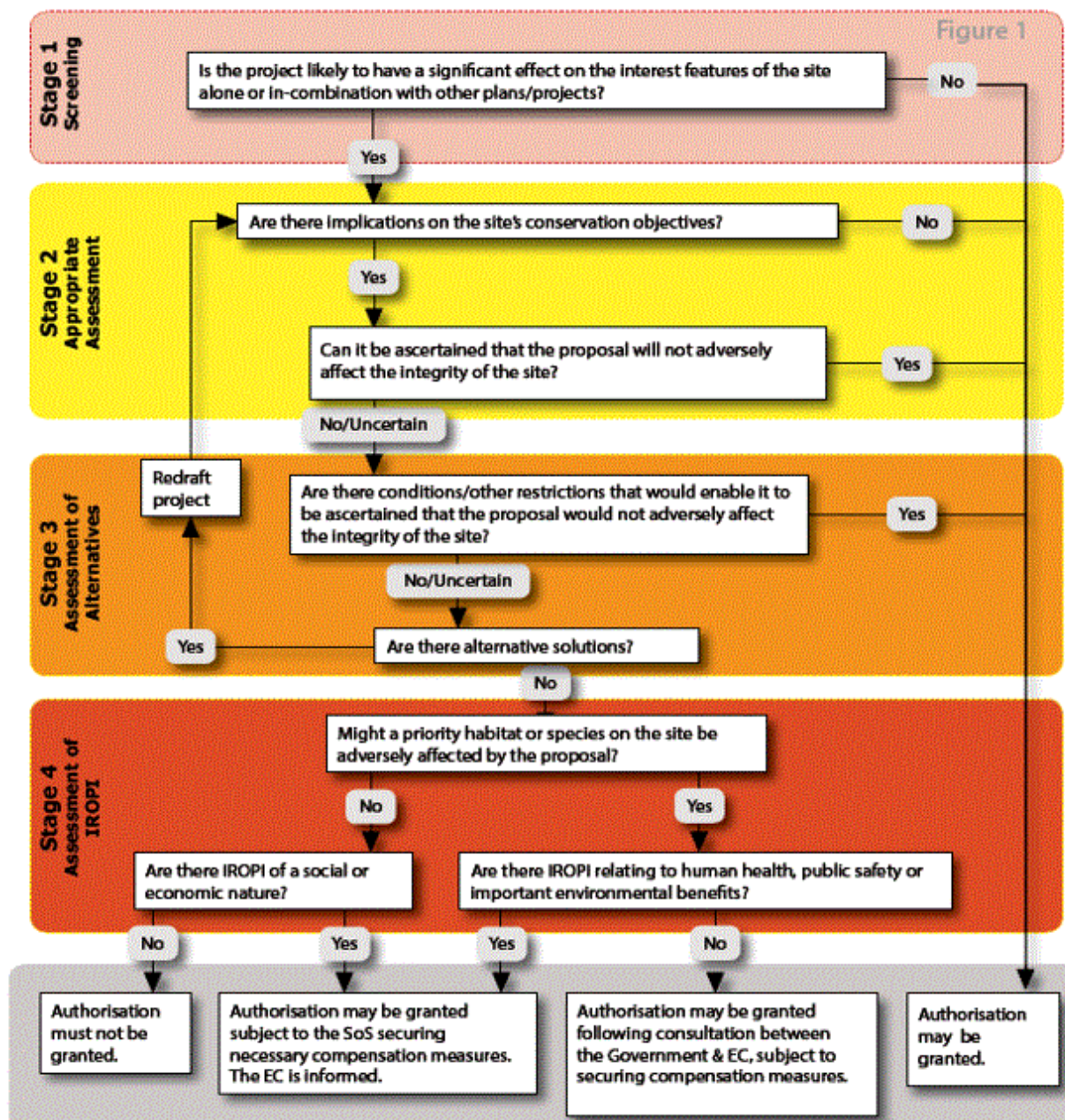


Plate A17.1 The HRA process (Planning Inspectorate 2017)

- 1) **Screening/Likely Significant Effect (LSE) assessment:** The process of identifying potentially relevant European sites, and whether the Facility is likely to have a significant effect on the qualifying features of the site, either alone or in-combination with other plans and projects. If it is concluded at this stage that there is no potential for LSE, there is no requirement to carry out subsequent stages of the HRA.
- 2) **Appropriate Assessment:** Where a LSE for a European site(s) cannot be ruled out, either alone or in-combination with other plans and projects, assessment of the potential effects on the integrity of the site(s), again either alone or in-combination

with other plans and projects, in view of its qualifying features and conservation objectives is required. Where there are potential adverse effects, an assessment of mitigation options is carried out and mitigation measures (where available) are proposed to address the

- 3) effects. If there nonetheless remains a likely significant residual adverse effect, the HRA must progress to Stages 3 and 4.
- 4) **Assessment of Alternative Solutions:** Identifying and examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid or have a lesser effect on the site(s).
- 5) **Imperative reasons of overriding public interest (IROPI):** Where no alternative solution exists and where an adverse effect on site integrity remains, the next stage of the process is to assess whether the development is necessary for IROPI and, if so, the identification of compensatory measures needed to maintain site integrity or the overall coherence of the designated site network.

### A17.3 Baseline Information for European Protected Sites

A17.3.1 Based on the preliminary findings of **Chapter 17 Marine and Coastal Ecology**, and in accordance with comments provided in the Scoping Opinion, it is concluded that the following European sites require further assessment within the HRA process:

- The Wash SPA (site code UK9008021).
- The Wash and North Norfolk Coast SAC (site code UK0017075).
- The Wash Ramsar site (site number 395).

A17.3.2 The following sub-sections provide details on the qualifying features and conservation objectives of the above European sites.

#### The Wash SPA

A17.3.3 The Wash SPA has been designated for the following qualifying features. Any sensitivities relating to vessel movements and anchorage have been included as supplementary information (Natural England, 2017).

**Table A17.1 Qualifying features of The Wash SPA, and Supplementary Information on Sensitivities. All Sensitivities are Low Risk Unless Otherwise Stated in Brackets.**

Qualifying feature	Above-water noise (medium-high risk)	Collision above water	Collision below water	Changes in suspended sediment solids	Introduction of light	Litter	Introduction or spread of invasive species	Contamination	Visual disturbance (medium-high risk)
Bar-tailed godwit ( <i>Limosa lapponica</i> ), Non-breeding	✓	✓	x	x	✓	x	x	✓	✓
Bewick's swan ( <i>Cygnus columbianus bewickii</i> ), Non-breeding	No interaction of concern between the feature and the pressures arising from vessel movements from the Facility.								
Black-tailed godwit ( <i>Limosa limosa islandica</i> ), Non-breeding	✓	✓	x	x	✓	x	✓	✓	✓



Qualifying feature	Above-water noise (medium-high risk)	Collision above water	Collision below water	Changes in suspended sediment solids	Introduction of light	Litter	Introduction or spread of invasive species	Contamination	Visual disturbance (medium-high risk)
Common scoter ( <i>Melanitta nigra</i> ), Non-breeding	✓	✓	x	x	x	✓	x	x	✓
Common tern ( <i>Sterna hirundo</i> ), Breeding	✓	✓	x	✓	x	✓	x	x	✓
Curlew ( <i>Numenius arquata</i> ), Non-breeding	✓	x	x	x	✓	x	x	x	✓
Dark-bellied brent goose ( <i>Branta bernicla bernicla</i> ),	✓	✓	x	x	✓	x	x	✓	✓

Qualifying feature	Above-water noise (medium-high risk)	Collision above water	Collision below water	Changes in suspended sediment solids	Introduction of light	Litter	Introduction or spread of invasive species	Contamination	Visual disturbance (medium-high risk)
Non-breeding									
Dunlin ( <i>Calidris alpina alpina</i> ), Non-breeding	✓	✓	x	x	✓	x	✓	✓	✓
Gadwall ( <i>Mareca strepera</i> ), Non-breeding	✓	✓	x	x	x	✓	x	x	✓
Goldeneye ( <i>Bucephala clangula</i> ), Non-breeding	✓	✓	x	x	✓	✓	x	x	✓
Grey plover ( <i>Pluvialis squatarola</i> ), Non-breeding	✓	✓	x	x	✓	x	✓	✓	✓

Qualifying feature	Above-water noise (medium-high risk)	Collision above water	Collision below water	Changes in suspended sediment solids	Introduction of light	Litter	Introduction or spread of invasive species	Contamination	Visual disturbance (medium-high risk)
Knot ( <i>Calidris canutus</i> ), Non-breeding	✓	✓	x	x	✓	x	✓	✓	✓
Little tern ( <i>Sternula albifrons</i> ), Breeding	✓	✓	✓	✓	x	✓	✓	x	✓
Oystercatcher ( <i>Haematopus ostralegus</i> ), Non-breeding	✓	✓	x	x	x	x	✓	✓	✓
Pink-footed goose ( <i>Anser brachyrhynchus</i> ), Non-breeding	No interaction of concern between the pressures from the Facility.								

Qualifying feature	Above-water noise (medium-high risk)	Collision above water	Collision below water	Changes in suspended sediment solids	Introduction of light	Litter	Introduction or spread of invasive species	Contamination	Visual disturbance (medium-high risk)
Pintail ( <i>Anas acuta</i> ), Non-breeding	✓	x	x	x	✓	x	✓	✓	✓
Redshank ( <i>Tringa totanus</i> ), Non-breeding	✓	✓	x	x	✓	x	✓	✓	✓
Sanderling ( <i>Calidris alba</i> ), Non-breeding	✓	✓	x	x	✓	x	✓	✓	✓
Shelduck ( <i>Tadorna tadorna</i> ), Non-breeding	✓	✓	x	x	✓	x	✓	✓	✓
Turnstone ( <i>Arenaria interpres</i> ), Non-breeding	✓	✓	x	x	✓	x	x	✓	✓

Qualifying feature	Above-water noise (medium-high risk)	Collision above water	Collision below water	Changes in suspended sediment solids	Introduction of light	Litter	Introduction or spread of invasive species	Contamination	Visual disturbance (medium-high risk)
Wigeon ( <i>Mareca penelope</i> ), Non-breeding	✓	✓	x	x	✓	x	x	✓	✓

A17.3.4 The conservation objectives for this SPA apply to the whole SPA site and the individual species/assemblage of species that have been identified as qualifying features above. The site aims to contribute to achieving the aims of the Birds Directive, by maintaining or restoring:

- the extent and distribution of the habitats of the qualifying features;
- the structure and function of the habitats of the qualifying features;
- the supporting processes on which the habitats of the qualifying features rely;
- the populations of each of the qualifying features; and
- the distribution of qualifying features within the site.

### **The Wash and North Norfolk Coast SAC**

A17.3.5 The Wash and North Norfolk Coast SAC has been designated for the following qualifying features. Any sensitivities relating to vessel movements and anchorage have been included as supplementary information (Natural England, 2017).



**Table A17.2 Qualifying Habitats and Supplementary Information on Sensitivities for The Wash and North Norfolk Coast SAC. All Sensitivities are Low Risk Unless Otherwise Stated in Brackets.**

Qualifying feature	Abrasion / disturbance of the substrate	Changes in suspended solids	Deoxygenation	Introduction of light	Introduction or spread of invasive species	Litter	Nutrient enrichment	Disturbance of sediment below the seabed	Smothering	Wave exposure changes
Atlantic salt meadows ( <i>Glaucopuccinelliet alia maritimae</i> )	✓	✓	x	x	✓	✓	x	✓	x	x
Coastal lagoons	✓	✓	✓	✓	✓		x	✓	✓	✓
Large shallow inlets and bays	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mediterranean and thermo-Atlantic halophilous scrubs ( <i>Sarcocorn</i>	The evidence base suggests that there is no interaction of concern between the pressure and the feature, or the effect of vessel movements and the feature could not interact.									

Qualifying feature	Abrasion / disturbance of the substrate	Changes in suspended solids	Deoxygenation	Introduction of light	Introduction or spread of invasive species	Litter	Nutrient enrichment	Disturbance of sediment below the seabed	Smothering	Wave exposure changes
<i>etea fruticosi</i> )										
Mudflats and sandflats not covered by seawater at low tide	✓	✓	✓	✓	✓	x	✓	✓	✓	✓
Reefs	✓	✓	✓	✓	✓	x	✓	✓	✓	✓
<i>Salicornia</i> and other annuals colonising mud and sand	✓	✓	x	x	✓	✓	x	✓	x	x

Qualifying feature	Abrasion / disturbance of the substrate	Changes in suspended solids	Deoxygenation	Introduction of light	Introduction or spread of invasive species	Litter	Nutrient enrichment	Disturbance of sediment below the seabed	Smothering	Wave exposure changes
Sandbanks which are slightly covered by sea water all the time	✓	✓	✓	✓	✓	x	x	✓	✓	x

**Table A17.3 Qualifying Species and Supplementary Information on Sensitivities for The Wash and North Norfolk Coast SAC. All Sensitivities are Low Risk Unless Otherwise Stated in Brackets.**

Qualifying feature	Above-water noise (medium-high risk)	Visual disturbance (medium-high risk)	Underwater noise changes (medium-high risk)	Collision below water	Litter	Introduction or spread of invasive species	Contamination
Harbour (common) seal ( <i>Phoca vitulina</i> )	✓	✓	x	✓	✓	x	x
Otter ( <i>Lutra lutra</i> )	✓	✓	x	✓	x	✓	✓

A17.3.6 The conservation objectives for the qualifying features (Natural England, 2018) are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and,
- The distribution of the qualifying species within the site.

### The Wash Ramsar site

A17.3.7 The Information Sheet on Ramsar Wetlands (May 2005)<sup>1</sup> for The Wash Ramsar site states that the site qualifies as a Ramsar site for the following reasons:

- Ramsar criterion 1 – The Wash is a large shallow bay comprising very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels. It is the largest estuarine system in Britain.
- Ramsar criterion 3 – Qualifies because of the inter-relationship between its various components including saltmarshes, intertidal sand and mudflats and the estuarine waters. The saltmarshes and the plankton in the estuarine water provide a primary source of organic material which, together with the other organic matter, forms the basis for the high productivity of the estuary.
- Ramsar criterion 5 – Assemblages of international importance (292,541 waterfowl (five-year peak mean 1998/99-2002/03)).

A17.3.8 The site also qualifies under Ramsar criterion 6 for the reasons set out in **Table A17.4**.

<sup>1</sup> [https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK11072&SiteName=The Wash&countyCode=&responsiblePerson=&SeaArea=&IFCAAra=](https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK11072&SiteName=TheWash&countyCode=&responsiblePerson=&SeaArea=&IFCAAra=) [accessed 30 January 2019]

**Table A17.4 Qualifying Features Under Ramsar Criterion 6.**

Qualifying feature	Status
Redshank ( <i>Tringa totanus</i> )	Peak counts in spring/autumn
Curlew ( <i>Numenius arquata</i> )	Peak counts in spring/autumn
Oystercatcher ( <i>Haematopus ostralegus</i> )	Peak counts in spring/autumn
Grey plover ( <i>Pluvialis squatarola</i> )	Peak counts in spring/autumn
Knot ( <i>Calidris canutus</i> )	Peak counts in spring/autumn
Sanderling ( <i>Calidris alba</i> )	Peak counts in spring/autumn
Black-tailed godwit ( <i>Limosa limosa islandica</i> )*	Peak counts in spring/autumn
Ringed plover ( <i>Charadrius hiaticula</i> )*	Peak counts in spring/autumn
Black-headed gull ( <i>Larus ridibundus</i> )	Peak counts in winter
Common eider ( <i>Somateria mollissima</i> )	Peak counts in winter
Bar-tailed godwit ( <i>Limosa lapponica</i> )	Peak counts in winter
Shelduck ( <i>Tadorna tadorna</i> )	Peak counts in winter
Dark-bellied brent goose ( <i>Branta bernicla bernicla</i> )	Peak counts in winter
Dunlin ( <i>Calidris alpina alpina</i> )	Peak counts in winter
Pink-footed goose ( <i>Anser brachyrhynchus</i> )	Peak counts in winter
Golden plover ( <i>Pluvialis apricaria</i> )*	Peak counts in winter
Lapwing ( <i>Vanellus vanellus</i> )*	Peak counts in winter

\* Species/populations identified subsequent to designation for possible future consideration under Ramsar criterion 6

**A17.3.9** For Ramsar sites, a decision has been made by Defra and Natural England not to produce conservation advice packages, instead focussing on the production of High-Level Conservation Objectives. As the provisions of the Habitats Regulations extend to Ramsar sites, Natural England considers the conservation advice packages for the overlapping European Site and designations (i.e. The Wash SPA and The Wash and North Norfolk Coast SAC) to be sufficient to support the management of the Ramsar site interests. Consequently, for the



purposes of the HRA, it will be assumed that the conservation objectives for The Wash SPA and The Wash and North Norfolk Coast SAC can be applied to The Wash Ramsar site.

#### **A17.4 Screening Exercise and Likely Significant Effect**

**A17.4.1 Chapter 17 Marine and Coastal Ecology** present a preliminary assessment of potential impacts of the proposed Facility on those receptors that are relevant to the scope of the HRA (i.e. marine and estuarine habitats, waterbirds, fish (as potential prey species of qualifying features) and marine mammals).

**A17.4.2** It is considered that the pathway for an effect on European sites during the construction phase is weak due to the very limited connection of the Facility construction works to The Wash area and the features of interest. The majority of the works will be completed from land and as such there will only be very limited vessel movements associated with the construction phase. In addition, the distance from the site to the interest features of the designated sites is far enough away to not cause impacts either directly or indirectly from the works themselves. It is acknowledged that many of the features of the designated sites are mobile (i.e. seals and birds), but the works area is not a key area for these species and therefore it is not expected that the construction phase will have a significant effect.

**A17.4.3** For the operational phase, the following were considered in this assessment as having the potential to have an impact on the qualifying features (and/or the supporting habitats of qualifying species) of The Wash SPA, The Wash and North Norfolk Coast SAC and The Wash Ramsar site (these potential impacts are summarised below and discussed in further detail in Section 6):

- Changes in vessel traffic and movement leading to increased collision risk and above ground and underwater noise and visual disturbance to birds and seals which are both features of the designated sites.
- The potential for Nitrogen Oxides (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), nitrogen, acid and ammonia deposition within the boundaries of European sites as a result of the operational phase emissions from the Facility.

**A17.4.4** As stated in the main chapter, no impacts to marine and coastal ecological receptors are anticipated during the decommissioning phase of the development. This is because the wharf will remain in place after the Facility is decommissioned, and the vessel movements arising from the operation of the

Facility will cease. As such, impacts from the decommissioning phase have not been considered in this HRA.

### Increased collision risk

A17.4.5 There will be an increase of 624 vessels/year due to the Facility operation, which will last for the duration of the facility. This equates to approximately 12 vessels per week. The number of vessels using The Haven would increase from 400/year to 1024/year. The Facility-related vessels will be travelling at a maximum speed of 4 knots through The Haven, and 6 knots through the shipping channel and the anchoring area (the shipping channel to be used can be seen on **Figure A17.1**). Although this would be a large increase in the context of The Haven, this assessment considers the impacts on the designated sites and the associated species.

A17.4.6 The birds and seals do use The Haven area to a limited extent (limited due to the narrow habitats in this area) but the main areas for feeding and roosting are in The Wash and the entrances to the inlets flowing into The Wash which are the areas where there are extensive mudflats and saltmarsh available to support these activities.

A17.4.7 It is not anticipated that vessel movements will have a significant effect on birds using the intertidal flats in The Haven because large commercial vessels that visit the Port of Boston and those that are proposed for the Facility will only be able to transit this area around high water due to the depth restrictions. The vessels will however need to access the Haven and will therefore be passing through The Wash.

A17.4.8 To put the number of vessels into context, there are approximately 11,000 vessels utilising the proposed shipping channel annually, or 30 vessels per day, as shown by the Marine Traffic data ([www.marinetraffic.com](http://www.marinetraffic.com), 2017). It has been assumed that this only accounts for commercial vessel numbers. As such, there will also be a large number of smaller vessels such as fishing fleets and leisure crafts. The increase of 624 vessels per year through the operational period of the Facility is a small increase compared to the number already present within The Wash (equating to an additional 5.6% of vessels utilising the shipping channel). However, both marine mammals and birds are known to be sensitive to vessel collision, even though they are able to avoid vessels to an extent. The features sensitive to collisions are shown in **Tables A17.3** and **A17.4**.

A17.4.9 **Section 17.8** of the **Chapter 17 Marine and Coastal Ecology** assesses the impact of increased collision risk on marine mammals. Marine mammals were

considered to be of low sensitivity to this impact, mainly due to their ability to detect and avoid vessels. However, this impact was considered to be of medium magnitude due to the increase in vessels. As such, it is included for assessment in Section 6 of this document.

A17.4.10 Otters were not considered further in this assessment due to the unsuitability of the environment of the shipping channel for foraging and other activities. As otters prefer to forage, breed and rest around vegetated river banks, islands and reedbeds, it is unlikely that they utilise the proposed shipping channel.

### Physical disturbance (noise and visual)

A17.4.11 The presence of Facility-related vessels will inevitably lead to visual disturbance and an increase in above and below water noise. **Tables A17.1 and A17.2** identify the qualifying features that are sensitive to physical disturbance. Birds and marine mammals are sensitive to both visual and auditory disturbance. Impacts of physical disturbance during the operational phase of the Facility have been assessed in **Section 17.8 of Chapter 17 Marine and Coastal Ecology** and have been included for further assessment in **Section A17.6**.

A17.4.12 Otters are unlikely to utilise any area within close proximity to the shipping channel and anchorage area, as the habitat available is not suitable for foraging, breeding, or the construction of holts. As such, otters were not considered further in this assessment.

### Increased air quality emissions

A17.4.13 The potential for nitrogen oxides (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), nitrogen, acid and ammonia deposition designated Annex I habitats (as part of The Wash and North Norfolk Coast SAC) during the operation of the Facility was assessed as a result of air quality dispersion modelling, carried out in **Chapter 14 Air Quality**. Currently, this did not identify any deposition on these sites. However, further analysis of the modelling results will be carried out at the ES stage and will be included in the final version of the HRA.

## A17.5 In-Combination Effects

### Introduction

A17.5.1 When assessing the implications of a plan or project in light of the conservation objectives for the European sites in question (i.e. assessing the potential for LSE and ascertaining the potential for effect on site integrity), it is necessary to

consider the potential for in-combination effects, as well as effects due to the project in isolation.

A17.5.2 Natural England's Habitats Regulations Guidance Note 4 (English Nature, 2001) provides guidance on in-combination effects and, at paragraph 2.3, states that other plans or projects should include:

- Approved but as yet uncompleted plans or projects;
- Permitted on-going activities such as discharge consents or abstraction licenses; and,
- Plans and projects for which an application has been made and which are currently under consideration but not yet approved by competent authorities.

A17.5.3 It is also noted that in some circumstances it may be appropriate to include plans and projects not yet submitted to a competent authority for consideration but for which sufficient detail exists on which to make judgements on their impact on the European site.

A17.5.4 In undertaking an in-combination assessment it is important to consider the potential for each plan or project to influence the site. For an in-combination effect to arise, the nature of two effects does not necessarily have to be the same. The in-combination effects assessment, therefore, focuses on the overall implications for the site's conservation objectives, regardless of the type of effect.

A17.5.5 In addition, this in-combination assessment has adopted the following principle: for the proposed scheme to have the potential to contribute to in-combination effects, there must be sufficient cause to consider that a relevant habitat or species is sensitive to effects due to the project itself (e.g. because of a particular influence or sensitivity, or the presence of a species in notable numbers on at least one survey occasion, rather than individuals being simply recorded within the site). Therefore, only where the project alone was determined to have the potential for LSE on European sites and features have these sites and features been included in the in-combination assessment.

### **Other Plans and Projects Screened in to the HRA Process**

A17.5.6 A list of plans and projects that have the potential to give rise to an in-combination effect with the proposed scheme has been compiled from the MMO Public register.

A17.5.7 Details of each project, alongside the distance from the Facility have been presented in **Table A17.5**. A limit of 30 km was taken for consideration of any

projects that could have a potential in-combination impact. From this a decision has been taken as to whether or not it is likely to have a combined impact with the proposed scheme. The plans and projects have, therefore, been screened in or out of further assessment on this basis.

**Table A17.5 Summary of Projects with the Potential to have in-Combination Impacts.**

Applicant	Project Description	Distance from Facility (closest point)	Potential Impacts on SPA, SAC or Ramsar	Potential for in-combination effects	Justification of in-combination effects
Environment Agency	Boston Tidal Barrier	1km	None assessed in project HRA screening	None	N/A
Port of Boston Limited	Port of Boston Maintenance Dredging & Disposal 2015	700m	Yes – the dredged sediment is being disposed of in the European designated sites	Yes	No adverse in-combination effects are anticipated considering the capital and maintenance dredge for the Facility are being carried out outside the European designated sites; and no dredged material associated with dredging for the Facility will be disposed to sea. However, there is potential for beneficial in-combination impacts if the dredged sediment from the Port of Boston will be used in the aggregate manufacturing



Applicant	Project Description	Distance from Facility (closest point)	Potential Impacts on SPA, SAC or Ramsar	Potential for in-combination effects	Justification of in-combination effects
					process at the Facility, thus reducing impacts on the European designated sites.
Water Level Management Alliance Limited	Wolferton Pumping Station	Approx. 30km	Yes – dependent on specific construction activities	None	Project-specific impacts are likely to be localised.
RNLI	RNLI Skegness - Emergency Works Application for Beach Re-Profiling	Approx. 30km	Yes - localised increased suspended sediment concentrations	None	The impacts will be very localised to the beach and the RNLI station.
Environment Agency	The Wash Tide Gauge (decommissioning, construction and maintenance), including scour protection	Approx. 15km	Yes – the works are located within the European designated sites	None	The installation will be small scale, therefore no in-combination impacts are anticipated.
University of Hull	Eel monitoring in The Wash	Approx. 15km	None	None	N/A

Applicant	Project Description	Distance from Facility (closest point)	Potential Impacts on SPA, SAC or Ramsar	Potential for in-combination effects	Justification of in-combination effects
Environment Agency	Hunstanton Beach Recharge	Approx. 30km	Yes - localised increased suspended sediment concentrations	None	The impacts will be very localised to the beach.
Environment Agency	Boston Barrier Phase 2 Ground Investigation	Approx. 1km	None – project only involves removal of small samples in The Haven	None	N/A
Environment Agency	Havenside Flood Defence Scheme	Adjacent to Facility	None	None	The Havenside works are planned to be completed before the construction of the Facility begins.

## A17.6 Appropriate Assessment

### The Wash SPA and The Wash Ramsar Site

A17.6.1 The Wash is a site of national and international importance for its wader and wildfowl populations, supporting a minimum estimate of approximately 359,000 individuals annually (excluding introduced species) during the years of 2008/09 to 2012/13 (Austin *et al.*, 2014). The majority of species are overwintering in the area, feeding on the extensive mud and sand flats exposed at low tide and roosting on the marshes bordering the feeding grounds at high tide. The area also supports resident species and breeding birds.

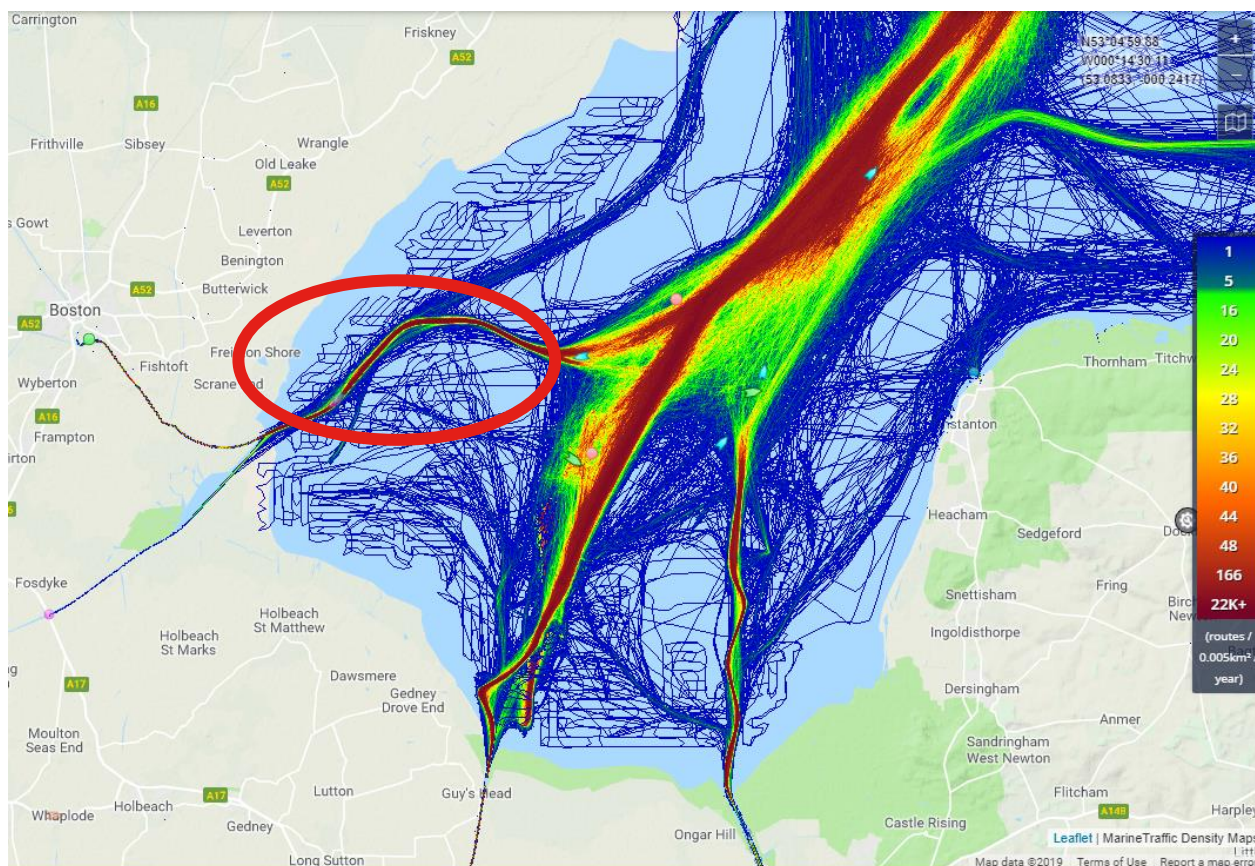
A17.6.2 Of the Wetland Bird Survey (WeBS) sectors, where birds are counted regularly, Frampton North is closest to the Facility, at the mouth of The Haven (**Figure 17.4c**), approximately 3 km from the Facility. High densities of birds were recorded at Frampton North 23, at the mouth of The Haven, with 41 species of birds recorded to be using the sector across six years. Waders were the most abundant group of birds (16,065 individuals across six years), followed by gulls and terns (4,625 individuals across six years). Frampton North 60 is also considered to be an important habitat for birds because it is suitable for nesting and feeding and considering that the mudflats are backed by wide saltmarsh.

#### Potential effects on birds due to vessel disturbance (visual and noise)

A17.6.3 As stated previously, the number of vessels travelling up and down The Haven will cause an extra 624 vessels to travel through The Wash per year. As the vessels will only be able to access The Haven around high water, no significant impacts on birds using The Haven as feeding grounds are anticipated. Vessels

will however be transiting within The Wash in the deeper channels at much greater durations of the tidal cycle.

**A17.6.4** The shipping corridor is located within close proximity to the intertidal sandbanks in The Wash (within 200m). This presents a likelihood for impact on all birds (waders, divers, ducks etc.) that are utilising this suitable habitat.



**Plate A17.2 Marine Traffic Density Map from 2017. The Shipping Channel for the Facility is Circled in red. The Colour Scale on the Right Represents Vessel Movements per 0.005km<sup>2</sup> per Year.**

**Source: Marine Traffic - <https://www.marinetraffic.com/>**

**A17.6.5** Plate A17.2 shows the existing vessel movements in The Wash area, with the shipping channel to be used is circled in red. The proposed shipping channel is currently being used by 11,000 vessels annually (30 vessels per day), as shown by the Marine Traffic data (www.marinetraffic.com, 2017). Thus, the increase of vessels through the operational period of the Facility will be a small increase compared to the number already present within The Wash (equating to an additional 5.6% of vessel movements within the shipping channel). The area of

the shipping corridor that will be used for the Facility is 10.46km<sup>2</sup>, which represents 1.7% of the total area of The Wash SPA (622.1166 km<sup>2</sup>).

- A17.6.6 At present, 77,441 vessels enter the whole of The Wash annually (212 vessels/day), as shown by the Vessel Density Grid Data 2015 from the MMO (MMO, 2017). As can be seen from **Plate A17.2**, the majority of these vessels are directed to Wisbech (middle shipping channel in Plate 6.1) and to King's Lynn (right-hand shipping channel in **Plate A17.2**). A smaller portion is directed to Boston through The Haven (the circled channel).
- A17.6.7 A wide range of recreational and other activities currently take place in The Wash. In a review carried out by Natural England (2010), which focused on the risks from ongoing activities within the European sites in The Wash, the area covering the proposed shipping channel was not highlighted as one of the sites at high risk to the protected features from commercial vessel movements. As such, considering the existing shipping activity within The Wash and the shipping channel, it is not anticipated that the increased shipping activity would have a significant impact on the birds already utilising the area.
- A17.6.8 The assessment of effects indicates that a small proportion of The Wash SPA and Ramsar site population of birds could be disturbed from vessel noise. Therefore, it can be concluded that there would be ***no adverse effect on the integrity of The Wash SPA in relation to the Conservation Objectives***.

## **The Wash and North Norfolk Coast SAC**

### **Changes in vessel traffic and movement leading to increased underwater noise, disturbance and collision risk on harbour seals**

#### Harbour seals within The Wash and North Norfolk Coast SAC

- A17.6.9 Marine Scotland commissioned the Sea Mammal Research Unit (SMRU) to produce maps of grey and harbour seal distribution in UK waters (Russell *et al.*, 2017). These maps were produced by combining information about the movement patterns of electronically tagged seals with survey counts of seals at haul-out sites. The resulting maps show estimates of mean seal usage (seals per 5km x 5km grid cell) within UK waters. The maps indicate that harbour seal usage is high in and around the shipping channel for the Facility and anchorage area, with a harbour seal density of 3.189 per km<sup>2</sup> within the shipping channel and anchorage location (**Figure A17.1**; Russel *et al.*, 2017). This is similar to the



harbour seal density within the whole of The Wash, with an estimated density of 3.2 per km<sup>2</sup>, based on the data provided by Russel *et al.* (2017).

A17.6.10 The most recently reported counts of harbour seals within The Wash were undertaken in August 2017, with the results showing a total count of 3,210 harbour seals in The Wash (SCOS, 2018).

A17.6.11 The haul-out sites in The Wash and adjacent to the proposed shipping channel have been shown in **Figure A17.2**.

Potential for effects on harbour seal due to vessel disturbance (presence and noise)

A17.6.12 As stated in **Section 17.8 of Chapter 17 Marine and Coastal Ecology**, there will be an increase in the number of vessels through the operational phase of the Facility. However, it is unlikely that vessel noise would be sufficient to cause the onset of either a permanent auditory injury (Permanent Threshold Shift (PTS)) or a temporary auditory injury (Temporary Threshold Shift (TTS)) in harbour seals.

A17.6.13 A study of the noise source levels from several different vessels (Jones *et al.*, 2017) shows that for a cargo vessel of 126m in length (on average), travelling at a speed of 11 knots (on average) would generate a mean sound level of 160 dB re 1 µPa @ 1m (with a maximum sound level recorded of 187 dB re 1 µPa @ 1m). For harbour seal, the sound level required to result in a permanent auditory injury (PTS) or temporary auditory injury (TTS) under the National Marine Fisheries Service (NMFS) (2018) threshold guidance for marine mammals, would be 218 dB re 1 µPa and 212 dB re 1 µPa, respectively, if an individual were to be exposed to vessel noise for a period of 24 hours.

A17.6.14 Taking in to account that a harbour seal would need to be exposed to vessel noise, at the maximum sound level recorded, for a period of 24 hours to be exposed to sound levels that could cause a temporary auditory injury (TTS), it is considered unlikely that vessels could cause an auditory injury in harbour seal. The sound levels that could result in a permanent or temporary auditory injury in harbour seal are higher than the maximum recorded sound levels for large cargo vessels, therefore, the only potential effect of underwater noise from vessels would be disturbance.

A17.6.15 Thomsen *et al.* (2006) reviewed the effects of ship noise on seal species. As seals use lower frequency sound for communicating (with acute hearing capabilities at 2kHz) there is the potential for detection, avoidance and masking effects in seals. Thomsen *et al.* (2006) consider that ship noise around 2kHz



could be heard above ambient noise (but not necessarily avoided) at a distance of approximately 3 km for harbour seals, and the zone of audibility will be approximately 20 km for vessels with a much lower frequency noise of 0.25kHz (ambient noise = 94 and 91dB rms re 1µPa at 0.25 and 2 kHz, respectively). The zone of responsiveness of harbour seal is considered to be at a maximum of 400 m from the vessel, although the frequency of the sound source, and the speed at which the vessel is travelling would affect the distance at which harbour seal may react (Thomsen *et al.*, 2006).

A17.6.16 The vessels travelling to and from the Facility will be slow moving (travelling at a speed of 6 knots or less), or would be stationary within the anchorage location, and most noise emitted is likely to be of a low frequency. However, the levels could be sufficient to cause local disturbance to sensitive marine mammals in the immediate vicinity of the vessel, depending on ambient noise levels.

A17.6.17 Marine mammals present within or near the Facility shipping channel would be habituated to the presence of vessels given the existing levels of marine traffic in the area. The current marine traffic data indicates that there are approximately 11,000 vessels entering the proposed shipping channel annually, or 30 vessels per day, as shown by the Marine Traffic data ([www.marinetraffic.com](http://www.marinetraffic.com), 2017) (**Plate A17.2**). The increase of 624 vessels per year through the operational period of the Facility is a small increase compared to the number already present within The Wash (equating to an additional 5.6% of vessel movements within The Wash).

A17.6.18 Similar levels of shipping traffic were also recorded by the MMO in 2015, which shows that there were 11,917 vessels entering the shipping channel and anchorage area in 2015, or 33 vessels per day (as shown by the Vessel Density Grid Data 2015 from the MMO (MMO, 2017)). The increase of 624 vessels per year through the operational period of the Facility is a small increase compared to the number already present within the shipping channel and anchorage area (equating to an additional 5.6% of existing vessels). The number of ships travelling to the Port of Boston, using the same shipping channel as for the Facility, is currently approximately 400 per year (or 8 per week), as described in **Section 18 Navigational Issues**.

A17.6.19 As a worst-case scenario, the number of harbour seals that could be disturbed by underwater noise from vessels has been assessed based on the total proposed scheme area, including the shipping corridor from The Wash to the project location, and the vessel anchorage area; a total area of 10.46km<sup>2</sup> (shown as the shipping channel on **Figure A17.2**). This is very precautionary, because it is highly unlikely that underwater noise from vessels could result in disturbance

to the entire area at any one time. Any disturbance is likely to be limited to the immediate vicinity around the actual vessel (for example, less than 10m) at any one time.

A17.6.20 Any disturbance of harbour seals due to vessel noise would be temporary (up to four vessel movements per day while the vessel was passing only, in addition to the existing 30 vessels per day) and could affect up to 33.4 harbour seals (or 1.0% of The Wash and North Norfolk Coast SAC population) based on the harbour seal density within the shipping corridor and anchorage area of 3.189 harbour seals per km<sup>2</sup> (Russell *et al.*, 2017). The assessment of effects indicates that 1% of The Wash and North Norfolk Coast SAC population of harbour seals could be temporarily disturbed as a result of vessel noise. Therefore, there would be ***no significant disturbance and no adverse effect on the integrity of The Wash and North Norfolk Coast SAC in relation to the Conservation Objectives for harbour seal.***

#### Potential disturbance at harbour seal haul-out sites

A17.6.21 A study was carried out by SMRU (Paterson *et al.*, 2015) using a series of controlled disturbance tests at harbour seal haul-out sites, consisted of regular (every three days) disturbance through direct approaches by vessel and effectively 'chasing' the seals into the water. The seal behaviour was recorded via GPS tags, and found that even intense levels of disturbance did not cause seals to abandon their haul-out sites more than would be considered normal (for example seals travelling between sites) and the seals were found to haul-out at nearby sites or to undertake a foraging trip in response to the disturbance (but would later return).

A17.6.22 Further studies on the effects of vessel disturbance on harbour seals when they are hauled out, suggest that even with repeated disturbance events that are severe enough to cause individuals to flee into the water, the likelihood of harbour seals moving to a different haul-out site would not increase. Furthermore, this appeared to have little effect on their movements and foraging behaviour (Paterson *et al.*, 2019).

A17.6.23 Studies on the distance of disturbance, on land or in the water, for hauled-out harbour seals have found that the closer the disturbance, the more likely seals are to move into the water. The estimated distance at which most seal movements into the water occurred varies from study site and type of disturbance but has been estimated at typically less than 100m (Wilson, 2014). Grey and

harbour seals have also been reported to move into the water when vessels are at a distance of approximately 200m to 300m (Wilson, 2014).

A17.6.24A study of the reactions of harbour seal from cruise ships found that, if a cruise ship was less than 100m from a harbour seal haul-out site, individuals were 25 times more likely to flee into the water than if the cruise ship was at a distance of 500m from the haul-out site (Jansen *et al.*, 2010). At distances of less than 100m, 89% of individuals would flee into the water, at 300m this would fall to 44% of individuals, and at 500m, only 6% of individuals would flee into the water (Jansen *et al.*, 2010). Beyond 600m, there was no discernible effect on the behaviour of harbour seal. As a precautionary approach, any harbour seal haul-out sites within 500m of the shipping channel and anchorage location will be considered to have the potential to disturb harbour seal while they are hauled out.

A17.6.25Within The Wash, there are a number of different harbour seal haul-out and pupping sites (a total of 50 sites within The Wash; **Figure A17.2** (SCOS, 2018)). Of these sites, none are located within 500m of the anchorage location and shipping channel to be used for the proposed Boston project, with the closest site being the Friskney South site, at approximately 840m from the shipping channel (**Figure A17.2**).

A17.6.26The 2017 count of harbour seals of the three closest sites to the shipping channel and anchorage location (**Figure A17.2**) recorded a total of 11 adults and pups at Friskney South, five adults and pups at the Rodger site, and none were recorded at the Ants site. This equates to a very small proportion (up to 0.3%) of the total harbour seal count, of 3,484 adults and 1,268 pups in 2017 (SCOS, 2018).

A17.6.27In the vicinity of the three sites located closest to the shipping channel and anchorage location there are a further 47 haul-out locations to which seals could move if disturbed, without having to move too far. The increased shipping levels would be present year-round, therefore, any potential pupping sites along the route would be exposed to disturbance, meaning that any harbour seal looking for a pupping site would be exposed to the potential for increased disturbance prior to the birth of any pups each season, allowing individuals to choose a nearby site with no increased shipping levels (as a result of the Facility), if required. Harbour seal pups are born having pre-shed their white coat in utero and are able to swim almost immediately (SCOS, 2018); they would therefore not be confined to the site at which they were born if they were exposed to any disturbance effects due to the increased vessel movements.

A17.6.28The harbour seal haul-out sites within The Wash are submerged at high tide due to being situated on tidally submerged mudflats. The tidal nature of The Haven

means that ships will only be able to travel up the shipping channel at or near high tide, commencing from the anchor point a maximum of two hours before high tide, and ending a maximum of 1.5 hours after high tide. As a result, the harbour seal haul-out sites would be submerged and inaccessible to seals when vessels would be able to travel along the shipping channel. There would therefore be no potential for harbour seal at haul-out sites to be disturbed when the vessels are using the shipping channel. The closest haul-out site is 2.2km from the anchorage site, therefore there is no potential disturbance at harbour seal haul-out sites from vessels located in the anchorage area.

A17.6.29 Due to the distance of these sites to the shipping channel and anchorage location, the low number of harbour seal (and pups) present at the nearest sites, and the ability of harbour seals and pups to move to any one of the other suitable sites nearby, it is concluded that harbour seal within The Wash would not be exposed to a disturbance effect, while hauled-out, due to the increased number of vessels using the shipping channel and anchorage sites. Therefore, there would be ***no adverse effect on the integrity of The Wash and North Norfolk Coast SAC in relation to the Conservation Objectives harbour seal.***

#### Potential for effects on harbour seal as a result of increased collision risk

A17.6.30 As stated within **Section 17.8 of Chapter 17 Marine and Coastal Ecology** and discussed above, during the operational phase of the Facility, it is expected that there will be an increase in vessel traffic, with an additional 624 vessel movements per year expected over the current vessel numbers currently using the shipping channel. As outlined above, this is a small increase of vessel numbers through the existing shipping channel, with a 5.6% increase over annual vessel numbers within this channel.

A17.6.31 As discussed above, the existing levels of shipping traffic around the facility shipping corridor is high and harbour seals are therefore habituated to the presence of vessels and would be able to detect and avoid vessels. Although marine mammals are able to detect and avoid vessels, vessel strikes are known to occur, possibly due to distraction whilst foraging and socially interacting, or due to the marine mammals' inquisitive nature (Wilson *et al.*, 2007). Therefore, increased vessel movements can pose an increased risk of vessel collision to harbour seals.

A17.6.32 Studies have shown that larger vessels are more likely to cause the most severe or lethal injuries, with vessels over 80m in length causing the most damage to marine mammals (Laist *et al.*, 2001). The vessels for the proposed Facility are expected to be 100m in length. Vessels travelling at high speeds are considered

to be more likely to collide with marine mammals, and those travelling at speeds below 10 knots would rarely cause any serious injury (Laist *et al.*, 2001). The vessels moving to and from the Facility would be restricted to a speed of 4 knots within The Haven, and 6 knots through the shipping channel and anchorage area within The Wash, and therefore would be unlikely to cause serious injury.

A17.6.33 Although the risk of collision related to the operation of the Facility is likely to be low given the low speed of the vessels and restricted area in The Wash, as a precautionary scenario, the number of harbour seals that could be at increased collision risk with vessels during the operation of the Facility has been assessed based on 5% to 10% of the number of individuals that could be present in the shipping channel and anchorage location.

A17.6.34 In total, the area that has been defined as having the potential for an increase in collision risk for marine mammals is 10.46 km<sup>2</sup>, with an estimated density of 3.189 harbour seals per km<sup>2</sup> within this area (as calculated from the Russel *et al.*, 2017 data).

A17.6.35 A total of 1.7 harbour seals (or 0.05% of The Wash and North Norfolk Coast SAC population) could be at increased risk of collision if it is considered that 5% would be at risk, and a total of 3.3 harbour seals (or 0.1% of The Wash and North Norfolk Coast SAC population) may be at risk of collision with vessels if it is considered that up to 10% could be at risk. Taking into consideration the small relative increase in the number of vessels in the area, their slow speed of travel (of 6 knots or less) and restricted area of the shipping channel and anchorage site, the likelihood that harbour seals would be able to detect and avoid any vessels in order to avoid collision and the small number of seals that could be at risk; it can be concluded that there would be ***no adverse effect on the integrity of The Wash and North Norfolk Coast SAC in relation to the Conservation Objectives for harbour seals.***

#### **In-combination effects for marine mammals**

A17.6.36 With regard to marine mammals, the only effect being considered is that of increased vessel presence within the shipping channel and anchorage area. There are no other projects that would have an in-combination effect on increased vessel use of the same shipping channel, for example any vessels associated with the offshore wind farms that are located within 30km of the shipping channel and anchorage area, would not be using the same shipping



channel and instead travelling to other nearby ports, such as Kings Lynn. Therefore, there is no potential for in-combination effects for marine mammals.

## **A17.7 Conclusion**

A17.7.1 In this assessment, only impacts arising from the increased vessel movements through The Wash to reach the Facility during operation and air emissions relating to the operation of the Facility are considered. This was informed by the preliminary impact assessment, as well as by consultation with Natural England and MMO. These activities are as follows:

- Collision risk
- Visual disturbance
- Increased noise levels
- Potential deposition of NO<sub>x</sub>, SO<sub>2</sub>, nitrogen, acid and ammonia deposition on designated Annex I habitats.

A17.7.2 Visual and noise disturbance were screened in for likely significant effects regarding birds and marine mammals. Collision risk and disturbance to harbour seal haul-out sites were also considered to have a likely significant effect on marine mammals. It was concluded that the shipping channel to be used for the Facility had existing high levels of marine traffic, of which the Facility-related traffic would form a small portion of (624 Facility-related vessels per year, compared to 11,000 vessels per year in the shipping channel). With that in mind, as well as the slow speed of the vessels (6 knots or less) and the restricted area of the shipping channel and anchorage site, the likelihood that harbour seals in particular would be able to detect and avoid any vessels, and that the area of the shipping channel is considered a low risk area from shipping activities in relation to birds, no adverse effects on the integrity of the European designated sites in relation to the conservation objectives were concluded.

A17.7.3 It should be noted that impacts of air quality on Annex I habitats have not been assessed fully in this document. As such, this will be revised and re-assessed as necessary when further analysis of the modelling results are carried out.

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## Appendix A17.1.1 - HRA Screening Matrices

This appendix contains the HRA screening matrices for the Facility in accordance with the structure and format specified in PINS Advice Note 10. The Appendix is structured as follows:

- **Appendix A17.1.1.1:** HRA screening matrix for The Wash SPA
- **Appendix A17.1.1.2:** HRA screening matrix for The Wash and North Norfolk Coast SAC
- **Appendix A17.1.1.3:** HRA screening matrix for The Wash Ramsar site

## **Advice Note 10**

### **Habitats Regulations Assessment**

#### **Appendix A17.1.1: Screening Matrices for The Wash SPA, The Wash and North Norfolk Coast SAC, The Wash Ramsar site**

## Potential Effects

Potential effects upon the European site(s)<sup>2</sup> which are considered within the submitted HRA report for the Facility are provided in the table below.

**Table A17.1.1.1 Effects considered within the screening matrices**

Designation	Effects described in submission information	Presented in screening matrices as
The Wash SPA The Wash and North Norfolk Coast SAC The Wash Ramsar site	<ul style="list-style-type: none"> <li>Collision risk associated with increased vessel movements</li> </ul>	<ul style="list-style-type: none"> <li>Increased collision risk</li> </ul>
	<ul style="list-style-type: none"> <li>Visual disturbance from increased vessel movements</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance</li> </ul>
	<ul style="list-style-type: none"> <li>Increased underwater noise levels from vessel movements</li> <li>Increased above water noise levels from vessel movements</li> </ul>	<ul style="list-style-type: none"> <li>Changes to noise levels</li> </ul>
	<ul style="list-style-type: none"> <li>Changes to air quality during operation</li> </ul>	<ul style="list-style-type: none"> <li>Changes to air quality</li> </ul>

<sup>2</sup> As defined in Advice Note 10.

## STAGE 1: SCREENING MATRICES

The European sites included within the screening assessment are:

- The Wash SPA
- The Wash and North Norfolk Coast SAC
- The Wash Ramsar site

Evidence for, or against, likely significant effects on the European site(s) and its qualifying feature(s) is detailed within the footnotes to the screening matrices below.

### Matrix Key:

✓ = Likely significant effect **cannot** be excluded

✗ = Likely significant effect **can** be excluded

C = construction

O = operation

D = decommissioning

Where effects are not relevant to a particular feature the matrix cell has been formatted as follows:



## HRA Screening Matrix A17.1.1.1: The Wash SPA

Table A17.1.1.2 HRA Screening Matrix for The Wash SPA

Name of European site and designation: The Wash SPA															
EU Code: UK9008021															
Distance to NSIP: 3km															
European site features	Likely effects of NSIP														
Effect	Increased collision risk			Disturbance			Changes to noise levels			Changes to air quality			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Bar-tailed godwit ( <i>Limosa lapponica</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Bewick's swan ( <i>Cygnus columbianus bewickii</i> ), Non-breeding	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Black-tailed godwit ( <i>Limosa limosa islandica</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Common scoter ( <i>Melanitta nigra</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Common tern ( <i>Sterna hirundo</i> ), Breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Curlew ( <i>Numenius arquata</i> ), Non-breeding	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Dark-bellied brent goose ( <i>Branta bernicla bernicla</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>

Name of European site and designation: The Wash SPA															
Dunlin ( <i>Calidris alpina alpina</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Gadwall ( <i>Mareca strepera</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Goldeneye ( <i>Bucephala clangula</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Grey plover ( <i>Pluvialis squatarola</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Knot ( <i>Calidris canutus</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Little tern ( <i>Sternula albifrons</i> ), Breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Oystercatcher ( <i>Haematopus ostralegus</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Pink-footed goose ( <i>Anser brachyrhynchus</i> ), Non-breeding	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Pintail ( <i>Anas acuta</i> ), Non-breeding	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Redshank ( <i>Tringa totanus</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Sanderling ( <i>Calidris alba</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Shelduck ( <i>Tadorna tadorna</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Turnstone ( <i>Arenaria interpres</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Waterbird assemblage, Non-breeding	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>

Name of European site and designation: The Wash SPA															
Wigeon ( <i>Mareca penelope</i> ), Non-breeding	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>

### Evidence supporting conclusions:

- No significant extra shipping activity through the Wash will take place due to the Facility, during the construction and decommissioning phases. A majority of the marine related construction works will take place from the land side of the Facility (dredging, piling). No marine works will take place during the decommissioning of the Facility. Specific impacts from these have been assessed in **Chapter 17 Marine and Coastal Ecology, Section 17.8**. However, for the purposes of this HRA, no LSE was concluded.
- Although increased shipping activity throughout The Wash could affect qualifying bird species that fly low above the sea surface, or below, this is considered a low risk environment by Natural England, where the recommendation for a low risk impact is “*Unless there are evidence based case or site specific factors that increase the risk, or uncertainty on the level of pressure on a receptor, this pressure generally does not occur at a level of concern and should not require consideration as part of an assessment*” . As such, no LSE was concluded.
- There is no interaction of concern between the increased collision risk caused from the Facility, as determined from the supplementary information provided by Natural England. As such, no LSE was concluded.
- Increased ship activity throughout The Wash has the potential to affect the behaviour of roosting, foraging, commuting and breeding birds. LSE could not be excluded, as the qualifying interest features are at medium-high risk from visual disturbance caused by vessel movements.
- Increased noise levels in The Wash SPA poses a medium-high risk to these qualifying interest features, as it has the potential to affect their foraging, roosting and breeding behaviour. As such, LSE could not be excluded.
- Although birds are sensitive to changes in air quality, it is unlikely that the increase in air emissions caused from the Facility will impact the qualifying features. As such, no LSE was concluded. It should be noted that this will be revised as necessary when air quality modelling results are available.
- The screening exercise for a potential LSE has confirmed that there are no other plans or projects relevant to the assessment of effects for this site (**Table A17.5**). LSIE with other plans and projects, therefore, can be excluded for this European Designated Site.

## HRA Screening Matrix A17.1.1.2: The Wash and North Norfolk Coast SAC

Table A17.1.1.3 HRA Screening Matrix for The Wash and North Norfolk Coast SAC

Name of European site and designation: The Wash and North Norfolk Coast SAC															
EU Code: UK0017075															
Distance to NSIP: 3km															
European site features	Likely effects of NSIP														
Effect	Increased collision risk			Disturbance			Changes to noise levels			Changes to air quality			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>
Coastal lagoons	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>
Large shallow inlets and bays	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>
Mediterranean and thermo-Atlantic halophilous scrubs ( <i>Sarcocornetea fruticosi</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>
Mudflats and sandflats not covered by seawater at low tide	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>
Reefs	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>
Salicornia and other annuals colonising mud and sand	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>



Name of European site and designation: The Wash and North Norfolk Coast SAC															
Sandbanks which are slightly covered by sea water all the time	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>
Otter ( <i>Lutra lutra</i> )	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>
Harbour (common) seal ( <i>Phoca vitulina</i> )	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>h</sub>	x <sub>a</sub>

### Evidence supporting conclusions:

- No significant extra shipping activity through the Wash will take place due to the Facility, during the construction and decommissioning phases. A majority of the marine related construction works will take place from the land side of the Facility (dredging, piling). No marine works will take place during the decommissioning of the Facility. Specific impacts from these have been assessed in **Chapter 17 Marine and Coastal Ecology, Section 17.8**. However, for the purposes of this HRA, no LSE was concluded.
- There is no pathway for impact from the increased vessel movements caused from the Facility, as determined from the supplementary information provided by Natural England. As such, no LSE was concluded.
- The habitats most at risk from these activities are not suitable for otter foraging, breeding, resting or holt construction. It is considered unlikely that any otters would be present in the shipping channel and anchorage area to be at risk from these effects. As such, no LSE was concluded.
- The harbour seal and otter have the potential to be affected by increased vessel movements, as The Wash is a very densely populated area, especially with regards to seals. As such, LSE could not be excluded.
- The harbour seal has the potential to be impacted by increased the increased presence of vessels as well as the associated increase in underwater noise relating to the Facility during operation. As such, LSE could not be excluded.
- This assessment will be revised and updated as necessary when the air quality modelling results, as these Annex I habitats are at risk from changes in air quality and subsequent deposition.
- The air quality modelling carried out for the operational phase of the Facility concluded that the area of influence does overlap with the SAC. However, marine mammals are unlikely to be sensitive to the potential effect of the Facility on air quality during operation. As such, no LSE was concluded.

- h. The screening exercise for a potential LSE has confirmed that there are no other plans or projects relevant to the assessment of effects for this site (**Table A17.5**). LSIE with other plans and projects, therefore, can be excluded for this European Designated Site.

## HRA Screening Matrix A17.1.1.3: The Wash Ramsar site

Table A17.1.1.4 HRA Screening Matrix for The Wash Ramsar Site

Name of European site and designation: The Wash Ramsar site															
EU Code: site number 395															
Distance to NSIP: 3km															
European site features	Likely effects of NSIP														
Effect	Increased collision risk			Disturbance			Changes to noise levels			Changes to air quality			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Redshank ( <i>Tringa totanus</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Curlew ( <i>Numenius arquata</i> )	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Oystercatcher ( <i>Haematopus ostralegus</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Grey plover ( <i>Pluvialis squatarola</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Knot ( <i>Calidris canutus</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Sanderling ( <i>Calidris alba</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Black-tailed godwit ( <i>Limosa limosa islandica</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Ringed plover ( <i>Charadrius hiaticula</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Black-headed gull ( <i>Larus ridibundus</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>

Name of European site and designation: The Wash Ramsar site															
Common eider ( <i>Somateria mollissima</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Bar-tailed godwit ( <i>Limosa lapponica</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Shelduck ( <i>Tadorna tadorna</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Dark-bellied brent goose ( <i>Branta bernicla bernicla</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Dunlin ( <i>Calidris alpina alpina</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Pink-footed goose ( <i>Anser brachyrhynchus</i> )	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>c</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Golden plover ( <i>Pluvialis apricaria</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>
Lapwing ( <i>Vanellus vanellus</i> )	x <sub>a</sub>	x <sub>b</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>d</sub>	x <sub>a</sub>	x <sub>a</sub>	✓ <sub>e</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>f</sub>	x <sub>a</sub>	x <sub>a</sub>	x <sub>g</sub>	x <sub>a</sub>

### Evidence supporting conclusions:

- a. No significant extra shipping activity through the Wash will take place due to the Facility, during the construction and decommissioning phases. A majority of the marine related construction works will take place from the land side of the Facility (dredging, piling). No marine works will take place during the decommissioning of the Facility. Specific impacts from these have been assessed in **Chapter 17 Marine and Coastal Ecology, Section 17.8**. However, for the purposes of this HRA, no LSE was concluded.
- b. Although increased shipping activity throughout The Wash could affect qualifying bird species that fly low above the sea surface, or below, this is considered a low risk environment by Natural England, where the recommendation for a low risk impact is “*Unless there are evidence based case or site specific factors that increase the risk, or uncertainty on the level of pressure on a receptor, this pressure generally does not occur at a level of concern and should not require consideration as part of an assessment*” . As such, no LSE was concluded.

- c. There is no interaction of concern between the increased collision risk caused from the Facility, as determined from the supplementary information provided by Natural England. As such, no LSE was concluded.
- d. Increased ship activity throughout The Wash has the potential to affect the behaviour of roosting, foraging, commuting and breeding birds. LSE could not be excluded, as the qualifying interest features are at medium-high risk from visual disturbance caused by vessel movements.
- e. Increased noise levels in The Wash SPA poses a medium-high risk to these qualifying interest features, as it has the potential to affect their foraging, roosting and breeding behaviour. As such, LSE could not be excluded.
- f. Although birds are sensitive to changes in air quality, it is unlikely that the increase in air emissions caused from the Facility will impact the qualifying features. As such, no LSE was concluded. It should be noted that this will be revised as necessary when air quality modelling results are available.
- g. The screening exercise for a potential LSE has confirmed that there are no other plans or projects relevant to the assessment of effects for this site (**Table A17.5**). LSIE with other plans and projects, therefore, can be excluded for this European Designated Site.

## **Appendix A17.1.2: HRA Integrity Matrices**

This appendix contains the integrity matrices for the Facility, in accordance with the structure and format specified in PINS Advice Note 10. The Appendix is structured as follows:

- **Appendix A17.1.2.1: HRA Integrity Matrix for The Wash SPA**
- **Appendix A17.1.2.2: HRA Integrity Matrix for The Wash and North Norfolk Coast SAC**
- **Appendix A17.1.2.3: HRA Integrity Matrix for The Wash Ramsar site**

## **Planning Inspectorate**

### **Advice Note 10 Habitats Regulations Assessment**

#### **Appendix A17.1.2: Integrity Matrix for The Wash SPA, The Wash and North Norfolk Coast SAC, The Wash Ramsar Site**

## STAGE 2: EFFECTS ON INTEGRITY

Likely significant effects have been identified for the following sites:

- The Wash SPA
- The Wash and North Norfolk Coast SAC
- The Wash Ramsar site

These sites have been subject to further assessment in order to establish if the NSIP could have an adverse effect on their integrity. Evidence for the conclusions reached on integrity is signposted within the footnotes to the matrices below.

### Matrix Key:

✓ = Adverse effect on integrity **cannot** be excluded

✗ = Adverse effect on integrity **can** be excluded

C = construction

O = operation

D = decommissioning

Where effects are not relevant to a particular feature the matrix cell has been formatted as follows:





## HRA Integrity Matrix A17.1.2.1: The Wash SPA

Table A17.1.2.1 HRA Integrity Matrix for The Was SPA

Name of European site and designation: The Wash SPA															
EU Code: UK9008021															
Distance to NSIP: 3km															
European site features	Adverse effect on integrity														
Effect	Increased collision risk			Disturbance			Changes to noise levels			Changes to air quality			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Bar-tailed godwit ( <i>Limosa lapponica</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Bewick's swan ( <i>Cygnus columbianus bewickii</i> ), Non-breeding	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Black-tailed godwit ( <i>Limosa limosa islandica</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Common scoter ( <i>Melanitta nigra</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Common tern ( <i>Sterna hirundo</i> ), Breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Curlew ( <i>Numenius arquata</i> ), Non-breeding	a	a	a	a	xb	a	a	xb	a	a	a	a	a	a	a

Name of European site and designation: The Wash SPA															
Dark-bellied brent goose ( <i>Branta bernicla bernicla</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Dunlin ( <i>Calidris alpina alpina</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Gadwall ( <i>Mareca strepera</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Goldeneye ( <i>Bucephala clangula</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Grey plover ( <i>Pluvialis squatarola</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Knot ( <i>Calidris canutus</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Little tern ( <i>Sternula albifrons</i> ), Breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Oystercatcher ( <i>Haematopus ostralegus</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Pink-footed goose ( <i>Anser brachyrhynchus</i> ), Non-breeding	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Pintail ( <i>Anas acuta</i> ), Non-breeding	a	a	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Redshank ( <i>Tringa totanus</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Sanderling ( <i>Calidris alba</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Shelduck ( <i>Tadorna tadorna</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a

Name of European site and designation: The Wash SPA															
Turnstone ( <i>Arenaria interpres</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Waterbird assemblage, Non-breeding	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Wigeon ( <i>Mareca penelope</i> ), Non-breeding	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a

### Evidence supporting conclusions:

- The Stage 1 Screening assessment concluded that LSE could be excluded (HRA Screening Matrix A17.1.1.1), therefore no adverse effect on integrity can be concluded.
- Maintaining the integrity of this SPA is based on the maintenance of the population levels and extent of supporting habitats. Due to the narrow width of the shipping channel, the area of risk (for collision, disturbance and increased noise) will be limited. It is not expected that the proposed works would affect the population levels of any of the SPA species, nor is it expected to affect the supporting habitats, as assessed in **Chapter 17 Marine and Coastal Ecology, Section 17.8**, assessment of impacts on marine and coastal ecology. See **Section A17.6** for the relevant appropriate assessment.

## HRA Integrity Matrix A17.1.2.2: The Wash and North Norfolk Coast SAC

Table A17.1.2.2 HRA Integrity Matrix for The Wash and North Norfolk Coast SAC

Name of European site and designation: The Wash and North Norfolk Coast SPA															
EU Code: UK0017075															
Distance to NSIP: 3km															
European site features	Adverse effect on integrity														
Effect	Increased collision risk			Disturbance			Changes to noise levels			Changes to air quality			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Atlantic salt meadows ( <i>Glaucopuccinellietalia maritimae</i> )	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Coastal lagoons	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Large shallow inlets and bays	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Mediterranean and thermo-Atlantic halophilous scrubs ( <i>Sarcocornetea fruticosi</i> )	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Mudflats and sandflats not covered by seawater at low tide	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Reefs	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Salicornia and other annuals colonising mud and sand	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a

Name of European site and designation: The Wash and North Norfolk Coast SPA															
Sandbanks which are slightly covered by sea water all the time	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Otter ( <i>Lutra lutra</i> )	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Harbour (common) seal ( <i>Phoca vitulina</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a

### Evidence supporting conclusions:

- a. The Stage 1 Screening assessment concluded that LSE could be excluded (HRA Screening Matrix A17.1.1.2). Therefore, no adverse effect on integrity can be concluded.
- b. Due to the size of the shipping channel representing a very small proportion of The Wash area, the increased shipping activity (leading to collision risk, disturbance and noise) is unlikely to interfere with the population and distribution of the harbour seal and otter. As such, no adverse effect on integrity can be concluded. See **Section A17.6** for the relevant appropriate assessment.

## HRA Integrity Matrix A17.1.2.3: The Wash Ramsar site

Table A17.1.2.3 HRA Integrity Matrix for The Wash Ramsar Site

Name of European site and designation: The Wash Ramsar site															
EU Code: site number 395															
Distance to NSIP: 3km															
European site features	Adverse effects on integrity														
Effect	Increased collision risk			Disturbance			Changes to noise levels			Changes to air quality			In combination effects		
Stage of Development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Redshank ( <i>Tringa totanus</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Curlew ( <i>Numenius arquata</i> )	a	a	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Oystercatcher ( <i>Haematopus ostralegus</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Grey plover ( <i>Pluvialis squatarola</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Knot ( <i>Calidris canutus</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Sanderling ( <i>Calidris alba</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Black-tailed godwit ( <i>Limosa limosa islandica</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Ringed plover ( <i>Charadrius hiaticula</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Black-headed gull ( <i>Larus ridibundus</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a
Common eider ( <i>Somateria mollissima</i> )	a	xb	a	a	xb	a	a	xb	a	a	a	a	a	a	a

Name of European site and designation: The Wash Ramsar site															
Bar-tailed godwit ( <i>Limosa lapponica</i> )	a	x b	a	a	x b	a	a	x b	a	a	a	a	a	a	a
Shelduck ( <i>Tadorna tadorna</i> )	a	x b	a	a	x b	a	a	x b	a	a	a	a	a	a	a
Dark-bellied brent goose ( <i>Branta bernicla bernicla</i> )	a	x b	a	a	x b	a	a	x b	a	a	a	a	a	a	a
Dunlin ( <i>Calidris alpina alpina</i> )	a	x b	a	a	x b	a	a	x b	a	a	a	a	a	a	a
Pink-footed goose ( <i>Anser brachyrhynchus</i> )	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Golden plover ( <i>Pluvialis apricaria</i> )	a	x b	a	a	x b	a	a	x b	a	a	a	a	a	a	a
Lapwing ( <i>Vanellus vanellus</i> )	a	x b	a	a	x b	a	a	x b	a	a	a	a	a	a	a

### Evidence supporting conclusions:

- a. The Stage 1 Screening assessment concluded that LSE could be excluded (HRA Screening Matrix A17.1.1.3). Therefore, to adverse effect on integrity can be concluded.
- b. Maintaining the integrity of this SPA is based on the maintenance of the population levels and extent of supporting habitats. Due to the narrow width of the shipping channel, the area of risk (for collision, disturbance and increased noise) will be limited. It is not expected that the proposed works would affect the population levels of any of the SPA species, nor is it expected to affect the supporting habitats, as assessed in **Chapter 17 Marine and Coastal Ecology, Section 17.8**, assessment of impacts on marine and coastal ecology. See **Section A17.6** for the relevant appropriate assessment.